

**This volume is dedicated to the memory
of the chief-editor Hüseyin Özdikmen's father-in-law**

TURGUT AKÇAY

who lived an honorable life

MUNIS

ENTOMOLOGY & ZOOLOGY

Ankara / Turkey

Scope: Munis Entomology & Zoology publishes a wide variety of papers on all aspects of Entomology and Zoology from all of the world, including mainly studies on systematics, taxonomy, nomenclature, fauna, biogeography, biodiversity, ecology, morphology, behavior, conservation, paleobiology and other aspects are appropriate topics for papers submitted to Munis Entomology & Zoology.

Submission of Manuscripts: Works published or under consideration elsewhere (including on the internet) will not be accepted. At first submission, one double spaced hard copy (text and tables) with figures (may not be original) must be sent to the Editors, Dr. Hüseyin Özdikmen for publication in MEZ. All manuscripts should be submitted as Word file or PDF file in an e-mail attachment. If electronic submission is not possible due to limitations of electronic space at the sending or receiving ends, unavailability of e-mail, etc., we will accept “hard” versions, in triplicate, accompanied by an electronic version stored in a floppy disk, a CD-ROM.

Review Process: When submitting manuscripts, all authors provides the name, of at least three qualified experts (they also provide their address, subject fields and e-mails). Then, the editors send to experts to review the papers. The review process should normally be completed within 45-60 days. After reviewing papers by reviewers: Rejected papers are discarded. For accepted papers, authors are asked to modify their papers according to suggestions of the reviewers and editors. Final versions of manuscripts and figures are needed in a digital format.

Preparation of Manuscripts

All manuscripts must be typed in English, using Microsoft Word. Entire manuscript must be double-spaced, with margins of at least 2-3 cm on all sides of the page (A4). Pages should be numbered consecutively. Authors whose native language is not English are encouraged to have their manuscripts read by a native English-speaking colleague before submission. Nomenclature must be in agreement with the International Code of Zoological Nomenclature (4th edition 1999). Author(s) of species name must be provided when the scientific name of any animal species is first mentioned (the year of publication needs not be given; if you give it, then provide a full reference of this in the reference list). Authors of plant species name need not be given. Metric systems should be used. If possible, use the common font Times New Roman (12 pt) and use as little formatting as possible (use only bold and italics). Special symbols (e.g. male or female sign) should be avoided.

Title and Name(s) of Author(s): The title should be informative and as possible as brief, in boldface capital letters, not exceed twenty words. The higher taxa containing the taxa dealt with in the paper should be indicated in parentheses. Full name(s) of author(s) should come underneath the title with full address, each on a separate line. The author(s) name (s) should be given in boldface lower case.

Abstract: The abstract should be concise and should draw attention to the significant contents of the paper and the author's main conclusions. It should normally not exceed 200 words and should contain no uncommon abbreviations or references. Any new names or new combinations proposed in the paper should be mentioned. The abstract should be followed by a list of key words. Up to seven keywords should be suggested by the author.

Text: Regular papers include as the main sections (except in Book Reviews and Scientific Notes etc.); Introduction, Material & Methods, Results, Discussion, Acknowledgments and Literature Cited. The section introduction should be written without a title. However, the main sections may be varies with different types of papers. According to types of papers, main section can be changed. All scientific names (only genus and species group names) should be italicized throughout the paper, including literature cited. References should be cited in the text as Turgut (2003), Turgut & Turgut (2000) or Turgut et al. (2001) (3 or more authors), or alternatively in a parenthesis (Turgut, 2003; Turgut & Turgut, 2000 or Turgut et al., 2001). All literatures in the text must be listed alphabetically in the literature cited in the following format.

Journal paper:

Turgut, S. 2003. Title of the paper. Title of the journal in full, volume number: page range.

Book chapter:

Turgut, S. & Turgut, A. 2000. Title of the Chapter. In: Turgut, A., Turgut, B. & Turgut, C. (Eds.), Title of Book. Publisher name and location, page range.

Book:

Turgut, A., Turgut, B. & Turgut, C. 2001. Title of Book, Publisher name and location, number of pages (e.g. 123 pp).

Internet resources:

Turgut, S. 2002. Title of website, database or other resources, Publisher name and location (if indicated), number of pages (if known). Available from: <http://xxx.xxx.xxx/> (Date of access).

Tables, Illustrations and Photographs: Tables, illustrations and photographs should be submitted in a separate file, not embedded in the text. They should be given at the end of the manuscript. Please use the table function in your word processor to build tables so that the cells, rows and columns can remain aligned when font size and width of the table are changed. Illustrations should be clean, sharp, with good contrast. Small illustrations should be grouped into plates. For species illustration, line drawings are preferred, although good quality B&W photographs are also acceptable. Maximum size of printed illustration, including all legends, is 12 x 16 cm. Images must be submitted either in .tif, .jpg, or .pdf (PC compatible format strongly preferred). Digital versions of illustrations should be prepared as follows: photographs should be saved as .pdf or .tif format at 300 dpi. Line figures should be saved in .tif or .jpg at 300 dpi. All illustrations must be numbered consecutively using Arabic numerals. They should be cited "Fig. 1" or "Figs. 1–4" in sequential order. Photographs must be of exceptional quality, good contrast.

Scientific Notes and Book Reviews. These are usually short contributions, typically not exceeding one (Book Review) or two (Scientific Notes) printed pages. Scientific notes and book reviews lack an abstract and most of the main headings, except for the acknowledgements and the literature cited sections.

Page Charge: There is no page charge for publishing with MEZ.

MEZ is indexed in Zoological Record, Biological Abstract, Biosis Preview, Agricola, ...

**PHILOSOPHY, EVOLUTION, AND TAXONOMY, OR:
WHAT BIOLOGICAL CLASSIFICATION IS FOR?
(PRACTICISING BIOLOGIST'S COMMENTS
ON SOME RECENT PAPERS BY PODANY)**

Roman B. Holynski*

* PL-05822 Milanówek, ul. Graniczna 35, skr. poczt. 65, POLAND. E-mail: holynski@interia.pl

[Holynski, R. B. 2011. Philosophy, evolution, and taxonomy, or: what biological classification is for? (practicising biologist's comments on some recent papers by PODANY). Munis Entomology & Zoology, 6 (2): 525-534]

ABSTRACT: Recently PODANY (2009; 2010a, b) published some papers promoting several (individually not novel, but composed into – to my knowledge – rather original complex) ideas from the notoriously controversial “triple junction” area between philosophy, evolution, and taxonomy. His main (at least in my evaluation) implicit thesis (that biological facts should be interpreted according to philosophical theorems) led him to several explicit conclusions, the two most important from the practising taxonomist's point of view being: 1) that diachronic classifications are ambiguous, incompatible with either Linnean hierarchy or Darwinian evolutionary postulates, and therefore only synchronic systems are sound; and 2) that binominal nomenclature is illogical and unnecessary, therefore genus names should be abandoned or fixed as parts of uninomina. As in my opinion these ideas should not be left uncommented, I wish to present some critical remarks here.

KEY WORDS: Classification, evolution, nomenclature, paraphyly, philosophy, taxonomy.

It is time that taxonomists find their backbones. A series of compromises and accommodations in the 20th century only served to further marginalize taxonomy.
WHEELER 2007

While towards the end of XX century advocates of strictly cladistic (based on the HENNIGIAN dogma of unacceptability of paraphyletic taxa) classifications seemed to have almost completely overrun at least the declarative “surface” of taxonomy (consistent implementation in the taxonomic **practice** – except in some groups – has been modernistic extravagance rather than rule...), in the last years the defenders of the synthetic (“evolutionary”, recognizing the priority of information content and truth to biological reality – cf. HOLYŃSKI 2005 for introduction of, and/or argumentation for, the terminology used here and in my other publications) systems begin to regain the voice in the dispute (e.g. BRUMMITT 2006; HOLYŃSKI 2005, 2008, 2010; HÖRANDL 2006, 2007, 2010; HÖRANDL & STUESSY 2010; MAYR & BOCK 2002; NORDAL & STEDJE 2005; STUESSY 2009; STUESSY & KÖNIG 2008, 2009). Acceptation of one or another of these approaches [some more or less intermediate suggestions do also exist, but from the perspective of our present considerations all of them are but insignificant “varieties” of this or that “main” idea] has various far-reaching theoretical, methodological, and practical consequences, and in this sense the “paraphyly contest” is arguably one of the most fundamental controversies in contemporary biology. Recent papers by PODANY (2009; 2010a, b) may serve as a good illustration of the kind of conclusions rigid application of the cladistic principles leads to, and as such they are certainly worthy of critical comments.

Beatty (1982) acknowledges that he is uncertain "under what circumstances, if any, scientists should take philosophers seriously". I am equally uncertain.
PLATNICK 1982

PODANY's argumentation (like those – even if not always so explicitly stated – of other cladists) is evidently (and admittedly: e.g. *"I do not think in science there is stronger argumentation than what results from a clear logic"* – PODANY 2010a) based on his firm conviction that consistency with logical/philosophical theorems should be considered absolutely decisive in solving taxonomic (and scientific in general) problems. At the first glance this looks incontestable, and indeed **in abstract philosophical sense** it is – but scientists do not work in abstract philosophical "environment", and their aim is not to solve abstract philosophical questions! Logical inference is reliable **only inasmuch** as reliable (and applicable to particular problem!) are the initial premises; as the basic philosophical theorems represent by far too *"different phenomenological levels"* [to use ELDREDGE & CRACRAFT's (1980) phrase] to make their applicability to biological issues directly assessable, the premises of argumentation must be based on **observed biological facts**, observed facts must be considered decisive in evaluation of results (and then – if somebody is interested – the final conclusion may be interpreted in terms of philosophical tenets – see HOLYŃSKI 2005 for more extensive explanation). Proceeding in the opposite direction amounts to invitation for errors (*"Logic has prompted many geologists, that ... humid periods – pluvials – should correspond to glacials of higher latitudes, but the same logic suggested to others, that pluvials should match warm, and thence humid, interglacials. Alas, hypotheses based only on logic, however 'iron-firm' may it be, often lead astray"* – VAN ANDEL 1991 [my retranslation from Polish]).

A natural system of classification seeks to build groups based on many congruent characters and character states. The more congruent characters that are employed successfully, the greater the information content of the system, and the more robust and stable it should remain even in the face of new information being added to it.
STUESSY 2009

So, although PODANY arrived at his conclusions by deduction from several preconceived assumptions, I will follow the opposite way: evaluating first his final stipulations in light of observed biological reality and only thereafter analyzing particular arguments set forth by him to substantiate his claims. But first of all we must answer the – very rarely discussed or even posed, but absolutely fundamental – question: **what is biological classification and what is it for?** My views have been formulated and argued in detail in several earlier publications, so here some brief quotations from one of them (HOLYŃSKI 2005) will suffice: *"classifications are taxonomic hypotheses"*, and – as *"the most essential property of a hypothesis is its predictive power"* [*"prediction is the very hallmark of science – indeed, ... a science isn't really a science if it lacks the power to predict"* (ELDREDGE 1989)] – *"they also should be evaluated on the same basis: according to the extent to which the (morphological, ecological, physiological, genetical, or any other) characteristics of an organism may be predicted from its placement in the system"*. Having said this, how can we judge PODANY's proposals?

Phylogenetic nomenclature ... offers many opportunities for interesting philosophical debate, but it is patently an absurd proposition as a practical system.
BENTON 2000

Let me start with the simpler one: the call for uninominal nomenclature. Nomenclature is a [component of] the language of taxonomy, a **tool** enabling taxonomists (or anybody speaking about living organisms) understand what are they speaking about. The most important property expected from any tool is to be **functional**; in case of language this means to enable as easy, as exact, and as unequivocal exchange of views and ideas as possible. And it was just the effort to maximally approach this goal that prompted the “father” of modern biological nomenclature to invent the binominal system! In the pre-Linnean times nomenclature was basically uninominal (“*vulpes*”, “*cuculus*”, “*apis*”, “*lilium*”), but even then the majority of less well-known animals were not given separate “one-unit” names, being rather “attached” to a more popular one with some words added as characters distinguishing them from the “model” [“*Homo diluvii testis*”, “*Elephas marinus sibericus*”, “*Hirudo cauda utrinque pinnata*”, &c.] – in principle exactly the same practice that was later formalized by LINNAEUS as obligatory binomina consisting of a “*Genus proximum*” and a “*differentia specifica*” [that both the “*genus*” and “*differentia*” were frequently erroneous – “Siberian marine elephant” has been proven a “composite” of walrus and mammoth, “man who witnessed the deluge” was in fact a salamander living, at that, much-much earlier than the “deluge”, “leech with the tail feathered on both sides” is now known as a parasitic copepod – is of course a completely different story]. Indeed, in the “compound” names used by pre-Linnean authors the added, distinguishing part often consisted of only one word (so the entire name was a binomen) thus many of them have been later simply adopted (and so made “available”) by LINNAEUS or his contemporaries and are “officially” used today. Also the vernacular names used by laymen all-over the world are very frequently of the same structure (“flying fox”, “white stork”, “honey bee”, “sugar cane”, “red oak” &c.); similarly, almost everywhere in the world the time of “uninominal” names of people (Imhotep, Hypatia, Attila, Beowulf) has passed long ago and we changed to “binominal nomenclature”: Francesco PIZARRO, Margaret THATCHER, Maria [CURIE-]SKŁODOWSKA... Such nearly universal tendency is, of course, not accidental: LINNAEUS knew very well why to adopt this, so widely established and tested scheme: to remember the meaning of even those few thousand names of the then known species of organisms separately, “out of context”, was practically impossible, they must have been added a “sign-post” pointing to the group (“*Genus proximum*”) the particular taxon belongs to. But by now biologists have described and named not thousands but millions of species (and scores of subspecies...), and these represent but a fraction of those really existing (to be – hopefully before they become **non**-existent... – described and named in future), so the (to say it very mildly...) impracticability of uninominal nomenclature is more than evident [and the – reasonable by themselves – suggestions of “*harmonization of the three codes*” (PODANY 2010a) would further underscore its worthlessness...]: even the mere invention of tens of millions of unique (non-homonymous) pronounceable combinations of letters would be a formidable task, but their proper application to the actually meant taxa by the speaker or writer, and then correct “re-translation” by listener or reader, would demand supernatural abilities!

Taxonomic hierarchies allow for retrieval of vastly more information on an included taxon (even if only by inference from knowledge of relatives) than the isolated species name alone.

NEW 1999

Well, one can say that also now nobody can know and remember the genus-names of all the animals and plants; indeed, the decades of efforts of indefatigable followers of “*current fashion of ‘split first and think later (if at all)’*” (HARVEY 2001) have produced such a multitude of “microgenera” that even within the group of one taxonomist’s special interest (e.g. in “my” **Coleoptera: Buprestidae**) it is very difficult to remember them all... This is true, but, on the one hand this is a problem created by some taxonomists, not “original sin” of binominal nomenclature, and on the other it is anyway much easier to remember several hundred generic names than fifteen or twenty thousand (in jewel-beetles – HOLYŃSKI 2001) of specific uninomina. And do not forget the information content: even if I would have never heard of *Metataenia longicollis* (KERR.), the very fact that the first part of its name is *Metataenia* gives me a general knowledge about this species: that it is a buprestid, lives somewhere in SW-Pacific, is about 15-25 mm. long, &c. (and if also the subgeneric – *Cyphogastrella* – name is mentioned, my acquaintance with the beetle is further augmented); from an uninominal epithet I know nothing...

The PhyloCode rests on arguments that range from the misguided (e.g. that names should be immutable for hypotheses that change; ...) to the false (e.g. that the PhyloCode is more stable than the Linnaean system; ...) to the absurd (e.g. that the Linnaean system cannot convey evolutionary schemes because it predates Darwin). ... it may be fairly concluded that what the PhyloCode seeks to do does not need to be done and what it claims to do it does not.

WHEELER 2004

So, what are PODANY’s arguments against the Linnean system? The main objection seems to be “*that genera have no meaning in the context of evolution*”, and “*if species are the only entities which have ... more or less sharp boundaries, while genera and those above do not, why do we attach the name of a species to the name of a higher taxon if the contents of that taxon varies in time?*” (PODANY 2010a). These reproaches are untrue both as regards genera (they **do have** evolutionary meaning, even if different from what the author has apparently in mind) and species (they **not always** have sharp boundaries), but even if true they are irrelevant: contrary to PODANY’s logic (that “*using binominals ... goes back to pre-evolutionary thinking and is therefore* [emphasis mine – RBH] *in serious conflict with evolutionary theory*”), not everything “*pre-evolutionary*” is necessarily “*in conflict with evolutionary theory*” even if both refer to the same objects (LINNAEUS’ **pre-evolutionary** classification in which wolf is closer to elephant than to sparrow or lizard fully agrees with modern **evolutionary** conclusions), and especially when their scopes **do not** overlap! The function of a language is not to describe or reflect our changing concepts but to enable communication between people; the function of biological nomenclature – as an element of language – is not to reflect evolutionary theory but to provide unequivocally understandable names to the objects of biologists’ interest. Whether these objects – groups of organisms, taxa – developed in the process of evolution, have been separately created by God, appeared independently from each other as a result of *ludus naturae*, or even are but a product of our imagination without real existence, is in this context perfectly immaterial: the only question that matters is how efficiently (exactly, unequivocally, easily) they can be recognized by their names: nomenclature is a **tool**, not a theory!

Whatever species concept or better stated whatever set of criteria for recognizing species taxa one accepts, this concept or set of recognizing criteria must be applied consistently to all organisms if species taxa are to have any meaning in describing biodiversity or in comparative studies in biology.
BOCK 2004

As signalized above, the allegations of “sharp boundaries” of species and “no meaning” of genera are not true, but the question of their justness being irrelevant to the matters of nomenclature, it will be better to discuss them in the context of taxonomy – so let us now turn to PODANY’s other stipulation: that of synchronous classification. Had this proposal been put forward by a dogmatic creationist, I would not be surprised: indeed, if “*tot sunt species quot creavit ab initio infinitum Ens*”, then we can classify only those species living today and need not bother with those of geological past because they either did not exist (fossils are but a result of Nature’s joke, *ludus naturae*, as it was explained in Middle Ages), or were the same which we observe now. Or, if – as according to CUVIER-D’ORBIGNY’s “theory of catastrophes” – in each epoch of its history the Earth was inhabited by separately created set of organisms, then the idea (quoted from CROWSON 1970) “to construct a separate classification of each era of the geological past” (PODANY 2010a) would make sense. But how can such concepts be fitted in the **evolutionary** context is totally beyond my comprehension... If we accept that all species have evolved from common ancestor; that the features of their structure, life and reproduction are variations traceable to the same fundamental “groundplan”; that extinction is as immanent aspect of phylogeny as speciation; &c., then we must also accept the fact that *Hallucigenia sparsa*, *Lepidodendron obovatum* or *Archaeopteryx lithographica* is perfectly “legitimate”, “full-right” element of the System of Life, exactly equivalent to *Boletus edulis*, *Dynastes hercules* or *Alligator mississippiensis*, and any classification excluding them would be atrociously distorted and misleading. As to separate classifications for each geological epoch, it is an evidently unrealistic proposal for the evolving organisms: since the origin of life, continuously throughout millions of years, some taxa become extinct, some others transform, new ones originate, so we would need at least thousands – not several tens (demanded by as many CUVIERIAN catastrophes) – of different systems, each of them fragmentary, unnatural, and no more reasonable or serviceable than separate classifications for organisms inhabiting each one-degree-of-longitude “lith” of the Earth or those described in each particular year...

The proximal aims of systematic biology are not to determine which of the many processes that shape evolution were operative in a particular instance, but to recognize the end-products of that history and to analyze the relationships among them.... insistence on the nonconspecificity of mother and daughter species that are identical in every respect is simply a belief divorced from evidence.

WHEELER & PLATNICK 2000: 93

PODANY’s main (as I understand him) argument against diachronous classification consists of what he calls “boundary paradox”: “*morphological and genetic gaps between higher taxa are the result of evolution; they are apparent only at a horizontal cross section of the phylogenetic tree*”, i.e. “*the classification itself evolves*” (PODANY 2009) and so, what an “imaginary taxonomist” at some “Time 1” in the past would consider a pair of closely related species, later on could develop into what another “imaginary taxonomist” at the “Time 2” would recognize as two genera, and for a recent specialist (“Time 3”) appears as distinct

families; “*obviously, our taxonomist at Time 1 did not put them into separate families because he could not **predict** [emphasis in the original] that divergence would be so strong*” (PODANY 2010a). All this is of course true but – again! – irrelevant! We are taxonomists of the “Time 3”, we **do know** (or, at least, assume to have known) the phenetic, genetic, taxonomic and evolutionary relationships between studied taxa, and based on this: on **our present** knowledge – **not on the knowledge of any “imaginary taxonomist” at any time in the past!** – propose our classification of the taxa known **to us** (we do not classify the organisms of “Time 4, 5, 6” or any other in the future)! Similarly true but irrelevant is that “*single classification, ... cannot reflect faithfully the process of evolution, only the results of it. ... a phylogenetic tree can*” – yes, of course! **just this** is the difference between their respective functions and purposes: to reconstruct and illustrate (e.g. in the form of trees) the process (or, more exactly, the course) of evolution is the task of **phylogeny**, while that of **taxonomy** is to discover and present as maximally informative (predictive) classification[-s] the **observed** pattern of “biodiversity” [and “*once the order has been found, we may, if we wish, assume that it’s the result of evolution*” (PLATNICK 1979 as quoted by PODANY 2009)]! By the way, the reproach of “ambiguity” against “pattern cladists” (“*who maintain that evolutionary pattern is central to their version of cladistics, while they dismiss the entire field of phylogeny reconstruction*” as the base for their classifications – PODANY 2009) is apparently a result of confusion between the **search for** the natural patterns and their **interpretation** (the distinction so clearly formulated by PLATNICK’s remark quoted above); it is just this, unfortunately frequent, confusion what allows creationists to claim that evolution is not a **fact** established as a **result** of scientific research, but on the contrary: scientific research (at least in biology) is **based on “preconceived dogma”** of evolution...

Unfortunately living organisms do not readily submit to our attempts to neatly categorize them. POOLE & VAN BERGEN 2006

Another alleged shortcoming of diachronous classification is that it “*can at best be a fuzzy one (i.e. without crisp boundaries)*” (PODANY 2009). Again, it seems to me a rather strange reproach in a publication by an author constantly adducing evolution as the basic “axiom” in any consideration: nothing would have pleased creationists more than the discovery that “crisp boundaries” separate all, or the majority of, taxa: this would be the best imaginable proof that evolution does not occur! In fact, the boundaries are “fuzzy” because the **true** relationships between **natural** taxa **are** fuzzy – they are such (as, by the way, the Author himself admits at several other occasions) also among “synchronous” species! – and if we wish our classifications to be natural, we must accept the fact and fit the “fuzziness” into them (or, for purely practical reasons, divide the **real**, fuzzy “border zones” by **admittedly conventional** “demarcation lines” – we do so frequently everywhere: the boundaries between colours, languages, oceans, biogeographical regions, between fluids and gases, planets and stars, &c., &c., &c., are all “fuzzy” (even if **artificially represented** as sharp) because such is the “nature of the Nature” that **natural** boundaries are rarely “crisp”!

Dividing up an evolutionary tree into mutually exclusive families, genera, and species, which are all strictly monophyletic, is a logical impossibility. ...The insistence on monophyletic taxa is increasingly causing unnecessary chaos in taxonomy.

NORDAL & STEDJE 2005

And here we arrive at the question of paraphyly. First of all, I use this term in its traditional, the only meaningful and logical sense: it denotes the situation where **all the ancestors of any member of a group, back to – and inclusive of – the last common ancestor, belong to that group, but one or more side-branches do not**; so, it is the antithesis of **holophyly**, while that of **polyphyly** is **monophyly** (including **both** holo- and paraphyly – ASHLOCK 1971, 1984; HOLYŃSKI 2005; HÖRANDL & STUESSY 2010). The “*various definitions*”, of which PODANY (2010b) quotes three and which allegedly are source of confusion demanding “resolution” in form of introduction of additional terms (“*paraclady*”, “*parathety*” and their analogues for “*mono-*” – i.e. holo- – and poly- relationships) are in fact the **results** of confusion generated by HENNIG’s “ban” of paraphyletic taxa: his own – HENNIG (1966), quoted by PODANY (2010b) as “*definition P2*” – formulation “*A group of species that has no ancestor in common only with them*” is a glaring nonsense (according to it, a group consisting of colibris, sharks, anemones and roses is paraphyletic...), and NELSON’s (1971) “*An incomplete sister-group system lacking one species or one monophyletic species-group*” – “*definition P3*” (PODANY 2010b) is not much better (would the group become holophyletic if **more than one** species[-group] is removed???). All such “modified” definitions – like philosophical sophistications to the effect that “*supraspecific taxa are not evolvable entities*” or that “*taxa cannot ‘occur’ anyway*” (PODANY (2010a) – lack any **biologically relevant** substantiation, having been invented in the (anyway futile...) attempt to smother the evident absurdity of the consequence (“*ancestral taxa do not exist*”) of cladistic “paraphylophobia”: they **do not justify** the rejection of paraphyly but, to the contrary, preconceived dogma of unacceptability of paraphyletic taxa is the only justification **for them** (“*the need for a term to describe the condition now called paraphyly originated from the cladistic school of classification and not from the workers studying the evolutionary process*” – HÖRANDL & STUESSY 2010)! As in science just dogmas are unacceptable, and as this particular dogma leads to illogical assertions and unnatural (uninformative) classifications (see HOLYŃSKI 2010 for more detailed comments), there is no reason to consider cladistic taxonomy as valid alternative to synthetic (“evolutionary”) approach.

Farris’ claim that cladistic classifications also convey the most information about phenetic similarity ... is true only by its own criterion, one which is not related to overall similarity, ...

BOTTJER 1980

Some statements in these works are apparently based on terminological misinterpretations, being incongruent with the Author’s own arguments. So, *e.g.*, in one of the papers (PODANY 2010b) he quotes (as I understand, approvingly) FARRIS’ explanation that “... *a valid monophyletic taxon can be polythetic* ...” to assert in the other (PODANY (2010a) that “*evolutionarily minded biologists cannot say that ‘Boraginaceae occurred, say, 80 million years ago’*” because “*we do not know if the combination of defining characters was possessed at all by the last common ancestor population of any recent taxonomic group*”! First of all, we **can** – at least in principle – know (“reconstruct”) the characters of the ancestor: this is one of the aims of phylogenetic analyses. But, more importantly, whether or not in the “first boraginacean” **all** the “defining characters” of recent representatives had already been developed is, of course, utterly irrelevant **both from the cladistic and from the “evolutionary” point of view**: for a cladist what matters is only that the **clade** he calls “Boraginaceae” had occurred 80 million years ago; for a synthetic taxonomist – that at that particular time the

Earth was inhabited, among others, by plants which, **based on their characters**, would be, if found today, classified as belonging to **Boraginaceae**, and so there is no reason to exclude them from the family only because they had later become extinct. Even among recent organisms not all subtaxa (often **none** of them!) show all the characters typical for the group they belong to: several **Hexapoda** have four instead of six legs (or even do not have any), some **Carnivora** are specialized on plant food, we know apterous **Pterygota**, egg-laying mammals, non-segmented arthropods – and certainly many such examples could be quoted by any botanist, too! The meaning of the word “polythetic” is just “taxon defined by a set of characters, **none** of them being diagnostic **alone**”!

Although the Script is pure truth, nevertheless if scientific facts seem to contradict it, the interpretation of the respective fragment should be reconsidered. MAJMONIDES, teste KRAUSS (1999)

Similarly misconstrued is PODANY'S (2009, 2010a) “**hierarchy conflict**”: “**Linnaean classification corresponds to a so-called inclusive hierarchy**” where “**all species are of equal rank, all the genera are equal to one another, and so on**”, while “**exclusive hierarchy ... is a partition of objects such that there is an ordering relation among the classes**”. “**The relation between members of a higher taxon cannot be at the same time equivalence relation and subordinate relation**” but, although most taxonomists “**strive for a ... basically Linnean, ... inclusive hierarchy**” concepts of subordination (“**lower plants**” vs. “**higher plants**”, “**primitive**” vs. “**advanced**”, etc.) “**are still present in our biological thinking**” (PODANY 2010a – emphasis in the original). All this reasoning is based on misinterpretation. First of all, there is no logical impossibility in two (or more) “**objects**” being co-ordinate in one respect but at the same time one of them being sub-ordinate to the other from a different point of view, and the relation may even be opposite in still another hierarchy: when I was university student, the professor of systematic zoology (A) was the Head of Zoology Department while professor of animal physiology (B) was the Dean of the Faculty of Biology; so, as a member of staff of the Zoology Dept. B was subordinate to A, while as a lecturer in the Faculty of Biology A was subordinate to B, and at the same time they were equal as professors of their respective subjects! And similar is the situation with taxa: all extant species are evidently equal as tips of terminal branches of the evolutionary tree; all genera (orders, classes and so on) are equivalent **as units of classification**; but at the same time – if our ideas of evolution are more or less true – the common ancestor of hering, frog, snake, colibri and gorilla was a fish (if survived and found today, it would be classified as a fish), *i.e.* (notwithstanding the cladistic-philosophical objections of the Author against taxa as ancestors) **Pisces** are the group from which **Amphibia**, **Reptilia**, **Aves** and **Mammalia** **further** evolved: **in this sense – as a stage of evolutionary development** – fishes are “lower” than other classes of **Vertebrata**. And similarly other taxa can be considered equal as genera or families being simultaneously “lower” or “higher” according to the “**exclusive**” hierarchy based on their place in phylogeny or degree of structural development – there is no contradiction: simply the “**categories**” of “lower” and “higher” (or “primitive” and “advanced”) on the one hand, and “**ranks**” of taxonomic classification on the other, are “**levels**” of **different** hierarchies!

If we opt for paraphyletic grades such as Invertebrata and Pisces, then the system is ... at least noncommittal as to the branching sequences. In which case it is of no use for anyone who needs that

particular kind of information. On the other hand that particular kind of information can be clearly and unequivocally expressed in the form of a tree-like diagram. And since the tree does the job perfectly well, the arguments for a strictly genealogical arrangements are by no means compelling.

GHISELIN 1997

To sum up: if our classifications are to be natural, *i.e.* informative, predictive, reflecting true taxonomic relationships among organisms, then

- there is no biologically relevant reason to eliminate fuzzy border areas from classifications, so there is no biologically relevant justification to consider systems enforcing strict holophyly as valid alternative to those accepting paraphyletic taxa;
- there is no biologically relevant reason to treat extinct taxa differently from those living today, so there is no biologically relevant justification to consider synchronous classifications as valid alternative to those including all known representatives of the studied group;
- there is no biologically relevant reason to remove the generic “sign-post” component from names of species, so there is no biologically relevant justification to consider uninomina as valid alternative to well tested, efficiently functioning, traditional Linnaean binominal nomenclature.

Quod erat demonstrandum.

LITERATURE CITED

- Andel, T. H. van.** [1985] 1991. [New views on an old planet. Continental drift and the history of the earth] Historia Ziemi i dryft kontynentów. [Cambridge Univ. Press] Warszawa: PWN: 1-284.
- Ashlock, P. D.** 1971. Monophyly and associated terms. *Syst. Zool.*, 20: 63-69.
- Ashlock, P. D.** 1984. Monophyly: its meaning and importance. *In*: T. Duncan, T. F. Stuessy [eds.]. *Cladistics: perspectives on the reconstruction of evolutionary history.* [N.York: Columbia Univ. Press]: 39-46.
- Beatty, J.** 1982. Classes and cladists. *Syst. Zool.*, 31: 25-34.
- Benton, M. J.** 2000. Stems, nodes, crown clades, and rank-free lists: is Linnaeus dead? *Biol. Rev.*, 75: 633-648.
- Bock, W. J.** 2004. Species: the concept, category and taxon. *J. Zool. Syst.*, 42: 178-190.
- Bottjer, P. D.** 1980. Farris' “information content” and phylogenetic versus evolutionary classification: the philosophical differences remain. *Syst. Zool.*, 29 (4): 382-386.
- Brummitt, R. K.** 2006. Am I a bony fish? *Taxon*, 55 (2): 268-269.
- Crowson, R. A.** 1970. *Classification and biology.* N. York: Atherton Press: 1-350.
- Eldredge, N.** 1989. *Time frames: the evolution of punctuated equilibria.* Princeton (N.J.): Princeton Univ. Press: 1-240.
- Eldredge, N. & Cracraft, J.** 1980. *Phylogenetic patterns and the evolutionary process.* N.York: Columbia Univ. Press: 1-349.
- Farris, J. S.** 1974. Formal definitions of paraphyly and polyphyly. *Syst. Zool.*, 26: 548-554.
- Ghiselin, M. T.** 1997. *Metaphysics and the origin of species.* Albany (N.Y.): St. Univ. NY Press: 1-377.
- Harvey, P.** 2001. [Review]: Shirihi & al.: *Sylvia warblers. Identification, taxonomy and phylogeny of the genus Sylvia.* *Br. Birds*, 94 (6): 297.

- Hennig, W.** 1966. Phylogenetic systematics. Urbana: Univ. Illinois Press: 1-263.
- Holynski, R. B.** 2001. The number of species of the Indo-Pacific Buprestidae LEACH (Coleoptera). *Jew. B.*, 10: 35-48.
- Holynski, R. B.** 2005. Philosophy of science from a taxonomist's perspective. *Genus*, 16 (4): 469-502.
- Holynski, R. B.** 2008. God save us from friends, or: How to ensure taxonomy against passing away by dint of a successful operation? *Pol. Tax. Mon.*, 15: 3-54.
- Holynski, R. B.** 2010. Is paraphyly indication of poor taxonomy? – open letter to Drs. CARVALHO and EBACH. *Munis Ent. Zool.*, 5, Suppl.: 825-829.
- Hörandl, E.** 2006. Paraphyletic versus monophyletic taxa – evolutionary versus cladistic classifications. *Taxon*, 55: 564-570.
- Hörandl, E.** 2007. Neglecting evolution is bad taxonomy. *Taxon*, 56 (1): 1-5.
- Hörandl, E.** 2010. Beyond cladistics: Extending evolutionary classifications into deeper time levels. *Taxon*, 59 (2): 345-350.
- Hörandl, E. & Stuessy, T. F.** 2010. Paraphyletic groups as natural units of biological classifications. *Taxon*, 59 (6): 1641-1653.
- Krauss, L. M.** [1997] 1999. [Beyond Star Trek] Tajemnice Kosmosu. [Basic Books] Warszawa: Prószyński i Ska: 1-205.
- Mayr, E. & Bock, W. J.** 2002. Classifications and other ordering systems. *J. Zool. Syst. Ev. Res.*, 40: 169-194.
- Nelson, G. J.** 1971. Paraphyly and polyphyly: Redefinitions. *Syst. Zool.*, 20: 471-472.
- New, T. R.** 1999. Descriptive taxonomy as a facilitating discipline in invertebrate conservation. *Tr. R. Zool. Soc. NSW* [1999]: 154-158.
- Nordal, I. & Stedje, B.** 2005. Paraphyletic taxa should be accepted. *Taxon*, 54 (1): 5-6.
- Platnick, N. I.** 1979. Philosophy and the transformation of cladistics. *Syst. Zool.*, 28: 537-546.
- Platnick, N. I.** 1982. Defining characters and evolutionary groups. *Syst. Zool.*, 31 (3): 282-284.
- Podany, J.** 2009. Taxonomy versus evolution. *Taxon*, 58 (4): 1049-1053.
- Podany, J.** 2010a. Taxonomy in evolutionary perspective. *Synbiol. Hung.*, 6: 1-42.
- Podany, J.** 2010b. Monophyly and paraphyly: A discourse without end? *Taxon*, 59 (4): 1011-1015.
- Poole, I. & Bergen, P. F. van.** 2006. Physiognomic and chemical characters in wood as palaeoclimate proxies. *Plant Ec.*, 182: 175-195.
- Stuessy, T. F.** 2009. Paradigms in biological classification (1707-2007): Has anything really changed? *Taxon*, 58 (1): 68-76.
- Stuessy, T. F. & König, C.** 2008. Patrocladistic classification. *Taxon*, 57 (2): 594-601.
- Stuessy, T. F. & König, C.** 2009. Classification should *not* be constrained *solely* by branching topology in a cladistic context. *Taxon*, 58 (2): 347-348.
- Wheeler, Q. D.** 2004. Taxonomic triage and the poverty of phylogeny. *Phil. Tr. RS Lond. (B)*, 359: 571-583.
- Wheeler, Q. D.** 2007. Invertebrate systematics or spineless taxonomy? *Zootaxa*, 1668: 11-18.
- Wheeler, Q. D. & Platnick, N. I.** 2000. A critique from the Wheeler and Platnick phylogenetic species concept perspective: problems with alternative concepts of species. *In*: Wheeler Q. D., R. Meier [eds.]. 2000. Species concepts and phylogenetic theory: a debate. N. York: Columbia Univ. Press: 133-145.

THE FIRST ATTEMPT ON SUBGENERIC COMPOSITION OF *CHLOROPHORUS* CHEVROLAT, 1863 WITH FOUR NEW SUBGENERA (COL.: CERAMBYCIDAE: CERAMBYCINAE)

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE. E-mail: ozdikmen@gazi.edu.tr

[Özdikmen, H. 2011. The first attempt on subgeneric composition of *Chlorophorus* Chevrolat, 1863 with four new subgenera (Col.: Cerambycidae: Cerambycinae). Munis Entomology & Zoology, 6 (2): 535-539]

ABSTRACT: The paper gives the first attempt on subgeneric composition of *Chlorophorus* Chevrolat, 1863. As a result of this, a total of 5 subgenera (including the nominotypical subgenus) are described for the world fauna as *Chlorophorus* (s. str.) Chevrolat, 1863; *Chlorophorus* (*Immaculatus*) subgen. n.; *Chlorophorus* (*Perderomaculatus*) subgen. n.; *Chlorophorus* (*Humeromaculatus*) subgen. n. and *Chlorophorus* (*Crassofasciatus*) subgen. n.. The type species of new taxa are figured. A key for subgenera is also given in the text.

KEY WORDS: *Chlorophorus*, new subgenera, world fauna.

Genus *CHLOROPHORUS* Chevrolat, 1863: 290

[Type species: *Callidium annulare* Fabricius, 1787]

Body length is small generally. It is approximately between 10 and 15 mm.

Head very feebly elevated between antennal insertion; antennal insertion close approximate, distinctively narrower in width than lower eye lobe; Frons comparatively broad, flat, without carinae, with longitudinal smooth line or groove in middle part of posterior half, and produced tubercle near antennal base. Antennae shorter than the body, thicken slightly toward apex, rarely longer than body, thin, contiguous at base; space between antennae less than distance between upper lobes of eyes. Antennae not extended beyond half of elytra in both sexes. Pronotum laterally rounded, barely oblong or even transverse, disk uniformly convex, with dense punctuation, and dense adherent and setaceous erect hairs. Elytra truncate at apex or with truncate sharp outer angle, as an exception rarely rounded, with dark brown and light-colored adherent hairy coat forming characteristic pattern for each species, consisting of spots and transverse bands. Legs with femora gradually thickened towards apex. Mid femora are carinate along its length, sometimes the hind femora as well (Cherepanov, 1990).

Larval and pupal developments are in broadleaf trees (e.g. in Europe, *Prunus*, *Crateagus*, *Quercus*, *Ficus*, *Morus*, *Alnus*, *Fraxinus*, *Pistacia*, *Juglans*, *Ceratonia*, *Platanus*, *Fagus*, *Castanea*, *Tilia*, *Ulmus*, *Salix*, *Populus*, *Pistacia*, *Robinia*, *Malus*, *Pyrus*, *Vitis*, *Acer*, *Betula*, *Carpinus*, *Acacia*, *Eleagnus*, *Paliurus* etc. and e.g. in Turkey, *Ostrya*, *Carpinus*, *Crateagus*, *Quercus*, *Fagus*, *Castanea*, *Tilia*, *Ulmus*, *Pistacia*, *Pyrus* etc.), in herbaceous plants (*Salicornia*, *Achillea*, *Spartium*) and in woody legumes (*Ononis*, *Dorycnium*). Pupation is in the wood generally. Life cycle is about 2-3 years (Bense, 1995; Vives, 2000; Sama, 2002; Hoskovec & Rejzek, 2009).

The genus has about 200 species in the world fauna. It is a subcosmopolit or almost cosmopolit genus. In the Holarctic region (in America) and Neotropic region (in SE Brasil), however, the genus is represented by only one species as

Chlorophorus annularis (Fabricius, 1787) that is the type species of the genus. For example, Monné & Bezark (2009) stated the species, *Chlorophorus annularis* (Fabricius, 1787) introduced in USA and SE Brasil. So, the genus *Chlorophorus* has the Palaearctic, Ethiopic and Oriental chorotypes in real. Distribution of the known species of this genus is not wide spread in the world generally (Özdikmen & Turgut, 2009).

The original description of the genus *Chlorophorus* Chevrolat, 1863 as follows:

CHLOROPHORUS gen. nov.

Genre proposé pour le *Clytus annularis* Fab., et qui ne diffère des *Anthoboscus* qu'en ce que les antennes sont plus grêles et le prothorax très-arrondi.

CARACTÈRES GÉNÉRAUX:

Corps ailé, allongé, convexe, d'un beau jaune doré. Tête un peu plus longue que large, inclinée vers le bas, élevée sur la base même des antennes et formant en dessus une échancrure anguleuse, sillonnée au milieu, présentant sur chaque côté delà face une soudure latérale en forme de carène, appuyée au bord interne de chaque oeil. Palpes labiaux de 3 articles: 1^{er} subtriangulaire, coudé à sa base, 2^e pas plus large que haut, 3^e renflé, plus grand, subconique. Lèvre en carré transverse. Chaperon large, entré sur le dedans. Mandibules triangulaires, arquées et aiguës au sommet. Yeux oblongs, profondément lunulés au-dessus du milieu interne. Antennes grêles, de onze articles, n'atteignant que le milieu des élytres: 2^e article plus grand que le 1^{er} et que les 3^e et 4^e. Prothorax brièvement arrondi, aminci, coupé droit et étroitement rebordé aux extrémités, Écusson grand, semi-arrondi. Élytres longitudinalement convexes, terminées par une épine marginale. Pattes de moyenne longueur; cuisses effilées, un peu courbées à leur naissance, les postérieures limitées au sommet des étuis, à peine bidentées sur les genoux. Sternum étroit, allongé, tronqué en arrière. Hanches antérieures globuleuses, déprimées en dessus; cavités cotyloïdes circulaires, anguleuses en dehors.

CHLOROPHORUS s. str.

Diagnosis: Apex of each elytron truncate and extended into an angle on the outer edge; elytra with distinctly contrasting thick spots or stripes.

Type species of subgenus: *Callidium annulare* Fabricius, 1787: 156 (Fig. 1.1)

Original description of *Chlorophorus* (s.str.) *annularis* (Fabricius, 1787) as follows:

annulare.

C. thorace rotundato nigro maculato, elytris bidentatis subvirescentibus: fasciis cribris nigris; prima annulari.
Habitat in Siam.

IMMACULATUS subgen. n.

Diagnosis: Apex of each elytron truncate and extended into an angle on the outer edge; elytra uniform without any contrasting spot or stripe.

Type species of subgenus: *Chlorophorus kanoi* Hayashi, 1963: 134 (Fig. 1.2)

Original description of *Chlorophorus (Immaculatus) kanoi* Hayashi, 1963 as follows:

***Chlorophorus kanoi*, sp. nov.**

Body black, covered with light olive green pubescence throughout, especially densely on body and finely on appendages.

Vertex narrow, one-fifth as broad as the width of head (incl. eyes); antennae (δ) reaching the apex of basal two-fifths of elytra; 3rd joint as long as 4th and shorter than scape. Prothorax 1.1 times as long as broad, broadest just before middle, the base being a little broader than the apex (ratio, 8: 7). Elytra broader than prothorax (ratio, 10: 12) at the maximum width, and 2.4 times as long as the basal width, fairly rounded at humeri, straightly narrowed posteriorly and not fully covering abdomen, the apex obliquely truncate with acute external angles. Hind femora comparatively short, slightly surpassing elytral apex and not reaching at abdominal apex; 1st hind tarsal joint 1.25 times as long as the following two united together (ratio, 5 : 4). Length, 10-11 mm., width, 2.5-3 mm.

From Japan (Ryukyus).

***PERDEROMACULATUS* subgen. n.**

Diagnosis: Apex of each elytron truncate; elytra with distinctly contrasting thin stripes; each elytron without a distinct spot at the shoulder.

Type species of subgenus: *Cerambyx sartor* Müller, 1766: 188 (Fig. 1.3)

Original description of *Chlorophorus (Perderomaculatus) sartor* (Müller, 1766) as follows:

***Cerambyx sartor*, niger, thorace mutico subgloboso: elytris fuscis, lineolis, punctoque albis.**

Minor: nigra sunt caput, thorax, oculi, antennae, pedes; elytra fusca; apice, lineaque media obliqua curva, ac basi puncto, lineolisque duabus albis, minimis.

***HUMEROMACULATUS* subgen. n.**

Diagnosis: Apex of each elytron truncate; elytra with distinctly contrasting thin stripes; each elytron with a distinct spot at the shoulder.

Type species of subgenus: *Cerambyx figuratus* Scopoli, 1763: 55 (Fig. 1.4)

Original description of *Chlorophorus (Humeromaculatus) figuratus* (Scopoli, 1763) as follows:

***Cerambyx figuratus*.**

El. long. lin. 3 1/3 lat. 3/4.

Diagn. Niger; elytri fascia, linea obliqua clavata curva, punctoque ad basim, albis.

In floribus plantarum Umbellatarum.

Thorax ovatus, villiosus. Elytra apice truncata. Abdominis segmenta tria prima margine albo. Si ab uno angulo externo lineae obliquae elytri duceretur alia recta, tunc in elytris unitis resultaret rudis figura vultus. Elytri etiam apex albidus est.

CRASSOFASCIATUS subgen. n.

Diagnosis: Apex of each elytron rounded; elytra with distinctly contrasting thick strips (or rarely like spots).

Type species of subgenus: *Callidium trifasciatum* Fabricius, 1781: 244 (Fig. 1.5)

Original description of *Chlorophorus* (*Crassofasciatus*) *trifasciatus* (Fabricius, 1781) as follows:

trifascitum.

C. thorace globoso ferrugineo, elytris nigris, fasciis tribus atris, prima annulari.

Habitat in Lusitania.

A key for subgenera of *Chlorophorus*

1. Apex of each elytron truncate or truncate and extended into an angle on the outer edge..... **2**
 -. Apex of each elytron rounded..... **Crassofasciatus subgen. n.**
2. Apex of each elytron truncate..... **3**
 -. Apex of each elytron extended into an angle on the outer edge..... **4**
3. Each elytron without a distinct spot at the shoulder.....
 **Perderomaculatus subgen. n.**
 -. Each elytron with a distinct spot at the shoulder.....
 **Humeromaculatus subgen. n.**
4. Elytra with distinctly contrasting thick spots or stripes..... **s. str.**
 -. Elytra uniform without spot or stripe..... **Immaculatus subgen. n.**

LITERATURE CITED

- Bense, U.** 1995. Illustrated key to the Cerambycidae (excl. Dorcadionini) and Vesperidae of Europe. Margraf Verlag, Germany, 512 pp.
- Cherepanov, A. I.** 1990. Cerambycidae of Northern Asia. Cerambycinae 2 (1). Brill publ., New Delhi, 292 pp.
- Chevrolat, A.** 1863. Clytides d'Asie et d'Océanie. Annales de la Société Entomologique de France, 4: 253-347.
- Fabricius, J. C.** 1787. Mantissa insectorvm sistens eorvm species nvper detectas adiectis characteribvs genericis, differentiis specificis, emendationibvs, observationibvs. Tom. I. - pp. I-XX [= 1-20], 1-348. Hafniae.
- Fabricius, J. C.** 1781. Species insectorvm exhibentes eorvm differentias specificas, synonyma avctorvm, loca natalia, metamorphosin adiectis observationibvs, descriptionibvs. Tom. I. - pp. I-VIII [= 1-8], 1-552. Hambvrgi, Kilonii.
- Hayashi, M.** 1963. Revision of some Cerambycidae on the basis of the types of the late Drs. Kano and Matsushita, with. descriptions of three new species (Coleoptera: Cerambycidae). Insecta Matsumurana, 25 (2): 129-136.
- Müller, O. F.** 1766: Manipulus Insectorum Taurensium a C. Allioni editus. Miesekneia Taurinenoiië, 3 (non visum), pp. 185-198.

Özdikmen, H. & Turgut, S. 2009. A synopsis of Turkish *Chlorophorus* Chevrolat, 1863 with zoogeographical remarks (Coleoptera: Cerambycidae: Cerambycinae). Munis Entomology & Zoology, 4 (2): 577-595.

Sama, G. 2002. Atlas of the Cerambycidae of Europe and the Mediterranean Area, Volume I, Kabourek, Zlin, 173 pp.

Scopoli, J. A. 1763. Entomologia Carniolica exhibens insecta Carnioliae indigena et distributa in ordines, genera, species, varietates. Methodo Linnæana. - pp. [1-35], 1-420, [1]. Vindobonae.

Vives, E. 2000. Coleoptera, Cerambycidae. Fauna Iberica, Vol. 12. Museo Nacional de Ciencias naturales. CSIC. Madrid, 715 pp.

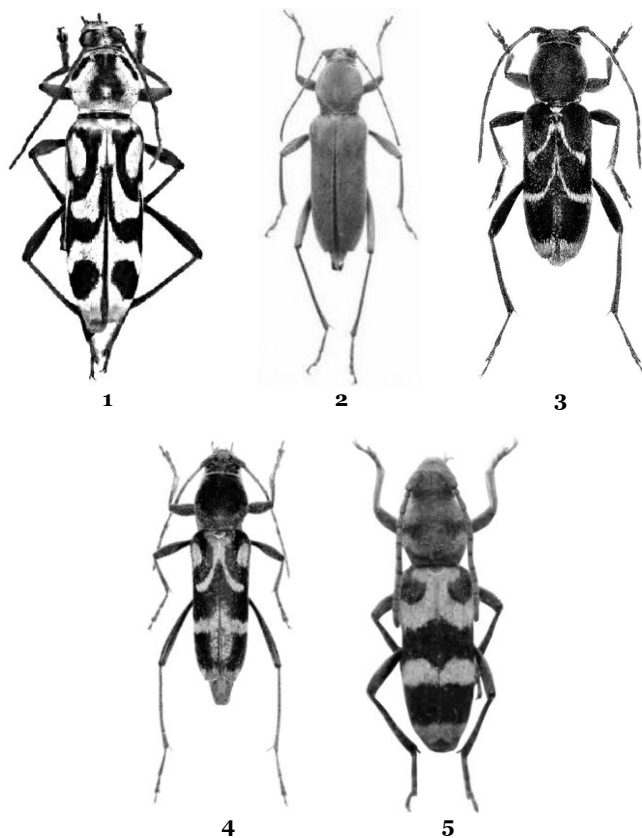


Figure 1. Dorsal view of type species of subgenera: 1. *Chlorophorus* (s.str.) *annularis* (Fabricius, 1787), 2. *Chlorophorus* (*Immaculatus*) *kanoi* Hayashi, 1963, 3. *Chlorophorus* (*Perderomaculatus*) *sartor* (Müller, 1766), 4. *Chlorophorus* (*Humeromaculatus*) *figuratus* (Scopoli, 1763), 5. *Chlorophorus* (*Crassofasciatus*) *trifasciatus* (Fabricius, 1781).

A COMPREHENSIVE CONTRIBUTION FOR LEAF BEETLES OF TURKEY WITH A ZOOGEOGRAPHICAL EVALUATION FOR ALL TURKISH FAUNA (COLEOPTERA: CHRYSOMELIDAE)

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE. E-mail: ozdikmen@gazi.edu.tr

[Özdikmen, H. 2011. A comprehensive contribution for leaf beetles of Turkey with a zoogeographical evaluation for all Turkish fauna (Coleoptera: Chrysomelidae). Munis Entomology & Zoology, 6 (2): 540-638]

ABSTRACT: The paper presents a comprehensive contribution for leaf beetles of Turkey with a zoogeographical analysis on entire Turkish fauna. Faunistical, taxonomical and zoogeographical information are given on 288 Turkish leaf beetles species with the present work. A check-list for all leaf beetles fauna of Turkey is also given in the text. Fifteen taxa as *Plateumaris consimilis* (Schränk, 1781) (Donaciinae); *Labidostomis cyanicornis* (Germar, 1822), *Smaragdina djebellina* (Lefevre, 1872) (Clytrinae); *Chrysolina analis* (Linnaeus, 1767), *Chrysolina saccharum* (Weise, 1890), *Chrysolina orientalis thraeissa* Bechyne, 1950, *Phratora vulgatissima* (Linnaeus, 1758) (Chrysomelinae); *Galerucella grisea* (Joannis, 1866), *Luperus viridipennis* (Germar, 1824) (Galerucinae); *Aphthona carbonaria* Rosenhauer, 1856, *Psylliodes picina* (Marsham, 1802) (Alticinae); *Cassida elongata* Weise, 1893, *Cassida flaveola* Thunberg, 1794, *Cassida parvula* Boheman, 1854, *Cassida sanguinosa* Suffrian, 1844 (Cassidinae) are recorded from Turkey for the first time. Also, four taxa as *Plateumaris sericea* (Linnaeus, 1760) (Donaciinae); *Smaragdina aurita* (Linnaeus, 1767) (Clytrinae); *Pachybrachis glycyrrhizae* (Olivier, 1808) and *Cryptocephalus octomaculatus* Rossi, 1790 (Cryptocephalinae) are recorded from Anatolia for the first time. Moreover, fourteen taxa as *Liliocercus merdiger* (Linnaeus, 1758), *Crioceris sokolowi* Jakobson, 1894, *Oulema duftschmidi* (Redtenbacher, 1874), *Oulema gallaeciana* Heyden, 1870 and *Oulema melanopus* (Linnaeus, 1758) for Criocerinae; *Labidostomis humeralis* Schneider, 1792, *Tituboea arabica* (Olivier, 1808) and *Smaragdina graeca* (Kraatz, 1872) for Clytrinae; *Cryptocephalus concolor* Suffrian, 1847 and *Cryptocephalus violaceus* Laicharting, 1781 for Cryptocephalinae; *Chrysolina reitteri pseudolurida* Roubal, 1917 and *Entomoscelis suturalis* Weise, 1882 for Chrysomelinae; *Monolepta anatolica* Bezdek, 1998 for Galerucinae and *Chaetocnema sahlbergii* (Gyllenhal, 1827) for Alticinae are added to the Palearctic Catalogue. So, 2 genera *Oulema* and *Monolepta* for Turkish fauna are also added to the Palearctic Catalogue. Furthermore, many taxa are also recorded from various provinces of Turkey for the first time.

KEY WORDS: Chrysomelidae, Fauna, Zoogeography, new records, Turkey.

Over the years, the Turkish leaf beetles fauna have undoubtedly been studied by various authors until now. Finally, Palearctic Catalogue of Chrysomeloidea (including the information on Turkish fauna) was published by Löbl & Smetana (2010). As known the authors for Chrysomelidae in the catalogue of Löbl & Smetana (2010) are H. Silfverberg for Donaciinae, M. Schmitt for Criocerinae, R. Regalin and L. N. Medvedev for Clytrinae, I. Lopatin, A. Smetana and M. Schöller for the genus *Cryptocephalus*, M. Schöller, I. Löbl and I. Lopatin for the remaining Cryptocephalinae, A. G. Moseyko and E. Sprecher-Uebbersax for Eumolpinae, H. Kippenberg for Chrysomelinae, R. Benee for Galerucinae, M. Döberl for Alticinae and, L. Borowiec and L. Sekerka for Cassidinae. According to the publication, leaf beetles fauna of Turkey includes 670 species of 87 genera of 9 subfamilies (including the tribe Clytrini in Cryptocephalinae).

With the present work, 43 % at species level, about 75 % at generic level and 100 % at subfamily level of entire fauna of Turkey are evaluated. Namely, 288

species of 64 genera of 10 subfamilies with many new faunistical data from Turkey are given in the present text.

The present materials were collected by different collectors from various parts of Turkey in the years of 1917, 1930, 1934, 1938-1940, 1951-1952, 1955-1956, 1961-1975, 1978-2001, 2003-2004, 2006-2008. They were deposited in Gazi University (Turkey: Ankara) (HE, BK, K, AD and GV) and Nazife Tuatay Plant Protection Museum (Turkey: Ankara) (NTPPM).

ARRANGEMENT OF INFORMATION

Information in the present text is given in the following order:

The subfamily and the tribe names are given simply.

For the genus and subgenus names, the type species are provided under the taxon names.

For each species, the subspecific name is provided under the taxon names.

The data, **Material examined**, **Remarks** and **Chorotype** under the title for each taxon is given. In the part of Material examined, original data of taxa are given. The data arranged into 5 different parts as **HE** (mostly C and SC Turkey), **NTPPM** (Nazife Tuatay Plant Protection Museum), **BK** (Western Black Sea Region and near in NW Anatolia), **K** (Kahramanmaraş province and near in SC Anatolia), **AD** (Amanos Mountains and near in SC Anatolia) and **GV** (Gevne valley and near in SW Anatolia). For chorotypes, the present zoogeographical characterization is based on the chorotype classification of Anatolian fauna, recently proposed by Vigna Taglianti et al. (1999). In the text, as far as possible one chorotype description can be identified for each taxon. But this kind of description can not be possible for some taxons, so two or more chorotypes are used for them.

RESULTS

The number of species of Turkish leaf beetles fauna is raised up 698 of 89 genera by the present paper with the added species to the Palaearctic Catalogue of Löbl & Smetana (2010) (see the list of Turkish Chrysomelidae at end of the text).

Following list includes only the examined taxa in the present work:

FAMILY CHRYSOMELIDAE

Subfamily DONACIINAE Kirby, 1837

Genus *PLATEUMARIS* Thomson, 1859

Subgenus *PLATEUMARIS* Thomson, 1859

Plateumaris consimilis (Schränk, 1781) (new to Turkey) NTPPM

Subgenus *EUPATEUMARIS* Iablokoff-Khnzorian, 1966

Plateumaris sericea (Linnaeus, 1760) (new to Anatolia) HE NTPPM

Plateumaris sericea sericea (Linnaeus, 1760)

Genus *DONACIA* Fabricius, 1775

Donacia bicolora Zschach, 1788 NTPPM BK

Donacia bicolora bicolora Zschach, 1788

Donacia impressa Paykull, 1799 HE

Donacia marginata Hoppe, 1795 K

Donacia simplex Fabricius, 1775 BK

Donacia vulgaris Zschach, 1788 K

Donacia vulgaris vulgaris Zschach, 1788

Subfamily CRIOCERINAE Latreille, 1804Genus *LILIOCERIS* Reitter, 1913*Lilioceris faldermanni* (Guérin-Méneville, 1844) NTPPM GV*Lilioceris merdigera* (Linnaeus, 1758) KGenus *CRIOCERIS* Geoffroy, 1762*Crioceris asparagi* (Linnaeus, 1758) HE BK AD*Crioceris bicrucata* (Shalberg, 1823) NTPPM*Crioceris duodecimpunctata* (Linnaeus, 1758) HE*Crioceris sokolowi* Jakobson, 1894 HEGenus *OULEMA* Des Gozis, 1886*Oulema duftschmidi* (Redtenbacher, 1874) NTPPM*Oulema gallaeciana* Heyden, 1870 BK*Oulema melanopus* (Linnaeus, 1758) HE NTPPM BK K AD GV**Subfamily CLYTRINAE Kirby, 1837**Genus *LABIDOSTOMIS* Chevrolat, 1836Subgenus *LABIDOSTOMIS* Chevrolat, 1836*Labidostomis asiatica* Faldermann, 1837 HE NTPPM BK AD GV*Labidostomis cyanicornis* (Germar, 1822) (new to Turkey) NTPPM*Labidostomis decipiens* Faldermann, 1837 HE NTPPM K AD GV*Labidostomis diversifrons* Lefevre, 1872 HE AD*Labidostomis humeralis* Schneider, 1792 BK*Labidostomis karamanica* Weise, 1900 GV*Labidostomis longimana* (Linnaeus, 1760) HE NTPPM BK K AD*Labidostomis maculipennis* Lefevre, 1870 HE GV*Labidostomis mesopotamica* Heyden, 1886 HE NTPPM BK K AD GV*Labidostomis oertzeni* Weise, 1889 HE NTPPM K*Labidostomis peregrina* Weise, 1900 HE NTPPM*Labidostomis propinqua* Faldermann, 1837 HE NTPPM BK K GV*Labidostomis rufa* (Waltl, 1838) HE NTPPM AD GVGenus *TITUBOEA* Lacordaire, 1848*Tituboea arabica* (Olivier, 1808) K*Tituboea macropus* (Illiger, 1800) HE NTPPM BK K AD GVGenus *LACHNAIA* Chevrolat, 1836Subgenus *LACHNAIA* Chevrolat, 1836*Lachnaia sexpunctata* (Scopoli, 1763) HE BK AD GVGenus *CLYTRA* Laicharting, 1781Subgenus *CLYTRA* Laicharting, 1781*Clytra aliena* Weise, 1897 BK*Clytra laeviuscula* Ratzeburg, 1837 HE NTPPM BK K*Clytra quadripunctata* (Linnaeus, 1758) HE*Clytra quadripunctata quadripunctata* (Linnaeus, 1758)Subgenus *CLYTRARIA* Semenov, 1903*Clytra atraphaxidis* (Pallas, 1773) HE NTPPM BK K GV*Clytra atraphaxidis atraphaxidis* (Pallas, 1773)*Clytra novempunctata* Olivier, 1808 HE NTPPM BK K AD GV*Clytra valeriana* Ménétériés, 1832 HE NTPPM GV*Clytra valeriana valeriana* Ménétériés, 1832Subgenus *OVOCLYTRA* Medvedev, 1961*Clytra bodemeyeri* Weise, 1900 HE NTPPM GV*Clytra bodemeyeri bodemeyeri* Weise, 1900Genus *SMARAGDINA* Chevrolat, 1836*Smaragdina aurita* (Linnaeus, 1767) (new to Anatolia) BK*Smaragdina aurita aurita* (Linnaeus, 1767)*Smaragdina biornata* (Lefèvre, 1872) HE BK K*Smaragdina biornata biornata* (Lefèvre, 1872)*Smaragdina biornata angorensis* (Lopatin, 2002) HE NTPPM*Smaragdina djebellina* (Lefevre, 1872) (new to Turkey) AD*Smaragdina graeca* (Kraatz, 1872) AD GV

Smaragdina hypocrita (Lacordaire, 1848) HE NTPPM BK AD GV
Smaragdina judaica (Lefevre, 1872) AD
Smaragdina limbata (Steven, 1806) HE NTPPM BK K AD GV
Smaragdina salicina (Scopoli, 1763) BK
Smaragdina tibialis (Brullé, 1832) HE BK
Smaragdina unipunctata (Olivier, 1808) NTPPM
Smaragdina viridana (Lacordaire, 1848) NTPPM BK AD GV
Smaragdina viridana viridana (Lacordaire, 1848)
Smaragdina xanthaspis (Germar, 1824) HE NTPPM BK K GV

Genus *CHEILOTOMA* Chevrolat, 1836

Subgenus *CHEILOTOMA* Chevrolat, 1836

Cheilotoma beldei Kasap, 1984 HE NTPPM BK
Cheilotoma erythrostoma Faldermann, 1837 HE BK GV
Cheilotoma erythrostoma erythrostoma Faldermann, 1837
Cheilotoma musciformis (Goeze, 1777) GV
Cheilotoma musciformis musciformis (Goeze, 1777)

Genus *COPTOCEPHALA* Chevrolat, 1836

Coptocephala destinoi Fairmaire, 1884 HE NTPPM BK K AD
Coptocephala unifasciata (Scopoli, 1763) HE NTPPM BK K AD GV
Coptocephala unifasciata unifasciata (Scopoli, 1763)

Subfamily CRYPTOCEPHALINAE Gyllenhal, 1813

Genus *PACHYBRACHIS* Chevrolat, 1836

Subgenus *PACHYBRACHIS* Chevrolat, 1836

Pachybrachis excisus (Weise, 1897) HE NTPPM
Pachybrachis fimbriolatus (Suffrian, 1848) HE NTPPM BK K GV
Pachybrachis glycyrrhizae (Olivier, 1808) (new to Anatolia) HE NTPPM
Pachybrachis hieroglyphicus (Laicharting, 1781) (new to Anatolia) HE
Pachybrachis limbatus (Menetries, 1836) HE
Pachybrachys mardinensis (Weise, 1900) AD
Pachybrachis scriptidorsum Marseul, 1875 NTPPM
Pachybrachis sinuatus (Mulsant & Rey, 1859) HE
Pachybrachis tessellatus (Olivier, 1791)
Pachybrachis tessellatus tauricus (Suffrian, 1848) HE NTPPM BK K GV
Pachybrachis velarum Warchalowski, 1998 HE NTPPM

Genus *CRYPTOCEPHALUS* Geoffroy, 1762

Subgenus *PROTOPHYSUS* Chevrolat, 1836

Cryptocephalus schaefferi Schrank, 1789
Cryptocephalus schaefferi moehringi Weise, 1884 HE
Subgenus *HETERICHNUS* Warchalowski, 1991
Cryptocephalus loebli Sassi, 1997 BK
Cryptocephalus prusias Suffrian, 1853 HE GV
Subgenus *ASIONUS* Lopatin, 1988
Cryptocephalus amasiensis Weise, 1894 K
Cryptocephalus curda Jacobson, 1897 NTPPM
Cryptocephalus pseudoreitteri Tomov, 1976 HE
Subgenus *CRYPTOCEPHALUS* Geoffroy, 1762
Cryptocephalus anticus Suffrian, 1848 HE NTPPM BK GV
Cryptocephalus aureolus Suffrian, 1847 HE NTPPM BK
Cryptocephalus aureolus aureolus Suffrian, 1847
Cryptocephalus biguttatus (Scopoli, 1763) K
Cryptocephalus biledjekensis Pic, 1903 GV
Cryptocephalus bipunctatus (Linnaeus, 1758) HE NTPPM BK K GV
Cryptocephalus bipunctatus bipunctatus (Linnaeus, 1758)
Cryptocephalus concolor Suffrian, 1847 HE BK K AD GV
Cryptocephalus cribratus Suffrian, 1847 HE K
Cryptocephalus duplicatus Suffrian, 1847 NTPPM BK GV
Cryptocephalus flavipes Fabricius, 1781 HE NTPPM BK
Cryptocephalus moraei (Linnaeus, 1758) HE NTPPM BK K AD
Cryptocephalus octomaculatus Rossi, 1790 (new to Anatolia) HE
Cryptocephalus octopunctatus (Scopoli, 1763) NTPPM
Cryptocephalus octopunctatus octopunctatus (Scopoli, 1763)
Cryptocephalus paphlagonius Sassi & Kismali, 2000 HE NTPPM BK

Cryptocephalus peyroni Marseul, 1875 AD
Cryptocephalus rugicollis Olivier, 1791 NTPPM
Cryptocephalus sericeus (Linnaeus, 1758) HE NTPPM BK GV
Cryptocephalus trimaculatus Rossi, 1790 HE NTPPM BK GV
Cryptocephalus turcicus Suffrian, 1847 HE NTPPM BK
Cryptocephalus violaceus Laicharting, 1781 NTPPM BK AD GV
Cryptocephalus violaceus Laicharting, 1781
 Subgenus *BURLINIUS* Lopatin, 1965
Cryptocephalus connexus Olivier, 1807 HE NTPPM BK K AD
Cryptocephalus elegantulus Gravenhorst, 1807 HE
Cryptocephalus labiatus (Linnaeus, 1761) NTPPM
Cryptocephalus lederi Weise, 1889 HE
Cryptocephalus ocellatus Drapiez, 1819 HE NTPPM BK
Cryptocephalus ocellatus ocellatus Drapiez, 1819
Cryptocephalus populi Suffrian, 1848 HE AD
Cryptocephalus pusillus Fabricius, 1777 HE
Cryptocephalus pygmaeus Fabricius, 1792
Cryptocephalus pygmaeus vittula Suffrian, 1848 HE

Subfamily EUMOLPINAE Hope, 1840

 Genus *MACROCOMA* Chapuis, 1874
Macrocoma brunnipes (Olivier, 1808)
 Macrocoma brunnipes obscuricolor (Pic, 1905) HE
Macrocoma delagrangi (Pic, 1898) NTPPM
Macrocoma korbi (Pic, 1901) HE
Macrocoma rubripes (Schaufuss, 1862) HE NTPPM GV
 Macrocoma rubripes rubripes (Schaufuss, 1862)
 Genus *BROMIUS* Chevrolat, 1836
Bromius obscurus (Linnaeus, 1758) AD
 Genus *PACHNEPHORUS* Chevrolat, 1836
 Subgenus *PACHNEPHORUS* Chevrolat, 1836
Pachnephorus villosus (Duftschmid, 1825) HE NTPPM
 Genus *COLASPINELLA* Weise, 1893
Colaspinella grandis (Frivaldszky, 1880) HE GV

Subfamily CHRYSOMELINAE Latreille, 1802

 Genus *TIMARCHA* Latreille, 1829
 Subgenus *TIMARCHA* Latreille, 1829
Timarcha olivieri Fairmaire, 1868 HE
 Timarcha olivieri olivieri Fairmaire, 1868
 Genus *LEPTINOTARSA* Chevrolat, 1836
Leptinotarsa decemlineata (Say, 1824) HE NTPPM BK K AD
 Genus *CHRYSOLINA* Motschulsky, 1860
 Subgenus *CHRYSOLINA* Motschulsky, 1860
Chrysolina blanchi (Fairmaire, 1865) BK
 Chrysolina blanchi blanchi (Fairmaire, 1865)
Chrysolina staphylae (Linnaeus, 1758) BK
 Chrysolina staphylae staphylae (Linnaeus, 1758)
 Subgenus *TAENIOSTICHA* Motschulsky, 1860
Chrysolina reitteri (Weise, 1884)
 Chrysolina reitteri pseudolurida Roubal, 1917 HE NTPPM BK GV
 Subgenus *ERYTHROCHRYSA* Bechyné, 1950
Chrysolina polita (Linnaeus, 1758) HE NTPPM BK K
 Chrysolina polita polita (Linnaeus, 1758)
 Subgenus *ZEUGOTAENIA* Motschulsky, 1860
Chrysolina limbata (Fabricius, 1775) NTPPM
 Subgenus *STICHOPTERA* Motschulsky, 1860
Chrysolina gypsophilae (Küster, 1845) HE NTPPM BK AD GV
 Subgenus *CHALCOIDEA* Motschulsky, 1860
Chrysolina analis (Linnaeus, 1767) (new to Turkey) HE NTPPM BK

- Chrysolina marginata* (Linnaeus, 1758) K GV
Chrysolina marginata marginata (Linnaeus, 1758)
 Subgenus *DIACHALCOIDEA* Bechyné, 1955
Chrysolina sacarum (Weise, 1890) (new to Turkey) NTPPM
 Subgenus *SULCICOLLIS* Sahlberg, 1913
Chrysolina chalcites (Germar, 1824) BK AD
Chrysolina oricalcia (Müller, 1776) K GV
 Subgenus *HYPERICIA* Bedel, 1892
Chrysolina didymata (Scriba, 1791) NTPPM
Chrysolina didymata didymata (Scriba, 1791)
Chrysolina hyperici (Forster, 1950) HE BK
Chrysolina hyperici hyperici (Forster, 1950)
 Subgenus *CHRYSOLINOPSIS* Bechyné, 1950
Chrysolina americana (Linnaeus, 1758) HE NTPPM
 Subgenus *OVOSOMA* Motschulsky, 1860
Chrysolina halysa Bechyné, 1950 HE NTPPM
Chrysolina orientalis (Olivier, 1807) HE NTPPM BK
Chrysolina orientalis orientalis (Olivier, 1807)
Chrysolina orientalis thraeissa Bechyne, 1950 (new to Turkey) NTPPM AD GV
Chrysolina sahlbergi (Ménétriérs, 1832) HE NTPPM BK K GV
Chrysolina vernalis (Brullé, 1832)
Chrysolina vernalis ottomana (Weise, 1906) NTPPM
 Subgenus *EUCHRYSOLINA* Bechyné, 1950
Chrysolina graminis (Linnaeus, 1758) NTPPM
Chrysolina graminis graminis (Linnaeus, 1758)
 Subgenus *SYNERGA* Weise, 1900
Chrysolina coerulans (Scriba, 1791) BK K AD GV
Chrysolina coerulans coerulans (Scriba, 1791)
Chrysolina herbacea (Duftschmid, 1825) HE NTPPM BK K AD GV
Chrysolina herbacea herbacea (Duftschmid, 1825) HE NTPPM BK GV
Chrysolina herbacea alacris Bechyne, 1950 HE NTPPM K AD GV
- Genus *COLAPHELLUS* Weise, 1916
Colaphellus sophiae (Schaller, 1783)
Colaphellus sophiae transsylvanicus Machatschke, 1954 HE NTPPM BK GV
- Genus *GASTROPHYSA* Chevrolat, 1836
 Subgenus *GASTROPHYSA* Chevrolat, 1836
Gastrophysa polygoni (Linnaeus, 1758) HE NTPPM BK K GV
Gastrophysa polygoni polygoni (Linnaeus, 1758)
- Genus *PHAEDON* Latreille, 1829
 Subgenus *PHAEDON* Latreille, 1829
Phaedon armoraciae (Linnaeus, 1758) HE BK
Phaedon cochleariae (Fabricius, 1792) GV
Phaedon cochleariae cochleariae (Fabricius, 1792)
- Genus *NEOPHAEDON* Jakobson, 1901
Neophaedon pyritosus (Rossi, 1792) HE BK GV
- Genus *PRASOCURIS* Latreille, 1802
 Subgenus *PRASOCURIS* Latreille, 1802
Prasocuris junci (Brahm, 1790) HE NTPPM AD
- Genus *PLAGIODERA* Chevrolat, 1836
Plagiodera versicolora (Laicharting, 1781) HE NTPPM BK K
- Genus *CHRYSOMELA* Linnaeus, 1758
Chrysomela collaris Linnaeus, 1758: NTPPM
Chrysomela populi Linnaeus, 1758 HE NTPPM BK K AD GV
Chrysomela saliceti (Weise, 1884) HE NTPPM K GV
Chrysomela saliceti saliceti (Weise, 1884)
Chrysomela tremula Fabricius, 1787 NTPPM
Chrysomela tremula tremula Fabricius, 1787
Chrysomela vigintipunctata (Scopoli, 1763) NTPPM
Chrysomela vigintipunctata vigintipunctata (Scopoli, 1763)

Genus *GONIOCTENA* Chevrolat, 1836

Subgenus *SPARTOMENA* Reitter, 1913

Gonioctena fornicata (Brüggemann, 1873) HE NTPPM BK K AD GV

Genus *PHRATORA* Chevrolat, 1836

Subgenus *PHRATORA* Chevrolat, 1836

Phratora vulgatissima (Linnaeus, 1758) (new to Turkey) HE BK

Subgenus *PHYLLODECTA* Kirby, 1837

Phratora laticollis (Suffrian, 1851) HE

Phratora vitellinae (Linnaeus, 1758) HE NTPPM

Genus *ENTOMOSCELIS* Chevrolat, 1836

Entomoscelis adonidis (Pallas, 1771) HE NTPPM BK K GV

Entomoscelis sacra (Linnaeus, 1758) HE NTPPM GV

Entomoscelis suturalis Weise, 1882 HE NTPPM BK K GV

Subfamily GALERUCINAE Latreille, 1802

Genus *DIORHABDA* Weise, 1883

Diorhabda elongata (Brullé, 1836) NTPPM

Genus *RADYMNA* Reitter, 1913

Radymna fischeri (Faldermann, 1837) HE

Radymna persica (Faldermann, 1837) HE

Genus *GALERUCELLA* Crotch, 1873

Subgenus *GALERUCELLA* Crotch, 1873

Galerucella grisescens (Joannis, 1866) (new to Turkey) NTPPM

Subgenus *NEOGALERUCELLA* Chujo, 1962

Galerucella lineola (Fabricius, 1781) HE

Galerucella lineola lineola (Fabricius, 1781)

Galerucella tenella (Linnaeus, 1760) NTPPM

Genus *XANTHOGALERUCA* Laboissière, 1934

Xanthogaleruca luteola (Müller, 1766) NTPPM

Xanthogaleruca subcoerulescens (Weise, 1884) GV

Genus *GALERUCA* Geoffroy, 1762

Subgenus *GALERUCA* Geoffroy, 1762

Galeruca pomonae (Scopoli, 1763) HE NTPPM BK K AD GV

Galeruca pomonae pomonae (Scopoli, 1763)

Galeruca spectabilis (Faldermann, 1837)

Galeruca spectabilis orientalis (Osculati, 1844) HE NTPPM BK GV

Galeruca tanacetii (Linnaeus, 1758) HE NTPPM BK

Galeruca tanacetii tanacetii (Linnaeus, 1758)

Subgenus *EMARHOPA* Weise, 1886

Galeruca rufa Germar, 1824 NTPPM

Genus *AGELASTICA* Chevrolat, 1836

Agelastica alni (Linnaeus, 1758) NTPPM

Agelastica alni alni (Linnaeus, 1758)

Genus *AULACOPHORA* Chevrolat, 1836

Aulacophora foveicollis (Lucas, 1849) NTPPM

Genus *MONOLEPTA* Chevrolat, 1836

Monolepta anatolica Bezdek, 1998 GV

Genus *NYMPHIUS* Weise, 1900

Nymphius ensifer (Weise, 1900) GV

Nymphius forcipifer (Weise, 1900) GV

Nymphius lydius (Weise, 1886) HE BK GV

Genus *PHYLLOBROTICA* Chevrolat, 1836

Phyllobrotica elegans Kraatz, 1866 HE BK

Phyllobrotica frontalis Weise, 1886 BK

Genus *EXOSOMA* Jacoby, 1903

Exosoma flavipes (Heyden, 1878) HE NTPPM BK
Exosoma neglectum Mohr, 1968 HE NTPPM GV
Exosoma thoracicum (Redtenbacher, 1843) NTPPM

Genus *CALOMICRUS* Dillwyn, 1829

Calomicrus angorensis (Pic, 1912) HE NTPPM
Calomicrus apicalis Demaison, 1891 HE GV
Calomicrus lividus (Joannis, 1866) AD

Genus *LUPERUS* Geoffroy, 1762

Luperus flavipes (Linnaeus, 1767) HE NTPPM
Luperus flavipes flavipes (Linnaeus, 1767)
Luperus xanthopoda (Schrank, 1781) HE NTPPM GV
Luperus viridipennis (Germar, 1824) (new to Turkey) K

Subfamily ALTICINAE Newman, 1835Genus *PHYLLOTRETA* Chevrolat, 1836

Phyllotreta atra (Fabricius, 1775) HE NTPPM
Phyllotreta corrugata Reiche & Saulcy, 1858 HE NTPPM
Phyllotreta cruciferae (Goeze, 1777) HE NTPPM
Phyllotreta erysimi Weise, 1900 HE
Phyllotreta erysimi erysimi Weise, 1900
Phyllotreta maculicornis Pic, 1906 HE NTPPM
Phyllotreta nemorum (Linnaeus, 1758) NTPPM
Phyllotreta nigripes (Fabricius, 1775) HE NTPPM
Phyllotreta nigripes nigripes (Fabricius, 1775)
Phyllotreta ochripes (Illiger, 1803) HE
Phyllotreta pallidipennis Reitter, 1891 HE
Phyllotreta striolata (Illiger, 1803) NTPPM
Phyllotreta toelgi Heikertinger, 1941 NTPPM
Phyllotreta vilis Weise, 1888 NTPPM

Genus *APHTHONA* Chevrolat, 1836

Aphthona bonvouloiri Allard, 1861 HE
Aphthona carbonaria Rosenhauer, 1856 (new to Turkey) NTPPM
Aphthona flaviceps Allard, 1859 NTPPM
Aphthona fuentei Reitter, 1901 NTPPM

Genus *LONGITARSUS* Latreille, 1829Subgenus *LONGITARSUS* Latreille, 1829

Longitarsus aeneicollis (Faldermann, 1837) HE NTPPM
Longitarsus atricillus (Linnaeus, 1760) HE GV
Longitarsus ballotae (Marsham, 1802) HE
Longitarsus exsoletus (Linnaeus, 1758)
Longitarsus exsoletus rufulus (Foudras, 1860) NTPPM
Longitarsus gracilis Kutschera, 1864 NTPPM
Longitarsus melanocephalus (De Geer, 1775) HE NTPPM
Longitarsus nigrofasciatus (Goeze, 1777) NTPPM BK
Longitarsus nigrofasciatus nigrofasciatus (Goeze, 1777)
Longitarsus parvulus (Paykull, 1799) NTPPM
Longitarsus picicollis Weise, 1900 HE
Longitarsus pratensis (Panzer, 1794) HE NTPPM
Longitarsus pulmonariae Weise, 1893 HE
Longitarsus rubiginosus (Foudras, 1860) (new to Turkey) NTPPM
Longitarsus substriatus Kutschera, 1864 GV
Longitarsus succineus (Foudras, 1860) NTPPM
Longitarsus suturellus (Duftschmid, 1825) NTPPM
Longitarsus tabidus (Fabricius, 1775) HE
Subgenus *TESTERGUS* Weise, 1893
Longitarsus anatolicus Weise, 1900 HE NTPPM

Genus *HERMAEOPHAGA* Foudras, 1860Subgenus *ORTHOCREPIS* Weise, 1888

Hermaeophaga ruficollis (Lucas, 1849) HE

Genus *ALTICA* Geoffroy, 1762*Altica ancyrensis* (Weise, 1897) HE NTPPM GV*Altica brevicollis* Foudras, 1861 NTPPM*Altica brevicollis brevicollis* Foudras, 1861*Altica carduorum* Guérin-Ménéville, 1858 NTPPM*Altica deserticola* (Weise, 1889) HE NTPPM*Altica lythri* Aubé, 1843 NTPPM*Altica oleracea* (Linnaeus, 1758) HE NTPPM GV*Altica oleracea oleracea* (Linnaeus, 1758)*Altica palustris* (Weise, 1888) HE NTPPM BK K*Altica quercetorum* Foudras, 1861 NTPPM AD*Altica quercetorum quercetorum* Foudras, 1861Genus *NEOCREPIDODERA* Heikertinker, 1911*Neocrepidodera transversa* (Marsham, 1802) HEGenus *OCHROSIS* Foudras, 1861*Ochrosis ventralis* (Illiger, 1807) NTPPM BK KGenus *DEROCREPIS* Weise, 1886*Derocephis rufipes* (Linnaeus, 1758) BKGenus *AESCHROCNEMIS* Weise, 1888*Aeschrocnemis anatolica* (Heikertinger, 1922) HEGenus *CREPIDODERA* Chevrolat, 1836*Crepidodera aurata* (Marsham, 1802) HE NTPPM BK*Crepidodera aurea* (Geoffroy, 1785) HE NTPPM*Crepidodera lamina* (Bedel, 1901) HE*Crepidodera phytus* (Latreille, 1804) HEGenus *SPHAERODERMA* Stephens, 1831*Sphaeroderma rubidum* (Graells, 1858)Genus *PODAGRICA* Chevrolat, 1836*Podagrica malvae* (Illiger, 1807) HE NTPPM AD*Podagrica malvae malvae* (Illiger, 1807)*Podagrica menetriesii* (Faldermann, 1837) HE NTPPM GVGenus *CHAETOCNEMA* Stephens, 1831Subgenus *TLANOMA* Motschulsky, 1845*Chaetocnema breviscula* (Motschulsky, 1845) HE*Chaetocnema chlorophana* (Duftschmid, 1825) HE NTPPM*Chaetocnema coyei* (Allard, 1864) HE NTPPM*Chaetocnema major* (Jacquelin du Val, 1852) HE*Chaetocnema semicoerulea* (Koch, 1803) NTPPM*Chaetocnema semicoerulea semicoerulea* (Koch, 1803)*Chaetocnema tibialis* (Illiger, 1807) HE NTPPMSubgenus *CHAETOCNEMA* Stephens, 1831*Chaetocnema arenacea* (Allard, 1860) HE NTPPM*Chaetocnema confusa* (Boheman, 1851) NTPPM*Chaetocnema obesa* (Boieldieu, 1859) HE*Chaetocnema sahlbergii* (Gyllenhal, 1827) HE NTPPMGenus *DIBOLIA* Latreille, 1829Subgenus *DIBOLIA* Latreille, 1829*Dibolia occultans* (Koch, 1803) HE*Dibolia rugulosa* Redtenbacher, 1849 HESubgenus *EUDIBOLIA* Iablokoff-Khnzorian, 1968*Dibolia carpathica* Weise, 1893 HESubgenus *PSEUDODIBOLIA* Iablokoff-Khnzorian, 1968*Dibolia zangezurica* Iablokoff-Khnzorian, 1968 HEGenus *PSYLLIODES* Latreille, 1829Subgenus *PSYLLIODES* Latreille, 1829*Psylliodes arista* Iablokoff-Khnzorian, 1962 HE*Psylliodes attenuata* (Koch, 1803) HE

Psylliodes chalcomera (Illiger, 1807) AD
Psylliodes chrysocephala (Linnaeus, 1758) HE NTPPM
Psylliodes chrysocephala chrysocephala (Linnaeus, 1758)
Psylliodes circumdata (Redtenbacher, 1842) NTPPM
Psylliodes cuprea (Redtenbacher, 1842) HE
Psylliodes hyoscyami (Linnaeus, 1758) HE AD
Psylliodes instabilis Foudras, 1860 NTPPM
Psylliodes luteola (Müller, 1776) HE
Psylliodes napi (Fabricius, 1792) HE NTPPM
Psylliodes picina (Marsham, 1802) (new to Turkey) HE
Psylliodes tricolor Weise, 1888 HE NTPPM AD
 Subgenus *MINICNEMA* Nadein, 2007
Psylliodes elliptica Allard, 1861 NTPPM

Subfamily HISPINAE Gyllenhal, 1813

Genus *HISPA* Linnaeus, 1767
Hispa atra Linnaeus, 1767 HE NTPPM BK
 Genus *DICLADISPA* Gestro, 1897
Dicladispa testacea (Linnaeus, 1767) HE NTPPM AD GV

Subfamily CASSIDINAE Gyllenhal, 1813

Genus *PILEMOSTOMA* Desbrochers des Loges, 1891
Pilemostoma fastuosum (Schaller, 1783) BK K

Genus *HYPOCASSIDA* Weise, 1893
Hypocassida meridionalis (Suffrian, 1844) HE
Hypocassida subferruginea (Schränk, 1776) HE NTPPM BK K AD

Genus *CASSIDA* Linnaeus, 1758
Cassida algerica Lucas, 1849 HE
Cassida atrata Fabricius, 1787 HE
Cassida bella Faldermann, 1837 BK
Cassida brevis Weise, 1884 BK
Cassida elongata Weise, 1893 (new to Turkey) GV
Cassida fausti Spaeth & Reitter, 1926 HE BK
Cassida flaveola Thunberg, 1794 (new to Turkey) NTPPM
Cassida hablitziae Motschulsky, 1838 HE NTPPM BK
Cassida inquinata Brullé, 1832 NTPPM
Cassida murraea Linnaeus, 1767 NTPPM BK
Cassida murraea murraea Linnaeus, 1767
Cassida nebulosa Linnaeus, 1758 NTPPM
Cassida nobilis Linnaeus, 1758 NTPPM
Cassida palaestina Reiche, 1858 NTPPM
Cassida pannonica Suffrian, 1844 HE NTPPM BK AD GV
Cassida parvula Boheman, 1854 (new to Turkey) GV
Cassida prasina Illiger, 1798 NTPPM BK
Cassida rubiginosa Müller, 1776 BK
Cassida rubiginosa rubiginosa Müller, 1776
Cassida sanguinolenta Müller, 1776 K
Cassida sanguinosa Suffrian, 1844 (new to Turkey) BK
Cassida saucia Weise, 1889 NTPPM BK
Cassida seraphina Ménétriés, 1836 HE NTPPM BK
Cassida stigmatica Suffrian, 1844 HE BK
Cassida subreticulata Suffrian, 1844 BK GV
Cassida vibex Linnaeus, 1767 HE NTPPM BK
Cassida viridis Linnaeus, 1758 HE NTPPM BK K AD GV
Cassida vittata Villers, 1789 HE

FAMILY CHRYSOMELIDAE**Subfamily DONACIINAE Kirby, 1837****Genus *Plateumaris* Thomson, 1859**

[Type sp.: *Donacia nigra* Fabricius, 1792 = *Prionus braccatus* Scopoli, 1772]

Subgenus *Plateumaris* Thomson, 1859

[Type sp.: *Donacia nigra* Fabricius, 1792 = *Prionus braccatus* Scopoli, 1772]

***Plateumaris consimilis* (Schränk, 1781) (new to Turkey)**

Material examined: NTPPM: **Bolu:** Seben, 11.08.1983, leg. A. Kalkandelen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** European.

Subgenus *Euplateumaris* Iablokoff-Khnzorian, 1966

[Type sp.: *Leptura sericea* Linnaeus, 1760]

Plateumaris sericea* (Linnaeus, 1760) (new to Anatolia)**Plateumaris sericea sericea* (Linnaeus, 1760)**

Material examined: HE: **Ankara:** Kızılcahamam, Karagöl, 02.V.2005, leg. H. Özdikmen, 1 specimen.

NTPPM: **Ankara:** Gölbaşı, 09.V.1968, leg. A. Kalkandelen, 1 specimen.

Remarks: The species has been known only from European Turkey for Turkey until now. So it is new to Ankara province and thereby to Anatolia (= Asian Turkey). It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Sibero-European.

Genus *Donacia* Fabricius, 1775

[Type sp.: *Donacia crassipes* Fabricius, 1775]

Donacia bicolora* Zschach, 1788**Donacia bicolora bicolora* Zschach, 1788**

Material examined: NTPPM: **Ankara:** Karagöl, 23.V.1967, leg. A. Kalkandelen, 2 specimens. **BK:** **Bolu:** Yeniçağa lake–Deliler village, 970m, 17.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. However, it is new to Ankara province. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Sibero-European.

***Donacia impressa* Paykull, 1799**

Material examined: HE: **Ankara:** Kızılcahamam, Karagöl, 1650m, 11.VII.1997, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** Palearctic.

***Donacia marginata* Hoppe, 1795**

Material examined: K: **Kahramanmaraş:** Afşin, Tanır, Yeşiloba, Karasalgan place, N 38° 22' E 36° 54', 1230m, 25.V.2003, leg. A. Y. Okutaner, 5 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Kahramanmaraş province. **Chorotype:** Palearctic.

***Donacia simplex* Fabricius, 1775**

Material examined: BK: **Zonguldak:** exit of Devrek, Çıplaklar village, 250m, 13.V.2003, leg. H. Özdikmen, 1 specimen as *D. simplex* ab. *aeruginosa* Westhoff, 1882.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Zonguldak province. **Chorotype:** Palearctic.

Donacia vulgaris* Zschach, 1788**Donacia vulgaris vulgaris* Zschach, 1788**

Material examined: K: **Kahramanmaraş:** Afşin, Tanır, Yeşiloba quarter, Farta place, N 38° 22' E 36° 54', 1230m, 25.V.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Sibero-European.

Subfamily CRIOCERINAE Latreille, 1804**Genus *Liliocerus* Reitter, 1913**[Type sp.: *Chrysomela merdigera* Linnaeus, 1758]***Liliocerus faldermanni* (Guérin-Ménéville, 1844)**

Material examined: NTPPM: **Ankara:** Çubuk, Karagöl, 03.VIII.1983, leg. Y. Özdemir, 1 specimen. **GV: Antalya:** Küçükli village, Şeker piknik, 1298m, 09.VII.2007, leg. H. Özdikmen, 3 specimens; Küçükli village env., 1762m, 09.VII.2007, leg. H. Özdikmen, 2 specimens; Alanya, Gökbel plateau, 1850m, 09.VII.2007, leg. H. Özdikmen, 3 specimens; Alanya, 20 km to Taşkent, 1822m, 10.VII.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. The present material was published by Özdikmen & Turgut (2008). It is new to Antalya province. **Chorotype:** E-Mediterranean or SW-Asiatic.

***Liliocerus merdigera* (Linnaeus, 1758)**

Material examined: **K: Kahramanmaraş:** Göksun, A. Türkeş excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Geben-Göksun road, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province and thereby to Southern Turkey. **Chorotype:** Sibero-European.

Genus *Criocerus* Geoffroy, 1762[Type sp.: *Chrysomela asparagi* Linnaeus, 1758]***Criocerus asparagi* (Linnaeus, 1758)**

Material examined: **HE: Aksaray:** Aşağı Dikmen, Hasan Mt., 1100m, 01.VI.1997 and 22.VI.1997, leg. H. Özdikmen, 15 specimens; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 02.VI.1997 and 25.VI.1997, leg. H. Özdikmen, 2 specimens. **BK: Karabük:** Safranbolu, Hızar Yanı place, 740m, 14.V.2003, leg. H. Özdikmen, 1 specimen. **AD: Osmaniye:** Zorkun road, Giftmazi, 223m, N 37° 01' E 36° 17', 20.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Aksaray, Karabük, Kayseri and Osmaniye provinces. Since, the materials were published by Özdikmen & Turgut (2008) and Özdikmen & Aslan (2009). **Chorotype:** Holarctic (except Far East).

***Criocerus bicrucata* (Shalberg, 1823)**

Material examined: NTPPM: **Aydın:** 15.V.1964, leg. A. Demirtola, 1 specimen; **İzmir:** Bornova, 09.07.1968, leg. N. Aysor, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. The present materials were published by Özdikmen & Turgut (2008). **Chorotype:** Turano-Mediterranean (Turano-Balkan).

***Criocerus duodecimpunctata* (Linnaeus, 1758)**

Material examined: **HE: Aksaray:** Aşağı Dikmen village, Hasan Mountain, 1020m, 17.V.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Şereflikoçhisar, 1000m, 20.V.1997 and 03.VI.1997, leg. H. Özdikmen, 48 specimens; **Konya Makası-Şereflikoçhisar**, 950m, 21.VI.1997, leg. H. Özdikmen, 6 specimens; **Konya:** Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 12 specimens; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor, 24.V.1997, leg. H. Özdikmen, 14 specimens; **Niğde-Bor road**, 17.VI.1997, leg. T. Türkeş, 1 specimen; **Bor, Bor-Ankara road**, 1100 m, 13.07.1997, leg. T. Türkeş, 4 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It was new to Aksaray, Ankara, Konya, Kayseri and Niğde provinces. Since the materials were published by Özdikmen & Turgut (2008). **Chorotype:** Sibero-European.

***Criocerus sokolowi* Jakobson, 1894**

Material examined: **HE: Ankara:** Şereflikoçhisar, 1000m, 20.V.1997 and 03.VI.1997, leg. H. Özdikmen, 29 specimens; **Konya makası-Şereflikoçhisar**, 950m, 21.VI.1997, leg. H. Özdikmen, 125 specimens; **Konya:** Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 5 specimens; **Niğde:** Bor, Bor-Ankara road, 1100m, 13.VII.1997, leg. H. Özdikmen, 6 specimens.

Remarks: The species was new to Ankara, Konya and Niğde provinces and thereby to Turkey. Since the materials were published by Özdikmen & Turgut (2008). **Chorotype:** SW-Asiatic (Anatolo-Caucasian).

Genus *Oulema* Des Gozis, 1886

[Type sp.: *Chrysomela melanopus* Linnaeus, 1758]

Oulema duftschmidi (Redtenbacher, 1874)

Material examined: NTPPM: **Afyon:** 04.VIII.1993, *Medicago*, leg. A. Kalkandelen, 4 specimens; **Ankara:** Ayaş, İlyakut, 31.VII.1980, leg. Y. Özdemir, 1 specimen; Çubuk, Sarayköy, 15.V.1984, leg. T. Davarcı, 1 specimen; Ayaş, 09.V.1990, *Medicago*, leg. M. Aydemir, 1 specimen; Beypazarı, İnönü plateau, 11.V.1999, Orchard, leg. Y. Özdemir, 2 specimens; Çubuk, Sirkeli, 13.VI.1999, Orchard, leg. Y. Özdemir, 1 specimen; **Bolu-Düzce:** 02.IX.1982, leg. Y. Özdemir, 1 specimen; **Çankırı:** Eldivan, 04.VI.1997, Orchard and *Medicago*, leg. Y. Özdemir, 1 specimen; Kızılırmak, 02.VII.1997, leg. Y. Özdemir, 2 specimens; **Eskişehir:** İnönü, 29.V.1995, leg. M. Aydemir, 3 specimens; İnönü, 29.V.1995, leg. Y. Özdemir, 1 specimen; **Kayseri:** 17.VI.1994, leg. A. Kalkandelen, 1 specimen; Kirşehir: Dinekbağı, 20.VII.1992, leg. M. Özdemir, 1 specimen.

Remarks: The present materials were published by Özdikmen & Turgut (2008) as a new records for Turkey. **Chorotype:** European (S, C and E European).

Oulema gallaeciana Heyden, 1870

Material examined: **BK: Bolu:** Yeniçağa lake-Deliler village, 970m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Eflani, Yağlıca village, 975m, 15.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Bolu and Karabük provinces. Since, the present materials were published by Özdikmen & Turgut (2008). **Chorotype:** Sibero-European.

Oulema melanopus (Linnaeus, 1758)

Material examined: **HE: Adana:** Pozanti-Mersin road, 1025m, 29.V.2001, leg. H. Özdikmen, 2 specimens; **Aksaray:** Aksaray-Ulukişla road, 1135m, 29.V.2001, leg. H. Özdikmen, 1 specimen; Ağaçören, Yenişabanlı, Velipınarı, 1340m, 21.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Evren, Şereflikoçhisar-Evren road, 1000m, 21.VI.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Kaçarlı, 1050m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Bel doruğu, 1550m, 19.VIII.1997, leg. H. Özdikmen, 1 specimen; **İçel:** Entry of Fındıklı, 1035m, 01.V.2001, leg. H. Özdikmen, 2 specimens; **Karaman:** Karaman-Ereğli road, 990m, 26.06.2001, leg. H. Özdikmen, 6 specimens; **Konya:** Entry of Ereğli, 1010m, 02.VI.2001, leg. H. Özdikmen, 2 specimens; **Turkey:** 2000, leg. H. Özdikmen, 15 specimens. **NTPPM: Ankara:** Beypazarı, Dibecek village, 09.V.1990, *Medicago*, leg. M. Aydemir, 1 specimen; **Diyanbakır:** Ergani, Gedick, 17.IV.1972, leg. Y. Dörtbudak, 1 specimen; Hazro, Dersil, 27.IV.1972, leg. Y. Dörtbudak, 1 specimen; **Eskişehir:** Kaymaz, 23.VI.1992, leg. Y. Özdemir, 1 specimen; Kaymaz, 20.VI.1997, *Medicago*, leg. Y. Özdemir, 1 specimen; Kaymaz, 23.VI.1997, *Medicago*, leg. Y. Özdemir, 3 specimens; **Kırklareli:** Pınarhisar, 10.VII.1974, *Oryza* sp., 4 specimens; Demirköy, 09.VII.1994, leg. A. Kalkandelen, 1 specimen; **Siirt:** Tillo, 11.V.1972, leg. Y. Dörtbudak, 1 specimen. **BK: Çorum:** Kargı-Boyabat road, Karagöl village, 700m, 16.VI.2003, , leg. H. Özdikmen, 1 specimen; **Karabük:** Safranbolu, Hızar Yarı place, 740m, 14.V.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** between Devrekani-Yaralıgöz, 15.VIII.2003, leg. H. Özdikmen, 1 specimen; **Samsun:** Alaçam, Kapaklı village, 620m, 16.VI.2004, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Narlı-Türkoğlu road, N 37° 21' E 37° 08', 490m, 23.VI.2003, leg. A. Y. Okutaner, 2 specimens; Ekinözü, 26.VI.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Gaziantep:** Nurdağı-İslahiye, N 37° 08' E 36° 42', 496m, 22.IV.2007, leg. H. Özdikmen, 6 specimens; **Hatay:** Kuzuculu, N 36° 53' E 36° 15', 134m, 23.IV.2007, leg. H. Özdikmen, 7 specimens; Aktepe, N 36° 39' E 36° 27', 207m, 18.V.2007, leg. H. Özdikmen, 1 specimen; Erzincan, Gökgöl, 600m, N 36° 57' E 36° 17', 04.VI.2007, leg. H. Özdikmen, 2 specimens; **Osmaniye:** Bahçe, Horu stream env., N 37° 10' E 36° 27', 562m, 17.V.2007, leg. H. Özdikmen, 4 specimens; Kırklık village, N 37° 09' E 36° 25', 470m, 21.IV.2007, leg. H. Özdikmen, 10 specimens; Zorkun plateau, 989m, N 36° 58' E 36° 17', 04.VI.2007, leg. H. Özdikmen, 1 specimen; Düziçi, Gökçay, N 37° 20' E 36° 27', 600m, leg. H. Özdikmen, 15 specimens; Issızca village, N 37° 08' E 36° 20', 139m, 21.IV.2007, leg. H. Özdikmen, 1 specimen; Castabala, Ören Yeri, N 36° 10' E 36° 11', 100m, 03.VI.2007, leg. H. Özdikmen, 4 specimens; Zorkun plateau, 04.VI.2007, leg. H. Özdikmen, 15 specimens; Zorkun, Çiftmazi, N 37° 01' E 36° 17', 786m, 02.VI.2007, leg. H. Özdikmen, 3 specimens; Hasanbeyli, Kalecik, N 37° 09' E 36° 28', 660m, 03.VI.2007, leg. H. Özdikmen, 3 specimens. **GV: Konya:** 10 km to Seydişehir, Akçalar, 1127m, 13.V.2006, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Çorum, Karabük and Kastamonu provinces. Since, the present materials were published by Özdikmen & Turgut (2008). It is new to Aksaray, Gaziantep, İçel, Karaman and Konya provinces. **Chorotype:** Holarctic.

Subfamily CLYTRINAE Kirby, 1837**Genus *Labidostomis* Chevrolat, 1836**[Type sp.: *Cryptocephalus taxicornis* Fabricius, 1792]**Subgenus *Labidostomis* Chevrolat, 1836**[Type sp.: *Cryptocephalus taxicornis* Fabricius, 1792]***Labidostomis asiatica* Faldermann, 1837**

Material examined: **HE: Ankara:** Çal Mountain, 1200m, 17.VI.1984, leg. H. Özdikmen, 7 specimens; Kızılcahamam, Soğuksu National Park, 1400m, 03.VII.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yenimahalle, 30.VI.1993, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Işık Mountain, 30.VI.1993, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 16.VI.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yenimahalle, 1100m, 05.VII.1997, leg. H. Özdikmen, 1 specimen; Çubuk dam II, 20.V.1999, leg. H. Özdikmen, 2 specimens; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Çamardı, Bademdere-Elmalı, 1750m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; Azathi-Tepeköy road, Murozu dam, 02.VII.1997, leg. H. Özdikmen, 7 specimens. **NTPPM: Ankara:** Ayaş road, 11.V.1999, leg. M. Özdemir, 1 specimen. **BK: Bolu:** between Yeniçağa-Gerede, exit of Yeniçağa, 1045m, 17.V.2003, leg. H. Özdikmen, 1 specimen; Gerede-Bolu road, 8 km to Bolu, 710m, 17.V.2003, leg. H. Özdikmen, 2 specimens; Bolu-Gerede road, Susuz Kınık village, 720m, 17.V.2003, leg. H. Özdikmen, 1 specimen; Gerede-Kızılcahamam, 15 km to Gerede, 1200m, 17.V.2003, leg. H. Özdikmen, 10 specimens; Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 3 specimens; Entry of Gerede highway, 1400m, 14.VI.2003, leg. H. Özdikmen 2 specimens; Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 4 specimens; Gerede-Karabük road, Dikmen and Sungur villages, 1450m, 14.VI.2003, leg. H. Özdikmen, 2 specimens; **Düzce:** Akçaören village, At Yolu district, Hasanlar Dam, 225m, 11.V.2003, leg. H. Özdikmen, 7 specimens; Yiğilca, Dutlar village, 200m, 12.V.2003, leg. H. Özdikmen, 1 specimen; Yiğilca, Karakaş village, 290m, 12.V.2003, leg. H. Özdikmen, 2 specimens; Yiğilca, Karataş-Yoğunpelit turn, 320m, 12.V.2003, leg. H. Özdikmen, 2 specimens; **Karabük:** Safranbolu, Balkuşu village, 275m, 13.V.2003, leg. H. Özdikmen, 16 specimens; Safranbolu, Kırklar village, 830m, 14.V.2003, leg. H. Özdikmen, 2 specimens; Eflani, 910m, 15.V.2003, leg. H. Özdikmen, 6 specimens; Eflani, Yağlıca village, 975m, 15.V.2003, leg. H. Özdikmen, 10 specimens; Eflani-Daday, Karaağaç village, 1080m, 15.V.2003, leg. H. Özdikmen, 1 specimen; Eflani, Örencik village, 970m, 15.V.2003, leg. H. Özdikmen, 5 specimens; Hanköy, Aşağıbağ district, 575m, 16.V.2003, leg. H. Özdikmen, 9 specimens; Bulak village, Bağ Evleri, 670m, 15.VI.2003, leg. H. Özdikmen, 4 specimens; **Kastamonu:** Araç road, Kastamonu Polis Ormanı, 975m, 16.V.2003, leg. H. Özdikmen, 2 specimens; Kastamonu-Safranbolu road, 56 km to Safranbolu, 695m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Kastamonu-Safranbolu road, 56 km to Safranbolu, 695m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; exit of Tosya, Zincirli Kuyu village, 650m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; **Sinop:** 35m, 17.VI.2003, leg. H. Özdikmen, 1 specimen; Boyabat, Büznük village, 1235m, 17.VI.2003, leg. H. Özdikmen, 1 specimen; **Zonguldak:** between Yedigöller-Devrek, 230m, 13.V.2003, leg. H. Özdikmen, 1 specimen; Devrek, Alparslan village, 425m, 13.V.2003, leg. H. Özdikmen 1 specimen. **AD: Osmaniye:** Zorkun-Karınca-Hassa road, Külli plateau, 1603m, N 36 57 E 36 21, 25.VI.2006, leg. H. Özdikmen, 1 specimen. **GV: Konya:** Derebucak, 1221m, 16.V.2007, leg. H. Özdikmen, 3 specimens; Gencek-Derebucak, 1212m, 20.V.2008, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Bolu, Düzce, Karabük, Kastamonu, Niğde, Osmaniye, Sinop and Zonguldak provinces and thereby to Western Black Sea Region and Amanos Mountains of Turkey. **Chorotype:** SW-Asiatic.

***Labidostomis cyanicornis* (Germar, 1822) (new to Turkey)**

Material examined: **NTPPM: Düzce:** 14.06.1994, leg. A. Kalkandelen, 1 specimen. **GV: Konya:** Taşkent, Feslikan plateau, Avşar, 1726m, 17.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** Sibero-European.

***Labidostomis decipiens* Faldermann, 1837**

Material examined: **HE: Adana:** Pozantı, entry of Findıklı, 1200m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Pozantı-Mersin road, Camlıyayla turn, 690m, 30.V.2001, leg. H. Özdikmen, 4 specimens; **Ankara:** Çubuk-II- dam, leg. H. Özdikmen, 1 specimen; **İçel:** Entry of Findıklı, 1035m, 31.V.2001, leg. H. Özdikmen, 1 specimen; Çağlayan, exit of Findıklı, 1070m, 25.VI.2001, leg. H. Özdikmen, 2 specimens; **Niğde:** Altunhisar-Çiftlik road, entry of Çiftlik, 29.VII.1997, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** Işık Mountain, 29.V.1962, leg. Y. Sürmeli, 2 specimens; 11.VI.1972, *Onobrychis*, 6 specimens; Şereflikoçhisar, Tuz Lake, 27.V.1998, leg. M. Özdemir, 2 specimens; **Şanlıurfa:** Ceylanpınar, 18.V.1961, leg. N. Tuatay, 10 specimens; 01.V.1966, leg. A. Demirtola, 3 specimens; 02.V.1966, leg. A. Demirtola, 4 specimens; 30.V.1969, leg. İ. Soydemir, 18 specimens; **Malatya:** 01.IX.1969, leg. N. Dinç, 3 specimens; **Niğde:** 19.V.1961, leg. Ş. Velibeyoğlu, 23 specimens. **K: Kahramanmaraş:** Göksun,

Çardak, N 38° 5' E 36° 49', 1338m, 26.V.2003, leg. A. Y. Okutaner, 1 specimen; Pazarcık, Armutlu village, Kartalkaya Dam env., N 37° 30' E 37° 15', 950m, 29.V.2003, leg. A. Y. Okutaner, 1 specimen; Kahramanmaraş-Kavaklı road, entry of Kavaklı, N 37° 35' E 36° 46', 700m, 02.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, A. Türkeş excursion spot place- Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Kamışcık village, N 38° 6' E 36° 52', 1340m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Ekinözü, N 38° 03' E 37° 11', 1015m, 27.VI.2003, leg. A. Y. Okutaner, 2 specimens; Andırın, Geben, Ardeşçalışı district, N 37° 46' E 36° 26', 1510m, 16.VII.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Gaziantep:** Fevzipaşa, Türkbağçe village, N 37 04 E 36 37, 521m, 18.V.2007, leg. H. Özdişken, 18 specimens; Nurdagı, N 37 10 E 36 42, 814m, 17.V.2007, leg. H. Özdişken, 2 specimens; **Hatay:** Akbez, N 36 51 E 36 32, 527m, 18.V.2007, leg. H. Özdişken, 1 specimen; Aktepe, N 36 39 E 36 27, 207m, 18.V.2007, leg. H. Özdişken, 4 specimens; **Osmaniye:** Akıyar village, 151m, N 37 02 E 36 11, 17.V.2006, leg. H. Özdişken, 11 specimens; Kesmeburun village Castabala, N 37 10 E 36 11, 107m, 22.IV.2007, leg. H. Özdişken, 3 specimens; Castabala, Ören Yeri, N 36 10 E 36 11, 100m, 03.VI.2007, leg. H. Özdişken, 6 specimens; Kaypak, N 37 09 E 36 27, 524m, 21.IV.2007, leg. H. Özdişken, 1 specimen; Bahçe, Kızlaç, N 37 10 E 36 37, 761m, 19.V.2007, leg. H. Özdişken, 2 specimens. **GV: Antalya:** between Sarımut-Karapınar, 1092m, 09.VII.2007, leg. H. Özdişken, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, Gaziantep, Hatay, Kahramanmaraş, Niğde and Osmaniye provinces. **Chorotype:** SW-Asiatic.

Labidostomis diversifrons Lefevre, 1872

Material examined: **HE: Adana:** Pozantı, Entry of Fındıklı, 1200m, 23.VI.1997, leg. H. Özdişken, 17 specimens; Pozantı-Mersin road, Çamlıyayla return, 690m, 30.V.2001, leg. H. Özdişken, 3 specimens; **Aksaray:** Ağzıkarahan, 1220m, 20.V.1997, leg. H. Özdişken, 1 specimen; Entry of Nevşehir-Aksaray, 20.V.1997, leg. H. Özdişken, 1 specimen; Entry of Nevşehir, 1040m, 03.VI.1997, leg. H. Özdişken, 3 specimens; Güzelyurt, 1700m, 27.VI.1997, leg. H. Özdişken, 1 specimen; Aksaray-Ulukışla road, 1135m, 29.V.2001, leg. H. Özdişken, 11 specimens; **Ankara:** Şereflikoçhisar, 950m, 20.V.1997, leg. H. Özdişken, 2 specimens; Çaldağ, 1050m, 28.V.1997, leg. H. Özdişken, 1 specimen; Çubuk dam II, 20.V.1999, leg. H. Özdişken, 14 specimens; Ayaş Beli, Atbayırı, 1100m, 18.V.2002, leg. H. Özdişken, 1 specimen; **İçel:** Fındıklı, 1035m, 31.V.2001, leg. H. Özdişken, 5 specimens; Uzuncaburç return env., 845m, 01.VI.2001, leg. H. Özdişken, 1 specimen; Entry of Çukurbağ, 1035m, 01.VI.2001, leg. H. Özdişken, 1 specimen; Mut-Silifke road, entry of Kurtsuyu, 120m, 01.VI.2001, leg. H. Özdişken, 1 specimen; Mut-Karaman road, Değirmenbaşı turn, 1430m, 02.VI.2001 and 26.VI.2001, leg. H. Özdişken, 10 specimens; **Karaman:** Karaman-Ereğli road, 995m, 02.VI.2001, leg. H. Özdişken, 4 specimens; **Kayseri:** Yahyalı, Yeşilköy, 1380m, 26.VI.1997, leg. H. Özdişken, 21 specimens; **Konya:** Kulu, Tavşancağı, 1000m, 31.V.1997, leg. H. Özdişken, 4 specimens; **Nevşehir:** Avanos, 1000-1100m, 20.VII.1992, leg. H. Özdişken, 2 specimens; **Niğde:** Bor, Üstünkaya, 07.VI.1997, leg. H. Özdişken, 1 specimen; Çamardı, Yelatan village, 1280m, 23.VI.1997, leg. H. Özdişken, 4 specimens; Altunhisar-Çiftlik road, Yeşilyurt plateau, 02.VII.1997, leg. H. Özdişken, 1 specimen; Niğde-Bor, Okçu village, 06.VII.1997, leg. H. Özdişken, 3 specimens; Exit of Ulukışla, Tabaklı village, 1145m, 29.V.2001, leg. H. Özdişken, 6 specimens; Exit of Ulukışla-Pozantı, 1290m, 24.VI.2001, leg. H. Özdişken, 1 specimen; **Turkey:** 2000, leg. H. Özdişken, 6 specimens. **AD: Kilis:** 2006, leg. H. Özdişken, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Aksaray, Ankara, İçel, Karaman, Kayseri, Kilis, Konya, Nevşehir and Niğde provinces. The species is known only from Amanos Mountains in Turkey before the present study. **Chorotype:** SW-Asiatic (Irano-Anatolian + Syro-Anatolian) or E-Mediterranean.

Labidostomis humeralis Schneider, 1792

Material examined: **BK: Çorum:** Kargı, Uzunyurt, 822m, 16.VI.2003, leg. H. Özdişken, 7 specimens; Kargı, 940m, 16.06.2003, leg. H. Özdişken, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Çorum province. **Chorotype:** European.

Labidostomis karamanica Weise, 1900

Material examined: **GV: Antalya:** Cevizli, Teke pass env., 1237m, 14.V.2006, leg. H. Özdişken, 1 specimen; **Konya:** Beyreli env., 1096m, 16.V.2006, leg. H. Özdişken, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya and Konya provinces. **Chorotype:** E-Mediterranean (Palestino-Cypriote-Taurian).

***Labidostomis longimana* (Linnaeus, 1760)**

Material examined: **HE:** Ağrı: Ağrı Mountain, 3600m, 29.VIII.2002, 1 specimen; **Ankara:** Kızılcahamam, Güvem, 30.VI.1993, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Işık Mountain, 02.VII.1994, leg. H. Özdikmen, 7 specimens; Kızılcahamam, Yukarı Çanlı, 1300-1400m, 14.VI.1997 and 11.VII.1997, leg. H. Özdikmen, 8 specimens; Kızılcahamam, Aköz village, 1150m, 26.VI.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Yenimahalle, 1150m, 05.VII.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Karagöl, 1650m, 11.VII.1997, leg. H. Özdikmen, 66 specimens; Kızılcahamam, Yasin village, 1400m, 11.VII.1997, leg. H. Özdikmen, 31 specimens; **Bolu:** Mengen, Gökçeşu road, 615 m, 06.VII.2009, leg. H. Özdikmen, 3 specimens; Hacıayaz pass, 1100 m, 07.VII.2009, leg. H. Özdikmen, 6 specimens; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 02.VI.1997, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Tilköy, 1270m, 25.VI.1997, leg. H. Özdikmen, 2 specimens; **Niğde:** Melendiz-Çiftlik road, Göllü Mountain, 1580m, 27.VI.1997, leg. H. Özdikmen, 2 specimens. **NTPPM:** **Düzce:** Kaynaşlı, 27.VI.1988, leg. Y. Özdemir, 1 specimen; **Kars:** Sankamış, 11.VII.1970, leg. A. Kalkandelen, 2 specimens; **Konya:** Beyşehir, 14.V.1991, leg. Y. Özdemir, 1 specimen. **BK:** **Bolu:** Gerede, 1240m, 19.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Küre, 1030m, 18.VI.2003, leg. H. Özdikmen, 2 specimens; Ağıl-Azdavay road, 1 km to Yumacık village, 825m, 18.VI.2003, leg. H. Özdikmen, 3 specimens; Azdavay, Yumacık village, 870m, 18.VI.2004, leg. H. Özdikmen, 1 specimen; Daday- Araç road, Akılçalı village, 958m, 19.VI.2004, leg. H. Özdikmen 1 specimen; **Samsun:** Alaçam, Dörtmen hill, 1460m, 16.VI.2004, leg. H. Özdikmen, 9 specimens; **Zonguldak:** Çayköy, 27.VI.2003, leg. H. Özdikmen, 2 specimens. **K:** **Kahramanmaraş:** Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 7 specimens; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 6 specimens; Göksun, Çardak, N 38° 05' E 36° 49', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen. **AD:** **Osmaniye:** Boğaz plateau, 713m, N 37 04 E 36 22, 18.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ağrı, Bolu, Düzce, Kahramanmaraş, Kars, Kastamonu, Konya, Niğde, Osmaniye and Zonguldak provinces. **Chorotype:** Sibero-European.

***Labidostomis maculipennis* Lefevre, 1870**

Material examined: **HE:** **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Entry of Nevşehir, 1040m, 03.VI.1997, leg. H. Özdikmen, 2 specimens; **Niğde:** Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 1 specimen. **GV:** **Konya:** Bozkır, 1 km to Yalnızca, 1437m, 13.VI.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kayseri, Konya, Nevşehir and Niğde provinces. **Chorotype:** SW-Asiatic (Irano-Anatolian).

***Labidostomis mesopotamica* Heyden, 1886**

Material examined: **HE:** **Aksaray:** Entry of Nevşehir-Aksaray, 20.V.1997, leg. H. Özdikmen, 7 specimens; Ağzıkarahan, 1220m, 20.V.1997, leg. H. Özdikmen, 2 specimens; Sivrihisar, 1710m, 02.VI.1997, leg. H. Özdikmen, 1 specimen; Belisırma, 1280m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; Entry of Nevşehir, 1040m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Şereflikoçhisar-Ankara road, 1250m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Kaçarlı, 1050m, 21.VI.1997, leg. H. Özdikmen, 1 specimen; **Konya:** Kulu, Tavşanca, 1000m, 31.V.1997, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Avanos, Zelbe, 19.V.1997, leg. H. Özdikmen, 1 specimen; Tilköy, 1270m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Altınhisar, Karacaören, 1440m, 18.V.1997, leg. H. Özdikmen, 1 specimen; Melendiz-Çiftlik road, Göllü Mountain, 1580m, 27.VI.1997, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Muş:** 07.VII.1971, leg. S. Çavdaroglu, 3 specimens. **BK:** **Kastamonu:** Kastamonu-Araç road, 960m, 16.V.2003, leg. H. Özdikmen, 1 specimen. **K:** **Kahramanmaraş:** Ekinözü, Ortaören village, N 38° 04' E 37° 09', 1271m, 23.V.2003, leg. A. Y. Okutaner, 1 specimen; Püren pass, N 37° 55' E 36° 35', 1600m, 28.V.2003, leg. A. Y. Okutaner, 2 specimens. **AD:** **Hatay:** Dörtöyl-Erzin, Kuzuculu, 188m, N 36 54 E 36 11, 17.VIII.2006, leg. H. Özdikmen, 1 specimen. **GV:** **Antalya:** Akseki, Büyükalın village, 937m, 16.IV.2007, leg. H. Özdikmen, 16 specimens; **Konya:** Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Antalya, Hatay, Kahramanmaraş, Kastamonu and Muş provinces. **Chorotype:** SW-Asiatic.

***Labidostomis oertzeni* Weise, 1889**

Material examined: **HE:** **Ankara:** Kızılcahamam, Yasin village, 1450m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Pazar village return, 26.V.2002, leg. H. Özdikmen, 2 specimens; **Niğde:** Bor, Üstinkaya, 07.VI.1997, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Çankırı:** Ilgaz, 20.VII.1994, leg. A. Kalkandelen, 1 specimen; **Eskişehir:** Central, Çavlum village, 23.VI.1997, *Malus*,

leg. Y. Özdemir, 1 specimen. **K: Kahramanmaraş:** Göksun, A. Türkiye excursion spot place- Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Çankırı, Eskişehir, Kahramanmaraş and Niğde provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Labidostomis peregrina Weise, 1900

Material examined: **HE: Aksaray:** Belisirma, 1280m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **İçel:** Exit of Kirobası, 1335m, 01.VI.2001, leg. H. Özdikmen, 1 specimen. **NTPPM: Kırşehir:** Özbağ, 27.V.1992, leg. Y. Özdemir, 1 specimen; **Nevşehir:** Avanos, 26.V.1998, leg. Y. Özdemir, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, İçel, Kırşehir and Nevşehir provinces. **Chorotype:** SW-Asiatic.

Labidostomis propinqua Faldermann, 1837

Material examined: **HE: Adana:** Pozantı, Entry of Fındıklı, 1200m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; **Aksaray:** Ağzıkarahan, 1220m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Akçakent, 1280m, 01.VI.1997, leg. H. Özdikmen, 1 specimen; Central, 1040m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Soğuksu National Park, 1100-1400m, 21.VI.1991 and 03.VII.1991 and 07.VI.1997, leg. H. Özdikmen, 5 specimens; Şereflikoçhisar, Hüsrev village, 990m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1540m, 14.06.1997, leg. H. Özdikmen, 4 specimens; Konya Makası-Şereflikoçhisar, 950m, 21.VI.1997, leg. H. Özdikmen, 3 specimens; Şereflikoçhisar, Kaçarlı, 1000m, 21.VI.1997, leg. H. Özdikmen, 3 specimens; Şereflikoçhisar, Büyükkışla, 920m, 21.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Karagöl, 1650m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; Çubuk-II- dam, 20.V.1999, leg. H. Özdikmen, 9 specimens; Asartepe dam, 18.V.2002, leg. H. Özdikmen, 1 specimen; **Bolu:** Gerede, 1329 m, 06.VII.2009, leg. H. Özdikmen, 6 specimens; **İçel:** Erdemli-Güzeloluk Memory Forest, 1340m, 30.V.2001, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, Yeşilköy, 1380m, 26.VI.1997, leg. H. Özdikmen, 3 specimens; **Nevşehir:** Tilköy, 1270m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Melendiz, Hançerli-Küçükköy, 03.VII.1996, leg. H. Özdikmen, 1 specimen; Bor, Karanlıkdere, 1150m, 18.V.1997, leg. H. Özdikmen, 1 specimen; Melendiz-Çiftlik road, Göllü Mountain, 1580m, 27.VI.1997, leg. H. Özdikmen, 2 specimens; **Turkey:** 2000, leg. H. Özdikmen, 2 specimens. **NTPPM: Çankırı:** Eldivan, 04.VI.1997, Orchard and *Medicago*, leg. Y. Özdemir, 1 specimen. **BK: Karabük:** Eflani-Daday, Karaağaç village, 1080m, 15.V.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Kastamonu-Araç road, 960m, 16.V.2003, leg. H. Özdikmen, 2 specimens. **K: Kahramanmaraş:** Elbistan, Elbistan-Taşburun road, Taşoluk, 100m, 23.V.2003, leg. A. Y. Okutaner, 1 specimen. **GV: Konya:** Entry of Gevne, 80 km to Alanya (Şeker district), 1482m, 18.VII.2006, leg. H. Özdikmen, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Adana, Aksaray, Bolu, Çankırı, İçel, Kahramanmaraş, Karabük, Kastamonu, Nevşehir and Niğde provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Labidostomis rufa (Waltl, 1838)

Material examined: **HE: Çorum:** Kargı, Karaköse district, 580m, 24.IV.2003, leg. H. Özdikmen, 1 specimen; **Niğde:** Melendiz, Hançerli-Küçükköy, 03.VII.1996, leg. H. Özdikmen, 1 specimen; Altunhisar, 1200m, 18.V.1997, leg. H. Özdikmen, 1 specimen; Çamardı, Bademdere-Elmalı, 1750m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; **NTPPM: Ankara:** Karagöl, 07.V.1968, leg. A. Kalkandelen, 1 specimen; **Bolu:** Seben, 26.IV.2001, leg. M. Özdemir, 1 specimen. **AD: Gaziantep:** Fevzipaşa, Türkbağçe village, N 37 04 E 36 37, 521m, 18.V.2007, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Akyar village, 230m, N 37 02 E 36 11, 07.IV.2006, leg. H. Özdikmen, 3 specimens; Karagedik village, 189m, N 37 12 E 36 15, 08.IV.2006, leg. H. Özdikmen, 1 specimen; Hasanbeyli, N 37 07 E 36 32, 711m, 21.IV.2007, leg. H. Özdikmen, 1 specimen; Bahçe, Taşoluk village, N 37 10 E 36 29, 514m, 21.IV.2007, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Border of province, Bademli Beli pass, 1432m, 14.V.2006, leg. H. Özdikmen, 2 specimens; **Konya:** Hadim, exit of Bozkır, 1569m, 14.V.2007, leg. H. Özdikmen, 1 specimen; Bozkır, Üçpınar village, 1471m, 15.V.2007, leg. H. Özdikmen, 1 specimen; Derebucak, 1221m, 16.V.2007, leg. H. Özdikmen, 5 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, Bolu, Çorum, Gaziantep, Niğde and Osmaniye provinces. **Chorotype:** Turano-Mediterranean (Balkano-Anatolian).

Genus *Tituboea* Lacordaire, 1848

[Type sp.: *Cryptocephalus sexmaculatus* Fabricius, 1781]

***Tituboea arabica* (Olivier, 1808)**

Material examined: **K:** Kahramanmaraş: Pazarcık, SE Kısıkobası, 1250m, 13.VII.2006, leg. A. Y. Okutaner, 1 specimen; **Hatay:** near Belen, 16.V.1990, leg. A. Warchalowski, 1 specimen (see remarks).

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Turkey. Since the materials were published by Özdikmen & Okutaner (2007).

Chorotype: E-Mediterranean.

***Tituboea macropus* (Illiger, 1800)**

Material examined: **HE:** Adana: Pozanti-Mersin, Çamlıyayla turn, 690-701m, 30.V.2001, leg. H. Ozdikmen, 6 specimens; **Aksaray:** Selime-Güzelyurt, 1240m, 27.VI.1997, leg. H. Ozdikmen, 1 specimen; **Ankara:** Şereflikoçhisar, Kaçarlı, 1050m, 21.VI.1997, leg. H. Ozdikmen, 10 specimens; **Bolu:** Gerede, 1329 m, 06.VII.2009, leg. H. Özdikmen, 1 specimen; **İçel:** Mut-Karaman road, Değirmenbaşı turn, 1430m, 02.VI.2001 and 26.VI.2001, leg. H. Ozdikmen, 18 specimens; Çağlayan, Fındıkpınarı road, 1070m, 25.VI.2001, leg. H. Ozdikmen, 1 specimen; **Kayseri:** Yeşilhisar, Güzelöz, 1260-1320m, 25.VI.1997, leg. H. Ozdikmen, 34 specimens; **Nevşehir:** Tilköy, 1270m, 25.VI.1997, leg. H. Ozdikmen, 3 specimens; **Niğde:** Bor-Altunhisar, 1240m, 24.VI.1997, leg. H. Ozdikmen, 1 specimen; Melendiz-Çiftlik road, Gölü Mountain, 1580m, 27.VI.1997, leg. H. Ozdikmen, 32 specimens; Tepeköy, 02.VII.1997, leg. H. Ozdikmen, 1 specimen; Gebere dam, 02.VII.1997, leg. H. Ozdikmen, 1 specimen; **Turkey:** 2000, leg. H. Ozdikmen, 64 specimens. **NTPPM:** **Çankırı:** Hasakça, Central, *Medicago*, 27.VII.1993, leg. A. Kalkendelen, 1 specimen; Eldivan, 04.VI.1997, Orchard and *Medicago*, leg. Y. Özdemir, 1 specimen; **Isparta:** Eğirdir, 28.VI.1995, *Pyrus* and *Malus*, leg. Y. Özdemir, 1 specimen; Eğirdir, Senirkent, 29.VI.1995, leg. Y. Özdemir, 1 specimen. **BK:** **Çorum:** Kargı, 940m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Safranbolu, Mencilis Cave env., Bulak village, 760m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** exit of Tosya, Zincirli Kuyu village, 650m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; Devrekani, Pınarözü village, 24.VII.2003, leg. H. Özdikmen, 3 specimens. **K:** **Kahramanmaraş:** Kahramanmaraş-Andırın road, Körsülü bridge env., N 37° 37' E 36° 39', 653m, 28.V.2003, leg. A. Y. Okutaner, 3 specimens; Pazarcık, Kocalar village, N 37° 36' E 37° 17', 1200m, 29.V.2003, leg. A. Y. Okutaner, 1 specimen; Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Ekinözü, N 38° 03' E 37° 11', 1015m, 27.VI.2003, leg. A. Y. Okutaner, 1 specimen; Ekinözü, Alpinar village, N 38° 5' E 37° 13', 1140m, 27.VI.2003, leg. A. Y. Okutaner, 2 specimens. **AD:** **Hatay:** Entry of Belen, Çakallı, 652m, N 36 28 E 36 13, 19.V.2006, leg. H. Özdikmen, 1 specimen; Erzin, Gököl, N 36 57 E 36 17, 600m, 04.VI.2007, leg. H. Özdikmen, 5 specimens; **Kilis:** Hassa-Kilis road, Hisar village, 16.V.2006, leg. H. Özdikmen, 2 specimens; **Osmaniye:** Küllü village, 1707m, N 36 57 E 36 24, 25.VI.2006, leg. H. Özdikmen, 3 specimens; Hasanbeyli, Kalecikli village, 587m, N 37 09 E 36 27, 19.V.2006, leg. H. Özdikmen, 7 specimens; Zorkun-Karınca-Hassa road, Küllü plateau, 1603m, N 36 57 E 36 21, 25.VI.2006, leg. H. Özdikmen, 1 specimen; Bahçe, 551m, N 37 11 E 36 33, 18.V.2006, leg. H. Özdikmen, 1 specimen; Hınzırlı plateau, Kalaycıbatıran, 1465m, N 36 58 E 36 27, 25.VI.2006, leg. H. Özdikmen, 1 specimen. **GV:** **Antalya:** Akseki, Büyükalın village, 937m, 16.IV.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Bozkır, 1 km to Yalnızca, 1445m, 12.VI.2007, leg. H. Özdikmen, 8 specimens; Bozkır, 1 km to Yalnızca, 1437m, 13.VI.2007, leg. H. Özdikmen, 22 specimens; Yalnızca env., 10 km to Bozkır, 1490m, 12.VI.2008, leg. H. Özdikmen, 8 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Hatay, Kilis and Osmaniye provinces. Since the materials were published by Özdikmen & Aslan (2009). It is new to Adana, Aksaray, Antalya, Bolu, Çankırı, Çorum, İçel, Karabük, Kastamonu, Kayseri, Nevşehir and Niğde provinces. **Chorotype:** Turano-European.

***Genus Lachnaia* Chevrolat, 1836**

[Type sp.: *Chrysomela variolosa* Linnaeus, 1767]

***Subgenus Lachnaia* Chevrolat, 1836**

[Type sp.: *Chrysomela variolosa* Linnaeus, 1767]

***Lachnaia sexpunctata* (Scopoli, 1763)**

Material examined: **HE:** **Kayseri:** Yeşilhisar, Güzelöz, 1260 m, 02.VI.1997, leg. H. Ozdikmen, 1 specimen; Yahyalı, Şelale district, Derebaşı, 1280m, 25.VI.1997, leg. H. Ozdikmen, 1 specimen; **Turkey:** 2004, leg. H. Özdikmen, 1 specimen. **BK:** **Çorum:** Kargı, Uzunyurt, 822m, 16.VI.2003, leg. H. Özdikmen, 1 specimen. **AD:** **Osmaniye:** Küllü-İslahiye road, Hınzırlı plateau, 1620m, N 36 57 E 36 25, 25.VI.2006, leg. H. Özdikmen, 1 specimen; Bahçe, Kızlaç, N 37 10 E 36 37, 761m, 19.V.2007, leg. H. Özdikmen, 1 specimen. **GV:** **Antalya:** Alanya, Çayarası, Şihlar village plateau, 1192m, 13.V.2007, leg. H. Özdikmen, 2 specimens; between Sarımut-Çayarası, 1108m, 14.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, Kayseri and Osmaniye provinces. **Chorotype:** European.

Genus *Clytra* Laicharting, 1781[Type sp.: *Chrysomela quadripunctata* Linnaeus, 1758]**Subgenus *Clytra* Laicharting, 1781**[Type sp.: *Chrysomela quadripunctata* Linnaeus, 1758]***Clytra aliena* Weise, 1897****Material examined:** BK: Kastamonu: Küre, 1040m, 18.VI.2003, leg. H. Özdikmen, 1 specimen.**Remarks:** The species has been known only from Anatolia for Turkey until now. It was new to Kastamonu province. Since, the present material was published by Özdikmen et al. (2010). **Chorotype:** Turano-Mediterranean (Balkano-Anatolian).***Clytra laeviuscula* Ratzeburg, 1837****Material examined:** HE: Ankara: Kızılcahamam, Işık Mountain, 24.VI.1993, leg. H. Ozdikmen, 1 specimen; Kızılcahamam, Işık Mountain, 01-02.VII.1994, leg. H. Ozdikmen, 11 specimens; Kızılcahamam, Yukarı Çanlı, 1300m, 19.VIII.1997, leg. H. Ozdikmen, 2 specimens; Kızılcahamam, Bel top, 1550m, 21.VIII.1997, leg. H. Ozdikmen, 6 specimens; **Turkey:** 2000, leg. H. Ozdikmen, 3 specimens. **NTPPM:** **Sakarya:** Adapazarı, Poyrazlar village, 12.VII.1993, leg. A. Kalkandelen, 1 specimen; **Ankara:** Haymana, 18.VI.1999, *Triticum*, leg. M. Özdemir, 1 specimen; **Çankırı:** Ilgaz, 20.VII.1984, leg. Y. Özdemir, 3 specimens; **Isparta:** Eğirdir, 29.VI.1995, Wild herb, leg. Y. Özdemir, 2 specimens. **BK:** **Karabük:** Bartın-Safranbolu road, Soğuksu place, 21.VII.2003, leg. H. Özdikmen, 1 specimen; Safranbolu, Gürleyik, 21.VII.2003, leg. H. Özdikmen, 1 specimen; Safranbolu, Bulak village, 22.VII.2003, leg. H. Özdikmen, 1 specimen. **K:** **Kahramanmaraş:** Göksun, Değirmendere, N 37° 55' E 36° 29', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Göksun-Çardak road, entry of Kocaahmet village, 1330m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens; Afşin, Tanır, N 38° 25' E 36° 55', 1251m, 26.VI.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Tanır, Farta place, N 38° 25' E 36° 55', 1230m, 26.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Göksun-Çardak road, N 38° 01' E 36° 35', 1320m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Tanır, Farta place, N 38° 25' E 36° 55', 1230m, 17.VII.2003, leg. A. Y. Okutaner, 2 specimens.**Remarks:** The species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province. Also, it was new to Karabük province. Since, the present materials were published by Özdikmen et al. (2010). **Chorotype:** Centralasiatic-European.***Clytra quadripunctata* (Linnaeus, 1758)*****Clytra quadripunctata quadripunctata* (Linnaeus, 1758)****Material examined:** HE: Ankara: Yukarı Çanlı, 1400m, 14.VI.1997, leg. H. Ozdikmen, 1 specimen; Çubuk II, leg. H. Ozdikmen, 2 specimens; **Bolu:** Atayaylası, 17.VI.2010, leg. H. Özdikmen, 4 specimens.**Remarks:** The species has been known only from Anatolia for Turkey until now. It was new to Ankara province. Since, the materials were published by Özdikmen et al. (2010) as *C. appendicina*. It is new to Bolu province. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Sibero-European + Centralasiatic.**Subgenus *Clytraria* Semenov, 1903**[Type sp.: *Clytra jacobsoni* Semenov, 1903]***Clytra atraphaxidis* (Pallas, 1773)*****Clytra atraphaxidis atraphaxidis* (Pallas, 1773)****Material examined:** HE: Ankara: Kızılcahamam, Keçikaya, 1630m, 24.VI.1987, leg. H. Ozdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1300m, 08.VIII.1990, leg. H. Ozdikmen, 1 specimen; Ayaş, Başbereket, 13.VII.1997, leg. H. Ozdikmen, 1 specimen; **İçel:** Mut-Silifke road, 100m, 13.VI.2001, leg. H. Ozdikmen, 1 specimen; Mersin-Gözne road, Çukurkeklik turn, 275m, 25.VI.2001, leg. H. Ozdikmen, 2 specimens; Silifke-Mut road, 145m, 26.VI.2001, leg. H. Ozdikmen, 2 specimens; Silifke- Mut road, Gölsu bridge, 30m, 26.VI.2001, leg. H. Ozdikmen, 1 specimen; Mut road, Değirmenbaşı turn, 1370m, 26.VI.2001, leg. H. Ozdikmen, 1 specimen; **Nevşehir:** Anavos, 1120m, 22.VII.1992, leg. H. Ozdikmen, 2 specimens; **Niğde:** Ferteke, 08.VI.1997, leg. H. Ozdikmen, 1 specimen; Bor, Bor-Ankara road, 1100m, 13.VII.1997, leg. H. Ozdikmen, 3 specimens; Bor, Pınarbaşı-Bor, Altunhisar road, 1100m, 17.VII.1997, leg. H. Ozdikmen, 1 specimen; Bor, Balcı village, 17.VII.1997, leg. H. Ozdikmen, 1 specimen; Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Ozdikmen, 4 specimens; Ulukışla, exit of Pozanti, 1290m, 24.VI.2001, leg. H. Ozdikmen, 1 specimen; **Turkey:** 2000, leg. H. Ozdikmen, 2 specimens. **NTPPM:** **Denizli:** 15.VI.1964, leg. N. Canbulat, 2 specimens; **Eskişehir:** Central, Çavium village, 23.VI.1997, *Malus*, leg. Y. Özdemir, 1 specimen. **BK:** **Kastamonu:** exit of Tosya, Zincirli Kuyu village, 650m, 16.VI.2003, leg. H. Özdikmen, 1 specimen. **K:** **Kahramanmaraş:** Pazarcık, Sakarya village, Kısık, N 37°

38° E 37° 24', 1250m, 13.VII.2003, leg. A. Y. Okutaner, 2 specimens. **GV: Konya:** Entry of Seydişehir, 1111m, 20.VII.2006, leg. H. Özdikmen, 1 specimen; Hadım-Bozkır road, 1372m, 13.VI.2007, leg. H. Özdikmen, 9 specimens; Yakhiyüyük plateau, 1736m, 11.VII.2007, leg. H. Özdikmen, 3 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province. Also, it was new to İçel, Kastamonu, Nevşehir and Niğde provinces. Since, the present materials were published by Özdikmen et al. (2010).

Chorotype: Sibero-European or Centralasiatic-European.

Clytra novempunctata Olivier, 1808

Material examined: **HE: Adana:** Pozanti-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 3 specimens; Pozanti-Mersin road, Çamlıyayla turn 20.km, 285m, 30.V.2001, leg. H. Özdikmen, 3 specimens; **Ankara:** Kızılcahamam-Güvem, 1100m, 26.V.1990, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1400m, 03.VI.1990, H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1150m, 21.VI.1991, H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1200m, 28.VI.1991, H. Özdikmen, 1 specimen; Kızılcahamam, Işık Mountain, 1550m, 24.VI.1993, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Güvem, 1100m, 30.VI.1993 and 14.VI.1997, leg. H. Özdikmen, 2 specimens; Şereflikoçhisar – Evren, Evren, 1220m, 21.VI.1997, Leg. H. Özdikmen, 1 specimen; Kızılcahamam-Güvem, 1000m, 26.VI.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yasin village, 1400m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; **Bolu:** Gerede, 1329 m, 06.VII.2009, leg. H. Özdikmen, 1 specimen; Abant, 30.IV.2010, leg. H. Özdikmen, 1 specimen; **İçel:** Gözne-Mersin, 200m, 28.VI.2000, leg. H. Özdikmen, 1 specimen; Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 30 specimens; Erdemli-Güzeloluk road 17. km, 920m, 30.V.2001, leg. H. Özdikmen, 1 specimen; Entry of Fındıklıpanarı 1035m, 31.V.2001, leg. H. Özdikmen, 1 specimen; Silifke, Uzuncaburç, 845m, 01.VI.2001, leg. H. Özdikmen, 2 specimens; Mut-Karaman road, 1345m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; Mut-Karaman road, Değirmenbaşı turn, 1425m, 26.VI.2001, leg. H. Özdikmen, 7 specimens; **Karaman:** Mut-Karaman road, Değirmenbaşı, 1370m, 26.VI.2001, leg. H. Özdikmen, 11 specimens; Karaman-Ereğli, 1050m, 01.VII.2000, leg. H. Özdikmen, 4 specimens; **Kayseri:** Yahyalı, İlyalı, 1140m, 02.VI.1997, leg. H. Özdikmen, 11 specimens; **Konya:** Entry of Ereğli 8.km, 1010m, 02.VI.2001, leg. H. Özdikmen, 9 specimens; **Niğde:** Çamardı, 29.VI.1996, leg. H. Özdikmen, 3 specimens; Niğde-Bor road, 17.VI.1997, leg. H. Özdikmen, 3 specimens; 5 km to Ulukışla, 1400m, 23.VI.1997, leg. H. Özdikmen, 11 specimens; Değirmenli-Ovacık, E of Melendiz Mountain, 1500m, 24.VI.1997, leg. H. Özdikmen, 2 specimens; Çamardı, Bulduruş pass, 1720m, 24.VI.1997, leg. H. Özdikmen, 2 specimens; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 3 specimens; **Osmaniye:** leg. H. Özdikmen, 8 specimens; **Turkey:** leg. H. Özdikmen, 3 specimens. **NTPPM: Ankara:** Bağlum, 07.VI.1961, leg. N. Tuatay, 1 specimen; Kızılcahamam, 31.V.1962, leg. Y. Sürmeli, 6 specimens; 12.VI.1964, leg. Y. Sürmeli, 3 specimens; Çubuk, Karagöl, 09.VI.1966, leg. Y. Sürmeli, 1 specimen; Mogan Lake, 27.VI.1980, 1 specimen; Beypazarı, İnönü plateau, 21.VI.1994, leg. Y. Özdemir, 1 specimen; **Burdur:** Ağlasun, 26.VI.1995, *Medicago*, leg. Y. Özdemir, 1 specimen; **Elazığ:** 14.V.1968, leg. Y. Sürmeli, 1 specimen; Central, 07.VI.1972, leg. Y. Dörtbudak, 5 specimens; **Gaziantep:** 30.IV.1966, leg. A. Demirtola, 3 specimens; **Hatay:** Dörtöl, 05.VI.1975, leg. S. Kornoşor, 1 specimen; **Isparta:** Eğirdir, Semirkent, 29.VI.1995, leg. Y. Özdemir, 1 specimen; **İzmir:** 25.V.1961, leg. O. Değirmenci, 4 specimens; **Karaman:** 17.V.2001, *Juglans*, leg. M. Özdemir, 1 specimen; **Konya:** 08.VI.1962, leg. N. Karabıyık, 1 specimen; **Mardin:** 09.V.1966, leg. A. Demirtola, 1 specimen; **Niğde:** Yenihisar, 05.VI.1996, leg. A. Kalkandelen, 1 specimen; **Siirt:** 20.V.1966, leg. Y. Sürmeli, 1 specimen; **Tokat:** Zile, 19.VI.1964, leg. A. Demirtola, 1 specimen; **Tunceli:** Pertek, 07.VI.1972, leg. Y. Dörtbudak, 1 specimen; **Yozgat:** 27.VI.1962, leg. Y. Sürmeli, 3 specimens. **BK: Bartın:** Ulus, kalecik village, 21.VII.2003, leg. H. Özdikmen, 1 specimen; **Bolu:** between Gerede-Kızılcahamam, 1405m, 17.V.2003, leg. H. Özdikmen, 1 specimen; Bolu-Gerede road, Susuz Kınık village, 720m, 17.V.2003, leg. H. Özdikmen, 1 specimen; Entry of Gerede highway, 1400m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Gerede-Karabük road, Dikmen and Sungur villages, 1450m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Hanköy, Aşağıbağ district, 575m, 16.V.2003, leg. H. Özdikmen, 1 specimen; exit of Safranbolu, Kastamonu road, 520m, 15.VI.2003, leg. H. Özdikmen 1 specimen; **Kastamonu:** Pınarbaşı, Uzunçam village, 655m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; **Sinop:** Sinop-Zonguldak road, 43 km to Ayancık, 25m, 17.06.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Nurhak, Tatlar, N 37° 57' E 37° 35', 1325m, 22.V.2003, leg. A. Y. Okutaner, 1 specimen; Elbistan-Kahramanmaraş road, entry of Karaelbistan, N 38° 12' E 37° 05', 1138m, 24.V.2003, leg. A. Y. Okutaner, 5 specimens; Kahramanmaraş-Andırın road, Körsülü bridge env., N 37° 37' E 36° 39', 653m, 28.V.2003, leg. A. Y. Okutaner, 1 specimen; Pazarcık, Kocalar village, N 37° 36' E 37° 17', 1200m, 29.V.2003, leg. A. Y. Okutaner, 2 specimens; Göksun-Mehmet Beyli road, N 38° 05' E 36° 27', 1480m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak road, Gücük plateau, N 38° 3' E 36° 39', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Soğucak-Nadir road, N 38° 9' E 36° 57', 1250m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens; Andırın, Geben, Ardıççalısı district, N 37° 46' E 36° 26', 1510m, 16.VII.2003, leg. A. Y. Okutaner, 1 specimen; 2003, leg. A. Y. Okutaner, 1 specimen; Sadakalar-Körsülü bridge, leg. A. Y. Okutaner, 1 specimen. **AD: Gaziantep:** Kuşçubeli pass, 1134m, N 37° 06' E 36° 36, 19.V.2006, leg. H. Özdikmen, 1 specimen; Nurdagi, N 37° 10' E 36° 42, 814m, 17.V.2007, leg. H. Özdikmen, 7 specimens; **Hatay:** Dörtöl-Erzin, Kuzuculu, 188m, N 36° 54' E 36° 11, 17.VIII.2006, leg. H. Özdikmen, 1 specimen; Yukarı Ekinci village, 178m, N 36° 15' E 36° 07, 27.VI.2006, leg. H. Özdikmen, 1

specimen; **Osmaniye:** Bahçe, 551m, N 37 11 E 36 33, 18.V.2006, leg. H. Özdikmen, 2 specimens; Akyar village, 151m, N 37 02 E 36 11, 17.V.2006, leg. H. Özdikmen, 1 specimen; Yarpuz road, Forest store env., 273m, N 37 05 E 36 19, 18.V.2006, leg. H. Özdikmen, 1 specimen; Boğaz plateau, 713m, N 37 04 E 36 22, 18.V.2006, leg. H. Özdikmen, 1 specimen; Haraz plateau, 713m, N 37 04 E 36 21, 18.V.2006, leg. H. Özdikmen, 1 specimen; Zorkun, Çiftmazı, N 37 01 E 36 17, 786m, 02.VI.2007, leg. H. Özdikmen, 4 specimens; Bahçe, Kabacalı village, N 37 11 E 36 36, 722m, 02.VI.2007, leg. H. Özdikmen, 3 specimens; Düziçi, Yarbaz, N 37 11 E 36 25, 376m, 02.VI.2007, leg. H. Özdikmen, 2 specimens; Düziçi, Gökçay, N 37 20 E 36 27, 600m, leg. H. Özdikmen, 1 specimen; Bahçe, Horu stream env., N 37 10 E 36 27, 562m, 17.V.2007, leg. H. Özdikmen, 1 specimen; Küllü village, 1707m, N 36 57 E 36 24, 25.VI.2006, leg. H. Özdikmen, 1 specimen; Küllü-İslahiye road, Hınzırlı plateau, 1620m, N 36 57 E 36 25, 25.VI.2006, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Akseki-Güzelsu road, 720m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; 1 specimen; Beyşehir-Akseki road, 80 km to Akseki, 1410m, 11.VI.2007, leg. H. Özdikmen, 4 specimens; Beyşehir-Akseki road, 65 km to Akseki, 1434m, 12.VI.2007, leg. H. Özdikmen, 1 specimen; between Sarımut-Çayarası, 1108m, 14.VI.2007, leg. H. Özdikmen, 1 specimen; Taşkent, 1761m, 15.VI.2007, leg. H. Özdikmen, 2 specimens; **Konya:** Bozkır, 1 km to Yalnızca, 1437m, 13.VI.2007, leg. H. Özdikmen, 2 specimens; Yalnızca env., 10 km to Bozkır, 1490m, 12.VI.2008, leg. H. Özdikmen, 3 specimens; **Turkey:** leg. H. Özdikmen, 6 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Adana, Antalya, Kahramanmaraş and Karaman provinces. Also, it was new to Bartın, Bolu, Hatay, Karabük, Kastamonu and Osmaniye provinces. Since, the materials were published by Özdikmen et al. (2010). **Chorotype:** Mediterranean or E-Mediterranean.

Clytra valeriana Ménétris, 1832

Clytra valeriana valeriana Ménétris, 1832

Material examined: HE: Aksaray: Belisırma, 1280m, 03.VI.1997, leg. H. Ozdikmen, 4 specimens; Güzelyurt, 1700m, 27.VI.1997, leg. H. Ozdikmen, 2 specimens; **Ankara:** Kızılcahamam, Yenimahalle, 1150m, 30.VI.1993 and 05.VII.1997, leg. H. Ozdikmen, 5 specimens; Şereflikoçhisar, İbrahimbeyli, Evren road, 1200m, 21.VI.1997, leg. H. Ozdikmen, 1 specimen; Kızılcahamam, Güvem, 1080m, 11.VII.1997, leg. H. Ozdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1300m, 11.VII.1997, leg. H. Ozdikmen, 29 specimens; **İçel:** Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 1 specimen; **Kayseri:** Güzelöz, Yeşilhisar, 1320m, 25.VI.1997, leg. H. Ozdikmen, 1 specimen; **Nevşehir:** Tilköy, 1270m, 25.VI.1997, leg. H. Ozdikmen, 4 specimens; **Niğde:** Çamardı, 29.VI.1996, leg. H. Ozdikmen, 1 specimen; Bor, Üstünkaya, 07.VI.1997, leg. H. Ozdikmen, 1 specimen; Niğde-Bor road, 17.VI.1997, leg. H. Ozdikmen, 1 specimen; Ulukışla env., 1280-1400m, 23.VI.1997, leg. H. Ozdikmen, 2 specimens; Çamardı, Bademdere- Ekmekli, 1750m, 24.VI.1997, leg. H. Ozdikmen, 2 specimens; Entry of Kayseri-Niğde, 1420m, 24.VI.1997, leg. H. Ozdikmen, 1 specimen; Çamardı, Bulduruş pass, 1720m, 24.VI.1997, leg. H. Ozdikmen, 2 specimens; Ovacık, E of Melendiz Mt.-Değirmenli, 1500m, 24.VI.1997, leg. H. Ozdikmen, 5 specimens; Niğde-Nevşehir road, 1380m, 24.VI.1997, leg. H. Ozdikmen, 1 specimen; between Araplı-Höyük, 1350m, 26.VI.1997, leg. H. Ozdikmen, 9 specimens; Melendiz-Çiftlik road, Göllü Mountain, 1580m, 27.VI.1997, leg. H. Ozdikmen, 15 specimens; Gebere dam, 02.VII.1997, leg. H. Ozdikmen, 2 specimens; **Osmaniye:** leg. H. Özdikmen, 6 specimens; **Turkey:** leg. H. Ozdikmen, 1 specimen. **NTPPM: Ankara:** Kızılcahamam, 03.VIII.1983, leg. S. Bilgetekin, 1 specimen; **Eskişehir:** Seyitgazi, 25.VI.1997, leg. Y. Özdemir, 1 specimen; **İzmir:** Selçuk, 15.VI.1964, leg. O. Özar, 1 specimen; **Niğde:** 13.VI.1990, leg. A. Kalkandelen, 1 specimen; **Yozgat:** Kazankaya, 28.VII.1987, leg. Y. Özdemir, 1 specimen; Sorgun, 27.IX.1994, *Triticum*, leg. P. Erdoğan, 1 specimen; **Turkey:** without exact locality, 1 specimen. **GV: Antalya:** Karapınar, 1704m, 13.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. Most of the materials except GV were published by Özdikmen et al. (2010). It is new to Antalya, İçel and Osmaniye provinces. **Chorotype:** Turano-Mediterranean.

Subgenus *Ovoclytra* Medvedev, 1961

[Type sp.: *Clythra nigrocincta* Lacordaire, 1848]

Clytra bodemeyeri Weise, 1900

Clytra bodemeyeri bodemeyeri Weise, 1900

Material examined: HE: Niğde: 5 km to Ulukışla, 1400m, 23.VI.1997, leg. H. Ozdikmen, 4 specimens; **Osmaniye:** leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** Hacıkadın, 21.VI.1940, 1 specimen; **Kırşehir:** Özbağ, 27.V.1992, leg. Y. Özdemir, 1 specimen. **AD: Gaziantep:** Nurdağı, N 37 10 E 36 42, 814m, 17.V.2007, leg. H. Özdikmen, 3 specimens; Nurdağı, Gökçedere village, N 37 09 E 36 43, 496m, 17.V.2007, leg. H. Özdikmen, 2 specimens; Fevzipaşa, N 37 06 E 36 39, 1126m, 18.V.2007, leg. H. Özdikmen, 1 specimen; **Hatay:** Erzin-kaplıcalar district, 123m, N 36 57 E 36 15, 17.V.2006, leg. H. Özdikmen, 4 specimens; Akbez, N 36 51 E 36 32, 527m, 18.V.2007, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Akyar village, 151m, N 37 02 E 36 11, 17.V.2006, leg. H. Özdikmen, 2 specimens; entry of

Yarpuz, 930m, N 37 03 E 36 25, 18.V.2006, leg. H. Özdikmen, 2 specimens; Kaypak-Yarpuz road, N 37 04 E 36 26, 1194m, 03.VI.2007, leg. H. Özdikmen, 3 specimens; Bahçe, Kızlaç, N 37 10 E 36 37, 761m, 19.V.2007, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Gündoğmuş road, 450m, 12.VI.2008, leg. H. Özdikmen, 1 specimen; Küçükklü village, Şeker piknik, 1298m, 09.VII.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is represented only by nominotypical subspecies in Turkey. It was new to Gaziantep and Osmaniye provinces. Since, the materials except GV were published by Özdikmen et al. (2010). It is new to Antalya province. **Chorotype:** SW-Asiatic or E-Mediterranean.

Genus *Smaragdina* Chevrolat, 1836

[Type sp.: *Clythra menetriesii* Ménétries, 1832 = *Clythra unipunctata* Lacordaire, 1848]

Smaragdina aurita (Linnaeus, 1767) (new to Anatolia)

Smaragdina aurita aurita (Linnaeus, 1767)

Material examined: **HE: Bolu:** Abant, 1052 m, 19.VI.2009, leg. H. Özdikmen, 2 specimens; **BK: Bolu:** Pazarköy, 20.V.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from European Turkey for Turkey until now. It has been represented only by the nominotypical subspecies in Turkey. So it is new to Bolu province and thereby to Anatolia (Asian Turkey). **Chorotype:** Sibero-European for the species. European for the subspecies.

Smaragdina biornata (Lefèvre, 1872)

Smaragdina biornata biornata (Lefèvre, 1872)

Material examined: **HE: Aksaray:** Ağzakarahan village, 1220m, 20.V.1997, leg. H. Özdikmen, 68 specimens; Ortaköy, Çatalçeşme-Hocaveli village, 1360m, 22.VI.1997, leg. H. Özdikmen, 4 specimens; **Bolu:** Abant, Dereceören env., 983 m, 19.VI.2009, leg. H. Özdikmen, 5 specimens; **Konya:** Kulu, Tavşançalı, 1000m, 17.V.1997, leg. H. Özdikmen, 2 specimens; Cihanbeyli, Karatepe, 1005m, 31.V.1997, leg. H. Özdikmen, 1 specimen; Cihanbeyli, 1040m, 31.V.1997, leg. H. Özdikmen, 5 specimens; **Osmaniye:** leg. H. Özdikmen, 8 specimens; **Turkey:** leg. H. Özdikmen, 1 specimen. **BK: Kastamonu:** Devrekani, 17.V.2004, leg. H. Özdikmen, 2 specimens; Kastamonu-Safranbolu road, 56 km to Safranbolu, 695m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; **Samsun:** Alaçam, Dürtmen hill, 1460m, 16.06.2004, leg. H. Özdikmen, 2 specimens. **K: Kahramanmaraş:** Elbistan, Elbistan-Taşburun road, Taşoluk, 100m, 23.V.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Kahramanmaraş, Kastamonu, Osmaniye and Samsun provinces. It is represented by two subspecies in Turkey as the nominotypical subspecies [mostly in NE Turkey (Amasya to Caucasian borders) and Caucasus] and *S. biornata angorensis* [only in Ankara and near]. **Chorotype:** SW-Asiatic.

Smaragdina biornata angorensis (Lopatin, 2002)

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1000-1600m, 23.V.1990, 21.VI.1991 and 03.VII.1991, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Hüsrev village, 990m, 20.V.1997, leg. H. Özdikmen, 3 specimens; Şereflikoçhisar, 1000m, 20.V.1997, leg. H. Özdikmen, 118 specimens; Şereflikoçhisar-Ankara road, 1250m, 20.V.1997, leg. H. Özdikmen, 23 specimens; Kızılcahamam, Soğuksu National Park, 1350-1510m, 28.V.1997 and 07.VI.1997, H. Özdikmen, 9 specimens; Şereflikoçhisar, 1000m, 03.VI.1997, leg. H. Özdikmen, 3 specimens. **NTPPM: Ankara:** Polatlı, 17.V.1984, *Triticum*, leg. T. Davarcı, 4 specimens; Ayaş, 21.VII.1988, leg. A. Kalkandelen, 1 specimen; Polatlı, 08.V.1990, *Medicago*, leg. Y. Özdemir, 6 specimens; Ayaş, Beşberket, 05.VI.1990, leg. M. Aydemir, 5 specimens; Çubuk, Sirkeli, 13.VI.1999, leg. Y. Özdemir, 1 specimen; **Çankırı:** Central, 29.V.1974, leg. G. Altınayar, 4 specimens.

Remarks: The subspecies has been known only from Anatolia for Turkey until now. **Chorotype:** Anatolian.

Smaragdina djebellina (Lefevre, 1872) (new to Turkey)

Material examined: **AD: Hatay:** Akbez, N 36 51 E 36 32, 527m, 18.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** E-Mediterranean (Palestino-Taurian).

Smaragdina graeca (Kraatz, 1872)

Material examined: **HE: Bolu:** Abant, Dereceören env., 983 m, 19.VI.2009, leg. H. Özdikmen, 1 specimen; **AD: Gaziantep:** Fevzipaşa, N 37 06 E 36 39, 1126m, 18.V.2007, leg. H. Özdikmen, 2

specimens; Nurdağı, N 37 10 E 36 42, 814m, 17.V.2007, leg. H. Özdikmen, 3 specimens; Nurdağı, Gökçedere village, N 37 09 E 36 43, 496m, leg. H. Özdikmen, 1 specimen; **Osmaniye**: Zorkun road, Giftmazi, 223m, N 37 01 E 36 17, 20.V.2006, leg. H. Özdikmen, 1 specimen. **GV: Antalya**: Alanya, Taşkent road, exit of Karapınar village, entry of Gevne, 1100m, 16.V.2006, leg. H. Özdikmen, 19 specimens.

Remarks: The subspecies has been known only from Anatolia for Turkey until now. It is new to Antalya, Bolu, Gaziantep and Osmaniye provinces. **Chorotype**: Turano-Mediterranean (Balkano-Anatolian).

Smaragdina hypocrita (Lacordaire, 1848)

Material examined: **HE: Ankara**: Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 40 specimens. **NTTPM: Çankırı**: Ilgaz, Kadınçayırı, 03.VI.1997, leg. Y. Özdemir, 1 specimen. **BK: Bolu**: between Yeniçağa–Gerede, exit of Yeniçağa, 1045m, 17.V.2003, leg. H. Özdikmen, 2 specimens; between Gerede–Kızılcahamam, 1200m, 17.V.2003, leg. H. Özdikmen, 11 specimens; Gerede–Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Gerede–Karabük road, Dikmen and Sungur villages, 1450m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Yeniçağa, 1025m, 19.VI.2003, leg. H. Özdikmen, 1 specimen; **Çorum**: Kargı, Göletdere, Karagöl village, 1120m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Düzce**: Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Özdikmen, 16 specimens; Yiğilca, Aydın village – Dutlar village, 200m, 12.V.2003, leg. H. Özdikmen, 50 specimens; Yiğilca, Karakaş village, 390m, 12.V.2003, leg. H. Özdikmen, 4 specimens; **Kastamonu**: Kastamonu–Tosya road, Tosya–İlgaz pass, 1650m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; Daday–Araç road, Akılçalmaz village, 958m, 19.VI.2004, leg. H. Özdikmen 4 specimens; Daday, Daday–Araç road, 1107m, 19.VI.2004, leg. H. Özdikmen, 2 specimens; **Samsun**: Alaşım, Dürtmen hill, 1460m, 16.VI.2004, leg. H. Özdikmen, 2 specimens; **Sinop**: Ayancık, Akgöl, 1170m, 17.VI.2004, leg. H. Özdikmen, 2 specimens. **AD: Gaziantep**: Nurdağı, N 37 10 E 36 42, 814m, 17.V.2007, leg. H. Özdikmen, 2 specimens; Fevzipaşa, Türkbağçe village, N 37 04 E 36 37, 521m, 18.V.2007, leg. H. Özdikmen, 2 specimens; Nurdağı, Gökçedere village, N 37 09 E 36 43, 496m, 17.V.2007, leg. H. Özdikmen, 1 specimen; **Hatay**: Antakya, Saint Pierre church env., N 16 12 E 36 10, 210m, 30.III.2007, leg. H. Özdikmen, 5 specimens; Harbiye–Yayladağı road, N 36 07 E 36 08, 275m, 30.III.2007, leg. H. Özdikmen, 5 specimens; Harbiye, N 36 07 E 36 08, 273m, 30.III.2007, leg. H. Özdikmen, 1 specimen; Alahan castle, N 36 19 E 36 11, 147m, 30.III.2007, leg. H. Özdikmen, 3 specimens; Yayladağı, N 35 55 E 36 06, 787m, 20.IV.2007, leg. H. Özdikmen, 1 specimen; Aktepe, N 36 39 E 36 27, 207m, 18.V.2007, leg. H. Özdikmen, 1 specimen; Akbez, N 36 50 E 36 32, 464m, 22.IV.2007, leg. H. Özdikmen, 1 specimen; **Osmaniye**: Hasanbeyli, N 37 07 E 36 32, 711m, 21.IV.2007, leg. H. Özdikmen, 1 specimen, 31.III.2007, 2 specimens. **GV: Konya**: Feslikan plateau, Afşar, Taşkent, 1900m, 13.V.2007, leg. H. Özdikmen, 1 specimen; Hadim-Beyreli road, 1880m, 14.V.2007, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It was new to Hatay, Gaziantep and Osmaniye provinces. Since the materials were published by Özdikmen & Aslan (2009). It is new to Bolu, Çankırı, Çorum, Düzce, Konya and Sinop provinces. **Chorotype**: SW-Asiatic.

Smaragdina judaica (Lefevre, 1872)

Material examined: **AD: Osmaniye**: Hasanbeyli, N 37 07 E 36 32, 711m, 21.IV.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The subspecies has been known only from Anatolia for Turkey until now. It is new to Osmaniye province. **Chorotype**: E-Mediterranean (Palestino-Taurian).

Smaragdina limbata (Steven, 1806)

Material examined: **HE: Ankara**: Kızılcahamam, Soğuksu National Park, 1050-1200m, 02-03.06.1990, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Aköz Village, 1150m, 28.05.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Yukarı Çanlı, 1250m, 28.05.1997, leg. H. Özdikmen, 11 specimens; Kızılcahamam, Güvem, 1100m, 28.05.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Salın Village, 1300m, 14.06.1997, leg. H. Özdikmen, 2 specimens; Ayaş Bel, 1100m, 18.05.2002, Leg. H. Özdikmen, 20 specimens; **Bolu**: Seben, Güneyce, 01.V.2010, leg. H. Özdikmen, 1 specimen; **Niğde**: Ulukışla–Altunhisar, 1380-1400m, 01.06.1997, Leg. H. Özdikmen, 2 specimens; Ferteke, 08.06.1997, leg. H. Özdikmen, 1 specimen. **NTTPM: Ankara**: Kızılcahamam, 31.V.1962, leg. Y. Sürmeli, 2 specimens; Elmadag, 24.V.1967, leg. A. Kalkandelen, 1 specimen; Ayaş, Beşberek, 05.VI.1990, leg. M. Aydemir, 2 specimens; Polatlı, Sarıközü, 14.VI.1990, leg. M. Aydemir, 1 specimen; Çubuk, Sirkeli, 13.VI.1996, leg. Y. Özdemir, 1 specimen; **Burdur**: Akçaköy village, Karegent bridge, 27.IV.1968, leg. A. Kalkandelen, 1 specimen; Hacılar, 09.V.2000, leg. Y. Özdemir, 1 specimen; **Çankırı**: Eldivan, 04.VI.1997, Orchard and *Medicago*, leg. Y. Özdemir, 1 specimen; Eldivan, 04.VI.1997, *Quercus*, leg. Y. Özdemir, 1 specimen; Eldivan, 04.VI.1997, Orchard, leg. Y. Özdemir, 2 specimens; **Diyarbakır**: Ergani, 09.IV.1961, leg. N. Adıgüzel, 1 specimen; **Gaziantep**: İslahiye, 13.IV.1962, leg. Y. Sürmeli, 8 specimens; **Hakkari**: 21.V.1966, leg. Y. Sürmeli, 2 specimens; **Hatay**: Antakya, Samandağı, 16.IV.1962, leg. Y. Sürmeli, 1 specimen; **Isparta**: Alabey, 07.V.1962, leg. Y. Sürmeli, 1 specimen; Iskara village, 25.IV.1968, leg. A.

Kalkandelen, 1 specimen; Eğirdir, 11.V.2000, leg. Y. Özdemir, 1 specimen; **İzmir**: 06.V.1961, leg. O. Değirmenci, 1 specimen; **Niğde**: 15.V.1961, leg. Ş. Velibeyoğlu, 1 specimen. **BK: Çorum**: Kargı, Uzunyurt, 822m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Düzce**: Karakaş village, 510m, 12.V.2003, leg. H. Özdikmen, 8 specimens; **Karabük**: Safranbolu, Hızar Yanı place, 740m, 14.V.2003, leg. H. Özdikmen, 3 specimens; Eflani–Daday, Karaağaç village, 1080m, 15.V.2003, leg. H. Özdikmen, 4 specimens; Safranbolu, Konarı village, 485m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu**: Kastamonu–Araç road, 960 m, 16.V.2003, leg. H. Özdikmen, 16 specimens; between Araç–Karabük, Çıraklar village, 440m, 16.V.2003, leg. H. Özdikmen, 1 specimen; **Sinop**: 35m, 17.VI.2003, leg. H. Özdikmen, 1 specimen; **Zonguldak**: between Yedigöller–Devrek, 230m, 13.V.2003, leg. H. Özdikmen, 3 specimens. **K: Kahramanmaraş**: Nurhak, Tatlar, N 37° 57' E 37° 35', 1325m, 22.V.2003, leg. A. Y. Okutaner, 2 specimens; Çağlayançerit, N 37° 44' E 37° 17', 1250m, 03.VI.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Gaziantep**: Kuşçubeli pass, N 37 06 E 36 36, 1115m, 17.V.2007, leg. H. Özdikmen, 4 specimens; **Hatay**: Antakya, Saint Pierre church env., N 16 12 E 36 10, 210m, 30.III.2007, leg. H. Özdikmen, 1 specimen; Akbez, N 36 50 E 36 32, 464m, 22.IV.2007, leg. H. Özdikmen, 17 specimens; Samandağı, Hüseyinli village, N 36 09 E 36 04, 149m, 20.IV.2007, leg. H. Özdikmen, 2 specimens; Kuzuculu, N 36 53 E 36 15, 134m, 23.IV.2007, leg. H. Özdikmen, 4 specimens; Harbiye–Yayladağı road, N 36 07 E 36 08, 275m, 30.III.2007, leg. H. Özdikmen, 3 specimens; İskenderun, Sakıtlı plateau, N 36 32 E 36 14, 1003m, 20.IV.2007, leg. H. Özdikmen, 4 specimens; Samandağı, Üzençili village, N 36 09 E 36 04, 141m, 20.IV.2007, leg. H. Özdikmen, 3 specimens; Yayladağı, N 35 55 E 36 06, 787m, 20.IV.2007, leg. H. Özdikmen, 1 specimen; Harbiye, N 36 07 E 36 08, 273m, 30.III.2007, leg. H. Özdikmen, 1 specimen; Akbez, N 36 51 E 36 32, 527m, 18.V.2007, leg. H. Özdikmen, 1 specimen; Alahan castle, N 36 19 E 36 11, 147m, 30.III.2007, leg. H. Özdikmen, 6 specimens; **Osmaniye**: Castabala (Hieropolis) Ören Yeri, N 37 10 E 36 11, 90m, 31.III.2007, leg. H. Özdikmen, 1 specimen; Bahçe, Kızlaç village, Aslanlı Bel, N 37 10 E 36 38, 768m, 21.IV.2007, leg. H. Özdikmen, 9 specimens; Hasanbeyli, N 37 07 E 36 32, 711m, 21.IV.2007, leg. H. Özdikmen, 3 specimens; Bıçakçı village, N 37 09 E 36 17, 293m, 21.IV.2007, leg. H. Özdikmen, 1 specimen; Toprakkale, N 37 03 E 36 08, 107m, 23.IV.2007, leg. H. Özdikmen, 1 specimen; Kaypak, N 37 09 E 36 27, 524m, 21.IV.2007, leg. H. Özdikmen, 1 specimen; Bahçe, N 37 11 E 36 32, 540m, 19.V.2007, leg. H. Özdikmen, 2 specimens; Zorkun, Çiftmazi, N 37 01 E 36 17, 786m, 19.V.2007, leg. H. Özdikmen, 1 specimen; Kesmeburun village, (Hierapolis) Castabala Ören Yeri, 99m, N 37 10 E 36 11, 09.IV.2006, leg. H. Özdikmen, 6 specimens; Kalecik–Hasanbeyli road, 689m, N 37 03 E 36 30, 19.V.2006, leg. H. Özdikmen, 2 specimens; Zorkun road, Giftmazi, 223m, N 37 01 E 36 17, 20.V.2006, leg. H. Özdikmen, 7 specimens; Mitisin plateau, 1402m, N 36 58 E 36 21, 20.V.2006, leg. H. Özdikmen, 26 specimens; Hasanbeyli, Kalecikli village, 587m, N 37 09 E 36 27, 19.V.2006, leg. H. Özdikmen, 1 specimen; Kalecik–Hasanbeyli road, 679m, N 37 09 E 36 28, 19.V.2006, leg. H. Özdikmen, 1 specimen. **GV: Antalya**: Alanya, Çayarası, Şihlar village plateau, 1192m, 13.V.2007, leg. H. Özdikmen, 2 specimens; Akseki, 1233m, 14.V.2006, leg. H. Özdikmen, 1 specimen; Cevizli, Teke pass env., 1237m, 14.V.2006, leg. H. Özdikmen, 9 specimens; Akdağ, Akseki, between Bademli Bel–Teke pass, 1435m, 14.V.2006, leg. H. Özdikmen, 4 specimens; Güzelbağ, 860m, 15.V.2006, leg. H. Özdikmen, 2 specimens; Alanya–Tashtent road, exit of Karapınar village, entry of Gevne, 1100m, 16.V.2006, leg. H. Özdikmen, 2 specimens; İbradı, 1036m, 16.V.2007, leg. H. Özdikmen, 1 specimen; Beyşehir–Akseki road, 65 km to Akseki, 1434m, 12.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya**: Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 8 specimens; Bozkır, Sorkun–Akseki road, 1347m, 15.V.2007, leg. H. Özdikmen, 1 specimen; Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 5 specimens; Entry of Gevne, 80 km to Alanya (Şeker district), 1482m, 18.VII.2006, leg. H. Özdikmen, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Antalya, Burdur, Çankırı, Düzce, Gaziantep, Hakkari, Hatay, Kahramanmaraş, Karabük, Kastamonu, Niğde, Osmaniye, Sinop and Zonguldak provinces.

Chorotype: Turano-Mediterranean (Turano-Balkan).

Smaragdina salicina (Scopoli, 1763)

Material examined: **BK: Karabük**: Safranbolu, Hızar Yanı place, 740m, 14.V.2003, leg. H. Özdikmen, 2 specimens; Safranbolu, Bulak village, Mağaradüzü district, 21.V.2004, leg. H. Özdikmen, 2 specimens; **Sinop**: 35 m, 17.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Karabük and Sinop provinces and thereby to Turkey. Since, the present materials were published by Özdikmen & Okutaner (2007) as a new record for Turkey. **Chorotype:** Sibero-European.

Smaragdina tibialis (Brullé, 1832)

Material examined: **HE: Ankara**: Kızılcahamam, Soğuksu National Park, 1250m, 07.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 1 specimen. **BK: Karabük**: Safranbolu, Hızar Yanı district, 740m, 14.V.2003, leg. H. Özdikmen, 1 specimen as *S. tibialis* (typical form); **Düzce**: Yığılca, Karakaş village, 390m, 12.V.2003, leg. H. Özdikmen, 1 specimen as *S. tibialis* ab. *liturata*; Yığılca, Aydın village – Dutlar village, 200m, 12.V.2003, leg. H. Özdikmen, 1 specimen as *S. tibialis* ab. *liturata*; **Karabük**: Eflani, Yağlıca village, 975m, 15.V.2003, leg. H. Özdikmen, 2 specimens as *S. tibialis* ab. *liturata*; Safranbolu, Hızar Yanı place, 740m, 14.V.2003, 2 specimens as *S.*

tibialis ab. *liturata*; **Kastamonu**: Pazarköy-Eskipazar, Kayılar village, 20.V.2004, leg. H. Özdikmen, 1 specimen as *S. tibialis* ab. *liturata*.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Düzce, Karabük and Kastamonu provinces. **Chorotype**: E-Mediterranean or E-European.

Smaragdina unipunctata (Olivier, 1808)

Material examined: NTPPM: **Şanlıurfa**: Birecik, 15.IV.1963, leg. F. Altinkaya, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. **Chorotype**: Turano-Mediterranean.

Smaragdina viridana (Lacordaire, 1848)

Smaragdina viridana viridana (Lacordaire, 1848)

Material examined: NTPPM: **Diyanbakır**: Ergani, Bereketli, 17.IV.1972, leg. Y. Dörtbudak, 1 specimen; Kadıköy, 10.V.1972, leg. Y. Dörtbudak, 1 specimen; **Siirt**: Central, 11.V.1972, leg. Y. Dörtbudak, 1 specimen. **BK: Bolu**: between Gerede-Kızılcahamam, 1200m, 17.V.2003, leg. H. Özdikmen, 6 specimens. **AD: Gaziantep**: Fevzipaşa-İslahiye road, N 37 05 E 36 38, 542m, 31.III.2007, leg. H. Özdikmen, 1 specimen; Nurdagi, N 37 10 E 36 42, 814m, 17.V.2007, leg. H. Özdikmen, 1 specimen; **Hatay**: Antakya, Saint Pierre church env., N 16 12 E 36 10, 210m, 30.III.2007, leg. H. Özdikmen, 4 specimens; Harbiye-Yayladağı road, N 36 07 E 36 08, 275m, 30.III.2007, leg. H. Özdikmen, 2 specimens; Harbiye-Yayladağı road, N 36 07 E 36 08, 275m, 30.III.2007, leg. H. Özdikmen, 1 specimen; Akbez, N 36 50 E 36 32, 464m, 22.IV.2007, leg. H. Özdikmen, 2 specimens. **GV: Antalya**: Border of province, Bademli Beli pass, 1432m, 14.V.2006, leg. H. Özdikmen, 1 specimen; **Konya**: Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is represented only by the nominotypical subspecies in Turkey. It is new to Antalya, Bolu, Diyanbakır, Hatay, Konya and Siirt provinces. **Chorotype**: E-Mediterranean.

Smaragdina xanthaspis (Germar, 1824)

Material examined: **HE: Ankara**: Kızılcahamam, Soğuksu National Park, 1200-1300m, 13.VII.1990 and 28.VI.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Işık Mountain, 1550m, 24.VI.1993, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1100-1250m, 28.V.1997 and 07.VI.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yukarı Çanlı, 1300-1540m, 14.VI.1997 and 11.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Güvem, 1100m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Salın Village, 1300m, 14.VI.1997, leg. H. Özdikmen, 2 specimens; Şereflikoçhisar – Evren, Evren, 1220m, 21.VI.1997, leg. H. Özdikmen, 8 specimens; Kızılcahamam, Güvem, 1000-1080m, 26.VI.1997 and 11.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yasin village, 1450m, 11.VII.1997, leg. H. Özdikmen, 5 specimens; **Bolu**: Abant, Dereceören env., 983 m, 19.VI.2009, leg. H. Özdikmen, 1 specimen; Between Gerede-Mengen, 856 m, 06.VII.2009, leg. H. Özdikmen, 1 specimen; Hacıayaz pass, 1100 m, 07.VII.2009, leg. H. Özdikmen, 1 specimen; Yeniçağa-Mengen road, 14.VI.2010, leg. H. Özdikmen, 1 specimen; Entry of Abant, 15.VI.2010, leg. H. Özdikmen, 1 specimen; Abant-Akçaalan, 15.VI.2010, leg. H. Özdikmen, 1 specimen; Abant lake env., 15.VI.2010, leg. H. Özdikmen, 4 specimens; **Niğde**: Niğde Bağları, Kayaardı, 17.VI.1997, leg. H. Özdikmen, 3 specimens; Niğde-Bor, Derbent district, 17.VI.1997, leg. H. Özdikmen, 4 specimens; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 2 specimens; Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 8 specimens; Niğde-Bor road, Derbent district, 15.VII.1997, leg. H. Özdikmen, 16 specimens; Altunhisar – Çiftlik road, Entry of Çiftlik, 29.VII.1997, leg. H. Özdikmen, 1 specimen; **Ordu**: leg. H. Özdikmen, 4 specimens; **Turkey**: leg. H. Özdikmen, 1 specimen. **NTPPM: Afyon**: D. dere, 1000m, 14.VI.1998, *Papaver*, leg. M. Özdemir, 1 specimen; **Ankara**: Çubuk, Ömürdede, 30.VI.1980, leg. Y. Özdemir, 1 specimen; Çubuk, Karagöl, 03.VIII.1983, leg. Y. Özdemir, 2 specimens; Ayaş, 21.VII.1988, leg. A. Kalkandelen, 3 specimens; Ayaş, 20.IX.1993, leg. Y. Özdemir, 1 specimen; Çubuk, Sirkeli, 13.VI.1996, leg. Y. Özdemir, 9 specimens; Çubuk, 13.VI.1996, leg. Y. Özdemir, 1 specimen; Haymana, 18.VI.1999, leg. M. Özdemir, 2 specimens; **Bartın**: Amasra, 29.VI.1988, leg. A. Kalkandelen, 1 specimen; **Bolu**: Gerede, 14.VI.1994, leg. A. Kalkandelen, 1 specimen; Mudurnu, 15.VI.1994, leg. A. Kalkandelen, 1 specimen; Yedigöller, 01.VI.1999, leg. Y. Özdemir, 1 specimen; **Çankırı**: Central, 20.IX.1993, leg. Y. Özdemir, 1 specimen; **Düzce**: Kaynaşlı, 27.VI.1988, leg. Y. Özdemir, 1 specimen; Yeşilköy, 28.VI.1988, leg. A. Kalkandelen, 1 specimen; Cumaovası, 27.VII.1988, leg. A. Kalkandelen, 1 specimen; 14.VI.1994, leg. A. Kalkandelen, 2 specimens; **Sakarya**: Poyrazlar village, 12.VII.1993, leg. A. Kalkandelen, 1 specimen; **Zonguldak**: Alaplı, 29.VI.1988, leg. A. Kalkandelen, 1 specimen; Çaycuma, Saltukova, 10.VI.1994, leg. A. Kalkandelen, 1 specimen. **BK: Bartın**: Bartın-Çaycuma road, Yazıcılar village, 19.V.2004, leg. H. Özdikmen, 1 specimen; **Bolu**: Yeniçağa-Mengen, 20.V.2004, leg. H. Özdikmen, 2 specimens; Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 3 specimens; Devrek-Mengen road, 17 km to Mengen, 560m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; Yeniçağa, 1025 m, 19.VI.2003, leg. H. Özdikmen, 9 specimens; **Çorum**: Kargı, Göletdere, Karagöl village, 1120m, 16.VI.2003, leg. H. Özdikmen, 4

specimens; **Karabük:** Üçevler, 1000m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Safranbolu, Mencilis Cave env., Bulak village, 760m, 14.VI.2003, 9 specimens; Bulak village, Bağ Evleri, 670 m, 15.VI.2003, leg. H. Özdikmen, 2 specimens; Bulak village, Bağ Evleri, 670m, 15.VI.2003, leg. H. Özdikmen, 2 specimens; Safranbolu, Gürleyik National Park, 21.VII.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Kanlıgöl, 1125m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Kastamonu-Tosya road, Tosya-İlgaz pass, 1650m, 16.VI.2003, leg. H. Özdikmen, 9 specimens; Küre, 1030m, 18.VI.2003, leg. H. Özdikmen, 11specimens; Ağılı-Azdavay road, Yumacık village, 825m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; between Azdavay-Pınarbaşı, 885m, 18.VI.2003, leg. H. Özdikmen, 2 specimens; Pınarbaşı-Azdavay road, Suğla Plateau, 23.VII.2003, leg. H. Özdikmen, 1 specimen; Devrekani, Pınarözü village, 24.VII.2003, leg. H. Özdikmen, 5 specimens; Doğanyurt-Şenpazar road, 7 km to Şenpazar, 687m, 18.VI.2004, leg. H. Özdikmen, 9 specimens; Doğanyurt-Dağyurdu, 727m, 18.VI.2004, leg. H. Özdikmen, 4 specimens; Doğanyurt-Dağyurdu, 950m, 18.VI.2004, leg. H. Özdikmen, 3 specimens; Daday- Araç road, Akılçalmaz village, 958m, 19.VI.2004, leg. H. Özdikmen 1 specimen; Daday-Araç road, 7 km to Araç, 1010m, 19.VI.2004, leg. H. Özdikmen, 4 specimens; **Samsun:** Alaçam, Dürümen hill, 1460m, 16.VI.2004, leg. H. Özdikmen, 17 specimens; Alaçam, Kapaklı village, 620m, 16.VI.2004, leg. H. Özdikmen, 2 specimens; **Sinop:** Ayvancık, exit of Yenikonak, 125m, 17.VI.2003, leg. H. Özdikmen, 5 specimens; **Zonguldak:** between Yedigöller-Devrek, 230m, 13.V.2003, leg. H. Özdikmen, 1 specimen; entry of Ulus, 600m, 19.VI.2003, leg. H. Özdikmen, 1 specimen; Çayköy, 27.VI.2003, leg. H. Özdikmen, 1 specimen. **K:** Kahramanmaraş: Püren pass, N 37° 55' E 36° 35', 1600m, 28.V.2003, leg. A. Y. Okutaner, 1 specimen. **GV:** **Antalya:** Alanya, Çayarası, Şihlar village plateau, 1192m, 13.V.2007, leg. H. Özdikmen, 5 specimens; **Konya:** Bozkır, Sorkun-Akseki road, 1347m, 15.V.2007, leg. H. Özdikmen, 3 specimens; Bozkır, 10.IX.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Afyon, Antalya, Bartın, Bolu, Çankırı, Düzce, Kahramanmaraş, Karabük, Kastamonu, Konya, Niğde, Ordu, Sakarya, Samsun, Sinop and Zonguldak provinces. **Chorotype:** European (S, C and E European).

Genus *Cheilotoma* Chevrolat, 1836

[Type sp.: *Chrysomela bucephala* Schaller, 1783 = *Chrysomela muscifformis* Goeze, 1777]

Subgenus *Cheilotoma* Chevrolat, 1836

[Type sp.: *Chrysomela bucephala* Schaller, 1783 = *Chrysomela muscifformis* Goeze, 1777]

Cheilotoma beldei Kasap, 1984

Material examined: **HE:** **Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997 and 14.VI.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Aköz Village, 1150m, 28.V.1997, leg. H. Özdikmen, 5 specimens; Kızılcahamam, Soğuksu National Park, 1350m, 07.VI.1997, leg. H. Özdikmen, 18 specimens; Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Yenimahalle, 1100m, 05.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Karagöl, 1650m, 11.VII.1997, leg. H. Özdikmen, 2 specimens. **NTPPM:** **Bolu:** Gerede, 14.VI.1994, leg. A. Kalkandelen, 1 specimen; **Eskişehir:** Seyitgazi, 14.VI.1973, leg. G. Altınayar, 1 specimen. **BK:** **Bolu:** between Gerede-Kızılcahamam, 1200m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Samsun:** Alaçam, Kapaklı village, 620m, 16.VI.2004, leg. H. Özdikmen, 5 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Samsun province. Most of the present materials were published by Özdikmen et al. (2007a). **Chorotype:** E-Mediterranean or SW-Asiatic.

Cheilotoma erythrostoma Faldermann, 1837

Cheilotoma erythrostoma erythrostoma Faldermann, 1837

Material examined: **HE:** **Ankara:** Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Salın Village, 1300m, 14.VI.1997, leg. H. Özdikmen, 2 specimens. **BK:** **Bolu:** Bolu-Gerede road, Susuz Kınık village, 720 m, leg. H. Özdikmen, 1 specimen; between Gerede-Kızılcahamam, 1200m, 17.V.2003, leg. H. Özdikmen, 2 specimens; Yeniçağa-Mengen, Çamlık village, 20.V.2004, leg. H. Özdikmen, 4 specimens; Yeniçağa-Mengen, 20.V.2004, leg. H. Özdikmen, 2 specimens; **Kastamonu:** Kastamonu-İnebolu, 17.V.2004, leg. H. Özdikmen, 2 specimens; **Samsun:** Alaçam, Kapaklı village, 620m, 16.VI.2004, leg. H. Özdikmen, 1 specimen. **GV:** **Konya:** Beyşehir, 1137m, 16.V.2007, leg. H. Özdikmen, 16 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Turkey. Since, the materials except GV were published by Özdikmen et al. (2007a) as new record for Turkey. It is new to Konya province. **Chorotype:** Turano-European for the species. Turano-Mediterranean (Turano-Balkan) for the subspecies.

Cheilotoma musciformis (Goeze, 1777)*Cheilotoma musciformis musciformis* (Goeze, 1777)

Material examined: **GV: Konya:** Hadim, Küçükklü village, Şeker Piknik, 1300m, 18.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Konya province. **Chorotype:** Sibero-European.

Genus *Coptocephala* Chevrolat, 1836

[Type sp.: *Clytra melanocephala* Olivier, 1808 = *Cryptocephalus plagiocephalus* Fabricius, 1792]

Coptocephala destinoi Fairmaire, 1884

Material examined: **HE: Adana:** Pozanti-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 1 specimen; **İçel:** Silifke-Mut road, 10. km, 100-115m, 01.VI.2001 and 26.VI.2001, leg. H. Özdikmen, 11 specimens; Mersin-Gözne road, Entry of Yeniköy, 930m, 25.VI.2001, 2 specimens. **NTPPM: Konya:** Karapınar, 22.VIII.1991, leg. Y. Özdemir, 1 specimen. **BK: Kastamonu:** between Taşköprü-Hanönü, 24.VII.2003, leg. H. Özdikmen, 2 specimens. **K: Kahramanmaraş:** Kahramanmaraş-İlica road, N 37° 52' E 36° 50', 1340m, 23.VI.2003, leg. A. Y. Okutaner, 1 specimen; Çağlayançerit, Bozlar, N 37° 38' E 37° 55', 1200m, 13.VII.2003, leg. A. Y. Okutaner, 1 specimen; Andırın-Çokak road, Çınar place, N 37° 36' E 36° 21', 1200m, 15.VII.2003, leg. A. Y. Okutaner, 3 specimens; Andırın-Çokak road, Akifiye, N 37° 41' E 36° 20', 1205m, 16.VII.2003, leg. A. Y. Okutaner, 9 specimens; Nurhak, Nurhak-Malatya road, Tatlar, N 37° 57' E 37° 35', 1325m, 18.VII.2003, leg. A. Y. Okutaner, 1 specimen; Andırın, Andırın-Çokak road, Çınar place, N 37° 36' E 36° 21', 1200m, 11.VIII.2003, leg. A. Y. Okutaner, 1 specimen; Andırın, Andırın-Çokak road, Çınar place, N 37° 36' E 36° 21', 1200m, 11.VIII.2003, leg. A. Y. Okutaner, 2 specimens. **AD: Hatay:** Payas, 27m, N 36 47 E 36 12, 27.VI.2006, leg. H. Özdikmen, 2 specimens; **Osmaniye:** Düziçi, Böcekli village, 209m, N 37 18 E 36 20, 28.VI.2006, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Hatay, İçel, Kahramanmaraş, Kastamonu, Konya and Osmaniye provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Coptocephala unifasciata (Scopoli, 1763)*Coptocephala unifasciata unifasciata* (Scopoli, 1763)

Material examined: **HE: Adana:** Pozanti-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 11 specimens; **Ankara:** Kızılcahamam, Soğuksu National Park, 1300-1650m, 03.VIII.1990 and 02.VII.1991, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Bel Doruğu, 1600m, 21.VIII.1997, leg. H. Özdikmen, 1 specimen; **Antalya:** Aksu bridge env., 12.VII.2002, leg. H. Özdikmen, 1 specimen; **İçel:** Erdemli-Güzeloluk road, 215m, 30.V.2001, leg. H. Özdikmen, 1 specimen; Silifke-Mut road, 10. km, 100m, 01.VI.2001, leg. H. Özdikmen, 3 specimens; Mersin-Gözne road, Çukurkeçilik turn, 275m, 25.VI.2001, 1 specimen; Silifke-Mut road, Gökusu bridge, 45m, 02 and 26.VI.2001, leg. H. Özdikmen, 12 specimens; Karaman-Mut, near Mut, 1150m, 26.VII.2000, leg. H. Özdikmen, 10 specimens; **Neveşehir:** Avanos, 1050m, 22.VII.1992, leg. H. Özdikmen, 1 specimen; **Niğde:** Gebere dam, 29.VII.1997, leg. H. Özdikmen, 10 specimens; Çiftlik, Murtaza dam, 29.VII.1997, leg. H. Özdikmen, 11 specimens; Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 33 specimens. **NTPPM: Afyon:** Central, 04.VIII.1993, leg. A. Kalkandelen, 1 specimen; Bolvadin, 09.VIII.1999, *Medicago*, leg. Y. Özdemir, 1 specimen; **Ankara:** Kalecik, 07.VII.1993, leg. A. Kalkandelen, 1 specimen; **Çankırı:** Yapraklı, 28.VII.1993, leg. A. Kalkandelen, 2 specimens; Ilgaz, 16.IX.1993, leg. A. Kalkandelen, 2 specimens; **Erzincan:** Çağlayan, 04.VII.1979, leg. A. Kalkandelen, 1 specimen. **BK: Bartın:** Bartın-Karabük road, Gökırmak bank, 14.VIII.2003, leg. H. Özdikmen, 2 specimens; Bartın-Karabük road, Dereköy, 14.VIII.2003, leg. H. Özdikmen, 2 specimens; **Karabük:** Safranbolu, Gürleyik National Park, 21.VII.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** between Taşköprü-Hanönü, 24.VII.2003, leg. H. Özdikmen, 1 specimen; Pınarözü, 24.VII.2003, leg. H. Özdikmen, 1 specimen; Yaralıgöz pass, 1450m, 24.VII.2003, leg. H. Özdikmen, 1 specimen; Ilgaz-Kastamonu road, 25.VII.2003, leg. H. Özdikmen, 1 specimen; Küre, Masruf pass env., 1200m, 16.VIII.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Kahramanmaraş-Andırın road, Körsülü bridge env., N 37° 37' E 36° 39', 653m, 23.VI.2003, leg. A. Y. Okutaner, 2 specimens; Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Tanır, N 38° 25' E 36° 55', 1251m, 26.VI.2003, leg. A. Y. Okutaner, 1 specimen; Pazarcık, Sakarkaya village, Göynük env., N 37° 38' E 37° 25', 1200m, 13.VII.2003, leg. A. Y. Okutaner, 2 specimens. **AD: Osmaniye:** Zorkun road, 477m, N 37 02 E 36 16, 13.VII.2007, leg. H. Özdikmen, 4 specimens; Bahçe road, Çona village, 126m, N 37 07 E 36 19, 28.VI.2006, leg. H. Özdikmen, 3 specimens; Arslantaş-Osmaniye road, Kazmaca village, 117m, N 37 11 E 36 11, 28.VI.2006, leg. H. Özdikmen, 5 specimens; Karataş dam env., 143m, N 37 16 E 36 16, 28.VI.2006, leg. H. Özdikmen, 4 specimens; Toprakkale, Antakya road, 75m, N 37 00 E 36 08, 27.VI.2006, leg. H. Özdikmen, 2 specimens; Zorkun road, Karacalar village, 381m, N 37 02 E 36 16, 24.VI.2006, leg. H. Özdikmen, 1 specimen; Düziçi, between Böcekli-Hıdırlı, 266m, N 37 18 E 36 20, 28.VI.2006, leg. H. Özdikmen, 2 specimens. **GV: Antalya:** Gündoğmuş road, 1215m, 10.VI.2007, leg. H. Özdikmen, 3 specimens; Gündoğmuş road, 245m, 11.VI.2007, leg. H.

Özdikmen, 1 specimen; **Konya**: Taşkent, Ilıcınar, 1147m, 19.VII.2006, leg. H. Özdikmen, 1 specimen; Hadim-Bozkır road, 20 km to Bozkır, 1315m, 10.VII.2007, leg. H. Özdikmen, 1 specimen; between Hadim-Bozkır, 1000m, 19.VII.2006, leg. H. Özdikmen, 3 specimens; Seydişehir, between Tepearası-Yenice, 1560m, 20.VII.2006, leg. H. Özdikmen, 1 specimen; **Turkey**: leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Afyon, Antalya, Bartın, Çankırı, Erzincan, Kahramanmaraş, Karabük, Kastamonu, Konya, Nevşehir, Niğde and Osmaniye provinces. **Chorotype**: Centralasiatic-European.

Subfamily CRYPTOCEPHALINAE Gyllenhal, 1813

Genus *Pachybrachys* Chevrolat, 1836

[Type sp.: *Cryptocephalus hieroglyphicus* Laicharting, 1781]

Subgenus *Pachybrachys* Chevrolat, 1836

[Type sp.: *Cryptocephalus hieroglyphicus* Laicharting, 1781]

***Pachybrachis excisus* (Weise, 1897)**

Material examined: **HE**: **Aksaray**: Gülağaç, Kızıl kaya, Aşıklı Höyük, 1100m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde**: Bor, Melendiz, Okçu village, 08.VI.1997, leg. H. Özdikmen, 1 specimen; Melendiz, Göllü Mountain, 1580m, 27.VI.1997, leg. H. Özdikmen, 1 specimen; Çiftlik, Yeşilyurt Plateau-Altunhisar, 02.VII.1997, leg. H. Özdikmen, 19 specimens; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 1 specimen; Gebere dam, 29.VII.1997, leg. H. Özdikmen, 1 specimen; **Osmaniye**: leg. H. Özdikmen, 1 specimen. **NTPPM**: **Ankara**: Ayaş, 03.VII.1987, leg. Y. Özdemir, 2 specimens.

Remarks: The species has been known only from European Turkey for Turkey until now. It is new to Aksaray, Niğde and Osmaniye provinces. **Chorotype**: Turano-Mediterranean (Balkano-Anatolian).

***Pachybrachis fimbriolatus* (Suffrian, 1848)**

Material examined: **HE**: **Aksaray**: Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 2 specimens; Ulukışla junction, 1390m, 29.V.2001, leg. H. Özdikmen, 2 specimens; **Ankara**: Şereflikoçhisar, 950m, 21.VI.1997, leg. H. Özdikmen, 1 specimen; Çubuk dam II, 20.V.1999, leg. H. Özdikmen, 2 specimens; **Karaman**: Karaman-Ereğli road, Exit of Karaman, 995m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; Karaman-Ereğli road, Exit of Karaman 6. km, 990m, 26.VI.2001, leg. H. Özdikmen, 1 specimen; **Konya**: Cihanbeyli, Karatepe, 1005m, 31.V.1997, leg. H. Özdikmen, 2 specimens; Entry of Ereğli 8. km, 1010m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; Ereğli-Ulukışla road, 30 km to Ulukışla, 1035m, 03.VI.2001, leg. H. Özdikmen, 1 specimen; **Niğde**: Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor road, Derbent district, 15.VII.1997, leg. H. Özdikmen, 1 specimen; Bor, Üstüncükay, Bor-Altunhisar road, 1150m, 17.VII.1997, leg. H. Özdikmen, 1 specimen; **Osmaniye**: leg. H. Özdikmen, 3 specimens. **NTPPM**: **Ankara**: Elmadağ, 24.V.1967, leg. A. Kalkandelen, 1 specimen; Polatlı, Temelli, 06.VI.1985, leg. H. Zeki, 1 specimen; Elmadağ, 24.V.1987, leg. A. Kalkandelen, 2 specimens; Ayaş, 03.VII.1987, leg. Y. Özdemir, 1 specimen; **Eskişehir**: Kaymaz, Alpu road, 23.VI.1997, 2 specimens; **Nevşehir**: Avanos, 26.V.1998, leg. Y. Özdemir, 6 specimens; **Van**: 14.VII.1972, leg. Y. Dörtbudak, 2 specimens. **BK**: **Bolu**: Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Gerede-Karabük road, Dikmen and Sungur villages, 1450m, 14.VI.2003, leg. H. Özdikmen, 1 specimen. **K**: **Kahramanmaraş**: Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen. **GV**: **Antalya**: Border of province, Bademli Beli pass, 1432m, 14.V.2006, leg. H. Özdikmen, 1 specimen; **Konya**: Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 1 specimen; Beyreli, 1467m, 17.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Antalya, Bolu, Eskişehir, Kahramanmaraş, Karaman, Konya and Osmaniye provinces. **Chorotype**: Sibero-European.

***Pachybrachis glycyrrhizae* (Olivier, 1808) (new to Anatolia)**

Material examined: **HE**: **İçel**: Silifke-Mut road, Entry of Kurtuyu, 120m, 01.VI.2001, leg. H. Özdikmen, 3 specimens; Mut-Silifke 10. km, 100m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; Mut-Silifke, 100m, 30.VI.2001, leg. H. Özdikmen, 61 specimens. **NTPPM**: **Şanlıurfa**: Ceylanpınar, 04.VI.1965, leg. A. Kalkandelen, 2 specimens. **Turkey**: 2000, leg. H. Özdikmen, 5 specimens.

Remarks: The species has been known only from European Turkey for Turkey until now. So, it is new to İçel and Şanlıurfa provinces and thereby to Anatolia (= Asian Turkey). **Chorotype**: Centralasiatic + SW-Asiatic.

***Pachybrachis hieroglyphicus* (Laicharting, 1781) (new to Anatolia)**

Material examined: **HE**: **İçel**: Silifke, Uzuncaburç, 845m, 01.VI.2001, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from European Turkey for Turkey until now. So, it is new to İçel province and thereby to Anatolia (= Asian Turkey). **Chorotype:** European.

***Pachybrachis limbatus* (Menetries, 1836)**

Material examined: **HE: Adana:** Pozanti, Entry of Fındıklı, 1200m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Güvem, 1080m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; Ayaş Belı, 1100m, 18.V.2002, leg. H. Özdikmen, 2 specimens; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; Yahyalı, Yeşilköy, 26.VI.1997, 1380m, leg. H. Özdikmen, 1 specimen; **Niğde:** Niğde-Bor road, 17.VI.1997, leg. H. Özdikmen, 1 specimen; Azatlı-Tepeköy road, Murozu dam, 02.VII.1997, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. So, it is new to Adana, Kayseri and Niğde provinces. **Chorotype:** E-European.

***Pachybrachys mardinensis* (Weise, 1900)**

Material examined: **AD: Gaziantep:** Nurdağı, Gökçedere village, N 37 09 E 36 43, 496m, 17.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Gaziantep province. **Chorotype:** SW-Asiatic (Irano-Anatolian + Syro-Anatolian) or E-Mediterranean.

***Pachybrachis scriptidorsum* Marseul, 1875**

Material examined: **NTPPM: Bolu:** Mudurnu, 15.VI.1994, leg. A. Kalkandelen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Bolu province. **Chorotype:** Centralasiatic + E-European or Centralasiatic-European.

***Pachybrachis sinuatus* (Mulsant & Rey, 1859)**

Material examined: **HE: Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** European.

***Pachybrachis tessellatus* (Olivier, 1791)**

***Pachybrachis tessellatus tauricus* (Suffrian, 1848)**

Material examined: **HE: Adana:** Pozanti, Entry of Fındıklı, 1200m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; **Aksaray:** Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 17 specimens; Ulukışla junction 7. km, 1290m, 29.V.2001, leg. H. Özdikmen, 9 specimens; Doğanatepe, Yalnızcağaç, 1150m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yukarı Çanlı, 1250 and 1400m, 28.V.1997 and 14.VI.1997, leg. H. Özdikmen, 10 specimens; Kızılcahamam, Salın village, 1300m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Ayaş belı, 1100m, 18.V.2002, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Karagöl, 1650m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; **Karaman:** Karaman-Ereğli road, Exit of Karaman, 995m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, Derebağı, Şelale district, 02.VI.1997, 1280m, leg. H. Özdikmen, 2 specimens; Yahyalı, Yeşilköy, 26.VI.1997, 1380m, leg. H. Özdikmen, 5 specimens; **Konya:** Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 2 specimens; Altunhisar, Ulukışla, 1200m, 01.VI.1997, leg. H. Özdikmen, 7 specimens; Bor, Melendiz, Okçu village, 08.VI.1997, leg. H. Özdikmen, 6 specimens; Niğde-Bor road, 17.VI.1997, leg. H. Özdikmen, 6 specimens; Çamardı, Yelatan Village, 1280m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; 5 km to Ulukışla, 1400m, 23.VI.1997, leg. H. Özdikmen, 6 specimens; Araplı-Höyük, 1360m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; Melendiz, Göllü mountain, 1600m, 27.VI.1997, leg. H. Özdikmen, 21 specimens; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 14 specimens; Azatlı-Tepeköy road, Murozu dam, 02.VII.1997, leg. H. Özdikmen, 7 specimens; Çiftlik, Yeşilyurt Plateau-Altunhisar, 02.VII.1997, leg. H. Özdikmen, 7 specimens; Bor, Okçu village, 06.VII.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 3 specimens; Niğde-Bor road, Derbent district, 15.VII.1997, leg. H. Özdikmen, 3 specimens; Çiftlik, Murtaza dam, 29.VII.1997, leg. H. Özdikmen, 3 specimens; Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 2 specimens; Turkey: 2000, leg. H. Özdikmen, 10 specimens. **NTPPM: Ankara:** Çubuk, 09.VII.1968, leg. A. Kalkandelen, 1 specimen; Ayaş, 03.VII.1987, leg. A. Kalkandelen, 2 specimens; Ayaş, 18.VI.1987, leg. A. Kalkandelen, 6 specimens; Ayaş, İlyakut, 29.V.1996, leg. A. Kalkandelen, 1 specimen; **Bolu:** Mudurnu, 15.VI.1994, leg. A. Kalkandelen, 1 specimen; **Çankırı:** Eldivan, 04.VI.1997, leg. Y. Özdemir, 1 specimen; **Tokat:** Niksar, Erbaa, 06.VI.1995, leg. A. Kalkandelen, 1 specimen; **Van:** 14.VII.1972, leg. Y. Dörtbudak, 9 specimens. **BK: Bolu:** Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m,

25.VI.2003, leg. A. Y. Okutaner, 9 specimens; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 8 specimens; Göksun, Göksun-Çardak road, Güçük plateau, N 38° 3' E 36° 39', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen. **GV: Antalya:** 7 km to Akseki, 1274m, 10.VI.2007, leg. H. Özdikmen, 1 specimen; Gündoğmuş, 1024m, 10.VI.2007, leg. H. Özdikmen, 2 specimens; Gündoğmuş, 1024m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya:** İbradı-Derebucak road, 12 km to Derebucak, 1388m, 12.VI.2007, leg. H. Özdikmen, 2 specimens; Bozkır, 10.IX.2007, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Antalya, Çankırı, Karaman and Konya provinces. **Chorotype:** Turano-European.

***Pachybrachis velarum* Warchalowski, 1998**

Material examined: HE: Ankara: Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Soğuksu National Park, 1200m, 03.VI.1990, leg. H. Özdikmen, 1 specimen. **NTPPM: Bolu:** Merkezler, 14.VI.1994, leg. A. Kalkandelen, 1 specimen.

Remarks: The endemic species was known only from the type locality, Anatolia: Erzincan prov.: Refahiye for Turkey in 2007. So, it was a new record to Ankara and Bolu provinces. The present materials were published by Özdikmen et al. (2007d). **Chorotype:** Anatolian.

Genus *Cryptocephalus* Geoffroy, 1762

[Type sp.: *Chrysomela sericea* Linnaeus, 1758]

Subgenus *Protophysus* Chevrolat, 1836

[Type sp.: *Cryptocephalus lobatus* Fabricius, 1792 = *Cryptocephalus schaefferi* Schrank, 1789]

***Cryptocephalus schaefferi* Schrank, 1789**

***Cryptocephalus schaefferi moehringi* Weise, 1884**

Material examined: HE: Ankara: Kızılcahamam, Soğuksu National Park, 1080m, 02.VI.1990, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1200m, 03.VI.1990, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. This species is represented by the subspecies *C. schaefferi moehringi* in Turkey. **Chorotype:** European for the species. E-Mediterranean for the subspecies.

Subgenus *Heterichnus* Warchalowski, 1991

[Type sp.: *Cryptocephalus macrodactylus* Gebler, 1830]

***Cryptocephalus loebli* Sassi, 1997**

Material examined: BK: Karabük: Eflani, 920m, 15.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It is new to Karabük province. **Chorotype:** Anatolian.

***Cryptocephalus prusias* Suffrian, 1853**

Material examined: HE: Ankara: Kızılcahamam, Soğuksu National Park, 1600m, 21.VI.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1500m, 02.VII.1991, leg. H. Özdikmen, 2 specimens; Kazan, Güvenç village, 1020m, 11.V.2002, leg. H. Özdikmen, 1 specimen. **GV: Konya:** Bozkır, 1 km to Yalınca, 1437m, 13.VI.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and Konya provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Subgenus *Asionus* Lopatin, 1988

[Type sp.: *Cryptocephalus flavicollis* Fabricius, 1781]

***Cryptocephalus amasiensis* Weise, 1894**

Material examined: K: Kahramanmaraş: Nurhak, Tatlar, N 37° 57' E 37° 35', 1325m, 22.V.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, A. Türkeş excursion spot place- Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 10 specimens; Nurhak, Nurhak-Malatya road, Tatlar village, N 37° 59' E 37° 55', 1325m, 27.VI.2003, leg. A. Y. Okutaner, 4 specimens; Nurhak-Malatya road, N 37° 57' E 37° 35', 1325m, 27.VI.2003, leg. A. Y. Okutaner, 3 specimens; Nurhak, Yeşilkent-Malatya road, N 37° 57' E 37° 35', 1325m, 12.VIII.2003, leg. A. Y. Okutaner, 4 specimens; Pazarcık, Sakarya village, Göynük env., N 37° 38' E 37° 25', 1200m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province. **Chorotype:** Anatolian.

***Cryptocephalus curda* Jacobson, 1897**

Material examined: NTPPM: Çankırı: Eldivan, 29.VII.1993, leg. A. Kalkandelen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Çankırı province. **Chorotype:** SW-Asiatic.

***Cryptocephalus pseudoreitteri* Tomov, 1976**

Material examined: HE: Ankara: Ayaş, Ayaş Beli, Atbayırı district, 1100m, 18.V.2002, leg. H. Özdikmen & S. Turgut, 4 specimens.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It was published by Özdikmen et al. (2007c). **Chorotype:** Anatolian.

Subgenus *Cryptocephalus* Geoffroy, 1762

[Type sp.: *Chrysomela sericea* Linnaeus, 1758]

***Cryptocephalus anticus* Suffrian, 1848**

Material examined: HE: Aksaray: Ortaköy, Hocaveli village, 1260m, 22.VI.1997, leg. H. Özdikmen, 1 specimen; Ankara: Kızılcahamam, Salın Village, 1300m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1400m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1300m, 11.VII.1997, leg. H. Özdikmen, 4 specimens; Bolu: Abant, Dereceören env., 983 m, 19.VI.2009, leg. H. Özdikmen, 1 specimen; Hacıayaz pass, 1100 m, 07.VII.2009, leg. H. Özdikmen, 1 specimen; İçel: Karaman-Mut, near Mut, 1150m, 26.VII.2000, leg. H. Özdikmen, 1 specimen; Konya: Sultanhanı, 920m, 27.VI.1997, leg. H. Özdikmen, 1 specimen; Niğde: Çamardı, Yelatan Village, 1280m, 23.VI.1997, leg. H. Özdikmen, 2 specimens; Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 2 specimens; Niğde-Bor, Delbent district, 15.VII.1997, leg. H. Özdikmen, 1 specimen; Bor, Bor-Altunhisar road, Pınarbaşı, 1100m, 17.VII.1997, leg. H. Özdikmen, 1 specimen. NTPPM: Ankara: Gölbaşı, 09.V.1968, leg. A. Kalkandelen, 2 specimens; Kazan, 07.VII.1982, leg. Y. Özdemir, 2 specimens; Çubuk, Karagöl, 03.VIII.1983, leg. Y. Özdemir, 1 specimen; Altınova, 27.VII.1993, leg. A. Kalkandelen, 1 specimen; Çanakkale: Çan, Çat, 03.VIII.1982, leg. H. Memişoğlu, 1 specimen; Çankırı: Ilgaz, Yerkuyu, 20.VII.1989, leg. Y. Özdemir, 1 specimen; Niğde: Ereğli, 21.VIII.1984, leg. A. Kalkandelen, 1 specimen; Sakarya: Adapazarı, Poyrazlar village, 12.VII.1993, *Populus*, leg. A. Kalkandelen, 4 specimens; Adapazarı, Karasu, 22.VII.1993, leg. A. Kalkandelen, 1 specimen; Zonguldak: Alaph, 20.VI.1988, leg. A. Kalkandelen, 1 specimen. BK: Bolu: Yeniçağa, 1025m, 19.VI.2003, leg. H. Özdikmen, 1 specimen; Mengen, Devrek–Mengen, entry of Mengen, 650m, 19.VI.2003, leg. H. Özdikmen, 1 specimen; Yeniçağa, Deliler and Adaköy village turn, 1000m, 20.VII.2003, leg. H. Özdikmen, 2 specimens; Karabük: Üçevler, 1000m, 14.VI.2003, leg. H. Özdikmen, 5 specimens; Sinop: 35m, 17.VI.2003, leg. H. Özdikmen, 4 specimens; Zonguldak: Çaydeğirmeni, 105m, 19.VI.2003, leg. H. Özdikmen, 1 specimen. GV: Konya: Seydişehir-Antalya road, Tınaztepe-Seydişehir road, 6 km to Seydişehir, 1102m, 20.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey as *C. octacosmus* Bedel, 1891 until now. It is new to Aksaray, Çanakkale, İçel, Karabük, Konya, Sakarya and Sinop provinces. **Chorotype:** Sibero-European.

***Cryptocephalus aureolus* Suffrian, 1847**

***Cryptocephalus aureolus aureolus* Suffrian, 1847**

Material examined: HE: Ankara: Kızılcahamam, Soğuksu National Park, 1500m, 19.VII.1991, leg. H. Özdikmen, 1 specimen; Bolu: Abant road, Akçaalan district, 12.VII.2010, leg. H. Özdikmen, 1 specimen; İçel: Gözne-Mersin, 200m, 28.VI.2000, leg. H. Özdikmen, 1 specimen. NTPPM: Kırklareli: Istranca Mountains, Venika valley, 09.VII.1994, leg. Y. Özdemir, 1 specimen; Turkey: without locality data, 1 specimen. BK: Kastamonu: Tosya-Kastamonu road, exit of Tosya, 25.VII.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from European Turkey for Turkey until now. It is new to Ankara, Bolu, İçel and Kastamonu provinces. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** European.

***Cryptocephalus biguttatus* (Scopoli, 1763)**

Material examined: K: Kahramanmaraş: Göksun, A. Türkeş excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 5 specimens; Göksun, Göksun-Çardak road, entry of Kocaahmet village, 1330m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Çardak, N 38° 05' E 36° 49', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Mehmetbey, N 38° 05' E 36°

27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Göksun-Çardak road, N 38° 01' E 36° 35', 1320m, 17.VII.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Çardak-Afşin road, N 38° 05' E 36° 49', 1290m, 17.VII.2003, leg. A. Y. Okutaner, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province and thereby to Southern Turkey. **Chorotype:** Sibero-European.

Cryptocephalus biledjekensis Pic, 1903

Material examined: GV: Konya: Derebucak, 1221m, 16.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Konya province. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Cryptocephalus bipunctatus (Linnaeus, 1758)

Cryptocephalus bipunctatus bipunctatus (Linnaeus, 1758)

Material examined: HE: Ankara: Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1200m, 28.VI.1991, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Soğuksu National Park, 1400m, 04.VII.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yasin village, 1400m, 11.VII.1997, leg. H. Özdikmen, 4 specimens; **Bolu:** Mudurnu-Göynük road, 711 m, 07.VII.2009, leg. H. Özdikmen, 1 specimen; Hacıyaz pass, 1100 m, 07.VII.2009, leg. H. Özdikmen, 1 specimen; **İçel:** Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 4 specimens; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 2 specimens; **Niğde:** Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 2 specimens. **NTPPM:** **Çankırı:** Kızılırmak, Kuyupınar, 02.VII.1997, leg. Y. Özdemir, 1 specimen. **BK: Bolu:** Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 2 specimens; **Çorum:** Tosya-Kargı road, 655m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Safranbolu, Mencilis Cave env., Bulak village, 760m, 14.VI.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** between Kastamonu-Tosya, Darıbükü village, 880m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; between Azdavay-Pınarbaşı, 885m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; **Sinop:** Ayancık, exit of Yenikonak, 125m, 17.VI.2003, leg. H. Özdikmen, 1 specimen. **K:** Kahramanmaraş: entry of Ilca, N 37° 51' E 36° 51', 1340m, 23.VI.2003, leg. A. Y. Okutaner, 1 specimen; Kahramanmaraş-Göksun road, entry of Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 2 specimens; Andırın, Kabaklar village, N 37° 33' E 36° 27', 970m, 15.VII.2003, leg. A. Y. Okutaner, 1 specimen. **GV: Antalya:** Gündoğmuş road, 396m, 15.V.2007, leg. H. Özdikmen, 1 specimen; Koğulu village, 1288m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; Gündoğmuş road, 450m, 12.VI.2008, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, Çankırı, Kahramanmaraş, Karabük, Kastamonu, Kayseri, Niğde and Sinop provinces. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** European.

Cryptocephalus concolor Suffrian, 1847

Material examined: HE: Adana: Pozanti-Mersin road, Çamlıyayla turn 10.km, 710m, 30.V.2001, leg. H. Özdikmen, 4 specimens; Pozanti-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 1 specimen; **Aksaray:** Güllağaç, Kızılcahamam, Aşıklı Höyük, 1100m, 03.VI.1997, leg. H. Özdikmen, 3 specimens; Ortaköy, Çatalçeşme-Hocaveli village, 1360m, 22.VI.1997, leg. H. Özdikmen, 3 specimens; **Ankara:** Kızılcahamam, Soğuksu National Park, 1650m, 03.VI.1990, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Soğuksu National Park, 1200m, 03.VII.1990, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1650m, 03.VIII.1990, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1400m, 10.VIII.1990, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 17.V.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1400m, 03.VII.1991, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Işık Mountain, 1550m, 24.VI.1993, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yenimahalle, 30.VI.1993, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 30.VI.1993, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Işık Mountain, 02.VII.1994, leg. H. Özdikmen, 11 specimens; Kızılcahamam, Salin Village, 1300m, 14.VI.1997, leg. H. Özdikmen, 5 specimens; Kızılcahamam, Yukarı Çanlı, 1400m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Kaçarlı, 1050m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; Evren, Şereflikoçhisar – Evren, 1220m, 21.VI.1997, leg. H. Özdikmen, 5 specimens; Kızılcahamam, Güvem, 1000m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 26.VI.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yukarı Çanlı, 1300m, 11.VII.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yasin village, 1400m, 11.VII.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Karagöl (Işık Mountain), 1650m, 11.VII.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yenimahalle, 1100m, 21.VIII.1997, leg. H. Özdikmen, 1 specimen; **Bolu:** Mudurnu-Göynük road, 711 m, 07.VII.2009, leg. H. Özdikmen, 1 specimen; Mengen-Yedigöller road, 14.VI.2010, leg. H. Özdikmen, 1 specimen; Yedigöller env., 14.VI.2010, leg. H. Özdikmen, 3 specimens; **İçel:** Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 8 specimens; Erdemli-Güzeloluk road 17. km, 920m, 30.V.2001, leg. H.

Özdikmen, 1 specimen; Entry of Fındıkpınarı 1035m, 31.V.2001, leg. H. Özdikmen, 1 specimen; Fındıkpınarı, 1035m, 31.V.2001, leg. H. Özdikmen, 1 specimen; Silifke, Yeniçiftlik, 1065m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; Mut, near Sason Bridge, 1275m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; **Karaman**: Karaman-Ereğli road, Exit of Karaman, 995m, 02.VI.2001, leg. H. Özdikmen, 2 specimens; Mut-Karaman road, Değirmenbaşı, 1370m, 26.VI.2001, leg. H. Özdikmen, 2 specimens; **Kayseri**: Yahyalı, Derebağı, Şelale district, 1280m, 02.VI.1997, leg. H. Özdikmen, 3 specimens; Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 10 specimens; Yahyalı, Yeşilköy, 1380m, 26.VI.1997, leg. H. Özdikmen, 12 specimens; **Konya**: Kulu, 1100m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; **Niğde**: Niğde-Bor road, 17.VI.1997, leg. H. Özdikmen, 1 specimen; Ulukışla-Exit of Adana, 1300m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Çamardı, Bulduruş pass, 1720m, 24.VI.1997, leg. H. Özdikmen, 2 specimens; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 16 specimens; Çiftlik, Murtaza dam, 29.VII.1997, leg. H. Özdikmen, 1 specimen; Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 1 specimen; **Osmaniye**: leg. H. Özdikmen, 40 specimens. **BK: Bartın**: Bartın-Çaycuma road, Yazıcılar village, 19.05.2004, leg. H. Özdikmen, 3 specimens; Bartın-Çaycuma road, Çiftlik village, 19.V.2004, leg. H. Özdikmen, 6 specimens; **Karabük**: Safranbolu, Bulak village, Mağaradüzü district, 21.V.2004, leg. H. Özdikmen, 2 specimens; **Kastamonu**: Doğanıyurt-Dağyurdu, 727m, 18.VI.2004, leg. H. Özdikmen, 3 specimens; Doğanıyurt-Dağyurdu, 950m, 18.VI.2004, leg. H. Özdikmen, 8 specimens; Doğanıyurt-Şenpazar road, 7 km to Şenpazar, 687m, 18.VI.2004, leg. H. Özdikmen, 2 specimens; Daday, Daday-Araç road, 1107m, 19.VI.2004, leg. H. Özdikmen, 3 specimens; Daday-Araç road, 7 km to Araç, 1010m, 19.VI.2004, leg. H. Özdikmen, 3 specimens; Daday-Araç road, Akılçalı village, 958m, 19.VI.2004, leg. H. Özdikmen, 1 specimen; **Samsun**: Alaçam, Dürtmen hill, 1460m, 16.VI.2004, leg. H. Özdikmen, 4 specimens; **Sinop**: Ayancık, Akgöl, 1170m, 17.VI.2004, leg. H. Özdikmen, 3 specimens. **K: Kahramanmaraş**: Göksun, Değirmendere, N 37° 55' E 36° 29', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, A. Türkiye excursion spot place- Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 8 specimens; Göksun-Mehmet Beyli road, N 38° 05' E 36° 27', 1480m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Göksun-Çardak road, entry of Kocaahmet village, 1330m, 25.VI.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, Göksun-Çardak road, Güçük plateau, N 38° 3' E 36° 39', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Çardak, N 38° 05' E 36° 49', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Kamışcık village, N 38° 6' E 36° 52', 1340m, 25.VI.2003, leg. A. Y. Okutaner, 6 specimens; Ekinözü, Türkeli, N 38° 3' E 37° 10', 1015m, 26.VI.2003, leg. A. Y. Okutaner, 1 specimen; Ekinözü, N 38° 03' E 37° 11', 1015m, 27.VI.2003, leg. A. Y. Okutaner, 2 specimens; Ekinözü, Alpınar village, N 38° 5' E 37° 13', 1140m, 27.VI.2003, leg. A. Y. Okutaner, 5 specimens; Andırın-Çokak road, Parmaksız plateau, N 37° 38' E 36° 20', 1210m, 16.VII.2003, leg. A. Y. Okutaner, 1 specimen; Andırın, Geben, Ardıçlı district, N 37° 46' E 36° 26', 1510m, 16.VII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Hatay**: Entry of Belen, Çakallı, 652m, N 36 28 E 36 13, 19.V.2006, leg. H. Özdikmen, 1 specimen; **Osmaniye**: Haraz plateau, 713m, N 37 04 E 36 21, 18.V.2006, leg. H. Özdikmen, 4 specimens; Bahçe, 551m, N 37 11 E 36 33, 18.V.2006, leg. H. Özdikmen, 1 specimen; Hasanbeyli, Kaleckli village, 587m, N 37 09 E 36 27, 19.V.2006, leg. H. Özdikmen, 2 specimens; Yaylalık village-Türkoğlu road, 701m, N 36 17 E 36 37, 18.V.2006, leg. H. Özdikmen, 1 specimen; entry of Yarpuz, 930m, N 37 03 E 36 25, 18.V.2006, leg. H. Özdikmen, 2 specimens; Zorkun road, Çiftmazı, 223m, N 37 01 E 36 17, 20.V.2006, leg. H. Özdikmen, 5 specimens; Castabala Ören yeri, 100m, N 36 10 E 36 11, 17.V.2006, leg. H. Özdikmen, 1 specimen; Akıyar village, 151m, N 37 02 E 36 11, 17.V.2006, leg. H. Özdikmen, 1 specimen. **GV: Antalya**: Alanya, Çayarası, Şihlar village plateau, 1192m, 13.V.2007, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Aksaray, Antalya, Bartın, Bolu, Hatay, Kahramanmaraş, Karabük, Karaman, Kastamonu, Kayseri, Niğde and Osmaniye provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Cryptocephalus cribratus Suffrian, 1847

Material examined: **HE: Ankara**: Kızılcahamam, Soğuksu National Park, 1300m, 03.VII.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Salın Village, 1300m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde**: Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş**: Nurhak, Tatlar, N 37° 57' E 37° 35', 1325m, 22.V.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara, Kahramanmaraş and Niğde provinces. **Chorotype:** SW-Asiatic (Anatolo-Caucasian + Irano-Caucasian + Irano-Anatolian + Syro-Anatolian) + Turanian.

Cryptocephalus duplicatus Suffrian, 1847

Material examined: **NTPPM: Ankara:** Bağlum, 07.VIII.1961, 1 specimen; Ayaş, Ilıca, 25.VI.1987, leg. A. Kalkandelen, 2 specimens; Ayaş, 17.VI.1988, leg. A. Kalkandelen, 1 specimen; Ayaş, 21.VII.1988, leg. A. Kalkandelen, 1 specimen; Çubuk, Dumlupınar, 13.VI.1996, leg. Y. Özdemir, 1 specimen; Beypazarı, İnönü plateau, 11.V.1999, leg. Y. Özdemir, 1 specimen; Çubuk, Sirkeli, 13.VI.1999, leg. Y. Özdemir, 1 specimen; **Bolu:** Şairdertli, 14.VI.1994, leg. A. Kalkandelen, 4 specimens; Mudurnu, 15.VI.1994, leg. A. Kalkandelen, 1 specimen; Mudurnu, Abant, 15.VI.1994, leg. A. Kalkandelen, 1 specimen; **Eskişehir:** Kaymaz, 23.VI.1997, leg. Y. Özdemir, 1 specimen; **Isparta:** Eğirdir, 28.VI.1995, *Malus* and *Pyrus*, leg. Y. Özdemir, 2 specimens; **Ordu:** 20.VII.1965, leg. M. Işık, 2 specimens; **Yozgat:** Şefaati, Caferli Village, 27.VI.1996, leg. P. Erdoğan, 1 specimen; Sorgun, 27.VI.1996, *Triticum*, leg. P. Erdoğan, 1 specimen. **BK: Bolu:** Yeniçağa lake, 1040m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Devrek–Mengen road, 17 km to Mengen, 560m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; Yeniçağa, Deliler and Adaköy village turn, 1000m, 20.VII.2003, leg. H. Özdikmen, 9 specimens; **Çorum:** Kargı, Gölet Plateau env., 1090m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; Kargı, Uzunyurt, 822m, 16.VI.2003, , leg. H. Özdikmen, 1 specimen; Kargı, Göletdere, 5 km to Karagöl village, 1120m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Safranbolu, Mencilis Cave env., Bulak village, 760m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Safranbolu–Eflani road, Örencik village, 22.VII.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** between Safranbolu–Araç, 535m, 15.VI.2003, leg. H. Özdikmen, 48 specimens; Devrekani, Pınarözü village, 24.VII.2003, leg. H. Özdikmen, 4 specimens; Küre, Masruf pass env., 1200m, 16.VIII.2003, leg. H. Özdikmen, 2 specimens; **Zonguldak:** Entry of Ulus, 600m, 19.VI.2003, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Gündoğmuş road, 396m, 15.V.2007, leg. H. Özdikmen, 1 specimen; Koğulu village, 1288m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Derebucak, 1221m, 16.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, Eskişehir, Karabük, Konya, Ordu and Zonguldak provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Cryptocephalus flavipes Fabricius, 1781

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1400m, 03.VII.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1250m, 07.VI.1997, leg. M. Akçay, 1 specimen; Kızılcahamam, Güvem, 1100m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Yasin village, 1400m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; Çubuk dam II, 20.V.1999, leg. H. Özdikmen, 1 specimen; **İçel:** Silifke, Uzuncaburç, 845m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, Derebağı, Şelale district, 02.VI.1997, 1280m, leg. H. Özdikmen, 1 specimen; Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 2 specimens. **NTPPM: Ordu:** 20.VII.1965, leg. M. Işık, 2 specimens. **BK: Düzce:** Yiğilca, Aydın village–Dutlar village, 200m, 12.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Düzce and Kayseri provinces. **Chorotype:** Sibero-European.

***Cryptocephalus moraei* (Linnaeus, 1758)**

Material examined: **HE: Aksaray:** Eskil, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 1 specimen; Ağaçören, Yenişabanlı, Velipınarı, 1340m, 21.06.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Güvem, 1100m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yasin village, 1400m, 11.VII.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Soğuksu National Park, 1400m, 10.VIII.1990, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Bel Doruğu, 1550m, 19.VIII.1997, leg. H. Özdikmen, 1 specimen; **Bolu:** Between Gerede–Mengen, 856 m, 06.VII.2009, leg. H. Özdikmen, 1 specimen; Yeniçağa–Mengen road, 14.VI.2010, leg. H. Özdikmen, 1 specimen; Gökçeşu–Mengen road, 14.VI.2010, leg. H. Özdikmen, 1 specimen; **İçel:** Fındıklı, 1035m, 31.V.2001, leg. H. Özdikmen, 2 specimens; Silifke–Mut road, Entry of Kurtuyu, 120m, 01.VI.2001, leg. H. Özdikmen, 2 specimens; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Çamardı, Yelatan Village, 1280m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Altınhisar–Yeşilyurt, 29.VII.1997, leg. H. Özdikmen, 2 specimens. **NTPPM: Ankara:** Çamlıdere, 18.VIII.1983, leg. Y. Özdemir, 1 specimen. **BK: Çorum:** Kargı, Gölet Plateau env., 1090m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Safranbolu, Balıksu village, 275m, 13.V.2003, leg. H. Özdikmen, 1 specimen; Safranbolu, Mencilis Cave env., Bulak village, 760m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** between Araç–Karabük, Çıraklar village, 440m, 16.V.2003, leg. H. Özdikmen, 1 specimen; Ağıl–Azdavay road, 1 km to Yumacık village, 825m, 18.VI.2003, leg. H. Özdikmen, 3 specimens; Pınarbaşı–Azdavay road, exit of Karafasıl village, 23.VII.2003, leg. H. Özdikmen, 1 specimen; Hanönü, 387m, 17.VI.2004, leg. H. Özdikmen, 1 specimen; Doğanıyurt–Şenpazar road, 7 km to Şenpazar, 687m, 18.VI.2004, leg. H. Özdikmen, 5 specimens; Doğanıyurt–Dağyurdu, 727m, 18.VI.2004, leg. H. Özdikmen, 4 specimens; **Sinop:** Ayancık, Akgöl, 1170m, 17.VI.2004, leg. H. Özdikmen, 3 specimens; **Zonguldak:** Çaycuma, 27.VI.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Kahramanmaraş–Andırın road, Körsülli bridge env., N 37° 37' E 36° 39', 653m, 23.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, A. Türkeş excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 2

specimens; Göksun, Göksun-Çardak road, entry of Kocaahmet village, 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Andırın-Çokak road, Parmaksız plateau, N 37° 38' E 36° 20', 1210m, 16.VII.2003, leg. A. Y. Okutaner, 2 specimens; Afşin, Tanır, Farta place, N 38° 25' E 36° 55', 1230m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Hatay:** Akbez, N 36 51 E 36 32, 527m, 18.V.2007, leg. H. Özdikmen, 5 specimens; Erzincan, Gököl, 600m, N 36 57 E 36 17, 04.VI.2007, leg. H. Özdikmen, 5 specimens; **Osmaniye:** Düziçi, Gökçay, N 37 20 E 36 27, 600m, leg. H. Özdikmen, 1 specimen; Zorkun road, Giftmazı, 223m, N 37 01 E 36 17, 20.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Çorum, Hatay, Kahramanmaraş, Karabük, Kayseri, Niğde, Osmaniye and Sinop provinces. **Chorotype:** European.

***Cryptocephalus octomaculatus* Rossi, 1790 (new to Anatolia)**

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1300m, 08.VIII.1990, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from European Turkey for Turkey until now. It is new to Ankara province and thereby to Anatolia (= Asian Turkey). **Chorotype:** S and E-European.

***Cryptocephalus octopunctatus* (Scopoli, 1763)**

***Cryptocephalus octopunctatus octopunctatus* (Scopoli, 1763)**

Material examined: **NTPPM: Ankara:** Eymir, 27.VI.1968, leg. A. Kalkandelen, 1 specimen; Çubuk, 09.VII.1968, leg. A. Kalkandelen, 4 specimens; Eymir, 11.VII.1968, leg. A. Kalkandelen, 1 specimen; Eymir, 31.VII.1968, leg. A. Kalkandelen, 1 specimen; **Diyarbakır:** Silvan, Suran, 04.VI.1972, leg. İ. Serel, 1 specimen; **Düzce:** Yeşilköy, 05.IV.1988, *Corylus*, leg. Ö. Ataç, 1 specimen; **Kars:** Gaziler, 12.VII.1970, leg. A. Kalkandelen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Ankara, Diyarbakır and Kars provinces. **Chorotype:** Sibero-European.

***Cryptocephalus paphlagonius* Sassi & Kısmalı, 2000**

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1500m, 07.VIII.1990, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1400m, 10.VIII.1990, leg. H. Özdikmen, 1 specimen; **İçel:** Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Avanos, 1120m, 22.VII.1992, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** Kızılcahamam, Soğuksu, 21.VII.1999, leg. Y. Özdemir, 1 specimen. **BK: Karabük:** Safranbolu, Hızar Yarı place, 740m, 14.V.2003, leg. H. Özdikmen, 1 specimen; Safranbolu, Bulak village, Mağaradüzü district, 21.V.2004, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Kastamonu-Tosya road, Tosya-İlgaz pass, 1650m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; between Azdavay-Pınarbaşı, 885m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; Küre, Masruf pass env., 1200m, 16.VIII.2003, leg. H. Özdikmen, 1 specimen; Doğanıyurt-Dağyurdu, 727m, 18.VI.2004, leg. H. Özdikmen, 2 specimens.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It was new to Karabük and Kastamonu provinces. Since, the present materials were published by Özdikmen et al. (2007d). It is new to İçel and Nevşehir provinces. **Chorotype:** Anatolian.

***Cryptocephalus peyroni* Marseul, 1875**

Material examined: **AD: Gaziantep:** Kuşçubeli pass, N 37 06 E 36 36, 1115m, 17.V.2007, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Düziçi, Yarbaş, N 37 11 01 E 36 25 04, 376m, 02.VI.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Gaziantep and Osmaniye provinces. **Chorotype:** E-Mediterranean (Palestino-Taurian).

***Cryptocephalus rugicollis* Olivier, 1791**

Material examined: **NTPPM: Aydın:** 17.V.1964, leg. A. Demirtola.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. The present material was published by Özdikmen et al. (2007b). **Chorotype:** Mediterranean.

***Cryptocephalus sericeus* (Linnaeus, 1758)**

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1400m, 10.VIII.1990, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Avanos, 950-1130m, 21-23.VII.1992, leg. H. Özdikmen, 4 specimens. **NTPPM: Çankırı:** 27.VII.1964, leg. Y. Sürmeli, 1 specimen; **Kırklareli:** Demirköy, 09.VII.1994, leg. A. Kalkandelen, 1 specimen; **Nevşehir:** Avanos, 23.VII.1992, leg. Y. Özdemir, 1

specimen; **Turkey:** without exact locality data, 1 specimen. **BK: Çorum:** Kargı, Göletdere, Karagöl village, 1120m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** between Taşköprü–Hanönü, 24.VII.2003, leg. H. Özdikmen, 1 specimen. **GV: Konya:** Hadim, 1778m, 17.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Çankırı, Çorum, Kastamonu, Konya and Nevşehir provinces. **Chorotype:** Sibero-European.

Cryptocephalus trimaculatus Rossi, 1790

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1400m, 03.VII.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Güvem, 1080m, 11.VII.1997, leg. H. Özdikmen, 3 specimens; **İçel:** Karaman–Mut, near Mut, 1150m, 26.VII.2000, leg. H. Özdikmen, 3 specimens; **Karaman:** Mut–Karaman road, Değirmenbaşı, 1370m, 26.VI.2001, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** Ayaş, 09.VII.1987, *Quercus*, leg. Y. Özdemir, 1 specimen; **Burdur:** 29.VI.1995, leg. Y. Özdemir, 1 specimen. **BK: Çorum:** Tosya–Kargı road, 655m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; Kargı, Uzunyurt, 822m, 16.VI.2003, , leg. H. Özdikmen, 2 specimens; Kargı, 940m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; **Karabük:** Safranbolu, Mencilis Cave env., Bulak village, 760m, 14.VI.2003, leg. H. Özdikmen, 4 specimens; **Kastamonu:** between Azdavay–Pınarbaşı, 885m, 18.VI.2003, leg. H. Özdikmen, 2 specimens. **GV: Konya:** Derebucak, Tekebeli pass, 1224m, 12.VI.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It is new to Burdur, Çorum, Karabük, Karaman, Kastamonu and Konya provinces. **Chorotype:** Turano-Mediterranean.

Cryptocephalus turcicus Suffrian, 1847

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1500m, 21.VI.1991, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Güvem, 1000m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; Ayaş Beli: 1100m, 18.V.2002, leg. H. Özdikmen, 7 specimens. **NTPPM: Samsun:** Havza, 25.V.1978, *Medicago*, leg. N. Yılmaz, 1 specimen; 08.VI.1978, *Medicago*, leg. N. Yılmaz, 1 specimen; Havza, 20.VI.1978, *Medicago*, leg. N. Yılmaz, 2 specimens; Havza, 15.VIII.1978, *Medicago*, leg. N. Yılmaz, 1 specimen. **BK: Düzce:** Akçaören village, At Yolu place, Hasanlar Dam, 225m, 11.V.2003, leg. H. Özdikmen, 1 specimen; Yiğilca, Aydın village – Dutlar village, 200m, 12.V.2003, leg. H. Özdikmen, 5 specimens; Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Safranbolu, Mencilis Cave env., Bulak village, 760 m, 14.VI.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** between Azdavay–Pınarbaşı, 885m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; Kastamonu–İnebolu road, 17.V.2004, leg. H. Özdikmen, 3 specimens; Doğanıyurt–Dağyurdu, 950m, 18.VI.2004, leg. H. Özdikmen, 2 specimens; Daday–Araç road, 7 km to Araç, 1010m, 19.VI.2004, leg. H. Özdikmen, 1 specimen; **Samsun:** Alaçam, Kapaklı village, 620m, 16.VI.2004, leg. H. Özdikmen, 4 specimens; Alaçam, Dürtmen hill, 1460m, 16.06.2004, leg. H. Özdikmen, 1 specimen; **Zonguldak:** between Yedigöller–Devrek, 230m, 13.05.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Düzce, Karabük, Kastamonu, Samsun and Zonguldak provinces. **Chorotype:** S-European or S-European + SW-Asiatic.

Cryptocephalus violaceus Laicharting, 1781

Cryptocephalus violaceus Laicharting, 1781

Material examined: **NTPPM: Adana:** Karaisalı, Hacıkırı, 18.V.1917, 2 specimens; 15.V.1939, 1 specimen. **BK: Bolu:** between Mengen–Bolu road, Bolu–Yumrutaş Köyü return, 740m, 19.VI.2003, leg. H. Özdikmen, 2 specimens; Mengen, Devrek–Mengen, 770m, 19.VI.2003, leg. H. Özdikmen, 16 specimens; Gerede, 1240m, 19.VI.2003, leg. H. Özdikmen, 5 specimens; Yeniçağa, 1025m, 19.VI.2003, leg. H. Özdikmen, 6 specimens; Mengen, Devrek–Mengen, entry of Mengen, 650m, 19.VI.2003, leg. H. Özdikmen, 5 specimens; **Karabük:** Safranbolu, Mencilis Cave env., Bulak village, 760m, 14.VI.2003, leg. H. Özdikmen, 2 specimens; Safranbolu, Konarı village, 485m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Bulak village, Bağ Evleri, 670m, 15.VI.2003, leg. H. Özdikmen, 2 specimens; Safranbolu, Konarı village, 485m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Kastamonu–Safranbolu road, 56 km to Safranbolu, 695m, 15.VI.2003, leg. H. Özdikmen, 2 specimens; Kastamonu–Tosya road, Akkaya–Taşköprü turn, 1415m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; Kastamonu–Tosya road, Tosya–İlgaz pass, 1650m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; Ağlı–Azdavay road, 1 km to Yumacık village, 825m, 18.VI.2003, leg. H. Özdikmen, 14 specimens; between Azdavay–Pınarbaşı, 885m, 18.VI.2003, leg. H. Özdikmen, 8 specimens; Küre, 1030m, 18.VI.2003, leg. H. Özdikmen, 18 specimens; Küre–Ağlı road, 1220m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; Pınarbaşı–Azdavay road, exit of Karafasıl village, 23.VII.2003, leg. H. Özdikmen, 1 specimen; Küre, 1 km to Masruf pass, 24.VII.2003, leg. H. Özdikmen, 3 specimens; Yarılgöz pass, 1450m, 24.VII.2003, leg. H. Özdikmen, 1 specimen; **Sinop:** 35m, 17.VI.2003, leg. H. Özdikmen, 11 specimens; **Zonguldak:** Çaydeğirmeni, 105m,

19.VI.2003, leg. H. Özdikmen, 5 specimens. **AD: Osmaniye:** Hınzırlı plateau, Kalaycıbatıran, 1465m, N 36 58 E 36 27, 25.VI.2006, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Beyşehir-Akseki road, 65 km to Akseki, 1434m, 12.VI.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It is new to Adana, Antalya, Bolu, Karabük, Kastamonu, Osmaniye, Sinop and Zonguldak provinces. **Chorotype:** European.

Subgenus *Burlinius* Lopatin, 1965

[Type sp.: *Chrysomela fulva* Goeze, 1777]

Cryptocephalus elegantulus Gravenhorst, 1807

Material examined: **HE: Niğde:** Azatlı-Tepeköy road, Murozu dam, 02.VII.1997, leg. H. Özdikmen, 1 specimen; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor, Delbent district, 15.VII.1997, leg. H. Özdikmen, 36 specimens; Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 37 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Niğde province. **Chorotype:** Sibero-European.

Cryptocephalus connexus Olivier, 1807

Material examined: **HE: Aksaray:** Eskil, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 2 specimens; **Ankara:** Kızılcahamam, Soğuksu National Park, 1300m, 20.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Bel Doruğu, 1550m, 19.VIII.1997, Leg. H. Özdikmen, 5 specimens; Kızılcahamam, Yukarı Çanlı, 1400m, 19.VIII.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Bel Doruğu, 1550m, 21.VIII.1997, Leg. H. Özdikmen, 4 specimens; Kızılcahamam, Aköz Village, 1150m, 30.VIII.1997, leg. H. Özdikmen, 5 specimens; **İçel:** Gözne-Mersin, 200m, 28.VI.2000, leg. H. Özdikmen, 3 specimens; Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 11 specimens; Silifke, Atakent, 0m, 01.VI.2001, leg. H. Özdikmen, 4 specimens; Silifke-Mut road, Exit of Kurtsuyu, 120m, 01.VI.2001, leg. H. Özdikmen, 16 specimens; Erdemli-Silifke road, Exit of Atakent, 0m, 26.VI.2001, leg. H. Özdikmen, 2 specimens; Silifke-Mut road, Göksu bridge, 30m, 26.VI.2001, leg. H. Özdikmen, 6 specimens; **Karaman:** Mut-Karaman road, Değirmenbaşı, 1370m, 26.VI.2001, leg. H. Özdikmen, 1 specimen; Sertavul Pass, 1410m, 26.VI.2001, leg. H. Özdikmen, 2 specimens; **Niğde:** Niğde-Bor, Delbent district, 15.VII.1997, leg. H. Özdikmen, 2 specimens; Bor, Bor-Altunhisar road, Pınarbaşı, 1100m, 17.VII.1997, leg. H. Özdikmen, 4 specimens; Gebere dam, 29.VII.1997, leg. H. Özdikmen, 3 specimens; Altunhisar – Çiftlik road, Entry of Çiftlik, 29.VII.1997, leg. H. Özdikmen, 2 specimens; **Turkey:** leg. H. Özdikmen, 1 specimen. **NTPPM: Afyon:** 04.VIII.1993, leg. A. Kalkandelen, 1 specimen; **Ağrı:** Patnos, 15.VII.1970, leg. A. Kalkandelen, 2 specimens; **Ankara:** Bağlum, 21.VII.1980, leg. Y. Özdemir, 1 specimen; Ayaş, İlyakut, 31.VII.1980, leg. Y. Özdemir, 1 specimen; Polatlı, Temelli, 08.VIII.1980, leg. M. Aydemir, 1 specimen; Çubuk, Karagöl, 03.VIII.1983, leg. Y. Özdemir, 4 specimens; Çamlidere, 16.VIII.1983, leg. Y. Özdemir, 1 specimen; **Bursa:** Kemalpaşa, 24.V.1968, leg. N. Aysev, 1 specimen; **Eskişehir:** Sivrihisar, 03.VIII.1993, leg. A. Kalkandelen, 1 specimen; **Sakarya:** Adapazarı, Poyrazlar village, 22.VII.1993, leg. A. Kalkandelen, 1 specimen. **BK: Bartın:** Bartın-Karabük road, Dereköy, 14.VIII.2003, leg. H. Özdikmen, 2 specimens; **Karabük:** between Ulus-Pınarbaşı, Gökpinar village, 14.VIII.2003, leg. H. Özdikmen, 5 specimens; **Kastamonu:** Pınarbaşı, Karafasıl village, 14.VIII.2003, leg. H. Özdikmen, 1 specimen; between Devrekani-Yaralgöz, 15.VIII.2003, leg. H. Özdikmen, 1 specimen; **Zonguldak:** Çaycuma, 27.VI.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Andırın, Andırın-Çokak road, Çınar place, N 37° 36' E 36° 21', 1200m, 11.VIII.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, Geben-Göksun road, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Gaziantep:** Fevzipaşa, Türkbahçe village, N 37 04 E 36 37, 521m, 18.V.2007, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Issızca, 17.V.2007, leg. H. Özdikmen, 1 specimen; Hınzırlı plateau, Kalaycıbatıran, 1465m, N 36 58 E 36 27, 25.VI.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Afyon, Ağrı, Aksaray, Bartın, Eskişehir, Gaziantep, İçel, Kahramanmaraş, Karabük, Karaman, Niğde, Osmaniye and Sakarya provinces. **Chorotype:** Turano-Mediterranean.

Cryptocephalus labiatus (Linnaeus, 1761)

Material examined: **NTPPM: Ordu:** 20.VII.1965, leg. M. Işık, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. The present materials were published by Özdikmen et al. (2007b).

Chorotype: European.

***Cryptocephalus lederi* Weise, 1889**

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1000m, 23.V.1990, H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** Turanian.

Cryptocephalus ocellatus* Drapiez, 1819**Cryptocephalus ocellatus ocellatus* Drapiez, 1819**

Material examined: **HE: Aksaray:** Ulukışla junction 7. km, 1290m, 29.V.2001, leg. H. Özdikmen, 12 specimens; **Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Soğuksu National Park, 1510m, 28.V.1997, H. Özdikmen, 4 specimens; Kızılcahamam, Soğuksu National Park, 1250m, 07.VI.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar – Evren, Evren, 1220m, 21.06.1997, Leg. H. Özdikmen, 1 specimen; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor-Altunhisar, 07.VI.1997, leg. H. Özdikmen, 7 specimens. **NTPPM: Ankara:** Kızılcahamam, 30.VI.1983, leg. Y. Özdemir, 1 specimen. **BK: Çorum:** Kargı, Göletdere, 5 km to Karagöl village, 1120m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Sinop:** Ayancık, exit of Yenikonak, 125m, 17.VI.2003, leg. H. Özdikmen, 6 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Niğde and Sinop provinces. **Chorotype:** Sibero-European or European.

***Cryptocephalus populi* Suffrian, 1848**

Material examined: **HE: Ankara:** Kızılcahamam, Aköz Village, 1150m, 30.VIII.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor, Derbent district, 15.VII.1997, leg. H. Özdikmen, 1 specimen. **AD: Gaziantep:** Nurdağı, N 37 10 E 36 42, 814m, 17.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara, Gaziantep and Niğde provinces. **Chorotype:** Sibero-European.

***Cryptocephalus pusillus* Fabricius, 1777**

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1300m, 20.VII.1997, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** European.

Cryptocephalus pygmaeus* Fabricius, 1792**Cryptocephalus pygmaeus vittula* Suffrian, 1848**

Material examined: **HE: Adana:** Pozanti, Tekir Plateau, 1300m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; **Aksaray:** Eskil, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 1 specimen; **İçel:** Güzne-Mersin, 200m, 28.VI.2000, leg. H. Özdikmen, 1 specimen; Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 2 specimens; Erdemli-Güzeloluk road 7. km, 450m, 30.V.2001, leg. H. Özdikmen, 10 specimens; Silifke, Atakent, 0m, 01.VI.2001, leg. H. Özdikmen, 24 specimens; Erdemli-Silifke road, Exit of Kocahasanlı, 0m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; Erdemli-Silifke road, Exit of Atakent, 0m, 26.VI.2001, leg. H. Özdikmen, 20 specimens; **Niğde:** Niğde-Bor, Delbent district, 17.VI.1997, leg. H. Özdikmen, 2 specimens; Bor, Okçu village, 06.VII.1997, leg. H. Özdikmen, 4 specimens; Niğde-Bor, Delbent district, 15.VII.1997, leg. H. Özdikmen, 1 specimen; Bor, Bor-Altunhisar road, Pınarbaşı, 1100m, 17.VII.1997, leg. H. Özdikmen, 12 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Adana, Aksaray, İçel and Niğde provinces. **Chorotype:** W-Palaearctic for the species. European for the subspecies.

Subfamily EUMOLPINAE Hope, 1840**Genus *Macrocoma* Chapuis, 1874**

[Type sp.: *Macrocoma eriophora* Chapuis, 1874]

Macrocoma brunnipes* (Olivier, 1808)**Macrocoma brunnipes obscuricolor* (Pic, 1905)**

Material examined: **HE: Adana:** Pozanti-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 27 specimens.

Remarks: The endemic subspecies has been known only from Anatolia for Turkey until now. **Chorotype:** E-Mediterranean (Palestino-Taurian) for the species. Anatolian for the subspecies.

***Macrocoma delagrangiei* (Pic, 1898)**

Material examined: NTPPM: **Diyarbakır:** Mermer, 14.VI.1972, leg. Y. Dörtbudak, 4 specimens; 18.VI.1972, leg. N. Adıgüzel, 2 specimens; Çınar, 03.VII.1972, leg. Y. Dörtbudak, 1 specimen.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It is new to Diyarbakır province. **Chorotype:** Anatolian.

***Macrocoma korbi* (Pic, 1901)**

Material examined: HE: **İçel:** Mut-Silifke 10. km, 100m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; **Niğde:** Gebere dam, 29.VII.1997, leg. H. Özdikmen, 1 specimen.

Remarks: The endemic subspecies has been known only from Anatolia for Turkey until now. It is new to İçel and Niğde provinces. **Chorotype:** Anatolian.

***Macrocoma rubripes* (Schaufuss, 1862)**

***Macrocoma rubripes rubripes* (Schaufuss, 1862)**

Material examined: HE: **Adana:** Pozantı-Mersin road, Çamlıyayla turn 20. km, 285m, 30.V.2001, leg. H. Özdikmen, 1 specimen; **Niğde:** 12 km to Ulukışla, 1280m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Bor, Üstünkay, Bor-Altunhisar road, 1150m, 17.VII.1997, leg. H. Özdikmen, 1 specimen. NTPPM: **Ankara:** Kızılcahamam, Kurtboğazi, 16.VIII.1983, leg. Y. Özdemir, 1 specimen; **Çankırı:** Merkez, 29.VII.1993, leg. A. Kalkandelen, 1 specimen; **Gaziantep:** Nizip, 06.VII.1971, leg. M. Y. Çelik, 5 specimens; **Kayseri:** Yahyalı, 27.V.1963, leg. A. Kalkandelen, 2 specimens. **GV: Konya:** between Hadim-Bozkır, 1000m, 19.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Adana, Ankara, Çankırı, Gaziantep, Kayseri, Konya and Niğde provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Genus *Bromius* Chevrolat, 1836

[Type sp.: *Chrosomela obscura* Linnaeus, 1758]

***Bromius obscurus* (Linnaeus, 1758)**

Material examined: AD: **Osmaniye:** Toprakkale, Antakya road, 75m, N 37 00 E 36 08, 27.VI.2006, leg. H. Özdikmen, 1 specimen; Fakiuşağı village, 218m, N 37 01 E 36 12, 26.VI.2006, leg. H. Özdikmen, 6 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It was new to Osmaniye province. Since the materials were published by Özdikmen et al. (2007d). **Chorotype:** Holarctic or Sibero-European + Nearctic.

Genus *Pachnephorus* Chevrolat, 1836

[Type sp.: *Cryptocephalus arenarius* Panzer, 1797 = *Cryptocephalus pilosus* Rossi, 1790]

Subgenus *Pachnephorus* Chevrolat, 1836

[Type sp.: *Cryptocephalus arenarius* Panzer, 1797 = *Cryptocephalus pilosus* Rossi, 1790]

***Pachnephorus villosus* (Duftschmid, 1825)**

Material examined: HE: **İçel:** Silifke, Atakent, 0m, 01.VI.2001, leg. H. Özdikmen, 128 specimens; Erdemli-Silifke road, Exit of Atakent, 0m, 26.06.2001, leg. H. Özdikmen, 4 specimens. NTPPM: **Ankara:** Mogan Lake, 27.VI.1980, leg. Y. Özdemir, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** Turano-European (Ponto-Pannonian).

Genus *Colaspinella* Weise, 1893

[Type sp.: *Colaspidea grandis* Frivaldszky, 1880]

***Colaspinella grandis* (Frivaldszky, 1880)**

Material examined: HE: **Adana:** Pozantı-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 6 specimens; **Konya:** Entry of Ereğli 8. km, 1010m, 02.VI.2001, leg. H. Özdikmen, 1 specimen. **GV: Konya:** Beyreli, 1467m, 17.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It is new to Adana and Konya provinces. **Chorotype:** Anatolian.

Subfamily CHRYSOMELINAE Latreille, 1802**Genus *Timarcha* Latreille, 1829**[Type sp.: *Tenebrio laevigatus* Linnaeus, 1767]**Subgenus *Timarcha* Latreille, 1829**[Type sp.: *Tenebrio laevigatus* Linnaeus, 1767]***Timarcha olivieri* Fairmaire, 1868*****Timarcha olivieri olivieri* Fairmaire, 1868****Material examined:** HE: Turkey: leg. H. Özdikmen, 1 specimen.**Remarks:** The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** SE-European.**Genus *Leptinotarsa* Chevrolat, 1836**[Type sp.: *Leptinotarsa heydenii* Stål, 1858]***Leptinotarsa decemlineata* (Say, 1824)**

Material examined: HE: **Adana:** Pozanti, Entry of Fındıklı, 1200m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; **Aksaray:** Hasan Mountain, Aşağı Dikmen, 1020m, 17.V.1997, leg. H. Özdikmen, 1 specimen; Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Sivrihisar, 1710m, 02.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Ambarkaya hill, 1550m, 16.VI.1987, leg. H. Özdikmen, 2 specimens; Şereflikoçhisar, Akarca, 1000m, 21.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Güvem, 1080m, 11.VII.1997, leg. H. Özdikmen, 6 specimens; Kızılcahamam, Yenimahalle, 1100, 21.VIII.1997, leg. H. Özdikmen, 1 specimen; 850m, 31.VIII.1997, leg. H. Özdikmen, 1 specimen; **Kahramanmaraş:** Binboğa Mountain, 1350m, 30.V.1989, leg. H. Özdikmen, 2 specimens; **Karaman:** Karaman-Ereğli road, Exit of Karaman, 995m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, İlyalı, 1140m, 02.VI.1997, leg. H. Özdikmen, 2 specimens; Yeşilhisar, Güzelöz, 1260m, 02.VI.1997, leg. H. Özdikmen, 4 specimens; Yeşilhisar, Güzelöz, 1260m, 25.VI.1997, leg. H. Özdikmen, 3 specimens; Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; Yahyalı, Kapuzbaşı, Büyükcayır-Yeşilköy, 610m, 26.VI.1997, leg. H. Özdikmen, 2 specimens; **Nevşehir:** Göre, 1260m, 19.V.1997, leg. H. Özdikmen, 9 specimens; Avanos, Zelve, 19.V.1997, leg. H. Özdikmen, 1 specimen; Tilköy, 1270m, 25.VI.1997, leg. H. Özdikmen, 2 specimens; Avanos, 1120m, 22.VII.1992, leg. H. Özdikmen, 1 specimen; **Niğde:** Çamardı, 29.VI.1996, leg. H. Özdikmen, 1 specimen; Bor, Melendiz, Okçu village, 09.VII.1996, leg. H. Özdikmen, 1 specimen; Altunhisar – Çiftlik road, 21.VIII.1996, leg. H. Özdikmen, 1 specimen; Azatlı-Tepeköy road, 21.VIII.1996, leg. H. Özdikmen, 1 specimen; Bor, Karanlık Dere, 1150m, 18.V.1997, leg. H. Özdikmen, 2 specimens; Altunhisar, Karacaören, 1440m, 18.V.1997, leg. H. Özdikmen, 1 specimen; Ağcaşar, 1280m, 02.VI.1997, leg. H. Özdikmen, 5 specimens; Bor, Fesleğen village, 08.VI.1997, leg. H. Özdikmen, 1 specimen; Niğde Bağları, Kayaardı, 17.VI.1997, leg. H. Özdikmen, 7 specimens; Niğde-Bor road, 17.VI.1997, leg. H. Özdikmen, 1 specimen; Ulukışla-Exit of Adana, 1300m, 23.VI.1997, leg. H. Özdikmen, 3 specimens; Çamardı, Bulduruş pass, 1720m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; Çamardı, Bademdere-Elmalı, 1750m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; Azatlı-Tepeköy road, Murozu dam, 02.VII.1997, leg. H. Özdikmen, 1 specimen; Çiftlik, Yeşilyurt Plateau-Altunhisar, 02.VII.1997, leg. H. Özdikmen, 1 specimen; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 4 specimens; 06.VII.1997, leg. H. Özdikmen, 1 specimen; Bor-Altınova, 1200m, 17.VII.1997, leg. H. Özdikmen, 1 specimen; Ulukışla, 1350m, 28.VII.2000, leg. H. Özdikmen, 10 specimens; Çiftlik, Yeşilyurt-Altunhisar, 29.VII.1997, leg. H. Özdikmen, 1 specimen; Exit of Ulukışla, 1145m, 29.V.2001, leg. H. Özdikmen, 22 specimens; **Sinop:** Türkeli, 07.VIII.1999m, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Ankara:** Lalahan, 27.VI.1968, leg. A. Kalkandelen, 1 specimen; Kızılcahamam, Bağlıca village, 06.VI.1979, 3 specimens; Ayaş, Peruz village, 16.VI.1979, 2 specimens; Kazan, 05.VII.1979, leg. A. Has, 1 specimen; Eymir Lake, 27.VI.1980, leg. A. Kalkandelen, 1 specimen; **Bolu:** Bozkırlı village, 28.VIII.1981, leg. R. Kedici, 16 specimens; Çoban kaya, 18.VIII.1981, leg. R. Kedici, 1 specimen; Seben, Kaşbıyıklar village, 11.VIII.1983, **Solanum**, leg. A. Kalkandelen, 1 specimen; **Düzce:** Akçakoca, 03.VIII.1999, leg. M. Özdemir, 9 specimens; **Edirne:** 02.VII.1963, leg. H. Birkardeşler, 7 specimens; 1964, leg. R. Musluoğlu, 1 specimen; **Turkey:** without locality data, 4 specimens. **BK:** **Düzce:** Yiğilca, Aydın village – Dutlar village, 200m, 12.05.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** Kastamonu-Safranbolu road, 56 km to Safranbolu, 695m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Daday, Akpınar village, 15.VIII.2003, leg. H. Özdikmen, 17 specimens; Doğanıyurt-Dağyurdu, 950m, 18.VI.2004, leg. H. Özdikmen, 1 specimen; **Sinop:** Durağan, Başağaç village, 270m, 16.VI.2004, leg. H. Özdikmen, 3 specimens; **Zonguldak:** Özbağı-Çiplaklar village, 160m, 13.V.2003, leg. H. Özdikmen, 3 specimens. **K:** **Kahramanmaraş:** Göksun, Andırın-Göksun road, entry of Taşoluk, N 37° 58' E 36° 27', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen. **AD:** **Osmaniye:** Küllü village, Kışpe, 1425m, N 36° 57' E 36° 24', 17.VIII.2007, leg. H. Özdikmen, 30 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. According to references, it is new to Adana, Aksaray, Bolu, Düzce, Kahramanmaraş, Karaman, Kastamonu, Kayseri, Nevşehir, Niğde, Osmaniye, Sinop and

Zonguldak provinces. However, it is the common species for Turkey (in growing potato areas). **Chorotype:** European + Nearctic.

Genus *Chrysolina* Motschulsky, 1860

[Type sp.: *Chrysomela staphylaea* Linnaeus, 1758]

Subgenus *Chrysolina* Motschulsky, 1860

[Type sp.: *Chrysomela staphylaea* Linnaeus, 1758]

Chrysolina blanchei (Fairmaire, 1865)

Chrysolina blanchei blanchei (Fairmaire, 1865)

Material examined: **BK: Karabük:** Eflani, Örencik village, 970m, 15.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Karabük province. **Chorotype:** E-Mediterranean for the species. E-Mediterranean (Palaestino-Cyprito-Taurian) for the subspecies.

Chrysolina staphylae (Linnaeus, 1758)

Chrysolina staphylae staphylae (Linnaeus, 1758)

Material examined: **BK: Karabük:** Safranbolu, Konarı village, 485m, 15.VI.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** Araç road, Kastamonu Polis Ormanı, 975m, 16.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Karabük and Kastamonu provinces. **Chorotype:** Holarctic for the species. W-Palaearctic + Nearctic for the subspecies.

Subgenus *Taeniossticha* Motschulsky, 1860

[Type sp.: *Chrysomela lurida* Linnaeus, 1767 = *Chrysolina pseudolurida saxonica* Silfverberg, 1977]

Chrysolina reitteri (Weise, 1884)

Chrysolina reitteri pseudolurida Roubal, 1917

Material examined: **HE: Adana:** Pozantı-Mersin road, Çamlıyayla turn, 690m, 30.V.2001, leg. H. Özdikmen, 1 specimen; **Ankara:** between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Güven, 1150m, 06.V.1987, leg. H. Özdikmen, 1 specimen; **Konya:** Kulu, Tavşancağı, 1000m, 17.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Tepeköy, 24.VII.1996, leg. H. Özdikmen, 1 specimen; Altunhisar, Akmanlar, 06.VIII.1996, leg. H. Özdikmen, 6 specimens; Altunhisar, Karacaören, 1440m, 18.V.1997, leg. H. Özdikmen, 1 specimen; Bor, Karanlık Dere, 1150m, 18.V.1997, leg. H. Özdikmen, 2 specimens; Altunhisar, Akçaören, 1280m, 01.VI.1997, leg. H. Özdikmen, 7 specimens; **Turkey:** leg. H. Özdikmen, 2 specimens. **NTPPM: Ankara:** Etlik, 04.V.1939, 2 specimens; 07.V.1939, 1 specimen; Elmadag, 16.V.1939, 1 specimen; Dam road, 28.V.1951, leg. N. Tuatay, 1 specimen; Eymir lake, 09.VII.1939, 1 specimen. **BK: Bolu:** Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 1 specimen. **GV: Konya:** Hadim, exit of Bozkır, 1569m, 14.V.2007, leg. H. Özdikmen, 2 specimens; Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 7 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Ankara, Bolu and Konya provinces. **Chorotype:** S-European.

Subgenus *Erythrochrysa* Bechyné, 1950

[Type sp.: *Chrysomela polita* Linnaeus, 1758]

Chrysolina polita (Linnaeus, 1758)

Chrysolina polita polita (Linnaeus, 1758)

Material examined: **HE: Kastamonu:** İncebel, 19.08.1998, leg. H. Özdikmen, 1 specimen; **Niğde:** Çiftlik-Niğde road, 29.VII.1997, leg. H. Özdikmen, 2 specimens; Azatlı-Tepeköy road, 21.VIII.1996, leg. H. Özdikmen, 5 specimens; **Ordu:** Perşembe, Çaytepe, 300m, 15.VII.1997, leg. H. Özdikmen, 2 specimens. **NTPPM: Artvin:** Hopa, 15.VII.1972, leg. Y. Bozan, 4 specimens; **Çankırı:** Ilgaz, Kadınçayırı, 08.VI.1987, leg. Y. Özdemir, 1 specimen. **BK: Karabük:** Eflani-Daday road, Karlı village, 1040m, 15.V.2003, leg. H. Özdikmen, 4 specimens; **Kastamonu:** Küre-Ağılı road, 1220m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; 5. km of Tosya-Kastamonu road, 25.VII.2003, leg. H. Özdikmen, 3 specimens. **K: Kahramanmaraş:** Geben, Çokak-Geben road, Kırksu place, N 37° 45' E 36° 27', 1200m, 16.VII.2003, leg. A. Y. Okutaner, 11 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Çankırı, Kahramanmaraş, Karabük, Kastamonu, Niğde and Ordu provinces. **Chorotype:** Centralasiatic-European.

Subgenus *Zeugotaenia* Motschulsky, 1860

[Type sp.: *Chrysomela limbata* Fabricius, 1775]

Chrysolina limbata (Fabricius, 1775)

Material examined: NTPPM: Bingöl: Genç, 10.IX.1971, leg. N. Adıgüzel, 3 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Bingöl province. **Chorotype:** Sibero-European.

Subgenus *Stichoptera* Motschulsky, 1860

[Type sp.: *Chrysomela sanguinolenta* Linnaeus, 1758]

Chrysolina gypsophilae (Küster, 1845)

Material examined: HE: Afyon: Dumlupınar, 28.X.1997, leg. H. Özdikmen, 1 specimen; **Aksaray:** Hasan Mountain, Aşağı Dikmen, 1020m, 17.V.1997, leg. H. Özdikmen, 3 specimens; **Ankara:** 05-VI.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Soğuksu National Park, 1300m, 02.VII.1991, leg. H. Özdikmen, 1 specimen; **İçel:** Mut-Karaman road, Gökçeören Çamlığı, 1335m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Karaman:** 30. km of Ayrancı-Ereğli road, 1010m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Konya:** Kulu, Tavşançalı, 1000m, 17.V.1997, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Uçhisar, 1260m, 19.V.1997, leg. H. Özdikmen, 3 specimens; Avanos, Zelve, 19.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor, Karanlık Dere, 1150m, 18.VI.1997, leg. H. Özdikmen, 4 specimens; Exit of Ulukışla, 1350m, 29.05.2001, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Ankara:** Esenboğa, 02.V.1962, leg. M. Denkel, 2 specimens; 24.VI.1963, leg. Y. Sürmeli, 1 specimen; **Bartın:** Amasra, 11.VI.1980, leg. H. Ural, 1 specimen; **Konya:** Kadınhanı, 12.VI.1971, *Triticum* sp, leg. G. Altınayar, 1 specimen; **Zonguldak:** 11.VI.1980, *Triticum*, leg. M. Özkan, 1 specimen. **BK:** **Sinop:** Kargı-Boyabat, 1 km to Saraydüzü, 16.V.2004, leg. H. Özdikmen, 1 specimen. **AD:** **Osmaniye:** Kalecik-Hasanbeyli road, 689m, N 37 03 E 36 30, 19.V.2006, leg. H. Özdikmen, 1 specimen. **GV:** **Konya:** Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 4 specimens; **Turkey:** leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Afyon, Aksaray, Bartın, Karaman, Konya, Nevşehir, Niğde, Osmaniye, Sinop and Zonguldak provinces. **Chorotype:** Centralasiatic-European.

Subgenus *Chalcoidea* Motschulsky, 1860

[Type sp.: *Chrysomela marginata* Linnaeus, 1758]

Chrysolina analis (Linnaeus, 1767) (new to Turkey)

Material examined: HE: **Aksaray:** Hasan Mountain, Aşağı Dikmen, 1020m, 17.V.1997, leg. H. Özdikmen, 36 specimens; Ekecik stream, 1000m, 20.V.1997, leg. H. Özdikmen, 3 specimens; Nevşehir-Aksaray road, Entry of Aksaray, 20.V.1997, leg. H. Özdikmen, 11 specimens; Hasan Mountain, Aşağı Dikmen, 1100m, 01.VI.1997, leg. H. Özdikmen, 1 specimen; Entry of Nevşehir, 1040m, 03.VI.1997, leg. H. Özdikmen, 5 specimens; **Ankara:** Kızılcahamam, Soğuksu National Park, 1200m, 03.VI.1990, leg. H. Özdikmen, 2 specimens; Şereflikoçhisar, 950m, 20.V.1997, leg. H. Özdikmen, 2 specimens; **Karaman:** Karaman-Ereğli road, Exit of Karaman, 995m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, İlyalı, 1140m, 02.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor, Karanlık Dere, 1150m, 18.V.1997, leg. H. Özdikmen, 11 specimens; Çamardı turn, 1400m, 18.V.1997, leg. H. Özdikmen, 1 specimen; Ağcaşar, 1280m, 02.VI.1997, leg. H. Özdikmen, 1 specimen; 12 km to Ulukışla, 1280m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Altınhisar -Yeşilyurt, 29.07.1997, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Afyon:** Emirdağ, 10.VI.1998, leg. M. Özdemir, 1 specimen; **Ankara:** Çubuk, Sirkeli, 13.VI.1999, leg. Y. Özdemir, 2 specimens; **Eskişehir:** Sivrihisar, Biçer, 29.V.1963, leg. N. Çağatay, 1 specimen. **BK:** **Karabük:** Eflani, Yağlıca village, 975m, 15.V.2003, leg. H. Özdikmen, 48 specimens; Eskipazar, Hanköy, Aşağıbağ district, 575m, 16.V.2003, leg. H. Özdikmen, 1 specimen; Safranbolu, Bulak village, Bağ Evleri place, 670m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; **Sinop:** Kargı-Boyabat, 1 km to Saraydüzü, 16.V.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** C, E-European + Mediterranean.

Chrysolina marginata* (Linnaeus, 1758)**Chrysolina marginata marginata* (Linnaeus, 1758)**

Material examined: **K:** Kahramanmaraş: Nurhak, Yeşilkent-Malatya road, N 37° 57' E 37° 35', 1325m, 12.VIII.2003, leg. A. Y. Okutaner, 2 specimens. **GV:** Konya: Seydişehir, Fasillar village, 1215m, 13.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province. It is represented by two subspecies in Turkey as the nominotypical subspecies and *C. marginata unificans* Bechyné, 1950 (only in NE Anatolia).

Chorotype: European.

Subgenus *Diachalcoidea* Bechyné, 1955

[Type sp.: *Chrysomela sacarum* Weise, 1890]

***Chrysolina sacarum* (Weise, 1890) (new to Turkey)**

Material examined: **NTPPM:** Muş: Süngü, 03.06.1972, leg. Y. Dörtbudak, 9 specimens.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** Centralasiatic + SW-Asiatic (Irano-Anatolian).

Subgenus *Sulcicollis* Sahlberg, 1913

[Type sp.: *Chrysomela chalcites* Germar, 1824]

***Chrysolina chalcites* (Germar, 1824)**

Material examined: **HE:** Bolu: Mengen-Yedigöller road, 14.VI.2010, leg. H. Özdikmen, 1 specimen; **BK:** Sinop: Durağan, Başağaç village, 270m, 16.VI.2004, leg. H. Özdikmen, 1 specimen. **AD:** Gaziantep: Kilis-Gaziantep road, Oğuzeli return env., 16.V.2006, leg. H. Özdikmen, 3 specimens; **Osmaniye:** Zorkun road, Çiftmazı, 223m, N 37 01 E 36 17, 20.V.2006, leg. H. Özdikmen, 1 specimen; Fakuşağı village, 655m, N 36 01 E 36 12, 19.V.2006, leg. H. Özdikmen, 1 specimen; Fakuşağı village, 145m, N 37 02 E 36 13, 09.IV.2006, leg. H. Özdikmen, 1 specimen; Boğaz plateau, 713m, N 37 04 E 36 22, 18.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It was new to Gaziantep and Osmaniye provinces. Since the materials were published by Özdikmen & Aslan (2009). It is new to Bolu and Sinop provinces.

Chorotype: Centralasiatic-European or Sibero-European.

***Chrysolina oricalcia* (Müller, 1776)**

Material examined: **K:** Kahramanmaraş: Nurhak, Tatlar, N 37° 57' E 37° 35', 1325m, 22.V.2003, leg. A. Y. Okutaner, 1 specimen. **GV:** Antalya: Akseki, 1233m, 14.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Antalya and Kahramanmaraş provinces. **Chorotype:** Sibero-European.

Subgenus *Hypericia* Bedel, 1892

[Type sp.: *Chrysomela hyperici* Forster, 1950]

Chrysolina didymata* (Scriba, 1791)**Chrysolina didymata didymata* (Scriba, 1791)**

Material examined: **NTPPM:** Denizli: Çal-Hadım, 15.VIII.1968, leg. H. Alptekin, 3 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Denizli province. It is represented by two subspecies in Turkey. The subspecies, *C. didymata syriaca* (Weise, 1884), occurs only in SC Turkey and Syria. **Chorotype:** Turano-European or Centralasiatic-European.

Chrysolina hyperici* (Forster, 1950)**Chrysolina hyperici hyperici* (Forster, 1950)**

Material examined: **HE:** Ankara: Kızılcahamam, Soğuksu National Park, 1250m, 07.VI.1997, leg. H. Özdikmen, 4 specimens; **İçel:** Mut-Silifke 10. km, 100m, 01.VI.2001, leg. H. Özdikmen, 2 specimens; Silifke-Mut road, Entry of Kartsuyu, 120m, 01.VI.2001, leg. H. Özdikmen, 1 specimen. **BK:** Kastamonu: Hanönü, 387m, 17.VI.2004, leg. H. Özdikmen, 1 specimen; **Doğanyurt-Şenpazar** road, 7 km to Şenpazar, 687m, 18.VI.2004, leg. H. Özdikmen, 4 specimens; **Doğanyurt-Dağyurdu**, 950m, 18.VI.2004, leg. H. Özdikmen, 1 specimen; **Sinop:** Ayancık, Akgöl, 1170m, 17.VI.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Ankara, İçel, Kastamonu and Sinop provinces. **Chorotype:** Sibero-European + Australian.

Subgenus *Chrysolinopsis* Bechyné, 1950

[Type sp.: *Chrysomela gemina* Brullé, 1839]

Chrysolina americana (Linnaeus, 1758)

Material examined: **HE:** Aydın: Çine valley, 150m, 23.IV.2006, leg. H. Özdikmen, 9 specimens. **NTPPM:** Ankara: Karagöl, 09.VI.1966, leg. M. Çağatay, 1 specimen; **Manisa:** Salihli, 05.VIII.1964, leg. D. İyriboz, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and Aydın provinces. **Chorotype:** Mediterranean.

Subgenus *Ovosoma* Motschulsky, 1860

[Type sp.: *Chrysomela vernalis* Brullé, 1832]

Chrysolina halysa Bechyné, 1950

Material examined: **HE:** Niğde: Bor, 07.VI.1997, leg. H. Özdikmen, 3 specimens; Bor, Melendiz, Fesleğen village, 03.VII.1996, leg. H. Özdikmen, 2 specimens; Melendiz, Hançerli- Küçükköy, 03.VII.1996, leg. H. Özdikmen, 1 specimen; **Osmaniye:** leg. H. Özdikmen, 1 specimen. **NTPPM:** Adana: 04.IV.1939, 1 specimen. **BK:** Bolu: Pazarköy, 20.V.2004, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Doğanyurt-Şenpazar road, 7 km to Şenpazar, 687m, 18.VI.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is regarded by Kippenberg in Löbl & Smetana (2010) as a subspecies of *C. orientalis*. It is new to Bolu, Kastamonu, Niğde and Osmaniye provinces. **Chorotype:** E-Mediterranean (Palaestino-Cyprioto-Taurian).

Chrysolina orientalis (Olivier, 1807)

Chrysolina orientalis orientalis (Olivier, 1807)

Material examined: **HE:** Ankara: Teknikokullar, 850m, 09.VI.1997, leg. H. Özdikmen, 1 specimen; Beşevler, 15.XI.1997, leg. H. Özdikmen, 1 specimen; Teknikokullar, 850m, 25.IX.2000, leg. H. Özdikmen, 1 specimen; Teknikokullar, 1 specimen; Etimesgut, 1 specimen; **Aydın:** Çine valley, 150m, 23.IV.2006, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 02.VI.1997, leg. H. Özdikmen, 2 specimens; **Konya:** Central, 22.V.2003, leg. H. Özdikmen, 3 specimens; **Niğde:** Bor, 07.VI.1997, leg. H. Özdikmen, 4 specimens; Niğde-Bor, Derbent district, 17.VI.1997, leg. H. Özdikmen, 1 specimen; Çamardı, Yelatan Village, 1280m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Bor, Melendiz, Fesleğen village, 03.VII.1996, leg. H. Özdikmen, 1 specimen; Bor, Karanlık Dere, 20.VII.1996, leg. H. Özdikmen, 1 specimen; Tepeköy, 24.VII.1996, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Afyon:** Çakır, 27.V.1981, *Papaver*, leg. H. Karakaya, 1 specimen; Çakır, 10.VIII.1981, *Papaver*, leg. H. Karakaya, 1 specimen; **Ankara:** 23.V.1938, 2 specimens; 25.V.1962, leg. N. Tuatay, 18 specimens; Çubuk, Sirkeli, 13.VI.1999, leg. Y. Özdemir, 1 specimen; **Kayseri:** Develi, 15.IX.1961, leg. N. Tuatay, 1 specimen. **BK:** **Karabük:** Eflani-Daday road, Karlı village, 1040 m, 15.V.2003, leg. H. Özdikmen, 2 specimens; Üçevler, 1000m, 14.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Afyon, Ankara, Aydın, Karabük, Kayseri, Konya and Niğde provinces. The species is represented by two subspecies in Turkey as *C. orientalis thraeissa* probably occurs only in SW and SC Turkey, and the nominotypical subspecies occurs in other parts of Turkey. **Chorotype:** Turano-Mediterranean (Turano-Balkan) for the species. Anatolian for the subspecies.

Chrysolina orientalis thraeissa Bechyné, 1950 (new to Turkey)

Material examined: **NTPPM:** Adana: Kozan, 22.IV.1962, leg. Y. Sürmeli, 1 specimen; **Hatay:** İskenderun, Esentepe, 17.IV.1962, leg. Y. Sürmeli, 1 specimen. **AD:** **Hatay:** Dörtöl, Kuzuculu, 119m, N 36 54 E 36 13, 07.IV.2006, leg. H. Özdikmen, 2 specimens; Entry of Belen, Çakallı, 652m, N 36 28 E 36 13, 19.V.2006, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Kalecik-Hasanbeyli road, 679m, N 37 09 E 36 28, 19.V.2006, leg. H. Özdikmen, 1 specimen; Kalecik-Hasanbeyli road, 689m, N 37 03 E 36 30, 19.V.2006, leg. H. Özdikmen, 1 specimen. **GV:** **Konya:** Bozkır-Kuruçay, Ahırlı, 1270m, 28.III.2007, leg. H. Özdikmen, 3 specimens.

Remarks: The species is recorded from Adana, Hatay and Osmaniye provinces in Turkey for the first time. **Chorotype:** Turano-Mediterranean (Turano-Balkan) for the species. Turano-Mediterranean (Balkano-Anatolian) for the subspecies.

***Chrysolina sahlbergi* (Ménétriés, 1832)**

Material examined: **HE: Konya:** Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 1 specimen; Central, 22.V.2003, leg. H. Özdikmen, 4 specimens; **Niğde:** Bor, 07.VI.1997, leg. H. Özdikmen, 2 specimens; Bor, Karanlık Dere, 30.VI.1996, leg. H. Özdikmen, 2 specimens; Bor, Melendiz, Fesleğen village, 03.VII.1996, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** 25.V.1962, leg. N. Tuatay, 4 specimens; Çubuk, Sirkeli, 13.VI.1999, leg. Y. Özdemir, 4 specimens; **Aydın:** 21.V.1963, leg. Ayla Çekli, 1 specimen; Kuşadası, 16.V.1964, leg. A. Demirtola, 2 specimens; **Eskişehir:** Sivrihisar, Biçer, 29.V.1963, leg. N. Çağatay, 1 specimen; **Hatay:** İskenderun, Esentepe, 17.IV.1962, leg. Y. Sürmeli, 1 specimen; **İçel:** Silifke, 06.IV.1963, leg. Y. Sürmeli, 2 specimens; **Kayseri:** Develi, 15.IX.1961, leg. N. Tuatay, 1 specimen; **Siirt:** 29.V.1966, leg. Y. Sürmeli, 1 specimen. **BK: Karabük:** İsmet Paşa–Ovacık, 1017m, 13.VIII.2003, leg. H. Özdikmen, 1 specimen; **Sinop:** Boyabat, Bürnük village, 1235m, 17.VI.2003, leg. H. Özdikmen, 1 specimen; **Zonguldak:** Devrek, Alparslan village, 425m, 13.V.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Andırın–Çokak road, Parmaksız plateau, N 37° 38' E 36° 20', 1210m, 16.VII.2003, leg. A. Y. Okutaner, 1 specimen. **GV: Konya:** Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is regarded by Kippenberg in Löbl & Smetana (2010) as a subspecies of *C. orientalis*. It is new to Aydın, Kahramanmaraş, Karabük, Kayseri, Siirt, Sinop and Zonguldak provinces. **Chorotype:** SW-Asiatic (Irano-Anatolian).

Chrysolina vernalis* (Brullé, 1832)**Chrysolina vernalis ottomana* (Weise, 1906)**

Material examined: **NTPPM: İzmir:** Bergama, 11.V.1964, leg. Y. Sürmeli, 9 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is represented only by the subspecies *C. vernalis ottomana* in Turkey. **Chorotype:** S-European for the species. Turano-Mediterranean (Balkano-Anatolian) for the subspecies.

Subgenus *Euchrysolina* Bechyné, 1950

[Type sp.: *Chrysomela polita* Linnaeus, 1758]

Chrysolina graminis* (Linnaeus, 1758)**Chrysolina graminis graminis* (Linnaeus, 1758)**

Material examined: **NTPPM: Muş:** 20.VII.1967, leg. N. Adıgüzel, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Muş province and thereby to Eastern Anatolia. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Sibero-European for the species. European for the subspecies.

Subgenus *Synerga* Weise, 1900

[Type sp.: *Chrysomela bella* Jacoby, 1890]

Chrysolina coeruleans* (Scriba, 1791)**Chrysolina coeruleans coeruleans* (Scriba, 1791)**

Material examined: **BK: Kastamonu:** Safranbolu–Araç, 35 km to Araç, 535m, 15.VI.2003, leg. H. Özdikmen, 26 specimens. **K: Kahramanmaraş:** Göksun, A. Türkeş excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, A. Türkeş excursion spot place–Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun–Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Pazarcık, Aksu bridge, N 37° 32' E 37° 20', 790m, 13.VII.2003, leg. A. Y. Okutaner, 3 specimens; Kahramanmaraş–Andırın road, Körsülü bridge env., N 37° 37' E 36° 39', 653m, 15.VII.2003, leg. A. Y. Okutaner, 1 specimen; Kahramanmaraş–Andırın road, Körsülü bridge, N 37° 37' E 36° 39', 653m, 11.VIII.2003, leg. A. Y. Okutaner, 2 specimens; Andırın, Döngel–Andırın road, Çeteler place, N 37° 33' E 36° 38', 1100m, 11.VIII.2003, 1 specimen. **AD: Kahramanmaraş:** Türkoğlu, Büyük İmralı village, 600 m, N 37 21 E 36 47, 18.05.2006, 5 specimens. **GV: Antalya:** Border of province, Bademli beli pass, 1432m, 14.V.2006, leg. H. Özdikmen, 4 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Antalya, Kahramanmaraş and Kastamonu provinces. It is represented by two subspecies in Turkey as the nominotypical subspecies and *C. coeruleans angelica* (Reiche & Saulcy, 1858) (only in S Anatolia) in Turkey. **Chorotype:** Centralasiatic-European + Oriental or Sibero-European + Oriental for the species. European for the subspecies.

Chrysolina herbacea (Duftschmid, 1825)*Chrysolina herbacea herbacea* (Duftschmid, 1825)

Material examined: **HE: Aksaray:** Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 12 specimens; Eşkil, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 1 specimen; Ortaköy, Hocaveli village, 1260m, 22.VI.1997, leg. H. Özdikmen, 16 specimens; **Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 5 specimens; Şereflikoçhisar – Evren, Evren, 1220m, 21.VI.1997, leg. H. Özdikmen, 25 specimens; Şereflikoçhisar-Evren road, 1200m, 21.VI.1997, leg. H. Özdikmen, 5 specimens; Kızılcahamam, Aköz Village, 1150m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1350m, 10.VII.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Güvem, 1080m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 7 specimens; Kızılcahamam, Yukarı Çanlı, 1300m, 19.VIII.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Bel Doruğu, 1600m, 21.VIII.1997, leg. H. Özdikmen, 1 specimen; Etimesgut, 2001, 1 specimen; **Bolu:** Mudurnu-Göynük road, 853 m, 07.VII.2009, leg. H. Özdikmen, 7 specimens; Yedigöller env., 14.VI.2010, leg. H. Özdikmen, 2 specimens; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 02.VI.1997, leg. H. Özdikmen, 3 specimens; Yahyalı, Derebağı, Şelale district, 1280m, 02.VI.1997 and 25.06.1997, leg. H. Özdikmen, 28 specimens; 25.VII.1997, leg. H. Özdikmen, 4 specimens; **Konya:** Kulu, 1230m, 31.V.1997, leg. H. Özdikmen, 78 specimens; Kulu, Taşvançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 37 specimens; **Neveşehir:** Göre, 1260m, 19.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Çamardı, 1550m, 24.VI.1996, leg. H. Özdikmen, 1 specimen; Azatlı-Tepeköy road, 21.VIII.1996, leg. H. Özdikmen, 3 specimens; Ferteke, 08.VI.1997, leg. H. Özdikmen, 1 specimen; Bor, Bahçeli, 08.VI.1997, leg. H. Özdikmen, 13 specimens; Niğde Bağları, Kayaardı, 17.VI.1997, leg. H. Özdikmen, 2 specimens; Çamardı, Bademdere, 1580m, 24.VI.1997, leg. H. Özdikmen, 3 specimens; Çamardı, Bulduruş pass, 1720m, 24.VI.1997, leg. H. Özdikmen, 3 specimens; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor, Okçu village, 06.VII.1997, leg. H. Özdikmen, 1 specimen; Bor, Bor-Altunhisar road, Pınarbaşı, 1100m, 17.VII.1997, leg. H. Özdikmen, 3 specimens; Bor-Altunhisar, 1200m, 17.VII.1997, leg. H. Özdikmen, 1 specimen; Çiftlik-Niğde road, 29.VII.1997, leg. H. Özdikmen, 6 specimens; Altunhisar-Yeşilyurt, 29.VII.1997, leg. H. Özdikmen, 2 specimens; Bor, Metkavak district, 09.VIII.1997, leg. H. Özdikmen, 4 specimens; Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 191 specimens; Aksaray-Ulukışla road, 1290m, 29.V.2001, leg. H. Özdikmen, 32 specimens; **Ordu:** Perşembe, Çaytepe, 300m, 15.VII.1997, 7 specimens; leg. H. Özdikmen, 1 specimen; **Samsun:** Havza, Kocapınar village, 650m, 09.VIII.1999, leg. S. Turgut, 2 specimens. **NTPPM: Ankara:** Çubuk road, 06.VI.1952, *Mentha*, 3 specimens; Nallıhan, 24.VI.1981, *Oryza*, leg. M. Özkan, 1 specimen; Ayaş, 03.III.1987, leg. A. Kalkandelen, 1 specimen; Ayaş, 01.VI.1988, leg. Y. Özdemir, 1 specimen; **Bartın:** Güzelcehi, 30.VIII.1988, leg. A. Kalkandelen, 1 specimen; Amasra, 29.IX.1994, leg. Y. Özdemir, 3 specimens; **Bolu:** Çilimli, 29.IX.1993, leg. A. Kalkandelen, 1 specimen; **Eskişehir:** Sarıcakaya, 28.V.1983, leg. Y. Özdemir, 1 specimen; Mahmudiye, 05.VI.1991, leg. Y. Özdemir, 1 specimen; Sivrihisar, 21.IX.1993, leg. A. Kalkandelen, 1 specimen; **Kastamonu:** Pınarbaşı, 03.VIII.1934, 1 specimen; **Kayseri:** Devrek, Sarıca, 23.VIII.1984, leg. A. Kalkandelen, 1 specimen; **Kırşehir:** Central, 22.VII.1992, leg. Y. Özdemir, 1 specimen; Mucur, 27.V.1992, leg. Y. Özdemir, 2 specimens; Kaman, 23.IX.1992, leg. Y. Özdemir, 1 specimen; **Kocaeli:** Yarımcı, Wild herb, 01.V.1952, 1 specimen; **Konya:** Beyşehir, Bayat, 19.VI.1979, Wild herb, leg. A. Has, 8 specimens; Beyşehir, 21.VIII.1991, leg. Y. Özdemir, 1 specimen; **Neveşehir:** Ürgüp, Karacaviran, 04.VII.1984, leg. A. Kalkandelen, 1 specimen; **Zonguldak:** 11.VI.1980, *Triticum*, leg. M. Özkan, 1 specimen. **BK: Bartın:** Bartın-Çaycuma road, Çamlık village, 19.V.2004, leg. H. Özdikmen, 1 specimen; Bartın-Çaycuma road, Çiftlik village, 19.V.2004, leg. H. Özdikmen, 5 specimens; Bartın-Çaycuma road, Entry of Çaycuma, 19.V.2004, leg. H. Özdikmen, 1 specimen; **Bolu:** Gerede-Kızılcahamam, 15 km to Gerede, 1200m, 17.V.2003, leg. H. Özdikmen, 3 specimens; Mengen, Devrek-Mengen, 770m, 19.VI.2003, leg. H. Özdikmen, 2 specimens; Dorukhan Pass, 750m, 20.VII.2003, leg. H. Özdikmen, 3 specimens; **Düzce:** Akçaören village, At Yolu district, Hasanlar Dam, 11.V.2003, 225m, leg. H. Özdikmen, 1 specimen; Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Özdikmen, 13 specimens; Yiğilca, Karakaş village, 390m, 12.V.2003, leg. H. Özdikmen, 12 specimens; Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Özdikmen, 2 specimens; Karakaş village, 510m, 12.V.2003, leg. H. Özdikmen, 2 specimens; **Karabük:** Safranbolu, Balkuşu village, 275m, 13.V.2003, leg. H. Özdikmen, 3 specimens; Safranbolu, Bulak village, in front of Mencilis Cave, 720m, 14.V.2003, leg. H. Özdikmen, 9 specimens; Eflani-Daday road, Karlı village, 1040m, 15.V.2003, leg. H. Özdikmen, 15 specimens; Safranbolu, 520m, 15.VI.2003, leg. H. Özdikmen, 3 specimens; Bulak village, Bağ Evleri, 670m, 15.VI.2003, leg. H. Özdikmen, 2 specimens; Bartın-Safranbolu road, Soğuksu district, 21.VII.2003, 6 specimens; Safranbolu, Bulak village, 22.VII.2003, leg. H. Özdikmen, 1 specimen; İsmet Paşa-Ovacık, 1017m, 13.VIII.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** between Araç-Karabük, Çıraklar village, 440m, 16.V.2003, leg. H. Özdikmen, 14 specimens; Kastamonu-Araç road, 1000m, 16.V.2003, leg. H. Özdikmen, 4 specimens; Safranbolu-Araç, 35 km to Araç, 535m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Kastamonu-Tosya road, Akkaya-Taşköprü turn, 1415m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; Kastamonu-Tosya road, Tosya-İlgaz pass, 1650m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; Azdavay, 785m, 18.VI.2003, leg. H. Özdikmen, 1 specimens; Küre-Ağlılı road, 1220m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; Pınarbaşı-Azdavay road, exit of Karafasıl village, 23.VII.2003, leg. H. Özdikmen, 9 specimens; Küre, Masruf pass env., 1250m, 24.VII.2003, leg. H. Özdikmen, 6 specimens; İlgaz-Kastamonu road, Kadınçayırı turn, 25.VII.2003, leg. H. Özdikmen, 1 specimen; Daday, Daday-Araç road, 1250m, 15.VIII.2003, leg. H. Özdikmen, 1 specimen; between

Devrekani–Yaralıgöz, 15.VIII.2003, leg. H. Özdikmen, 20 specimens; Ilgaz–Tosya road, 39 km to Tosya, 16.V.2004, leg. H. Özdikmen, 4 specimens; Doğanıurt–Dağyurdu, 727m, 18.VI.2004, leg. H. Özdikmen, 2 specimens; **Samsun:** Bafra-Alaçam road, 75m, 16.VI.2004, leg. H. Özdikmen, 3 specimens; **Sinop:** 35m, 17.VI.2003, leg. H. Özdikmen, 3 specimens; **Zonguldak:** Özbaşı–Çıplaklar village, 160m, 13.V.2003, leg. H. Özdikmen, 8 specimens; between Yedigöller–Devrek 20. km, 350m, 13.V.2003, leg. H. Özdikmen, 1 specimen; between Yedigöller–Devrek, 230m, 13.V.2003, leg. H. Özdikmen, 46 specimens; exit of Devrek, Çıplaklar village, 250m, 13.V.2003, leg. H. Özdikmen, 2 specimens; Devrek–Ereğli road, Ormanlı, Sarıkaya village, 19.V.2004, leg. H. Özdikmen, 35 specimens. **GV: Konya:** Bozkır, between Dereköy–Sarkun, 1272m, 19.VII.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is represented by three subspecies in Turkey as the nominotypical subspecies, *C. herbacea reticulicollis* (in NE Anatolia) and *C. herbacea alacris* (in Southern Anatolia). It is new to Aksaray, Bartın, Bolu, Eskişehir, Karabük, Kastamonu, Kayseri, Niğde, Ordu and Zonguldak provinces. **Chorotype:** European.

Chrysolina herbacea alacris Bechyne, 1950

Material examined: **HE: İçel:** Exit of Kirobası 8.km, 1175m, 01.VI.2001, leg. H. Özdikmen, 4 specimens; Yüksekölkük village, 1045m, 25.VI.2001, leg. H. Özdikmen, 8 specimens; **Kahramanmaraş:** Binboğa Mountain, 1350m, 30.V.1989, leg. H. Özdikmen, 2 specimens; **Karaman:** Karaman–Mut, 1150–1430m, 25–26.VII.2000, leg. H. Özdikmen, 21 specimens. **NTPPM: Isparta:** Gölcük, 27.IX.1992, leg. A. Kalkandelen, 1 specimen; **K: Kahramanmaraş:** Nurhak, Tatlar, N 37° 57' E 37° 35', 1325m, 22.V.2003, leg. A. Y. Okutaner, 8 specimens; Afşin, Tanır, N 38° 25' E 36° 55', 1251m, 24.V.2003, leg. A. Y. Okutaner, 4 specimens; Afşin, Tanır, Yeşiloba quarter, Farta place, N 38° 22' E 36° 54', 1230m, 25.V.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Tanır, Yeşiloba, Karasalgan place, N 38° 22' E 36° 54', 1230m, 25.V.2003, leg. A. Y. Okutaner, 9 specimens; Kahramanmaraş–Göksun road, entry of Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, Değirmendere, N 37° 55' E 36° 29', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 32 specimens; Göksun, A. Türkeş excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, A. Türkeş excursion spot place–Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 5 specimens; Göksun–Mehmet Beyli road, N 38° 05' E 36° 27', 1480m, 24.VI.2003, leg. A. Y. Okutaner, 77 specimens; Göksun, Göksun–Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, Göksun–Çardak road, Gücük plateau, N 38° 3' E 36° 39', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 23 specimens; Göksun, Çardak, N 38° 05' E 36° 49', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Tanır, Farta place, N 38° 25' E 36° 55', 1230m, 26.VI.2003, leg. A. Y. Okutaner, 4 specimens; Afşin, Yeşiloba, near Hurman stream, N 38° 25' E 36° 55', 1230m, 26.VI.2003, leg. A. Y. Okutaner, 23 specimens; Ekinözü, N 38° 03' E 37° 11', 1015m, 27.VI.2003, leg. A. Y. Okutaner, 58 specimens; Nurhak, Nurhak–Malatya road, Tatlar village, N 37° 59' E 37° 55', 1325m, 27.VI.2003, leg. A. Y. Okutaner, 12 specimens; Nurhak–Malatya road, N 37° 57' E 37° 35', 1325m, 27.VI.2003, leg. A. Y. Okutaner, 4 specimens; Nurhak, Nurhak–Malatya road, Tatlar, N 37° 57' E 37° 35', 1325m, 27.VI.2003, leg. A. Y. Okutaner, 15 specimens; Andırın, Kabaklar village, N 37° 33' E 36° 27', 970m, 15.VII.2003, leg. A. Y. Okutaner, 2 specimens; Andırın–Çokak road, Parmaksız plateau, N 37° 38' E 36° 20', 1210m, 16.VII.2003, leg. A. Y. Okutaner, 1 specimen; Andırın, Andırın–Çokak road, exit of Akifiye, N 37° 41' E 36° 20', 1205m, 16.VII.2003, leg. A. Y. Okutaner, 6 specimens; Geben, Çökak–Geben road, Kırksu place, N 37° 45' E 36° 27', 1200m, 16.VII.2003, leg. A. Y. Okutaner, 19 specimens; Göksun, A. Türkeş excursion spot place, N 38° 03' E 36° 27', 1498m, 17.VII.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 14 specimens; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 19 specimens; Göksun, Göksun–Çardak road, N 38° 01' E 36° 35', 1320m, 17.VII.2003, leg. A. Y. Okutaner, 5 specimens; Afşin, Tanır, Farta place, N 38° 25' E 36° 55', 1230m, 17.VII.2003, leg. A. Y. Okutaner, 2 specimens; Nurhak, Nurhak–Malatya road, Tatlar, N 37° 57' E 37° 35', 1325m, 18.VII.2003, leg. A. Y. Okutaner, 15 specimens; Andırın, Andırın–Çokak road, Çınar place, N 37° 36' E 36° 21', 1200m, 11.VIII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Geben–Göksun road, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 29 specimens; Göksun, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 5 specimens; Göksun, Meryem Çil place–Küçük Çamlırlı, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, Geben–Göksun road, Değirmendere place, N 37° 55' E 36° 29', 1500m, 12.VIII.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, Mehmet Beyli env., N 38° 05' E 36° 27', 1480m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen; Nurhak, Yeşilkent–Malatya road, N 37° 57' E 37° 35', 1325m, 12.VIII.2003, leg. A. Y. Okutaner, 18 specimens; Pazarcık, Sakarya village, Göynük env., N 37° 38' E 37° 25', 1200m, 12.VIII.2003, leg. A. Y. Okutaner, 5 specimens. **AD: Osmaniye:** Hınzırlı plateau, Kalaycıbatıran, 1465m, N 36 58 E 36 27, 25.VI.2006, leg. H. Özdikmen, 9 specimens; Zorkun plateau, 11.VIII.2006, leg. H. Özdikmen, 18 specimens; Mitisin plateau, 1402m, N 36 58 E 36 21, 20.V.2006, leg. H. Özdikmen, 2 specimens; Zorkun road, Fenk plateau, 1049m, N 36 59 E 36 20, 24.VI.2006, leg. H. Özdikmen, 5 specimens; Zorkun road, Mitisin plateau, 1422m, N 36 58 E 36 20, 25.VI.2006, leg. H. Özdikmen, 1 specimen; Haraz plateau, 713m, N 37 04 E 36 21, 18.V.2006, leg. H. Özdikmen, 1 specimen; Zorkun road, Fenk plateau, 1049m, N 36 59 E 36 20, 22.VII.2006, leg. H. Özdikmen, 1 specimen; Zorkun, Fenk plateau, 04.VI.2007, leg. H. Özdikmen, 46 specimens; Kaypak, N 37 09 E 36 27, 583m, 03.VI.2007,

leg. H. Özdikmen, 1 specimen; Kabacalı village, N 37 11 E 36 36, 722m, 02.VI.2007, leg. H. Özdikmen, 8 specimens; Zorkun, Fenk plateau, 10.VII.2007, leg. H. Özdikmen, 18 specimens. **GV: Antalya:** Alanya, Beyreli, İshaklı village, 1508m, 10.VII.2007, leg. H. Özdikmen, 1 specimen; **İçel:** Hüseyin Okan Merkezci, 25.VI.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The subspecies has been known only from Anatolia for Turkey until now. It is new to Antalya and Osmaniye provinces. **Chorotype:** Anatolian.

Genus *Colaphellus* Weise, 1916

[Type sp.: *Chrysomela sophiae* Schaller, 1783]

Colaphellus sophiae (Schaller, 1783)

Colaphellus sophiae transsylvanicus Machatschke, 1954

Material examined: **HE: Aksaray:** Güzelyurt, Sivrihisar, 1710m, 18.V.1997, leg. H. Özdikmen, 3 specimens; Nevşehir-Aksaray road, Entry of Aksaray, 20.V.1997, leg. H. Özdikmen, 3 specimens; Entry of Nevşehir, 1040m, 03.VI.1997, leg. H. Özdikmen, 6 specimens; **Ankara:** Kızılcahamam, Işık Mountain, 01.VII.1994, leg. H. Özdikmen, 1 specimen; between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 5 specimens; **Konya:** Kulu, Tavşançalı, 1000m, 17.V.1997, leg. H. Özdikmen, 2 specimens. **NTPPM: Afyon:** Karabel, 13.IV.1967, leg. N. Çağatay, 1 specimen; **Ankara:** Polatlı, 08.V.1990, leg. M. Aydemir, 1 specimen; Polatlı, 09.IX.1990, leg. Y. Özdemir, 1 specimen; **Aydın:** 03.V.1966, leg. N. Çağatay, 2 specimens; **Denizli:** Bozkurt, 10.IV.1981, leg. H. Karakaya, 1 specimen; **Edirne:** 29.VI.1964, leg. İ. Yurtsever, 1 specimen; **İzmir:** 12.V.1964, leg. A. Demirtola, 1 specimen; Kemalpaşa, Karabel, 13.IV.1967, leg. N. Çağatay, 1 specimen; **Konya:** Karapınar, Hotamış, 02.VI.1969, *Triticum* Field, leg. G. Altınayar, 1 specimen; **Manisa:** Salihli, 13.V.1964, leg. A. Demirtola, 2 specimens. **BK: Bolu:** Gerede-Bolu road, 8 km to Bolu, 710m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Eskipazar, Hanköy, Aşağıbağ district, 575 m, 16.V.2003, leg. H. Özdikmen, 2 specimens; exit of Safranbolu, Kastamonu road, 520m, 15.VI.2003, leg. H. Özdikmen, 29 specimens; **Kastamonu:** Kastamonu-Tosya, Darıbükkü village, 880m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Taşköprü-Kastamonu road, 5 km, 17.V.2004, leg. H. Özdikmen, 2 specimens; Hanönü, 387m, 17.VI.2004, leg. H. Özdikmen, 1 specimen. **GV: Konya:** Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is represented at least by two subspecies in Turkey as *C. sophiae amasiae* (only in Amasya province) and *C. sophiae transsylvanicus* (in other parts of Turkey). It is new to Afyon, Aydın, Bolu, Denizli, Karabük, Kastamonu and Manisa provinces. **Chorotype:** Sibero-European.

Genus *Gastrophysa* Chevrolat, 1836

[Type sp.: *Chrysomela polygoni* Linnaeus, 1758]

Subgenus *Gastrophysa* Chevrolat, 1836

[Type sp.: *Chrysomela polygoni* Linnaeus, 1758]

Gastrophysa polygoni (Linnaeus, 1758)

Gastrophysa polygoni polygoni (Linnaeus, 1758)

Material examined: **HE: Adana:** 10 km of Pozanti-Mersin highway, 1025m, 29.V.2001, leg. H. Özdikmen, 1 specimen; **Aksaray:** Sivrihisar, 1710m, 02.VI.1997, leg. H. Özdikmen, 2 specimens; Ortaköy, Çatalçeşme-Hocaveli village, 1360m, 22.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Soğuksu National Park, 1400m, 04.VII.1991, leg. H. Özdikmen, 7 specimens; Eryaman, 01.V.2000, leg. H. Özdikmen, 2 specimens; **İçel:** Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 19 specimens; Entry of Fındıklıpınarı 1035m, 31.V.2001, leg. H. Özdikmen, 1 specimen; between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 57 specimens; **Karaman:** Karaman-Ereğli, 1050m, 01.VII.2000, leg. H. Özdikmen, 1 specimen; Karaman-Ereğli road, Exit of Karaman, 970m, 26.VI.2001, leg. H. Özdikmen, 2 specimens; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 25.VI.1997, leg. H. Özdikmen, 45 specimens; **Nevşehir:** Göre, 1260m, 19.V.1997, leg. H. Özdikmen, 1 specimen; Tilköy, 1270m, 25.VI.1997, leg. H. Özdikmen, 9 specimens; **Niğde:** Ağaçar, 1280m, 02.VI.1997, leg. H. Özdikmen, 1 specimen; Akkaya dam, 06.VII.1997, leg. H. Özdikmen, 2 specimens; Altunhisar – Çiftlik road, Entry of Çiftlik, 29.VII.1997, leg. H. Özdikmen, 1 specimen; **Ordu:** leg. H. Özdikmen, 5 specimens. **NTPPM: Ankara:** 03.VI.1966, leg. Y. Sürmeli, 1 specimen; Atatürk Forest Farm, 19.VIII.1982, leg. Y. Özdemir, 1 specimen; Çubuk, Karagöl, 03.VIII.1983, leg. Y. Özdemir, 1 specimen; Ayaş, 17.VI.1988, leg. A. Kalkandelen, 1 specimen; **Çankırı:** Central, 20.IX.1993, leg. E. Süzgün, 4 specimens; **Düzce:** 29.IX.1993, Orchard, leg. H. Zeki, 1 specimen; **Eskişehir:** Kaymaz, 23.VI.1997, leg. Y. Özdemir, 1 specimen; **İzmir:** Efes, Meryemana, 10.V.1964, leg. Y. Sürmeli, 1 specimen; Efes, Meryemana, 15.V.1964, leg. Y. Sürmeli, 5 specimens; Kemalpaşa, 21.V.1968, leg. N. Aysev, 1 specimen; Tire, 1996, leg. N. Çağatay, 1 specimen; **Kayseri:** Talas, 16.V.1967, leg. A. Kalkandelen, 1 specimen; **Konya:** Bozkır, 16.V.2001, leg. M. Özdemir, 1 specimen; **Samsun:** Gelemen, 15.VII.1983, leg. S. Kurçman, 5 specimens; **Yozgat:** Şefaattli, 27.VI.1996, leg. Y. Özdemir, 1 specimen. **BK: Amasya:** Merzifon, Tavşan Mountain, 1367m,

14.VI.2004, leg. H. Özdikmen, 1 specimen; **Bolu**: Gerede–Bolu road, 8 km to Bolu, 710m, 17.V.2003, leg. H. Özdikmen, 1 specimen; Gerede–Kızılcahamam, 1405m, 17.V.2003, leg. H. Özdikmen, 2 specimens; **Düzce**: Yiğilca, exit of Dutlar village, 170 m, 12.V.2003, leg. H. Özdikmen, 1 specimen; **Karabük**: Eflani, 920m, 15.V.2003, leg. H. Özdikmen, 1 specimen; Eflani, Yağlıca village, 975m, 15.V.2003, leg. H. Özdikmen, 5 specimens; Eflani–Daday, Gökören village, 1020m, 15.V.2003, leg. H. Özdikmen, 1 specimen; Eflani–Daday, Karaağaç village, 1080m, 15.V.2003, leg. H. Özdikmen, 3 specimens; Safranbolu, Konarı village, 485m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu**: Araç road, Kastamonu Polis Ormanı, 975m, 16.V.2003, leg. H. Özdikmen, 1 specimen; 6. km of Araç road, 1000m, 16.V.2003, leg. H. Özdikmen, 1 specimen; Kastamonu–Tosya, Darıbüklü village, 880m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Doğanıyurt–Dağyurdu, 727–950m, 18.VI.2004, leg. H. Özdikmen, 3 specimens; Araç, Boyalı, 720m, 19.VI.2004, leg. H. Özdikmen, 1 specimen; **Samsun**: Alaçam, Kapaklı village, 620m, 16.VI.2004, leg. H. Özdikmen, 2 specimens; **Sinop**: Ayancık, 456m, 17.VI.2004, leg. H. Özdikmen, 1 specimen. **K**: **Kahramanmaraş**: Kahramanmaraş–Göksun road, entry of Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, Değirmendere, N 37° 55' E 36° 29', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Andırın–Göksun road, entry of Taşoluk, N 37° 58' E 36° 27', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 6 specimens; Göksun, A. Türkeş excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun–Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, Göksun–Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, Göksun–Çardak road, Güçük plateau, N 38° 3' E 36° 39', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Soğucak–Nadir road, N 38° 9' E 36° 57', 1250m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Geben–Göksun road, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen. **GV**: **Turkey**: leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is represented only by the nominotypical subspecies in Turkey. It is new to Adana, Aksaray, Amasya, Bolu, Çankırı, Düzce, Eskişehir, İçel, İzmir, Kahramanmaraş, Karabük, Karaman, Kastamonu, Niğde, Ordu, Sinop and Yozgat provinces. **Chorotype**: Sibero-European + Nearctic.

Genus *Phaedon* Latreille, 1829

[Type sp.: *Chrysomela armoraciae* Linnaeus, 1758]

Subgenus *Phaedon* Latreille, 1829

[Type sp.: *Chrysomela armoraciae* Linnaeus, 1758]

Phaedon armoraciae (Linnaeus, 1758)

Material examined: **HE**: **Ordu**: Perşembe, Çaytepe, 300m, 15.VII.1997, leg. H. Özdikmen, 1 specimen. **BK**: **Bolu**: Yeniçağa Lake– Deliler village, 970m, 17.V.2003, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Bolu and Ordu provinces. **Chorotype**: Centralasiatic-European.

Phaedon cochleariae (Fabricius, 1792)

Phaedon cochleariae cochleariae (Fabricius, 1792)

Material examined: **GV**: **Konya**: Taşkent, Avşar, Feslikan plateau, Musalla district, 1229m, 16.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Konya province. **Chorotype**: Sibero-European.

Genus *Neophaedon* Jakobson, 1901

[Type sp.: *Chrysomela pyritosa* Rossi, 1792]

Neophaedon pyritus (Rossi, 1792)

Material examined: **HE**: **Aksaray**: Güzelyurt, Sivrihisar, 1710m, 18.V.1997, leg. H. Özdikmen, 2 specimens; **Ankara**: Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 10 specimens; **Ordu**: Perşembe, Çaytepe, 300m, 15.VII.1997, leg. H. Özdikmen, 1 specimen. **BK**: **Düzce**: Yiğilca, Karataş–Yoğunpelit turn, 320m, 12.V.2003, leg. H. Özdikmen, 1 specimen; **Karabük**: Eflani, Yağlıca village, 975m, 15.V.2003, leg. H. Özdikmen, 6 specimens; **Kastamonu**: Kastamonu–Tosya road, Akkaya–Taşköprü turn, 1415m, 16.VI.2003, leg. H. Özdikmen, 1 specimen. **GV**: **Antalya**: Alanya–Taşkent road, exit of Karapınar village, entry of Gevne, 1100m, 16.V.2006, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Antalya, Düzce, Karabük, Kastamonu and Ordu provinces. **Chorotype**: Centralasiatic-European.

Genus *Prasocuris* Latreille, 1802[Type sp.: *Chrysomela phellandrii* Linnaeus, 1758]**Subgenus *Prasocuris* Latreille, 1802**[Type sp.: *Chrysomela phellandrii* Linnaeus, 1758]***Prasocuris junci* (Brahm, 1790)**

Material examined: **HE: Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor, Karanlık Dere, 1150m, 18.V.1997, leg. H. Özdikmen, 3 specimens. **NTPPM: Ankara:** Karagöl, 03.VIII.1981, Wild herb, leg. T. Davarcı, 1 specimen. **AD: Gaziantep:** Nurdağı, Gökçedere village, 496 m, N 37 09 55 E 36 43 10, 17.05.2007, 1 specimen; **Osmaniye:** Bahçe, Kabacalı village, 722m, N 37 11 57 E 36 36 05, 02.06.2007, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Gaziantep and Osmaniye provinces. Since the materials were published by Özdikmen & Aslan (2009). It is new to Niğde province. **Chorotype:** European.

Genus *Plagioderia* Chevrolat, 1836[Type sp.: *Chrysomela armoraciae* Fabricius, 1775 = *Chrysomela versicolora* Laicharting, 1781]***Plagioderia versicolora* (Laicharting, 1781)**

Material examined: **HE: Aksaray:** Gülağaç, Kızılcağa, Aşıklı Höyük, 1100m, 03.VI.1997, leg. H. Özdikmen, 95 specimens; Doğanatepe, Yalnızagaç, 1150m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Güvem, 1080m, 14.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, 1000m, 20.V.1997, leg. H. Özdikmen, 2 specimens; Çankaya, 16.VI.1997, 19 specimens; Şereflikoçhisar – Evren, Evren, 1220m, 21.VI.1997, leg. H. Özdikmen, 5 specimens; Şereflikoçhisar, Kaçarlı, 980m, 21.VI.1997, Leg. H. Özdikmen, 2 specimens; Ayaş, Başbereket, 13.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 20 specimens; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 02.VI.1997, leg. H. Özdikmen, 3 specimens. **NTPPM: Ankara:** Ayaş, Akaya, 11.V.1999, **Salix**, leg. Y. Özdemir, 1 specimen; **Bolu:** Dörtdivan, 06.VII.1983, leg. Y. Özdemir, 1 specimen; **Burdur:** Ağlasun, 21.IX.1995, leg. Y. Özdemir, 1 specimen. **BK: Zonguldak:** Devrek, Alparslan village, 425m, 13.V.2003, leg. H. Özdikmen 1 specimen. **K: Kahramanmaraş:** Göksun, Göksun-Çardak road, Gücük plateau, N 38° 3' E 36° 39', 1330m, 25.VI.2003, leg. A. Y. Okutaner, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Burdur and Kahramanmaraş provinces. **Chorotype:** Palearctic + Oriental.

Genus *Chrysomela* Linnaeus, 1758[Type sp.: *Chrysomela populi* Linnaeus, 1758]***Chrysomela collaris* Linnaeus, 1758**

Material examined: **NTPPM: Adana:** 1939, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana province. **Chorotype:** Sibero-European.

***Chrysomela populi* Linnaeus, 1758**

Material examined: **HE: Aksaray:** Doğanatepe, Yalnızagaç, 1150m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; Ortaköy, Hocaveli village, 1260m, 22.VI.1997, leg. H. Özdikmen, 3 specimens; **Ankara:** Kızılcahamam, Güvem, 1080m, 14.V.1997, leg. H. Özdikmen, 2 specimens; Şereflikoçhisar – Evren, Evren, 1220m, 21.VI.1997, Leg. H. Özdikmen, 1 specimen; between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 5 specimens; **Karaman:** Karaman-Ereğli, 1050m, 01.VII.2000, leg. H. Özdikmen, 8 specimens; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 02.VI.1997, leg. H. Özdikmen, 7 specimens; **Konya:** Entry of Ereğli 8.km, 1010m, 02.VI.2001, leg. H. Özdikmen, 2 specimens; Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 2 specimens; **Nevşehir:** Avanos, 1100m, 21.VII.1992, leg. H. Özdikmen, 4 specimens; **Niğde:** Bor, Altunova, 1150m, 18.V.1997, leg. H. Özdikmen, 3 specimens; Niğde-Bor, Derbent district, 17.VI.1997, leg. H. Özdikmen, 22 specimens; Çamardı, Yelatan Village, 1280m, 23.VI.1997, leg. H. Özdikmen, 30 specimens; Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 16 specimens; Niğde-Bor, Derbent district, 15.VII.1997, leg. H. Özdikmen, 1 specimen; **NTPPM: Ankara:** Bala, Çavuşlu, 16.VI.1982, *Populus*, 1 specimen; Kızılcahamam, Çeltikçi, *Populus*, 16.VIII.1983, leg. A. Kalkandelen, 1 specimen; Çubuk, Sirkeli, 13.VI.1999, leg. Y. Özdemir, 2 specimens; **Aydın:** 12.VI.1963, leg. Ayta Çekli, 1 specimen; **Bitlis:** 30.VI.1966, leg. N. Adıgüzel, 2 specimens; **Burdur:** Ağlasun, 29.VI.1995, leg. Y. Özdemir, 1 specimen; Ağlasun, 21.IX.1995, leg. Y. Özdemir, 1 specimen; **Denizli:** 27.IX.1963, leg. D. Özü, 1 specimen; **Eskişehir:** Sivrihisar, 12.V.1966, leg. N. Çağatay, 1 specimen;

İsparta: Gölcük, 18.VI.1995, leg. Y. Özdemir, 1 specimen; **İzmir:** Bergama, 11.V.1964, leg. A. Demirtola, 1 specimen. **BK: Karabük:** Eflani–Daday road, turn of Karlı village, 1040m, 15.V.2003, leg. H. Özdikmen, 7 specimens; Hanköy, Aşağıbağ district, 575m, 16.V.2003, leg. H. Özdikmen, 40 specimens; **Kastamonu:** 2nd km of Tosya–İlgaz road, 25.VII.2003, leg. H. Özdikmen, 8 specimens; İlgaz–Tosya road, 39 km to Tosya, 16.V.2004, leg. H. Özdikmen, 5 specimens; Taşköprü–Kastamonu road, Bukkarşı village, 17.V.2004, leg. H. Özdikmen, 5 specimens; **Zonguldak:** exit of Devrek, Çıplaklar village, 250m, 13.V.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Pazarcık, Kısıp village, N 37° 38' E 37° 25', 1250m, 03.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, A. Türkiye excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 5 specimens; Göksun, A. Türkiye excursion spot place– Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 3 specimens; Göksun– Mehmet Beyli road, N 38° 05' E 36° 27', 1480m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun–Çardak road, entry of Kocaahmet village, 1330m, 25.VI.2003, leg. A. Y. Okutaner, 35 specimens; Göksun, Göksun–Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Nurhak, Nurhak–Malatya road, Tatlar, N 37° 57' E 37° 35', 1325m, 27.VI.2003, leg. A. Y. Okutaner, 2 specimens; Pazarcık, Sakarkaya village, Kısıp env., N 37° 38' E 37° 25', 1200m, 28.VI.2003, leg. A. Y. Okutaner, 4 specimens; Çağlayancerit, Bozlar, N 37° 38' E 37° 25', 1200m, 13.VII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, A. Türkiye excursion spot place, N 38° 03' E 36° 27', 1498m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun–Çardak road, N 38° 01' E 36° 35', 1320m, 17.VII.2003, leg. A. Y. Okutaner, 5 specimens. **AD: Osmaniye:** Haraz plateau, 713m, N 37° 04' E 36° 21, 18.V.2006, leg. H. Özdikmen, 2 specimens; Fakiuşağı village, 655m, N 36° 01' E 36° 12, 19.V.2006, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Camlık, between Beyşehir–Akseki, 1390m, 12.VI.2007, leg. H. Özdikmen, 2 specimens; **Konya:** Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 5 specimens; Dere, 1252m, 13.VI.2007, leg. H. Özdikmen, 1 specimen; Entry of Gevne, 80 km to Alanya (Şeker district), 1482m, 18.VII.2006, leg. H. Özdikmen, 5 specimens; Seydişehir, between Tepearası–Yenice, 1560m, 20.VII.2006, leg. H. Özdikmen, 48 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Antalya, Burdur, Eskişehir, Kahramanmaraş, Karabük, Karaman, Kastamonu, Kayseri, Konya, Ordu, Osmaniye and Zonguldak provinces. **Chorotype:** Sibero-European.

Chrysomela saliceti (Weise, 1884)

Chrysomela saliceti saliceti (Weise, 1884)

Material examined: **HE: Aksaray:** Eski, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 7 specimens; Ortaköy, Hocalı village, 1260m, 22.VI.1997, leg. H. Özdikmen, 10 specimens; **Ankara:** Kızılcahamam, Yenimahalle, 30.VI.1993, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1540m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Evren, Şereflikoçhisar – Evren, 1220m, 21.VI.1997, leg. H. Özdikmen, 3 specimens; Ayaş, Başbereket, 13.VII.1997, leg. H. Özdikmen, 6 specimens; Ayaş, Başbereket, 18.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Bel Doruğu, 1550m, 21.VIII.1997, leg. H. Özdikmen, 4 specimens; **Kayseri:** Pınarbaşı, Tözgün Village, 25.VII.1997, leg. H. Özdikmen, 1 specimen; **Konya:** Entry of Ereğli 8km, 1010m, 02.VI.2001, leg. H. Özdikmen, 7 specimens; **Niğde:** Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 95 specimens; Çamardı, Bulduruş pass, 1720m, 24.VI.1997, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** Çubuk, Dumlupınar, 13.VI.1996, leg. A. Kalkandelen, 1 specimen; Çubuk, Sirkeli, 13.VI.1999, leg. Y. Özdemir, 1 specimen; Haymana, 18.VI.1999, leg. M. Özdemir, 1 specimen; **Konya:** Karapınar, 22.VIII.1991, leg. Y. Özdemir, 1 specimen. **K: Kahramanmaraş:** Çağlayancerit, N 37° 44' E 37° 17', 1250m, 03.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 5 specimens. **GV: Konya:** Hadim, 1778m, 17.VII.2006, leg. H. Özdikmen, 7 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is represented only by the nominotypical subspecies in Turkey. It is new to Aksaray, Kahramanmaraş, Kayseri and Niğde provinces. **Chorotype:** Sibero-European.

Chrysomela tremula Fabricius, 1787

Chrysomela tremula tremula Fabricius, 1787

Material examined: **NTPPM: Ankara:** Delice, Çongar, 28.IV.1981, *Populus*, leg. A. Tazeoğlu, 9 specimens; Sincan, 18.VIII.1981, *Populus*, leg. H. Karakaya, 2 specimens; Çubuk, Mainroad Nursery, *Populus*, 03.VIII.1983, leg. A. Kalkandelen, 2 specimens; Kızılcahamam, Çeltikçi, *Populus*, 16.VIII.1983, leg. A. Kalkandelen, 4 specimens; **Çankırı:** Merkez, Yukarıpelitözü, 09.VI.1973, leg. E. Süzgün, 4 specimens; **Elazığ:** 29.IV.1964, leg. T. Günaydın, 2 specimens; 29.IV.1965, leg. T. Günaydın, 1 specimen; 24.IV.1966, leg. C. Ergül, 1 specimen; **Kırşehir:** 14.V.1940, 2 specimens; Kaman, 28.V.1956, *Populus*, 3 specimens; Kaman, 29.V.1956, *Populus*, 2 specimens; **Konya:** Ereğli, 25.IV.1951, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is represented only by the nominotypical subspecies in Turkey. It is new to Çankırı, Kırşehir and Konya provinces. **Chorotype:** Sibero-European + Nearctic.

Chrysomela vigintipunctata* (Scopoli, 1763)**Chrysomela vigintipunctata vigintipunctata* (Scopoli, 1763)**

Material examined: HE: **Çankırı:** Çerkeş, 01.VI.2010, leg. H. Özdikmen, 1 specimen; **NTPPM:** **Bursa:** Karacabey, 24.IV.1955, *Salix*, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is represented only by the nominotypical subspecies in Turkey. It is new to Bursa and Çankırı provinces. **Chorotype:** Sibero-European.

Genus *Gonioctena* Chevrolat, 1836

[Type sp.: *Chrysomela viminalis* Linnaeus, 1758]

Subgenus *Spartomena* Reitter, 1913

[Type sp.: *Phytodecta fornicata* Brüggeemann, 1873]

***Gonioctena fornicata* (Brüggeemann, 1873)**

Material examined: HE: **Adana:** Pozantı, Tekir Plateau, 1300m, 23.VI.1997, leg. H. Özdikmen, 2 specimens; Pozantı-Mersin road, 1310m, 30.V.2001, leg. H. Özdikmen, 2 specimens; Pozantı-Mersin road, Çamlıyayla turn, 690m, 30.V.2001, leg. H. Özdikmen, 12 specimens; **Aksaray:** Ekecik stream, 1000m, 20.V.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Pazar Village, 26.V.2002, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Salın Village, 1300m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Işık Mountain, 1550m, 24.VI.1993, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Aköz Village, 1150m, 26.VI.1997, leg. H. Özdikmen, 30 specimens; Kızılcahamam, Yenimahalle, 1150m, 05.VII.1997, leg. H. Özdikmen, 6 specimens; Çubuk, 900m, 06.VII.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Güvem, 1000-1080m, 11.VII.1997 and 26.06.1997, leg. H. Özdikmen, 23 specimens; Kızılcahamam, Yasin village, 1450m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 1 specimen; **Bolu:** Kırıbrıcık-Seben road, 1189 m, 18.VI.2009, leg. H. Özdikmen, 1 specimen; **İçel:** Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 35 specimens; Erdemli-Güzeloluk road, Hatıra Forest, 1340m, 30.V.2001, leg. H. Özdikmen, 2 specimens; Yenışıkçı-Kırobası road 20.km, 1310m, 01.VI.2001, leg. H. Özdikmen, 2 specimens; **Karaman:** Karaman-Ereğli road, Exit of Karaman, 995m, 02.VI.2001, leg. H. Özdikmen, 9 specimens; **Niğde:** Bor, Altınova, 1150m, 18.V.1997, leg. H. Özdikmen, 1 specimen; Bor, Üstünkay, Bor-Altunhisar road, 1150m, 17.VII.1997, leg. H. Özdikmen, 1 specimen; Çamlıyayla road, Çamalan turn, 725m, 24.VI.2001, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Afyon:** Dumlupınar, 13.VI.1996, leg. Y. Özdemir, 1 specimen; **Ankara:** Kayaş, 09.VI.1964, leg. N. Tuatay, 5 specimens; Çubuk, 26.VI.1968, leg. A. Kalkandelen, 1 specimen; Lalahan, 10.VIII.1968, leg. A. Kalkandelen, 5 specimens; Kazan, Orhaniye, 27.VII.1993, leg. A. Kalkandelen, 4 specimens; **Çankırı:** 05.VI.1969, leg. Y. Kornoşor, 13 specimens; Süleymaniye, 27.VII.1993, leg. A. Kalkandelen, 3 specimens; Ilgaz, 19.IX.1993, leg. A. Kalkandelen, 2 specimens; Şabanözü, 02.VII.1997, leg. M. Özdemir, 1 specimen; **Diyarbakır:** 09.VI.1971, leg. N. Asena, 8 specimens; Silvan, Susuzköy, 04.VI.1972, leg. İ. Serel, 1 specimen; **Eskişehir:** 01.VII.1963, leg. S. Bayraktaroğlu, 15 specimens; Alpu, 23.VI.1992, *Medicago*, leg. Y. Özdemir, 1 specimen; Kaymaz, 23.VI.1997, *Medicago*, leg. Y. Özdemir, 26 specimens; **İzmir:** 06.V.1996, leg. N. Çagaatay, 1 specimen; **Kayseri:** Devrek, 23.VIII.1984, *Medicago*, leg. A. Kalkandelen, 9 specimens; **Konya:** 22.VI.1962, leg. N. Karabiyik, 5 specimens; **Muş:** Hasköy, 02.VI.1972, leg. Y. Dörtbudak, 1 specimen; **Nevşehir:** Ürgüp, Karacaviran, 04.VII.1984, leg. A. Kalkandelen, 3 specimens; Avanos, 26.V.1998, leg. Y. Özdemir, 1 specimen; **Tunceli:** Central, 07.VI.1972, leg. Y. Dörtbudak, 1 specimen. **BK:** **Bolu:** Bolu-Gerede road, Susuz Kınık village, 720m, 17.V.2003, leg. H. Özdikmen, 66 specimens; between Gerede-Kızılcahamam, 1200m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Çorum:** Kargı, Uzunyurt, 822m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; **Düzce:** Yığılca, Aydın village – Dutlar village, 200m, 12.V.2003, leg. H. Özdikmen, 11 specimens; Yığılca, Karakaş village, 390m, 12.V.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Safranbolu, Balkuşu village, 275m, 13.V.2003, leg. H. Özdikmen, 2 specimens; Hanköy, Aşağıbağ district, 575m, 16.V.2003, leg. H. Özdikmen, 2 specimens; Üçevler, 1000m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Bulak village, Bağ Evleri, 670m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Safranbolu, Konarı village, 485m, 15.VI.2003, leg. H. Özdikmen, 12 specimens; **Kastamonu:** Safranbolu-Araç, 35 km to Araç, 535m, 15.VI.2003, leg. H. Özdikmen, 18 specimens; Safranbolu-Araç, 35 km to Araç, 535m, 15.VI.2003, leg. H. Özdikmen, 26 specimens; between Kastamonu-Araç, entry of Kastamonu centrum, 955 m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; Kastamonu-Tosya road, Tosya-İlgaz pass, 1650m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Sinop:** Ayancık, exit of Yenikonak, 125m, 17.VI.2003, leg. H. Özdikmen, 2 specimens; **Zonguldak:** exit of Devrek, Çıplaklar village, 250m, 13.V.2003, leg. H. Özdikmen, 1 specimen. **K:** **Kahramanmaraş:** Çağlayancerit, N 37° 44' E 37° 17', 1250m, 03.VI.2003, leg. A. Y. Okutaner, 1 specimen; Kahramanmaraş-İlca road, N 37° 52' E 36° 50', 1340m, 23.VI.2003, leg. A. Y. Okutaner, 1 specimen; Kahramanmaraş-Göksun road, entry of Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, A. Türkeş excursion spot area, N 38° 03' E 36° 27', 1498m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, A. Türkeş excursion spot place- Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 5 specimens; Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 44

specimens; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, Kamsıcık village, N 38° 6' E 36° 52', 1340m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Tanır, N 38° 25' E 36° 55', 1251m, 26.VI.2003, leg. A. Y. Okutaner, 9 specimens; Andırın-Çokak road, Parmaksız plateau, N 37° 38' E 36° 20', 1210m, 16.VII.2003, leg. A. Y. Okutaner, 26 specimens; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 56 specimens. **AD: Hatay:** Harbiye-Yayladağı road, N 36 07 E 36 08, 275m, 30.III.2007, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Bahçe, Taşoluk village, N 37 10 E 36 29, 514m, 21.IV.2007, leg. H. Özdikmen, 1 specimen; Kaypak, N 37 09 E 36 27, 583m, 03.VI.2007, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** İbradı, 1182m, 28.III.2007, leg. H. Özdikmen, 1 specimen; Beyşehir-Akseki road, 65 km to Akseki, 1434m, 12.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Seydişehir, Fasıllar village, 1215m, 13.V.2006, leg. H. Özdikmen, 1 specimen; Entry of Seydişehir, 10 km to Seydişehir, Akçalar, 1127m, 13.V.2006, leg. H. Özdikmen, 2 specimens; **Turkey:** leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Afyon, Aksaray, Antalya, Bolu, Çorum, Düzce, Eskişehir, Hatay, İçel, Kahramanmaraş, Karabük, Karaman, Kayseri, Muş, Osmaniye, Tunceli and Zonguldak provinces. **Chorotype:** E-European.

Genus *Phratora* Chevrolat, 1836

[Type sp.: *Chrysomela vulgatissima* Linnaeus, 1758]

Subgenus *Phratora* Chevrolat, 1836

[Type sp.: *Chrysomela vulgatissima* Linnaeus, 1758]

Phratora vulgatissima (Linnaeus, 1758) (new to Turkey)

Material examined: **HE: Aksaray:** Eskil, Esmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 8 specimens; **Ankara:** Kızılcahamam, Soğuksu National Park, 1700m, 21.VI.1991, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Güvem, 1080m, 14.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 4 specimens. **BK: Bartın:** 12th km of Bartın-Karabük road, bank of Gökırmak, 14.VIII.2003, leg. H. Özdikmen, 1 specimen; **Düzce:** Yığılca, Karataş-Yoğunpelit turn, 320m, 12.V.2003, leg. H. Özdikmen, 2 specimens; **Kastamonu:** Araç road, Kastamonu Polis Ormanı, 975m, 16.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now without any exact locality (Kippenberg in Löbl & Smetana, 2010). According to Aslan et al. (2003), it was recorded from Turkey without any exact locality by Gruev (1992). So, it is a new to Turkey with the exact localities. **Chorotype:** Sibero-European + Nearctic.

Subgenus *Phyllodecta* Kirby, 1837

[Type sp.: *Chrysomela vitellinae* Linnaeus, 1758]

Phratora laticollis (Suffrian, 1851)

Material examined: **HE: Ankara:** Kızılcahamam, Soğuksu National Park, 1500-1740m, 21.VI.1991 and 28.V.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. **Chorotype:** Sibero-European.

Phratora vitellinae (Linnaeus, 1758)

Material examined: **HE: Ankara:** Kızılcahamam, Güvem, 1080m, 14.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 1 specimen. **NTPPM: Amasya:** Amasya-Çaycuma road, 29.IX.1994, leg. Y. Özdemir, 1 specimen; **Ankara:** Nallıhan, 24.VII.1956, leg. S. Balamir, 1 specimen; **Çankırı:** Kurşunlu, Çardak, 14.V.1969, leg. Y. Karaşor, 18 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Amasya and Çankırı provinces. **Chorotype:** Sibero-European.

Genus *Entomoscelis* Chevrolat, 1836

[Type sp.: *Chrysomela adonidis* Pallas, 1771]

Entomoscelis adonidis (Pallas, 1771)

Material examined: **HE: Aksaray:** Hasan Mountain, Aşağı Dikmen, 1020m, 17.V.1997, leg. H. Özdikmen, 2 specimens; Akçakent, 1170m, 18.V.1997, leg. H. Özdikmen, 3 specimens; Nevşehir-Aksaray road, Entry of Aksaray, 20.V.1997, leg. H. Özdikmen, 1 specimen; Ağzıkarahan village, 1220m, 20.V.1997, leg. H. Özdikmen, 6 specimens; Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Hasan

Mountain, Aşağı Dikmen, 1100m, 01.VI.1997, leg. H. Özdikmen, 1 specimen; Gülağaç, Kızılkaya, Aşıklı Höyük, 1100m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara**: Şereflikoçhisar, 1000m, 20.V.1997, leg. H. Özdikmen, 2 specimens; Şereflikoçhisar-Ankara road, 1250m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Hüsrev village, 990m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 11 specimens; Şereflikoçhisar, Tuz Gölü, 980m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Salin village, 1300m, 14.VI.1997, leg. H. Özdikmen, 8 specimens; **Konya**: Kulu, Tavşançalı, 1000m, 17.V.1997, leg. H. Özdikmen, 2 specimens; Cihanbeyli, Karatepe, 1005m, 31.V.1997, leg. H. Özdikmen, 2 specimens; **Nevşehir**: Avanos, Zelve, 19.V.1997, leg. H. Özdikmen, 3 specimens; **Niğde**: Bor, Altunova, 1150m, 18.V.1997, leg. H. Özdikmen, 13 specimens; Altunhisar, 1200m, 18.V.1997, leg. H. Özdikmen, 4 specimens; Bor, Karanlık Dere, 1150m, 18.VI.1997, leg. H. Özdikmen, 1 specimen. **NTPPM**: **Ankara**: 1938, Wild herb, 1 specimen; Etlik, 04.V.1939, 10 specimens; 09.V.1939, 2 specimens; 11.V.1939, 3 specimens; 19.V.1939, 1 specimen; 04.VIII.1939, 2 specimens; Çankaya, 12.V.1939, 2 specimens; 24.V.1940, 1 specimen; Ayaş, Ilıca, 11.VI.1987, leg. A. Kalkandelen, 1 specimen; Ayaş, 11.V.1999, leg. Y. Özdemir, 2 specimens. **BK**: **Düzce**: Yiğilca, Karakaş village, 390m, 12.V.2003, leg. H. Özdikmen, 4 specimens; **Karabük**: Bulak village, Bağ Evleri, 670m, 15.VI.2003, leg. H. Özdikmen, 8 specimens; Safranbolu, 520m, 15.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu**: Kastamonu-Tosya road, Akkaya-Taşköprü turn, 1415m, 16.VI.2003, leg. H. Özdikmen, 3 specimens; **Zonguldak**: Devrek, Alparslan village, 425m, 13.V.2003, leg. H. Özdikmen 22 specimens; between Yedigöller-Devrek, 205m, 13.V.2003, leg. H. Özdikmen, 2 specimens. **K**: **Kahramanmaraş**: Afşin, Tanır, N 38° 25' E 36° 55', 1251m, 26.VI.2003, leg. A. Y. Okutaner, 1 specimen. **GV**: **Antalya**: Akseki, Büyükalın village, 937m, 16.IV.2007, leg. H. Özdikmen, 1 specimen; Cevizli, Tekke pass env., 1237m, 14.V.2006, leg. H. Özdikmen, 5 specimens; **Konya**: Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 120 specimens; between Seydişehir-Beyşehir, Ağıl Önü, 2 km to Beyşehir, 1193m, 13.V.2006, leg. H. Özdikmen, 22 specimens; Bozkır, Üçpınar village, 1471m, 15.V.2007, leg. H. Özdikmen, 1 specimen; Derebucak, 1221m, 16.V.2007, leg. H. Özdikmen, 10 specimens; Beyreli, 1467m, 17.VII.2006, leg. H. Özdikmen, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Antalya, Düzce, Kahramanmaraş, Karabük, Kastamonu and Zonguldak provinces. **Chorotype**: Sibero-European.

Entomoscelis sacra (Linnaeus, 1758)

Material examined: **HE**: **Aksaray**: Akçakent, 1170m, 18.V.1997, leg. H. Özdikmen, 4 specimens; Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 2 specimens; Ağzıkarahan, 1220m, 20.V.1997, leg. H. Özdikmen, 8 specimens; Ulukışla junction 5. km, 1275m, 29.V.2001, leg. H. Özdikmen, 1 specimen; Hasan Mountain, Aşağı Dikmen, 1100m, 01.VI.1997, leg. H. Özdikmen, 14 specimens; Belisırma, 1280m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; Gülağaç, Kızılkaya, Aşıklı village, 1100m, 03.VI.1997, leg. H. Özdikmen, 2 specimens; Ulukışla return, 1275m, 29.V.2001, leg. H. Özdikmen, 1 specimen; **Ankara**: Şereflikoçhisar-Ankara road, 1250m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Hüsrev village, 990m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Ankara-Şereflikoçhisar road, 1250m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Salin village, 1300m, 14.VI.1997, leg. H. Özdikmen, 4 specimens; **Karaman**: Karaman-Ereğli road, Yeşildere turn, 1020m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Konya**: Kulu, Tavşançalı, 1000m, 17.V.1997 and 31.V.1997, leg. H. Özdikmen, 8 specimens; **Nevşehir**: Avanos, Zelve, 19.V.1997, leg. H. Özdikmen, 5 specimens; **Niğde**: Altunhisar, 1200m, 18.V.1997, leg. H. Özdikmen, 9 specimens; Bor, Altunova, 1150m, 18.V.1997, leg. H. Özdikmen, 18 specimens; Değirmenli-Ovacık, E of Melendiz Mountain, 1500m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; between Araplı-Höyük, 1360m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; **Turkey**: 2000, leg. H. Özdikmen, 1 specimen. **NTPPM**: **Gaziantep**: Yavuzeli, 27.IV.1966, leg. A. Demirtola, 1 specimen; **Isparta**: Iskar village, 25.IV.1968, leg. A. Kalkandelen, 2 specimens; **Şanlıurfa**: Ceylanpınar, 18.V.1961, leg. N. Tuatay, 1 specimen. **GV**: **Konya**: Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Ankara, Gaziantep, Isparta, Karaman, Konya, Nevşehir, Niğde and Şanlıurfa provinces. **Chorotype**: E-European.

Entomoscelis suturalis Weise, 1882

Material examined: **HE**: **Adana**: Pozanti, 1000m, 27.VI.2000, leg. H. Özdikmen, 4 specimens; Pozanti-Mersin road, Çamlıyayla turn 10. km, 710m, 30.V.2001, leg. H. Özdikmen, 1 specimen; **Aksaray**: Hasan Mountain, Aşağı Dikmen, 1020m, 17.V.1997, leg. H. Özdikmen, 20 specimens; Akçakent, 1170m, 18.V.1997, leg. H. Özdikmen, 4 specimens; Ağzıkarahan village, 1220m, 20.V.1997, leg. H. Özdikmen, 8 specimens; Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 11 specimens; Gülağaç, Kızılkaya, Aşıklı Höyük, 1100m, 03.VI.1997, leg. H. Özdikmen, 2 specimens; Doğanstepe, Yalnızagaç, 1150m, 03.VI.1997, leg. H. Özdikmen, 7 specimens; Belisırma, 1280m, 03.VI.1997, leg. H. Özdikmen, 4 specimens; Ulukışla junction 5. km, 1275m, 29.V.2001, leg. H. Özdikmen, 151 specimens; **Ankara**: Şereflikoçhisar, 1000m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Hüsrev village, 990m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar-Ankara road, 1250m, 20.V.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Soğuksu

National Park, 1100m, 07.VI.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Salin village, 1300m, 14.VI.1997, leg. H. Özdikmen, 4 specimens; **İçel**: Silifke-Kırobası, 600-1000m, 29.VI.2000, leg. H. Özdikmen, 2 specimens; **Karaman**: Karaman-Ereğli road, Yeşildere turn, 1020m, 02.VI.2001, leg. H. Özdikmen, 8 specimens; Gölbaşı, 17.IV.2003, leg. H. Özdikmen, 1 specimen; **Kayseri**: Yeşilhisar, Güzelöz, 1260m, 02.VI.1997, leg. H. Özdikmen, 1 specimen; **Konya**: Kulu, Tavşançalı, 1000m, 17.V.1997, leg. H. Özdikmen, 7 specimens; Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 1 specimen; Ereğli-Ulukışla road, 30 km to Ulukışla, 1035m, 03.VI.2001, leg. H. Özdikmen, 4 specimens; **Nevşehir**: Avanos, Zelve, 19.V.1997, leg. H. Özdikmen, 5 specimens; **Niğde**: Altunhisar, 1200m, 18.V.1997, leg. H. Özdikmen, 7 specimens; Bor, Altunova, 1150m, 18.V.1997, leg. H. Özdikmen, 17 specimens; Niğde-Bor, Derbent district, 17.VI.1997, leg. H. Özdikmen, 69 specimens; Bor, Karanlık Dere, 1150m, 18.VI.1997, leg. H. Özdikmen, 1 specimen; Değirimenli-Ovacık, E of Melendiz Mountain, 1500m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; Araphi-Höyük, 1360m, 26.VI.1997, leg. H. Özdikmen, 1 specimen; Çiftlik, Yeşilyurt Plateau-Altunhisar, 02.VII.1997, leg. H. Özdikmen, 9 specimens; Ulukışla, 1350m, 26.VI.2000, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara**: Kızılcahamam, Işık Mountain, 31.V.1962, leg. Y. Sürmeli, 1 specimen; Kızılcahamam, 31.V.1962, leg. Y. Sürmeli, 1 specimen; **Bitlis**: 19.V.1966, leg. Y. Sürmeli, 4 specimens; **Erzurum**: Hasankale, 09.X.1965, leg. N. Uyat, 1 specimen; **Isparta**: Iskar village, 25.IV.1968, leg. A. Kalkandelen, 3 specimens; **Kayseri**: 16.V.1967, leg. A. Kalkandelen, 2 specimens; **Kırşehir**: 27.V.1962, leg. N. Karabıyık, 1 specimen; **Konya**: Akşehir, 05.V.1962, leg. N. Karabıyık, 1 specimen; 08.VI.1962, leg. N. Karabıyık, 8 specimens; Bozkır, 16.V.2001, leg. M. Özdemir, 1 specimen; **Nevşehir**: Avanos, 26.V.1998, leg. Y. Özdemir, 1 specimen; **Van**: Başkale, 20.V.1966, leg. Y. Sürmeli, 1 specimen. As *Entomoscelis suturalis* ab. *sancta* Mader, 1943; **Ankara**: Hacıkadın Stream, 18.III.1940, 1 specimen; Etlik, 04.V.1939, 4 specimens; 04.V.1939, 2 specimens; 09.V.1939, 1 specimen; 22.V.1940, 1 specimen; 24.V.1940, 1 specimen. **BK: Bolu**: Bolu-Gerede road, Susuz Kınık village, 720m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Çorum**: Tosya-Kargı road, 655m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu**: Kastamonu-Tosya road, Akkaya-Taşköprü turn, 1415m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; **Zonguldak**: between Yedigöller-Devrek, 205m, 13.V.2003, leg. H. Özdikmen, 2 specimens; Devrek, Alparslan village, 425m, 13.V.2003, leg. H. Özdikmen, 2 specimens. **K: Kahramanmaraş**: Ekinözü, Alınar village, N 38° 5' E 37° 13', 1140m, 27.VI.2003, leg. A. Y. Okutaner, 3 specimens. **GV: Konya**: Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 17 specimens; Ufacık village, 1409m, 13.V.2006, leg. H. Özdikmen, 7 specimens; Derebucak, 1221m, 16.V.2007, leg. H. Özdikmen, 7 specimens; entry of Gevne, 80 km to Alanya (Şeker district), 1482m, 18.VII.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Aksaray, Bitlis, Bolu, Çorum, Isparta, İçel, Kahramanmaraş, Karaman, Van and Zonguldak provinces. **Chorotype:** E-European.

Subfamily GALERUCINAE Latreille, 1802

Genus *Diorhabda* Weise, 1883

[Type sp.: *Galeruca elongata* Brullé, 1836]

***Diorhabda elongata* (Brullé, 1836)**

Material examined: **NTPPM: Çankırı**: Hasakça, Central, *Medicago*, 27.VII.1993, leg. A. Kalkandelen, 1 specimen; **Kayseri**: Süleymanlı, Central, 27.VII.1993, leg. A. Kalkandelen, 39 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Çankırı and Kayseri provinces. **Chorotype:** Mediterranean + Nearctic.

Genus *Radymna* Reitter, 1913

[Type sp.: *Diorhabda rickmersi* Weise, 1900]

***Radymna fischeri* (Faldermann, 1837)**

Material examined: **HE: Niğde**: Bor, Bor-Altunhisar road, Üstünkaya, 1150m, 17.VII.1997, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from Anatolia for Turkey until now. It is new to Niğde province. **Chorotype:** SW-Asiatic (Anatolo-Caucasian + Irano-Caucasian + Irano-Anatolian).

***Radymna persica* (Faldermann, 1837)**

Material examined: **HE: Aksaray**: Zengen, Yukarı Gündelen, 1060m, 23.06.1997, leg. H. Özdikmen, 1 specimen; **Ankara**: Şereflikoçhisar, Tuz Gölü, 980m, 03.06.1997, leg. H. Özdikmen, 3 specimens; Ayaşbeli, Atbayırı, 1100m, 18.V.2002, leg. H. Özdikmen, 1 specimen; **Kayseri**: Yahyalı, Derebaşı, Şelale district, 1280m, 25.06.1997, leg. H. Özdikmen, 4 specimens; **Konya**: Kulu, Tavşançalı, 1000m, 31.05.1997, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from Anatolia for Turkey until now. It was new to Aksaray, Kayseri and Konya provinces. Since the materials were published by Özdikmen et al. (2007d). **Chorotype:** Turanian.

Genus *Galerucella* Crotch, 1873

[Type sp.: *Chrysomela nymphaeae* Linnaeus, 1758]

Subgenus *Galerucella* Crotch, 1873

[Type sp.: *Chrysomela nymphaeae* Linnaeus, 1758]

***Galerucella grisescens* (Joannis, 1866) (new to Turkey)**

Material examined: NTPPM: **Isparta:** Gölcük, 18.V.1955, leg. Y. Özdemir, 3 specimens.

Remarks: It is recorded from Isparta province in Turkey for the first time. **Chorotype:** Sibero-European + Oriental.

Subgenus *Neogalerucella* Chujo, 1962

[Type sp.: *Chrysomela tenella* Linnaeus, 1760]

***Galerucella lineola* (Fabricius, 1781)**

***Galerucella lineola lineola* (Fabricius, 1781)**

Material examined: HE: **Ankara:** between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 1 specimen

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** Palearctic.

***Galerucella tenella* (Linnaeus, 1760)**

Material examined: NTPPM: **Bolu:** Akçakoca, 03.VIII.1999, leg. M. Özdemir, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new record to Bolu province. Since, the present materials were published by Özdikmen et al. (2007d). **Chorotype:** Sibero-European.

Genus *Xanthogaleruca* Laboissière, 1934

[Type sp.: *Chrysomela luteola* Müller, 1766]

***Xanthogaleruca luteola* (Müller, 1766)**

Material examined: NTPPM: **Eskişehir:** İnönü, 29.V.1995, leg. Y. Özdemir, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Eskişehir province. **Chorotype:** Centralasiatic-Mediterranean.

***Xanthogaleruca subcoerulescens* (Weise, 1884)**

Material examined: GV: **Konya:** Karapınar, Meke lake, 1000m, 26.VIII.2006, leg. H. Özdikmen, 102 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Konya province. **Chorotype:** Anatolian.

Genus *Galeruca* Geoffroy, 1762

[Type sp.: *Chrysomela taneceti* Linnaeus, 1758]

Subgenus *Galeruca* Geoffroy, 1762

[Type sp.: *Chrysomela taneceti* Linnaeus, 1758]

***Galeruca pomonae* (Scopoli, 1763)**

***Galeruca pomonae pomonae* (Scopoli, 1763)**

Material examined: HE: **Afyon:** Dumlupınar, 28.X.1997, leg. H. Özdikmen, 1 specimen; **Aksaray:** Aşağı Dikmen, Hasan Mountain, 1020m, 17.V.1997, leg. H. Özdikmen, 2 specimens; Exit of Ankara, Ekecik stream, 1000m, 20.V.1997, leg. H. Özdikmen, 2 specimens; Entry of Nevşehir, 1040m, 03.VI.1997, leg. H. Özdikmen, 6 specimens; Belisırma, 1280m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Şereflikoçhisar, 950m, 20.V.1997, leg. H. Özdikmen, 12 specimens; Şereflikoçhisar, Hüsrev village, 990m, 20.V.1997, leg. H. Özdikmen, 5 specimens; **Kayseri:** Yahyalı, Senirköy, 1060m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; Yeşilhisar, Güzelöz, 1260m, 02.VI.1997 and 25.VI.1997, leg. H. Özdikmen, 2 specimens; **Nevşehir:** Avanos, Zelbe, 19.V.1997, leg. H. Özdikmen, 2 specimens; Uçhisar, 1260m, 19.V.1997, leg. H. Özdikmen, 2 specimens; Avanos, 1000m, 20.VII.1992, leg. H. Özdikmen, 1 specimen;

Niğde: Bor, Altunova, 1150m, 18.V.1997, leg. H. Özdikmen, 7 specimens; Bor, Karanlıkdere, 1150m, 18.V.1997, leg. H. Özdikmen, 27 specimens; Ferteke, 08.VI.1997, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 4 specimens; **NTPPM: Ankara:** Atatürk Forest Farm, 09.VI.1930, 1 specimen; 21.XII.1938, 1 specimen; 26.XII.1938, 1 specimen; Tohum ıslah, 08.V.1939, 3 specimens; Elmadag, 12.V.1939, 1 specimen; Çankaya, 14.V.1939, 2 specimens; Keçiören yolu, 17.V.1939, 1 specimen; 18.V.1939, 1 specimen; Hacıkadın, 20.V.1939, 2 specimens; Kalaba, 23.V.1939, 2 specimens; Cebeci, 23.V.1939, 3 specimens; Beynam Ormanı, 28.V.1939, 1 specimen; Çankaya, 31.V.1939, 1 specimen; Keçiören, 02.VI.1939, 1 specimen; 07.VI.1939, 1 specimen; Ayrancı, 14.VI.1939, 3 specimens; 18.VI.1939, 1 specimen; Çankaya, 20.VI.1939, 1 specimen; 27.VI.1939, 1 specimen; Şereflikoçhisar, 07.VII.1939, 2 specimens; VII.1939, Wild herb, 1 specimen; Dikmen, 02.XI.1939, 1 specimen; 02.XI.1939, 1 specimen; 03.XI.1939, 5 specimens; 19.XII.1938, 1 specimen; 20.XII.1938, 1 specimen; 24.VI.1963, leg. Y. Sürmeli, 1 specimen; Beypazarı, İnönü plateau, 11.V.1999, leg. Y. Özdemir, 1 specimen; **Isparta:** 07.VI.1962, leg. N. Karabiyik, 1 specimen; **Nevşehir:** Avanos, 26.V.1998, Leg. Y. Özdemir, 9 specimens; **Turkey:** ?Rize, 04.VI.1939; **Turkey:** without exact locality data, 1 specimen. **BK: Bolu:** Bolu-Gerede road, Susuz Kınık village, 720m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Kastamonu-Tosya road, Akkaya-Taşköprü turn, 1415m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; **Zonguldak:** Devrek, Alparslan village, 425m, 13.V.2003, leg. H. Özdikmen, 44 specimens; exit of Devrek, Çıplaklar village, 250m, 13.V.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Kahramanmaraş-Andırın road, exit of Yenicekele, N 37° 35' E 36° 37', 700m, 15.VII.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Osmaniye:** Entry of Yarpuz, 930m, N 37° 03' E 36° 25', 18.V.2006, leg. H. Özdikmen, 17 specimens; Zorkun, Karıncalı-Hassa road, Küllü plateau, 1603m, N 36° 57' E 36° 21', 25.VI.2006, leg. H. Özdikmen, 8 specimens; Zorkun road, Karacalar village, 381m, N 37° 02' E 36° 16', 24.VI.2006, leg. H. Özdikmen, 1 specimen; Küllü-İslahiye road, Hınzırlı plateau, 1620m, N 36° 57' E 36° 25', 25.VI.2006, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Gündoğmuş road, 396m, 15.V.2007, leg. H. Özdikmen, 25 specimens; Beşehir-Akseki road, 65 km to Akseki, 1434m, 12.VI.2007, leg. H. Özdikmen, 2 specimens; Akseki, Irmasan road, 1473m, 12.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Seydişehir, Çavuş, 15 km to Seydişehir, 1186m, 13.V.2006, leg. H. Özdikmen, 3 specimens; Entry of Gevne, 80 km to Alanya (Şeker district), 1482m, 18.VII.2006, leg. H. Özdikmen, 20 specimens; Hadim, exit of Bozkuş, 1569m, 14.V.2007, leg. H. Özdikmen, 1 specimen; Central, 16.V.2007, leg. H. Özdikmen, 1 specimen; Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Osmaniye province. Since the materials were published by Özdikmen & Aslan (2009). It is new to Afyon, Aksaray, Ankara, Antalya, Bolu, Isparta, Kahramanmaraş, Kastamonu, Kayseri, Konya, Nevşehir, Niğde and Zonguldak provinces. **Chorotype:** Palaearctic.

Galeruca spectabilis (Faldermann, 1837)

Galeruca spectabilis orientalis (Osculati, 1844)

Material examined: HE: Aksaray: İhlara, Yeşilselime, 1200m, 19.V.1997, leg. H. Özdikmen, 6 specimens; Entry of Nevşehir, 1040m, 03.VI.1997, leg. H. Özdikmen, 4 specimens; between Aşağı and Yukarı Dikmen, 1150m, 22.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Soğuksu National Park, 1400-1500m, 19.VII.1991, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Işık Mountain, 01.VII.1994, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, 1000m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 25.VI.1997, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Tilköy, 1270m, 25.VI.1997, leg. H. Özdikmen, 5 specimens; **Niğde:** Melendiz, Hançerli-Küçükköy, 03.VII.1996, leg. H. Özdikmen, 1 specimen; Bor, Karanlıkdere, 1150m, 18.V.1997, leg. H. Özdikmen, 10 specimens; Altunhisar, Ulukışla, 1400m, 01.VI.1997, leg. H. Özdikmen, 1 specimen; **Turkey:** 1998, leg. H. Özdikmen, 2 specimens; **NTPPM: Ankara:** Etlik, 04.V.1939, 1 specimen; Hacıkadın, 20.V.1939, 1 specimen; Beynam Forest, 28.V.1939, 2 specimens; Çubuk, Karagöl, 04.VII.1939, 1 specimen; west, 12.VII.1939, 1 specimen; İncesaz, 28.VII.1939, 1 specimen; **Kırıkkale:** 18.VI.1939, 1 specimen; Yahşihan, 25.VI.1939, 1 specimen; İrmak, 02.VII.1939, 1 specimen. **BK: Kastamonu:** Yaralıgöz pass, 1300m, 15.VIII.2003, leg. H. Özdikmen, 42 specimens. **GV: Antalya:** between Akseki-Gündoğmuş, 591m, 14.V.2006, leg. H. Özdikmen, 1 specimen; Akseki, 1233m, 14.V.2006, leg. H. Özdikmen, 1 specimen; Gündoğmuş road, 396m, 15.V.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Bozkuş-Kuruçay, Ahırlı, 1270m, 28.III.2007, leg. H. Özdikmen, 6 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Antalya, Kastamonu, Kayseri, Kırıkkale, Konya, Nevşehir and Niğde provinces. It probably is represented only by the subspecies *G. spectabilis orientalis* in Turkey. Old records from Turkey should be belong to the subspecies. **Chorotype:** E-Palaearctic + SW-Asiatic.

Galeruca tanacetii (Linnaeus, 1758)

Galeruca tanacetii tanacetii (Linnaeus, 1758)

Material examined: HE: Ordu: leg. H. Özdikmen, 3 specimens. **NTPPM: Ankara:** Ayaş, 11.V.1999, Orchard, leg. Y. Özdemir, 1 specimen. **BK: Çorum:** Kargı, Göletdere, 5 km to Karagöl village, 1120m,

16.VI.2003, leg. H. Özdikmen, 1 specimen; Kargı, 940m, 16.VI.2003, leg. H. Özdikmen, 5 specimens; Tosya–Kargı road, 655m, 16.VI.2003, leg. H. Özdikmen, 3 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara, Çorum and Ordu provinces. **Chorotype:** Palaearctic.

Subgenus *Emarhopa* Weise, 1886

[Type sp.: *Galeruca rufa* Germar, 1824]

***Galeruca rufa* Germar, 1824**

Material examined: NTPPM: **Mardin:** 03.III.1966, leg. N. Adıgüzel, 3 specimens.

Remarks: The present materials were published by Özdikmen et al. (2007). So, the species was recorded by Özdikmen et al. (2007d) for the first time from Turkey with exact locality on the base of the present materials. **Chorotype:** S and E-European.

Genus *Agelastica* Chevrolat, 1836

[Type sp.: *Chrysomela alni* Linnaeus, 1758]

***Agelastica alni* (Linnaeus, 1758)**

***Agelastica alni alni* (Linnaeus, 1758)**

Material examined: NTPPM: **Giresun:** *Corylus* station, 18.VI.1940, 2 specimens; **Rize:** Pazar, 05.VI.1971, Leg. S. Kornoşor, 1 specimen; **Trabzon:** 31.V.1974, leg. Y. Kornoşor, 17 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Rize and Trabzon provinces. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Centralasiatic-European.

Genus *Aulacophora* Chevrolat, 1836

[Type sp.: *Galeruca quadraria* Olivier, 1808]

***Aulacophora foveicollis* (Lucas, 1849)**

Material examined: NTPPM: **Aydın:** 29.V.1963, leg. A. Çekli, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Rize and Trabzon provinces. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Mediterranean + African + Arabian + Oriental.

Genus *Monolepta* Chevrolat, 1836

[Type sp.: *Crioceris bioculata* Fabricius, 1781]

***Monolepta anatolica* Bezdek, 1998**

Material examined: GV: **Antalya:** Gündoğmuş, 1024m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; Akseki–Güzelsu road, 720m, 11.VI.2007, leg. H. Özdikmen, 74 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya province. **Chorotype:** Anatolian.

Genus *Nymphius* Weise, 1900

[Type sp.: *Luperus forcipifer* Weise, 1900]

***Nymphius ensifer* (Weise, 1900)**

Material examined: GV: **Antalya:** Border of province, Bademli Belı pass, 1432m, 14.V.2006, leg. H. Özdikmen, 9 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya province. **Chorotype:** E-Mediterranean (Palestino-Taurian).

***Nymphius forcipifer* (Weise, 1900)**

Material examined: GV: **Konya:** Hadim, exit of Bozkır, 1569m, 14.V.2007, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. **Chorotype:** Anatolian.

***Nymphius lydius* (Weise, 1886)**

Material examined: HE: **Ankara:** Kızılcahamam, Aköz village, 1150m, 28.V.1997, leg. H. Özdikmen, 3 specimens. **BK: Amasya:** Merzifon, Tavşan Mountain, 1367m, 14.VI.2004, leg. H. Özdikmen, 11

specimens; **Bartın**: Bartın-Çaycuma road, Çiftlik village, 19.V.2004, leg. H. Özdikmen, 13 specimens; **Karabük**: Safranbolu, Bulak village, Mağaradüzü district, 21.V.2004, leg. H. Özdikmen, 1 specimen; **Kastamonu**: Devrekani, 17.V.2004, leg. H. Özdikmen, 1 specimen; Taşköprü-Kastamonu road, Bukkarşı village, 17.V.2004, leg. H. Özdikmen, 3 specimens; Pazarköy-Eskipazar, Kayılar village, 20.V.2004, leg. H. Özdikmen, 1 specimen; **Samsun**: 19 Mayıs, Uzungöl, 6m, 16.VI.2004, leg. H. Özdikmen, 3 specimens. **GV**: **Antalya**: Cevizli, Teke pass env., 1237m, 14.V.2006, leg. H. Özdikmen, 1 specimen; Border of province, Bademli Beli pass, 1432m, 14.V.2006, leg. H. Özdikmen, 1 specimen; **Konya**: Seydişehir, Ufacık village, 1409m, 13.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Amasya, Antalya, Bartın, Karabük, Kastamonu, Konya and Samsun provinces. **Chorotype**: Turano-Mediterranean (Turano-Balkan).

Genus *Phyllobrotica* Chevrolat, 1836

[Type sp.: *Chrysomela quadrimaculata* Linnaeus, 1758]

Phyllobrotica elegans Kraatz, 1866

Material examined: **HE**: **İçel**: Yeniçiftlik road, 1310m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; **Osmaniye**: leg. H. Özdikmen, 1 specimen. **BK**: **Bolu**: Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; Gerede-Karabük road, Dikmen and Sungur villages, 1450m, 14.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Bolu, İçel and Osmaniye provinces. **Chorotype**: Turano-Mediterranean (Turano-Balkan).

Phyllobrotica frontalis Weise, 1886

Material examined: **BK**: **Kastamonu**: Küre-Ağılı road, 1220m, 18.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kastamonu province. **Chorotype**: SW-Asiatic (Irano-Anatolian + Syro-Anatolian).

Genus *Exosoma* Jacoby, 1903

[Type sp.: *Chrysomela lusitanica* Linnaeus, 1769]

Exosoma flavipes (Heyden, 1878)

Material examined: **HE**: **Ankara**: Kızılcahamam, Soğuksu National Park, 1100m and 1500m, 20.VII.1997 and 07.VIII.1990, leg. H. Özdikmen, 3 specimens. **NTPPM**: **Erzurum**: 12.VII.1972, leg. Y. Dörtbudak, 19 specimens. **BK**: **Bolu**: Gerede-Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and Bolu provinces. **Chorotype**: SW-Asiatic.

Exosoma neglectum Mohr, 1968

Material examined: **HE**: **Adana**: Pozantı, entry of Fındıklı, 1200m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Pozantı-Mersin road, 1025m, 29.V.2001, leg. H. Özdikmen, 6 specimens; **Ankara**: Şereflikoçhisar, Kaçarlı, 1050m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; **İçel**: Erdemli-Güzeloluk road, 450m, 30.V.2001, leg. H. Özdikmen, 1 specimen; **Osmaniye**: leg. H. Özdikmen, 9 specimens; **Turkey**: 2000, leg. H. Özdikmen, 2 specimens. **NTPPM**: **Antalya**: 29.V.1969, leg. M. A. Ambaroğlu, 5 specimens; **Burdur**: Bucak, Ürkütlü village, 08.VI.1972, *Allium*, 6 specimens; **Diyarbakır**: 1968, leg. N. Adıgüzel, 1 specimen; **Isparta**: Eğridir, 25.VIII.1968, leg. C. Koç, 6 specimens; **Şanlıurfa**: 06.IX.1966, leg. C. Ergül, 2 specimens. **GV**: **Antalya**: Alanya-Taşkent road, exit of Karapınar village, entry of Gevne, 1100m, 16.V.2006, leg. H. Özdikmen, 2 specimens; Koğulu village, 1288m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; Beyşehir-Akseki road, 65 km to Akseki, 1434m, 12.VI.2007, leg. H. Özdikmen, 1 specimen; Dikmetaş, 1142m, 14.VI.2007, leg. H. Özdikmen, 30 specimens; between Sarımut-Çayarası, 1108m, 14.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya**: Beyreli, 1467m, 17.VII.2006, leg. H. Özdikmen, 1 specimen; Bayraklı env., 1322m, 14.VI.2007, leg. H. Özdikmen, 31 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, Burdur, Isparta, İçel, Osmaniye and Şanlıurfa provinces. **Chorotype**: SW-Asiatic (Syro-Anatolian).

Exosoma thoracicum (Redtenbacher, 1843)

Material examined: **NTPPM**: **Diyarbakır**: 1968, leg. N. Adıgüzel, 1 specimen; **Mardin**: 05.V.1966, leg. A. Demirtola, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Diyarbakır and Mardin provinces. **Chorotype:** Turano-Mediterranean (Balkano-Anatolian).

Genus *Calomicrus* Dillwyn, 1829

[Type sp.: *Crioceris circumfusa* Marsham, 1802]

Calomicrus angorensis (Pic, 1912)

Material examined: **HE: Ankara:** Kızılcahamam-Güvem, 07.VII.1993, leg. H. Özdikmen, 4 specimens. **NTPPM: Ankara:** Ayaş, İlyakut, 31.VII.1980, leg. Y. Özdemir, 1 specimen; **Muş:** 07.VII.1971, leg. S. Çavdaroglu, 3 specimens.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. **Chorotype:** Anatolian.

Calomicrus apicalis Demaison, 1891

Material examined: **HE: İçel:** Pozanti-İçel, 1210m, 30.V.2001, leg. H. Özdikmen, 1 specimen; Exit of Fındıklı, 945m, 31.V.2001, leg. H. Özdikmen, 1 specimen; Mut-Silifke road, Exit of Karabağ, 1320m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Karaman:** Karaman-Ereğli road, Exit of Karaman, 995m, 02.VI.2001, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Beyşehir-Akseki road, 80 km to Akseki, 1410m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 4 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, İçel and Karaman provinces. **Chorotype:** SW-Asiatic (Syro-Anatolian).

Calomicrus lividus (Joannis, 1866)

Material examined: **AD: Osmaniye:** Kuşçubeli pass, 1134 m, N 37 06 675 E 36 36 525, 19.05.2006, leg. H. Özdikmen, 19 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Osmaniye province. Since the materials were published by Özdikmen & Aslan (2009). **Chorotype:** E-Mediterranean (Palaestino-Taurian).

Genus *Luperus* Geoffroy, 1762

[Type sp.: *Chrysomela flavipes* Linnaeus, 1767]

Luperus flavipes (Linnaeus, 1767)

Luperus flavipes flavipes (Linnaeus, 1767)

Material examined: **HE: Ankara:** Kızılcahamam-Güvem, 07.VII.1993, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Yenimahalle, 1150m, 05.VII.1997, leg. H. Özdikmen, 9 specimens; **Turkey:** leg. H. Özdikmen, 3 specimens. **NTPPM: Çankırı:** Şabanözü, 02.VII.1997, *Malus*, leg. M. Özdemir, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and Çankırı provinces. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Sibero-European.

Luperus xanthopoda (Schränk, 1781)

Material examined: **HE: Ankara:** Kızılcahamam, Akköz Village, 1150m, 28.V.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam-Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Soğuksu National Park, 1350m, 07.VI.1997, leg. H. Özdikmen, 1 specimen; **Nevşehir:** Göre, 1260m, 19.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor-Altunhisar, 07.VI.1997, leg. H. Özdikmen, 5 specimens; Fırtak, 08.VI.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor road, 17.VI.1997, leg. H. Özdikmen, 2 specimens; Niğde-Bor, Derbent district, 17.VI.1997, leg. H. Özdikmen, 1 specimen. **NTPPM: Aksaray:** Güzelçay, 18.V.2001, *Pyrus* and *Malus*, leg. M. Özdemir, 1 specimen; **Ankara:** Işık Mountain, 28.V.1982, leg. Y. Sürmeli, 2 specimens; Ayaş, 09.V.1990, leg. M. Aydemir, 1 specimen; Beynam Forest, 05.VI.1990, leg. M. Aydemir, 1 specimen; **Çankırı:** Eldivan, 04.VI.1997, Orchard and *Medicago*, leg. Y. Özdemir, 3 specimens; **Eskişehir:** İnönü, 29.V.1995, leg. Y. Özdemir, 1 specimen. **GV: Konya:** Bozkır, Üçpınar village, 1471m, 15.V.2007, leg. H. Özdikmen, 12 specimens; Bozkır, 10.VI.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Ankara, Çankırı, Eskişehir, Konya, Nevşehir and Niğde provinces. **Chorotype:** Centralasiatic-European.

***Luperus viridipennis* (Germar, 1824) (new to Turkey)**

Material examined: **K:** Kahramanmaraş: Kahramanmaraş-Andırın road, Körsülü bridge env., N 37° 37' E 36° 39', 653m, 28.V.2003, leg. A. Y. Okutaner, 1 specimen; Pazarcık, Armutlu village, Kartalkaya Dam env., N 37° 30' E 37° 15', 950m, 29.V.2003, leg. A. Y. Okutaner, 1 specimen; Pazarcık, Sakarkaya village, Pekmez stream place, N 37° 38' E 37° 25', 1200m, 03.VI.2003, leg. A. Y. Okutaner, 10 specimens; Göksun, Değirmendere, N 37° 55' E 36° 29', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 2 specimens; Göksun, N 38° 03' E 36° 27', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, Göksun-Çardak road, exit of Saraycık, N 38° 1' E 36° 35', 1320m, 25.VI.2003, leg. A. Y. Okutaner, 9 specimens; Göksun, Kamsıçık village, N 38° 6' E 36° 52', 1340m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Andırın-Çokak road, Akifiye, N 37° 41' E 36° 20', 1205m, 16.VII.2003, leg. A. Y. Okutaner, 3 specimens; Andırın, Geben, Ardiççalısı district, N 37° 46' E 36° 26', 1510m, 16.VII.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** E-European.

Subfamily ALTICINAE Newman, 1835**Genus *Phyllotreta* Chevrolat, 1836**

[Type sp.: *Chrysomela brassicae* Fabricius, 1787 = *Phyllotreta exclamationis* Thunberg, 1784]

***Phyllotreta atra* (Fabricius, 1775)**

Material examined: **HE:** Ankara: between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 1 specimen; **Niğde:** Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Ankara:** 01.VIII.1967, leg. M. Yüksel, 24 specimens; **Eskişehir:** 05.V.1993, *Hordeum vulgare*, leg. G. Altınayar, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Eskişehir and Niğde provinces. **Chorotype:** W-Palaearctic or Sibero-European + Centralasiatic-Mediterranean.

***Phyllotreta corrugata* Reiche & Saulcy, 1858**

Material examined: **HE:** Ankara: between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 5 specimens. **NTPPM:** **Afyon:** Sandıklı, 14.IV.1983, *Triticum*, leg. M. A. Doğru 2 specimens; **Ankara:** Polatlı, Temelli, 06.VI.1985, leg. H. Zeki, 1 specimen; **Konya:** Çumra, İnli village, 04.V.1983, leg. Ş. Gür, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Afyon province. **Chorotype:** Centralasiatic-Mediterranean.

***Phyllotreta cruciferae* (Goeze, 1777)**

Material examined: **HE:** Ankara: between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 2 specimens; **Kayseri:** Yeşilhisar, Güzelöz, 1320m, 25.VI.1997, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Isparta:** Yalvaç, 15.IV.1983, *Triticum*, leg. M. Kaya, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kayseri province. **Chorotype:** Centralasiatic-Mediterranean.

Phyllotreta erysimi* Weise, 1900**Phyllotreta erysimi erysimi* Weise, 1900**

Material examined: **HE:** Ankara: between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** Centralasiatic-European.

***Phyllotreta maculicornis* Pic, 1906**

Material examined: **HE:** **Niğde:** Altunhisar, Yeşilyurt, 29.VII.1997, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Isparta:** Gelendost, 11.V.1983, *Triticum*, leg. M. Kaya, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Niğde province. **Chorotype:** SW-Asiatic (Syro-Anatolian).

***Phyllotreta nemorum* (Linnaeus, 1758)**

Material examined: **NTPPM:** **Bolu:** Akçakoca, 400m, 03.VIII.1999, *Corylus*, leg. M. Özdemir, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Bolu province. **Chorotype:** Sibero-European + Australian.

***Phyllotreta nigripes* (Fabricius, 1775)**

***Phyllotreta nigripes nigripes* (Fabricius, 1775)**

Material examined: **HE:** **Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Aköz village, 1150m, 28.V.1997, leg. H. Özdikmen, 3 specimens; between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 58 specimens; **İçel:** Mut-Karaman road, 1345m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 6 specimens. **NTPPM:** **Ankara:** Atatürk Forest Farm, 21.VII.1980, leg. Y. Özdemir, 1 specimen; Ayaş, İlyakut, 31.VII.1980, leg. Y. Özdemir, 8 specimens; Beynam Forest, 16.VIII.1982, leg. Y. Özdemir, 16 specimens; Kalecik, Aktepe, 17.VII.1985, leg. H. Zeki, 1 specimen; Kalecik, Hacıköy, 17.VII.1985, leg. H. Zeki, 9 specimens; Keskin, Central, 15.VII.?, 1 specimen; **Eskişehir:** Seyitgazi, Central, 11.VII.1973, *Triticum*, leg. G. Altınaylar, 1 specimen; **Konya:** Göztepe, 08.VII.1986, leg. H. Zeki, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to İçel province. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Centralasiatic-Mediterranean.

***Phyllotreta ochripes* (Illiger, 1803)**

Material examined: **HE:** **Niğde:** Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 1 specimen; **Turkey:** 2001, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Niğde province. **Chorotype:** Sibero-European.

***Phyllotreta pallidipennis* Reitter, 1891**

Material examined: **HE:** **Ankara:** between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 5 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** Centralasiatic + SW-Asiatic or E-Palaearctic.

***Phyllotreta striolata* (Illiger, 1803)**

Material examined: **NTPPM:** **Düzce:** Akçakoca, Kırızlı, 30.VIII.1988, *Corylus*, leg. Ö. Ataç, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey according to Döberl in Löbl & Smetana (2010) until now. It was new record to Düzce province. Since the present material was published by Özdikmen et al. (2007d).

Chorotype: Sibero-European + African + Nearctic + Oriental + Australian or subcosmopolitan.

***Phyllotreta toelgi* Heikertinger, 1941**

Material examined: **NTPPM:** **Ordu:** 15.VII.1965, leg. M. Işık, 1 specimen.

Remarks: The endemic species has been known only from Anatolia: Eskişehir province as the type locality for Turkey until now. It is new to Ordu province. The present record is the first record except the type locality from Turkey. **Chorotype:** Anatolian.

***Phyllotreta vilis* Weise, 1888**

Material examined: **NTPPM:** **Ankara:** Ayaş, İlyakut, 31.VII.1980, leg. Y. Özdemir, 1 specimen; **İsparta:** Gelendost, 11.V.1983, *Triticum*, leg. M. Kaya, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and Isparta provinces. **Chorotype:** SE-European.

Genus *Aphthona* Chevrolat, 1836

[Type sp.: *Haltica cyparissiae* Koch, 1803]

***Aphthona bonvouloiri* Allard, 1861**

Material examined: **HE:** **İçel:** 6. km of Erdemli-Güzeloluk road, 200m, 30.V.2001, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to İçel province. **Chorotype:** E-Mediterranean or Turano-Mediterranean.

***Aphtona carbonaria* Rosenhauer, 1856 (new to Turkey)**

Material examined: NTPPM: **Gaziantep:** 02.V.1969, 1 specimen.

Remarks: It is recorded from Turkey for the first time. **Chorotype:** Probably Mediterranean.

***Aphtona flaviceps* Allard, 1859**

Material examined: NTPPM: **Adana:** 15.X.1974, *Pyrus* and *Malus*, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** Sibero-European.

***Aphtona fuentei* Reitter, 1901**

Material examined: NTPPM: **Adana:** 1971, on *Citrus*, 3 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. **Chorotype:** Mediterranean + African.

Genus *Longitarsus* Latreille, 1829

[Type sp.: *Chrysomela atricilla* Linnaeus, 1760]

Subgenus *Longitarsus* Latreille, 1829

[Type sp.: *Chrysomela atricilla* Linnaeus, 1760]

***Longitarsus aeneicollis* (Faldermann, 1837)**

Material examined: **HE: İçel:** Erdemli-Güzeloluk road, 25. km from Erdemli, 920m, 30.V.2001, leg. H. Özdikmen, 2 specimens. **NTPPM: Ankara:** Ayaş, İlyakut, 01.VII.1980, leg. Y. Özdemir, 1 specimen; Kalecik, Aktepe, 17.VII.1985, leg. H. Zeki, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and İçel provinces. **Chorotype:** Centralasiatic-Mediterranean.

***Longitarsus atricillus* (Linnaeus, 1760)**

Material examined: **HE: Ankara:** Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Bel Doruğu, 1550m, 19.VIII.1997, leg. H. Özdikmen, 1 specimen. **GV: Antalya:** Cevizli, Teke pass env., 1237m, 14.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and Antalya provinces. **Chorotype:** Palaearctic.

***Longitarsus ballotae* (Marshall, 1802)**

Material examined: **HE: İçel:** Silifke, Atakent, 0m, 01.VI.2001, leg. H. Özdikmen, 63 specimens; Erdemli, Kocahasanlı, 0m, 01.VI.2001, leg. H. Özdikmen, 10 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to İçel province. **Chorotype:** Sibero-European.

Longitarsus exsoletus* (Linnaeus, 1758)**Longitarsus exsoletus rufulus* (Foudras, 1860)**

Material examined: NTPPM: **Samsun:** Ladik, 05.VII.1978, leg. N. Yılmaz, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Samsun province. It probably is represented only by the subspecies *L. exsoletus rufulus* in Turkey. **Chorotype:** Centralasiatic-Mediterranean.

***Longitarsus gracilis* Kutschera, 1864**

Material examined: NTPPM: **Gaziantep:** 04.VI.1971, 2 specimens; **İzmir:** Selçuk, 22.V.1968, leg. N. Kaya, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Gaziantep and İzmir provinces and thereby to Southern Turkey. It is reported for the second time from Turkey. **Chorotype:** W-Palaearctic.

***Longitarsus melanocephalus* (De Geer, 1775)**

Material examined: **HE: Ankara:** Province border of Ankara-Çankırı, Işık Mountain, 1750m, 14.V.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Aköz Village, 1150m, 28.V.1997, leg. H. Özdikmen, 2 specimens; **Niğde:** Melendiz, Hançerli-Küçükköy, 03.VII.1996, leg. H. Özdikmen, 1 specimen. **NTPPM: Eskişehir:** Sivrihisar, Babadağ, 09.VII.1973, *Triticum*, leg. G. Altınay, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Eskişehir and Niğde provinces. **Chorotype:** Sibero-European.

***Longitarsus nigrofasciatus* (Goeze, 1777)**

***Longitarsus nigrofasciatus nigrofasciatus* (Goeze, 1777)**

Material examined: NTPPM: **Eskişehir:** Seyitgazi, Merkez, 11.VII.1973, *Triticum*, leg. G. Altınayar, 1 specimen. **BK: Düzce:** Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Düzce province. **Chorotype:** Sibero-European.

***Longitarsus parvulus* (Paykull, 1799)**

Material examined: NTPPM: **Şanlıurfa:** Ceylanpınar, 04.VI.1969, leg. A. Kalkandelen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Şanlıurfa province. **Chorotype:** Sibero-European.

***Longitarsus picicollis* Weise, 1900**

Material examined: HE: **Ankara:** Kızılcahamam, Aköz Village, 1150m, 30.VIII.1997, leg. H. Özdikmen, 6 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. **Chorotype:** Centralasiatic-European.

***Longitarsus pratensis* (Panzer, 1794)**

Material examined: HE: **Ankara:** Kızılcahamam, Aköz Village, 1150m, 09.VIII.1997 and 30.VIII.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Bel Doruğu, 1550m, 19.VIII.1997, Leg. H. Özdikmen, 1 specimen. NTPPM: **Eskişehir:** Seyitgazi, Doğançayır, 14.VI.1973, *Triticum*, leg. G. Altınayar, 2 specimens; Seyitgazi, Arslanbeyli, 11.VII.1973, *Triticum*, leg. G. Altınayar, 3 specimens; Seyitgazi, Merkez, 11.VII.1973, *Triticum*, leg. G. Altınayar, 1 specimen; Central, Sevinç, 15.VII.1973, *Triticum*, leg. G. Altınayar, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** Sibero-European + African + Nearctic.

***Longitarsus pulmonariae* Weise, 1893**

Material examined: HE: **İçel:** Fındıklı, 1035m, 31.V.2001, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Isparta province in Anatolia for Turkey until now. It is new to İçel province. **Chorotype:** European.

***Longitarsus rubiginosus* (Foudras, 1860) (new to Turkey)**

Material examined: NTPPM: **Ankara:** Beynam Forest, 16.VIII.1982, leg. Y. Özdemir, 1 specimen.

Remarks: The species has been known only by Döberl in Löbl & Smetana (2010) for Anatolia without any exact locality. So, the present material is the first record from Turkey with an exact locality. **Chorotype:** Sibero-European + Nearctic.

***Longitarsus substriatus* Kutschera, 1864**

Material examined: GV: **Konya:** Seydişehir, Ufacık village, 1409m, 13.V.2006, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Konya province. **Chorotype:** European.

***Longitarsus succineus* (Foudras, 1860)**

Material examined: NTPPM: **Eskişehir:** Seyitgazi, Karahöyük, 14.VI.1973, *Triticum*, leg. G. Altınayar, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Eskişehir province. **Chorotype:** Palaearctic + Nearctic.

***Longitarsus suturellus* (Duftschmid, 1825)**

Material examined: NTPPM: **Ankara:** Haymana, Dikilitaş and İkizce, 11.VII.1974, *Triticum*, leg. G. Altınayar, 2 specimens; **Eskişehir:** Seyitgazi, Sarısuçur, 11.VII.1973, *Triticum*, leg. G. Altınayar, 1 specimen; **Şanlıurfa:** Ceylanpınar, 04.VI.1969, leg. N. Tuatay, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara and Eskişehir provinces. **Chorotype:** Sibero-European.

***Longitarsus tabidus* (Fabricius, 1775)**

Material examined: **HE: Aksaray:** Ankara Exit of Aksaray, 1020m, 20.V.1997, leg. H. Özdikmen, 24 specimens; Eşkil, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 27 specimens; Eşmekaya-Eşkil road, Yazır, 960m, 27.VI.1997, leg. H. Özdikmen, 8 specimens; Güzelyurt, Selime, 1240m, 27.VI.1997, Leg. H. Özdikmen, 2 specimens; **İçel:** Silifke-Mut road, Exit of Kurtuluş, 115m, 26.VI.2001, leg. H. Özdikmen, 2 specimens; **Karaman:** Karaman-Ereğli road, Yeşildere turn, 1020m, 02.VI.2001, leg. H. Özdikmen, 12 specimens; **Konya:** Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 7 specimens; Cihanbeyli, 1040m, 31.V.1997, leg. H. Özdikmen, 11 specimens; Kulu, Zincirlikuyu, 1060m, 27.VI.1997, Leg. H. Özdikmen, 1 specimen; **Nevşehir:** Tilköy, 1270m, 25.VI.1997, Leg. H. Özdikmen, 1 specimen; **Niğde:** Bor, Üstünkay, 07.VI.1997, Leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, İçel, Karaman, Konya, Nevşehir and Niğde provinces. **Chorotype:** Palaearctic.

Subgenus *Testergus* Weise, 1893

[Type sp.: *Longitarsus lederi* Weise, 1889]

***Longitarsus anatolicus* Weise, 1900**

Material examined: **HE: Aksaray:** Hasan Mountain, Aşağı Dikmen, 1020m, 17.V.1997, leg. H. Özdikmen, 1 specimen. **NTPPM: Bartın:** Central, 06.X.1988, *Corylus*, leg. Ö. Ataç, 1 specimen; **Siirt:** Kurtalan, 12.IV.1972, leg. Y. Dörtbudak, 6 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Bartın and Siirt provinces. **Chorotype:** Turano-Mediterranean (Turano-Balkan).

Genus *Hermaeophaga* Foudras, 1860

[Type sp.: *Haltica cicatrix* Illiger, 1807]

Subgenus *Orthocrepis* Weise, 1888

[Type sp.: *Altica ruficollis* Lucas, 1849]

***Hermaeophaga ruficollis* (Lucas, 1849)**

Material examined: **HE: İçel:** Mut-Silifke 10. km, 100m, 01.VI.2001, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to İçel province. **Chorotype:** Palaearctic + African + Oriental.

Genus *Altica* Geoffroy, 1762

[Type sp.: *Chrysomela oleracea* Linnaeus, 1758]

***Altica ancylensis* (Weise, 1897)**

Material examined: **HE: Nevşehir:** 12.VI.1998, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** Haymana, 29.III.1979, leg. H. Memişoğlu, 2 specimens. **GV: Konya:** Sorkun, 1281m, 18.V.2007, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Konya and Nevşehir provinces. **Chorotype:** SW-Asiatic (Anatolo-Caucasian).

Altica brevicollis* Foudras, 1861**Altica brevicollis brevicollis* Foudras, 1861**

Material examined: **NTPPM: İçel:** Erdemli, 14.VI.1963, leg. Y. Sürmeli, 4 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new İçel province. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** Sibero-European + Oriental.

***Altica carduorum* Guérin-Ménéville, 1858**

Material examined: **NTPPM: Ankara:** 14.VIII.1940, 1 specimen; Çubuk, 03.VIII.1983, leg. A. Kalkandelen, 1 specimen; **Eskişehir:** 21.VIII.1963, leg. S. Oktay, 3 specimens; **Kırıkkale:** 17.VIII.1982, leg. Y. Özdemir, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Eskişehir and Kırıkkale provinces. **Chorotype:** Sibero-European + Nearctic.

***Altica deserticola* (Weise, 1889)**

Material examined: **HE: Aksaray:** Aksaray-Ulucışla road, 8 km later from Ereğli junction, 1390m, 29.V.2001, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Soğuksu National Park, 1200m,

03.VII.1991, leg. H. Özdişken, 2 specimens; Kızılcahamam, Aköz Village, 1150m, 26.VI.1997, leg. H. Özdişken, 1 specimen; **Niğde**: Altunhisar – Çiftlik road, Entry of Çiftlik, 29.VII.1997, leg. H. Özdişken, 1 specimen. **NTPPM: Afyon**: Köroğlu Bel, 03.VIII.1993, *Medicago*, leg. Y. Özdemir, 1 specimen; Kocatepe, 04.VIII.1993, *Medicago*, leg. Y. Özdemir, 3 specimens; Bolvadin, 09.VIII.1993, *Medicago*, leg. Y. Özdemir, 1 specimen; **Ankara**: Bepazarı, İnönü plateau, Orchard, 11.V.1999, 1 specimen; **Batman**: 11.VIII.1969, leg. S. Ergül, 17 specimens; **Çankırı**: 15.IX.1993, *Medicago*, leg. M. Özdemir, 1 specimen; **Diyarbakır**: Bismil, Kurukçu, 27.IV.1972, leg. Y. Dörtbudak, 1 specimen; **Düzce**: 15.IX.1993, leg. M. Özdemir, 1 specimen; **Sakarya**: Adapazarı, 15.IX.1993, *Medicago*, leg. M. Özdemir, 1 specimen; **Siirt**: Kurtalan, Aktaş, 11.V.1972, leg. Y. Dörtbudak, 1 specimen; **Van**: 14.VII.1972, leg. Y. Dörtbudak, 12 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Afyon, Aksaray, Ankara, Çankırı, Diyarbakır, Düzce, Niğde, Sakarya, Siirt and Van provinces. **Chorotype**: Centralasiatic + SW-Asiatic.

Altica lythri Aubé, 1843

Material examined: **NTPPM: İzmir**: Bergama, 11.V.1964, leg. Y. Sürmeli, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to İzmir province. Since the materials were published by Özdişken et al. (2007d). **Chorotype**: European.

Altica oleracea (Linnaeus, 1758)

Altica oleracea (Linnaeus, 1758)

Material examined: **HE: Ankara**: Kızılcahamam, Soğuksu National Park, 1400m, 03.VII.1991, leg. H. Özdişken, 2 specimens; Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdişken, 47 specimens; Kızılcahamam, Yukarı Çanlı, 1300–1540m, 14.VI.1997 and 19.VIII.1997, leg. H. Özdişken, 80 specimens; Kızılcahamam, Aköz Village, 1150m, 26.VI.1997, 09.VIII.1997 and 30.VIII.1997, leg. H. Özdişken, 17 specimens. **NTPPM: Ankara**: Haymana, 22.VII.1980, leg. H. Ural, 1 specimen; Bala, Beynam, 18.VIII.1983, leg. Y. Özdemir, 3 specimens; Polatlı, Sarıkoz, 14.VI.1990, leg. M. Aydemir, 4 specimens; Polatlı, Sarıkoz, 02.VIII.1990, *Medicago*, leg. M. Aydemir, 1 specimen; Polatlı, Sarıkoz, 02.VIII.1999, leg. M. Aydemir, 2 specimens; **Eskişehir**: Sarıcakaya, 25.VI.1997, leg. Y. Özdemir, 1 specimen; **Samsun**: Havza, 15.VIII.1978, leg. N. Yılmaz, 3 specimens; Ladik, 05.VII.1978, leg. N. Yılmaz, 1 specimen; 22.VIII.1978, leg. N. Yılmaz, 5 specimens; **Zonguldak**: Çaycuma, 27.IX.1994, *Populus*, leg. Y. Özdemir, 2 specimens. **GV: Antalya**: Gündoğmuş, 1024m, 10.VI.2007, leg. H. Özdişken, 1 specimen; **Konya**: Taşkent, Avşar, Feslikan plateau, Musalla district, 1229m, 16.V.2006, leg. H. Özdişken, 1 specimen; Taşkent, Avşar, 1509m, 17.VII.2006, leg. H. Özdişken, 1 specimen; Taşkent, Feslikan plateau, Avşar, 1726m, 17.VII.2006, leg. H. Özdişken, 1 specimen; Beyreli, 1467m, 17.VII.2006, leg. H. Özdişken, 153 specimens; between Hadim-Bozkır, 1000m, 19.VII.2006, leg. H. Özdişken, 25 specimens; Seydişehir, between Tepearası-Yenice, 1560m, 20.VII.2006, leg. H. Özdişken, 1 specimen; Hadim-Beyreli road, 1880m, 14.V.2007, leg. H. Özdişken, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Antalya, Eskişehir, Samsun and Zonguldak provinces. It is represented only by the nominotypical subspecies in Turkey. **Chorotype**: Sibero-European + Nearctic + Australian.

Altica palustris (Weise, 1888)

Material examined: **HE: Osmaniye**: leg. H. Özdişken, 4 specimens. **NTPPM: Ankara**: Kızılcahamam, Kurtboğazi, 16.VIII.1983, leg. Y. Özdemir, 2 specimens; **Bartın**: 11.VI.1980, leg. H. Ural, 1 specimen; **Çankırı**: İlgaz, 20.VII.1989, leg. Y. Özdemir, 1 specimen; **Düzce**: Akçakoca, 14.VI.1994, leg. A. Kalkandelen, 1 specimen; **İçel**: Tarsus, 05.VI.1966, leg. Y. Çanak, 7 specimens; **İzmir**: 12.V.1965, leg. A. Demirtola, 1 specimen. **BK: Bolu**: Gerede–Bolu road, 710m, 17.V.2003, leg. H. Özdişken, 1 specimen; Yeniçağa Lake– Deliler village, 970m, 17.V.2003, leg. H. Özdişken, 2 specimens; between Gerede–Kızılcahamam, 1405m, 17.V.2003, leg. H. Özdişken, 1 specimen; between Yeniçağa–Gerede, exit of Yeniçağa, 1045m, 17.V.2003, leg. H. Özdişken, 1 specimen; Bolu–Gerede road, Susuz Kınık village, 720m, 17.V.2003, leg. H. Özdişken, 7 specimens; Gerede–Karabük road, entry of Koçumlar village, 1400m, 14.VI.2003, leg. H. Özdişken, 3 specimens; **Düzce**: Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Özdişken, 3 specimens; Yiğilca, Aydın village – Dutlar village, 200m, 12.V.2003, leg. H. Özdişken, 7 specimens; Yiğilca, Karakaş village, 390m, 12.V.2003, leg. H. Özdişken, 1 specimen; Karakaş village, 510m, 12.V.2003, leg. H. Özdişken, 1 specimen; Yiğilca, Karataş–Yoğunpelit turn, 320m, 12.V.2003, leg. H. Özdişken, 3 specimens; **Karabük**: Safranbolu, Balkuşu village, 275m, 13.V.2003, leg. H. Özdişken, 10 specimens; Safranbolu, Hızır Yarı place, 740m, 14.V.2003, leg. H. Özdişken, 2 specimens; Eflani–Daday, Gökören village, 1020m, 15.V.2003, leg. H. Özdişken, 2 specimens; Hanköy, Aşağıbağ place, 575m, 16.V.2003, leg. H. Özdişken, 4 specimens; Üçevler, 1000m, 14.VI.2003, leg. H. Özdişken, 2 specimens; Safranbolu, Konarı village, 485m, 15.VI.2003, leg. H. Özdişken, 1 specimen; **Kastamonu**: between Araç–Karabük, Çıraklar village, 440m, 16.V.2003, leg. H. Özdişken, 26 specimens; Kastamonu–Araç road, 960m, 16.V.2003, leg. H. Özdişken, 1 specimen; Kanlıgöl, 1125m, 15.VI.2003, leg. H. Özdişken, 4 specimens; Kastamonu–Tosya road, Tosya–İlgaz pass,

1650m, 16.VI.2003, leg. H. Özdikmen, 2 specimens; Küre, 1030m, 18.VI.2003, leg. H. Özdikmen, 1 specimen; Yarahgöz pass, 1450m, 24.VII.2003, leg. H. Özdikmen, 9 specimens; between Devrekani–Yarahgöz, 15.VIII.2003, leg. H. Özdikmen, 4 specimens; **Sinop**: 35m, 17.VI.2003, leg. H. Özdikmen, 3 specimens; **Zonguldak**: Özbağı–Çıplaklar village, 160m, 13.V.2003, leg. H. Özdikmen, 2 specimens; Yedigöller–Devrek, 35 km to Devrek, 205m, 13.V.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş**: Elbistan–Kahramanmaraş road, entry of Karaelbistan, N 38° 12' E 37° 05', 1138m, 24.V.2003, leg. A. Y. Okutaner, 1 specimen; entry of Ilıca, N 37° 51' E 36° 51', 1340m, 23.VI.2003, leg. A. Y. Okutaner, 1 specimen; Tekir, N 37° 53' E 36° 37', 1014m, 24.VI.2003, leg. A. Y. Okutaner, 6 specimens; Göksun, Kamışık village, N 38° 6' E 36° 52', 1340m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Afşin, Soğucak–Nadir road, N 38° 9' E 36° 57', 1250m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen; Ekinözü, Alınar village, N 38° 5' E 37° 13', 1140m, 27.VI.2003, leg. A. Y. Okutaner, 1 specimen; Pazarcık, Aksu bridge, N 37° 32' E 37° 20', 790m, 28.VI.2003, leg. A. Y. Okutaner, 5 specimens; Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 8 specimens; Göksun, Göksun–Çardak road, N 38° 01' E 36° 35', 1320m, 17.VII.2003, leg. A. Y. Okutaner, 4 specimens; Andırın, Andırın–Çokak road, Çınar place, N 37° 36' E 36° 21', 1200m, 11.VIII.2003, leg. A. Y. Okutaner, 3 specimens; Andırın, Andırın–Çokak road, Çınar place, N 37° 36' E 36° 21', 1200m, 11.VIII.2003, leg. A. Y. Okutaner, 4 specimens; Göksun, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 3 specimens; Göksun, Geben–Göksun road, Değirmendere place, N 37° 55' E 36° 29', 1500m, 12.VIII.2003, leg. A. Y. Okutaner, 8 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara, Bartın, Bolu, Çankırı, Düzce, İçel, İzmir, Kahramanmaraş, Karabük, Kastamonu, Osmaniye, Sinop and Zonguldak provinces. **Chorotype:** Centralasiatic–Mediterranean.

Altica quercetorum Foudras, 1861

Altica quercetorum quercetorum Foudras, 1861

Material examined: NTPPM: **İzmir:** Bergama, 11.V.1964, leg. Y. Sürmeli, 3 specimens; 12.V.1964, leg. A. Demirtola, 8 specimens. **AD: Osmaniye:** Biçakçı village, 293 m, N 37° 09' 35" E 36° 17' 22", 21.04.2007, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It was new to Osmaniye province. Since the materials were published by Özdikmen & Aslan (2009). It is new to İzmir province. It is represented only by the nominotypical subspecies in Turkey. **Chorotype:** European.

Genus Neocrepidodera Heikertinker, 1911

[Type sp.: *Ochrosis sibirica* Pic, 1909]

Neocrepidodera transversa (Marshall, 1802)

Material examined: **HE: Aksaray:** Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 13 specimens; **İçel:** Kuyuluk Town, 195m, 31.V.2001, leg. H. Özdikmen, 1 specimen; Mut, near Sason bridge, 1275m, 01.VI.2001, leg. H. Özdikmen, 5 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray and İçel provinces. **Chorotype:** European.

Genus Ochrosis Foudras, 1861

[Type sp.: *Haltica ventralis* Illiger, 1807]

Ochrosis ventralis (Illiger, 1807)

Material examined: NTPPM: **Ankara:** Kalecik, Aktepe, 17.VII.1985, leg. H. Zeki, 1 specimen; Kalecik, Hasköy, 17.VII.1985, leg. H. Zeki, 2 specimens. **BK: Bolu:** Yeniçağa, 1025m, 19.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Karafasil village, Pınarbaşı–Azdavay road, 14.VIII.2003, leg. H. Özdikmen, 1 specimen. **K: Kahramanmaraş:** Göksun, Mehmetbey, N 38° 05' E 36° 27', 1490m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Meryem Çil place, N 37° 49' E 36° 24', 1300m, 12.VIII.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Bolu, Kahramanmaraş and Kastamonu provinces. **Chorotype:** W–Palaeartic + African.

Genus Derocrepis Weise, 1886

[Type sp.: *Chrysomela rufipes* Linnaeus, 1758]

Derocrepis rufipes (Linnaeus, 1758)

Material examined: **BK: Karabük:** Bulak village, Bağ Evleri, 670m, 15.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Karabük province. The present material is the first record from Turkey after 85 years (Heikertinger, 1925). **Chorotype:** Sibero-European.

Genus *Aeschrocnemis* Weise, 1888

[Type sp.: *Batophila graeca* Allard, 1884]

***Aeschrocnemis anatolica* (Heikertinger, 1922)**

Material examined: **HE: Ankara:** Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Soğuksu National Park, 1350m, 07.VI.1997, leg. H. Özdikmen, 1 specimen.

Remarks: The endemic species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** Anatolian.

Genus *Crepidodera* Chevrolat, 1836

[Type sp.: *Chrysomela nitidula* Linnaeus, 1758]

***Crepidodera aurata* (Marshall, 1802)**

Material examined: **HE: Aksaray:** Eskil, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 1 specimen; Doğanstepe, Yalnızcağaç, 1150m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; Ortaköy, Hocaveli village, 1260m, 22.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Güvem, 1080m, 14.V.1997 and 28.V.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Salın Village, 1300m, 14.VI.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Kaçarlı, 980m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; Şereflikoçhisar – Evren, Evren, 1220m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Aköz village, 1150m, 09.VIII.1997 and 30.VIII.1997, leg. H. Özdikmen, 5 specimens; Kızılcahamam, Yukarı Çanlı, 1300m, 19.VIII.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Bel Doruğu, 1550m, 21.VIII.1997, leg. H. Özdikmen, 7 specimens; between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 02.V.1997, leg. H. Özdikmen, 2 specimens; **Nevşehir:** Göre, 1260m, 19.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Niğde-Bor road, Derbent district, 06.VII.1997, leg. H. Özdikmen, 16 specimens; Niğde-Bor road, Derbent district, 15.VII.1997, leg. H. Özdikmen, 2 specimens; Altunhisar -Yeşilyurt, 29.VII.1997, leg. H. Özdikmen, 7 specimens; Altunhisar – Çiftlik road, Enry of Çiftlik, 29.VII.1997, leg. H. Özdikmen, 5 specimens; Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 5 specimens. **NTPPM: Ankara:** Çubuk, Yakuphasan, 30.VI.1980, leg. H. Ural, 1 specimen; Eymir Lake, 30.VI.1980, leg. Y. Özdemir, 2 specimens; Polatlı, Sarıköy, 14.06.1990, leg. M. Aydemir, 1 specimen; Ayaş, Akkaya, 11.V.1999, **Salix**, leg. Y. Özdemir, 1 specimen; **Bolu:** Akçakoca, 400m, 09.VIII.1999, leg. M. Özdemir, 1 specimen; **Çankırı:** Eldivan, 04.VI.1997, Orchard and *Medicago*, leg. Y. Özdemir, 2 specimens; **Kırşehir:** Hacıbektaş, 26.VIII.1998, leg. Y. Özdemir, 1 specimen; **Zonguldak:** Ereğli, Çamlıbel, 20.IV.1988, leg. Ö. Ataç, 7 specimens. **BK: Bolu:** between Gerede–Kızılcahamam, 1405m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Düzce:** Yiğilca, Gavur Pınarı, between İğneler–Dibektaş, 435m, 12.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Bolu, Düzce, Niğde and Zonguldak provinces. **Chorotype:** Sibero-European.

***Crepidodera aurea* (Geoffroy, 1785)**

Material examined: **HE: Ankara:** Kızılcahamam, Aköz Village, 1150m, 28.V.1997, 09.VIII.1997 and 30.VIII.1997, leg. H. Özdikmen, 19 specimens; Kızılcahamam, Güvem, 1100m, 14.VI.1997, leg. H. Özdikmen, 1 specimen. **NTPPM: Bartın:** 29.IX.1994, *Populus*, leg. Y. Özdemir, 1 specimen; **Ordu:** Fatsa, 2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Bartın and Ordu provinces. **Chorotype:** Sibero-European.

***Crepidodera lamina* (Bedel, 1901)**

Material examined: **HE: Ankara:** Kızılcahamam, Aköz Village, 1150m, 30.VIII.1997, leg. H. Özdikmen, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** S and E-European.

***Crepidodera phluta* (Latreille, 1804)**

Material examined: **HE: Ankara:** between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** Sibero-European + African.

Genus *Sphaeroderma* Stephens, 1831[Type sp.: *Altica testacea* Fabricius, 1775]***Sphaeroderma rubidum* (Graells, 1858)****Material examined:** HE: Ordu: leg. H. Özdikmen, 2 specimens.**Remarks:** The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Ordu province. **Chorotype:** W-Palaearctic.**Genus *Podagrica* Chevrolat, 1836**[Type sp.: *Altica fuscipes* Fabricius, 1775]***Podagrica malvae* (Illiger, 1807)*****Podagrica malvae malvae* (Illiger, 1807)****Material examined:** HE: **Ankara:** Kızılcahamam, 17.V.1991, leg. H. Özdikmen, 5 specimens; Güdül, Asartepe dam, 18.V.2002, leg. H. Özdikmen, 1 specimen; **Niğde:** Melendiz, Hançerli-Küçükköy, 03.VII.1996, leg. H. Özdikmen, 2 specimens; Bor, Melendiz, Okçu village, 09.VII.1996, leg. H. Özdikmen, 2 specimens; Bor, Balcı village, 17.VII.1997, leg. H. Özdikmen, 1 specimen; Çiftlik, Murtaza dam, 29.VII.1997, leg. H. Özdikmen, 2 specimens; Bor, Metkavak district, 09.VIII.1997, leg. H. Özdikmen, 24 specimens. **NTPPM: Kayseri:** 11.VI.1968, 11 specimens; **Manisa:** 18.VI.1970, *Gossypium*, leg. O. Tokmak, 15 specimens. **AD: Osmaniye:** Kuşçubeli pass, 1134m, N 37 06 E 36 36, 19.V.2006, leg. H. Özdikmen, 3 specimens; Entry of Yarpuz, 930m, N 37 03 E 36 25, 18.V.2006, leg. H. Özdikmen, 1 specimen.**Remarks:** The species has been known from both European Turkey and Anatolia for Turkey until now. It is represented only by the nominotypical subspecies in Turkey. It is new to Niğde and Osmaniye provinces. **Chorotype:** W-Palaearctic.***Podagrica menetriesii* (Faldermann, 1837)****Material examined:** HE: **Ordu:** leg. H. Özdikmen, 6 specimens. **NTPPM: Ankara:** Bağlum, 19.VIII.1982, leg. Y. Özdemir, 1 specimen. **GV: Antalya:** between Murtiçi-Güzelsu, 970m, 11.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Seydişehir, Antalya road, 1124m, 18.VI.2007, leg. H. Özdikmen, 6 specimens.**Remarks:** The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Ankara and Ordu provinces. **Chorotype:** Centralasiatic-European.**Genus *Chaetocnema* Stephens, 1831**[Type sp.: *Galeruca aridella* Paykull, 1799 = *Altica hortensis* Geoffroy, 1785]**Subgenus *Tlanoma* Motschulsky, 1845**[Type sp.: *Haltica dentipes* Koch, 1803 = *Chrysomela concinna* Marsham, 1802]***Chaetocnema breviscula* (Motschulsky, 1845)****Material examined:** HE: **Ankara:** between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 2 specimens; **İçel:** Erdemli-Güzeloluk, 220m, 28.VI.2000, leg. H. Özdikmen, 1 specimen.**Remarks:** The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Ankara and İçel provinces. **Chorotype:** Centralasiatic-European.***Chaetocnema chlorophana* (Duftschmid, 1825)****Material examined:** HE: **İçel:** Exit of Fındıkpınarı, 1025m, 31.V.2001, leg. H. Özdikmen, 1 specimen. **NTPPM: Gaziantep:** Nurgana, 11.VI.1969, leg. A. Kalkandelen, 1 specimen.**Remarks:** The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Gaziantep and İçel provinces. **Chorotype:** W-Palaearctic.***Chaetocnema coyei* (Allard, 1864)****Material examined:** HE: **Ankara:** Kızılcahamam, Yukarı Çanlı, 1400m, 14.VI.1997, leg. H. Özdikmen, 2 specimens; between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 1 specimen; **İçel:** Fındıkpınar, 1035m, 31.V.2001, leg. H. Özdikmen, 6 specimens; Çağlayan-Fındıkpınar road, near Yüksekova, 1045m, 25.VI.2001, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor, Melendiz, Okçu village, 08.VI.1997, leg. H. Özdikmen, 1 specimen; 12 km to Ulukışla, 1280m, 23.VI.1997, leg. H. Özdikmen, 5 specimens; Altunhisar-Çiftlik, Yeşilyurt plateau, 02.VII.1997, leg. H. Özdikmen, 2 specimens. **NTPPM: Ankara:** Saray, 16.V.1990, *Medicago*, leg. M. Aydemir, 1 specimen; Çubuk, Sünlü village, 02.VI.1990, *Medicago*, leg. M. Aydemir, 1 specimen; Çubuk, Sünlü village, 02.VIII.1990, *Medicago*, leg. M. Aydemir,

2 specimens; **Gaziantep**: Nurgana, 11.VI.1969, leg. A. Kalkandelen, 1 specimen; **Siirt**: 07.VIII.1974, leg. S. Çavdaroglu, 4 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Gaziantep, İçel, Niğde and Siirt provinces. **Chorotype**: Turano-Mediterranean (Turano-Balkan).

***Chaetocnema major* (Jacquelin du Val, 1852)**

Material examined: **HE**: İçel: Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to İçel province. **Chorotype**: W-Palaeartic.

***Chaetocnema semicoerulea* (Koch, 1803)**

***Chaetocnema semicoerulea semicoerulea* (Koch, 1803)**

Material examined: **NTPPM**: **Diyarbakır**: 22.V.1970, leg. E. Cizrelioğlu, 26 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Diyarbakır province. It is represented only by the nominotypical subspecies in Turkey. **Chorotype**: Sibero-European.

***Chaetocnema tibialis* (Illiger, 1807)**

Material examined: **HE**: **Aksaray**: Güzelyurt, Sivrihisar, 1710m, 18.V.1997, leg. H. Özdikmen, 1 specimen; **Ankara**: between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 6 specimens. **NTPPM**: **Amasya**: Taşova, Borabay, 05.X.1972, leg. M. Engüden, 1 specimen; **Ankara**: Çubuk, Ömürdede, 30.VI.1980, leg. Y. Özdemir, 1 specimen; Bağlum, 21.VII.1980, leg. Y. Özdemir, 2 specimens; Ayaş, 17.VI.1988, leg. A. Kalkandelen, 2 specimens; Ayaş, 29.VI.1988, leg. Y. Özdemir, 6 specimens; **Düzce**: Cumayeri, 19.IV.1988, *Corylus*, leg. Ö. Ataç, 1 specimen; Akçakoca, 03.VIII.1999, leg. M. Özdemir, 17 specimens; **Malatya**: Kürsü, 12.VIII.1982, leg. Y. Özdemir, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Amasya and Düzce provinces. **Chorotype**: Palaeartic or Centralasiatic-Mediterranean + Sibero-European.

Subgenus *Chaetocnema* Stephens, 1831

[Type sp.: *Galeruca aridella* Paykull, 1799 = *Altica hortensis* Geoffroy, 1785]

***Chaetocnema arenacea* (Allard, 1860)**

Material examined: **HE**: İçel: Exit of Fındıkpınarı, 31.V.2001, 945m, leg. H. Özdikmen, 1 specimen. **NTPPM**: **Ankara**: Polatlı, Karahacılı, 12.VI.1980, leg. M. Aydemir, 1 specimen; **Eskişehir**: Seyitgazi, Merkez, 11.V.1973, *Triticum*, leg. G. Altınayar, 3 specimens; Seyitgazi, Doğançayırı, 11.VII.1973, *Triticum*, leg. G. Altınayar, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Eskişehir and İçel provinces. **Chorotype**: Turano-Mediterranean.

***Chaetocnema confusa* (Boheman, 1851)**

Material examined: **NTPPM**: **Zonguldak**: Ereğli, Çayköy, 06.IV.1988, *Corylus*, leg. Ö. Ataç, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Zonguldak province. **Chorotype**: European.

***Chaetocnema obesa* (Boieldieu, 1859)**

Material examined: **HE**: **Turkey**: leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype**: Palaeartic.

***Chaetocnema sahlbergii* (Gyllenhal, 1827)**

Material examined: **HE**: **Ankara**: Kızılcahamam, Karagöl (Işık Mountain), 1650m, 11.VII.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yenimahalle, 21.VIII.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Aköz Village, 1150m, 30.VIII.1997, leg. H. Özdikmen, 11 specimens; **Karaman**: Karaman-Ereğli road, Exit of Karaman, 980m, 26.VI.2001, leg. H. Özdikmen, 1 specimen; **Konya**: Cihanbeyli, 1040m, 31.V.1997, leg. H. Özdikmen, 5 specimens; 8 km to Ereğli, 1010m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; Sultanhanı, 920m, 27.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde**: Azatlı-Tepeköy road, 21.VIII.1996, leg. H. Özdikmen, 1 specimen; Bor-Altınhisar, 07.VI.1997, leg. H. Özdikmen,

5 specimens; Altunhisar -Yeşilyurt, 29.VII.1997, leg. H. Özdikmen, 1 specimen; Exit of Ulukışla, 1145m, 29.V.2001, leg. H. Özdikmen, 1 specimen. **NTPPM: Konya:** Seydişehir, 16.V.2001, leg. M. Özdemir, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Karaman, Konya and Niğde provinces. **Chorotype:** Sibero-European.

Genus *Dibolia* Latreille, 1829

[Type sp.: *Haltica occultans* Koch, 1803]

Subgenus *Dibolia* Latreille, 1829

[Type sp.: *Haltica occultans* Koch, 1803]

***Dibolia occultans* (Koch, 1803)**

Material examined: HE: Ankara: Kızılcahamam, Aköz Village, 1150m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Yenimahalle, 1150m, 05.VII.1997, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** W-Palaearctic.

***Dibolia rugulosa* Redtenbacher, 1849**

Material examined: HE: İçel: Fındıklı, 1035m, 31.05.2001, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to İçel province. Since the material was published by Özdikmen et al. (2007d). **Chorotype:** European.

Subgenus *Eudibolia* Iablokoff-Khnzorian, 1968

[Type sp.: *Dibolia schillingii* Letzner, 1847]

***Dibolia carpathica* Weise, 1893**

Material examined: HE: Ankara: Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** E-European.

Subgenus *Pseudodibolia* Iablokoff-Khnzorian, 1968

[Type sp.: *Dibolia zangezurica* Iablokoff-Khnzorian, 1968]

***Dibolia zangezurica* Iablokoff-Khnzorian, 1968**

Material examined: HE: Karaman: Karaman-Ereğli road, Exit of Karaman, 985m, 26.VI.2001, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Karaman province. **Chorotype:** SW-Asiatic (Anatolo-Caucasian + Irano-Caucasian + Irano-Anatolian).

Genus *Psylliodes* Latreille, 1829

[Type sp.: *Chrysomela chrysocephala* Linnaeus, 1758]

Subgenus *Psylliodes* Latreille, 1829

[Type sp.: *Chrysomela chrysocephala* Linnaeus, 1758]

***Psylliodes arista* Iablokoff-Khnzorian, 1962**

Material examined: HE: Ankara: Kızılcahamam, Yenimahalle, 1150m, 05.VII.1997, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** SW-Asiatic (Anatolo-Caucasian + Irano-Caucasian + Irano-Anatolian).

***Psylliodes attenuata* (Koch, 1803)**

Material examined: HE: Adana: Pozanti-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 1 specimen; **Aksaray:** Hasan Mountain, Aşağı Dikmen, 1100m, 01.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar-Evren road, İbrahimbeyli, 1200m, 21.VI.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar – Evren, Evren, 1220m, 21.VI.1997,

Leg. H. Özdikmen, 1 specimen; **İçel**: Mut-Karaman road, Karabağ district, 1140m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Kayseri**: Yahyalı, Derebağı, Şelale district, 1280m, 02.VI.1997, leg. H. Özdikmen, 2 specimens; **Konya**: 8 km to Ereğli, 1010m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Niğde**: Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 2 specimens; Altunhisar -Yeşilyurt, 29.VII.1997, leg. H. Özdikmen, 1 specimen

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Aksaray, Ankara, İçel, Kayseri, Konya and Niğde provinces. **Chorotype**: Sıbero-European.

Psylliodes chalcamera (Illiger, 1807)

Material examined: **AD**: Hatay: Entry of Belen, Çakallı, 652m, N 36 28 E 36 13, 19.V.2006, leg. H. Özdikmen, 2 specimens; Dörtöl-Yeniuyurt, 11m, N 36 52 E 36 08, 17.V.2006, leg. H. Özdikmen, 1 specimen; **Osmaniye**: Castabala Ören yeri, 100m, N 36 10 E 36 11, 17.V.2006, leg. H. Özdikmen, 4 specimens; Bahçe, 551m, N 37 11 E 36 33, 18.V.2006, leg. H. Özdikmen, 6 specimens; Kalecik-Hasanbeyli road, 689m, N 37 03 E 36 30, 19.V.2006, leg. H. Özdikmen, 4 specimens; Akyar village, 151m, N 37 02 E 36 11, 17.V.2006, leg. H. Özdikmen, 1 specimen; Zorkun road, Çiftmazı, 223m, N 37 01 E 36 17, 20.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Hatay and Osmaniye provinces. **Chorotype**: Holarctic.

Psylliodes chrysocephala (Linnaeus, 1758)

Psylliodes chrysocephala chrysocephala (Linnaeus, 1758)

Material examined: **HE**: **Adana**: Ulukışla-Pozantı road, Tabaklı village, 1145m, 29.V.2001, 2 specimens; Pozantı-Mersin road, Çamlıyayla turn, 690m, 30.V.2001, leg. H. Özdikmen, 4 specimens; **Aksaray**: Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 2 specimens; Hasan Mountain, Aşağı Dikmen, 1100m, 01.VI.1997, leg. H. Özdikmen, 1 specimen; Akçakent, 1280m, 01.VI.1997, leg. H. Özdikmen, 3 specimens; Hasan Mountain, Aşağı Dikmen, 1100m, 01.VI.1997, leg. H. Özdikmen, 87 specimens; Güzelyurt, Bağlık district, 1340m, 02.VI.1997, leg. H. Özdikmen, 7 specimens; Gülağaç, Kızılkaşa, Aşık Höyük, 1100m, 03.VI.1997, leg. H. Özdikmen, 3 specimens; Belisırma, 1280m, 03.VI.1997, leg. H. Özdikmen, 13 specimens; Ağaören, Yenişabanlı, Velipınarı, 1340m, 21.VI.1997, leg. H. Özdikmen, 15 specimens; Aşağı Dikmen-Yukarı Dikmen, 1150m, 22.VI.1997, leg. H. Özdikmen, 1 specimen; Ortaköy, Hocaveli village, 1260m, 22.VI.1997, leg. H. Özdikmen, 13 specimens; Ortaköy-Aksaray road, 1400m, 22.VI.1997, leg. H. Özdikmen, 11 specimens; Ortaköy, Çatalçeşme-Hocaveli village, 1360m, 22.VI.1997, leg. H. Özdikmen, 3 specimens; Zengen, Yukarı Gündelen, 1060m, 23.VI.1997, leg. H. Özdikmen, 2 specimens; Güzelyurt, Selime, 1240m, 27.VI.1997, leg. H. Özdikmen, 2 specimens; Güzelyurt, 1700m, 27.VI.1997, leg. H. Özdikmen, 1 specimen; Aksaray-Ulukışla road, 1135m, 29.V.2001, leg. H. Özdikmen, 9 specimens; Ulukışla junction 5. km, 1275m, 29.V.2001, leg. H. Özdikmen, 9 specimens; **Ankara**: Kızılcahamam, Soğuksu National Park, 1500m, 21.VI.1991, leg. H. Özdikmen, 1 specimen; Kızılcahamam-Güven, 07.VII.1993, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Hüsvrev village, 990m, 20.V.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar, Tuz Gölü, 980m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; Şereflikoçhisar - Evren, Evren, 1220m, 21.VI.1997, leg. H. Özdikmen, 7 specimens; Evren, Şereflikoçhisar - Evren road, 1000m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yenimahalle, 1100m, 21.VIII.1997, leg. H. Özdikmen, 1 specimen; between Yenikent-Ayaş, 1000m, 01.V.2003, leg. H. Özdikmen, 1 specimen; **İçel**: Mut, near Sason Bridge, 1275m, 01.VI.2001, leg. H. Özdikmen, 9 specimens; Mut-Karaman road, 1345m, 02.VI.2001, leg. H. Özdikmen, 3 specimens; Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Özdikmen, 2 specimens; **Kayseri**: Yahyalı, Derebağı, Şelale district, 1280m, 02.VI.1997, leg. H. Özdikmen, 2 specimens; Yeşilhisar, Güzelöz, 1260-1320m, 02 and 25.VI.1997, leg. H. Özdikmen, 6 specimens; Yeşilköy-Yahyalı road, 1350m, 26.VI.1997, leg. H. Özdikmen, 6 specimens; **Konya**: Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 38 specimens; Kulu, 1230m, 31.V.1997, leg. H. Özdikmen, 3 specimens; Kulu, 1100m, 21.VI.1997, leg. H. Özdikmen, 9 specimens; Sultanhanı, 920m, 27.VI.1997, leg. H. Özdikmen, 4 specimens; 30. km of Ayrancı-Ereğli road, 1010m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; Exit of Ereğli, 960m, 03.VI.2001, leg. H. Özdikmen, 1 specimen; **Nevşehir**: Tilköy, 1270m, 25.VI.1997, leg. H. Özdikmen, 2 specimens; Avanos, 970m, 23.VII.1997, leg. H. Özdikmen, 3 specimens; **Niğde**: Bor, Melendiz, Fesleğen village, 03.VII.1996, leg. H. Özdikmen, 3 specimens; Altunhisar, Akçaören, 1280m, 01.VI.1997, leg. H. Özdikmen, 8 specimens; Ulukışla-Altunhisar, 1200m, 01.VI.1997, leg. H. Özdikmen, 6 specimens; Bor, Üstünkay, 07.VI.1997, leg. H. Özdikmen, 23 specimens; Bor, Fesleğen village, 08.VI.1997, leg. H. Özdikmen, 3 specimens; Ulukışla-Exit of Adana, 1300m, 23.VI.1997, leg. H. Özdikmen, 3 specimens; 5 km to Ulukışla, 1400m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Değirmenli-Ovacık, E of Melendiz Mountain, 1500m, 24.VI.1997, leg. H. Özdikmen, 8 specimens; Kayseri-Niğde road, Entry of Niğde, 1420m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; Çamardı, Bulduruş pass, 1720m, 24.VI.1997, leg. H. Özdikmen, 1 specimen; Çamardı, 1550m, 24.VI.1997, leg. H. Özdikmen, 13 specimens; Araplı-Höyük, 1360m, 26.VI.1997, leg. H. Özdikmen, 2 specimens; Nevşehir road junction, 1380m, 26.VI.1997, leg. H. Özdikmen, 2 specimens; Melendiz, Göllü Mountain, 1580m, 27.VI.1997, leg. H. Özdikmen, 4 specimens; Gebere dam, 02.VII.1997, leg. H. Özdikmen, 3 specimens; Tepeköy, 02.VII.1997, leg. H. Özdikmen, 1 specimen; Azatlı-Tepeköy road, Murozu dam, 02.VII.1997, leg. H. Özdikmen, 3 specimens; VII.1997, leg. H. Özdikmen, 1 specimen;

Akkaya dam, 06.VII.1997, leg. H. Özdikmen, 2 specimens; Bor, Okçu village, 06.VII.1997, leg. H. Özdikmen, 1 specimen; Gebere dam, 29.VII.1997, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 5 specimens. **NTPPM: Afyon:** Bayat, 10.VI.1998, *Triticum* and *Papaver*, leg. M. Özdemir, 1 specimen; Sandıklı, Bozağaç, 1000m, 14.VI.1998, *Malus*, leg. M. Özdemir, 1 specimen; **Ankara:** Eymir Lake, 30.VI.1980, leg. Y. Özdemir, 2 specimens; Yenimahalle, Ballıkuyumcu village, 12.VI.1990, leg. M. Aydemir, 1 specimen; Ayaş, 11.V.1999, *Orchard*, leg. Y. Özdemir, 1 specimen; **Eskişehir:** Central, Çavlım village, 23.VI.1997, *Malus*, leg. Y. Özdemir, 3 specimens; Kaymaz, 23.VI.1997, *Medicago*, leg. Y. Özdemir, 1 specimen; **Konya:** Ereğli, Kutören village, 23.V.1971, leg. G. Altınayar, 2 specimens; Meram, Hatunsaray, 06.VI.1991, leg. M. Aydemir, 1 specimen; Çumra, Kaşınhan, 06.VI.1991, leg. M. Aydemir, 1 specimen; **Nevşehir:** Avanos, 25.VIII.1956, leg. S. Balamir, 1 specimen; **Niğde:** Aktaş, 05.VI.1996, leg. Y. Özdemir, 3 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It was new to Afyon, Aksaray, Kayseri, Konya, Nevşehir and Niğde provinces. Since the materials were published by Özdikmen et al. (2007d). **Chorotype:** W-Palaearctic + African + Nearctic.

Psylliodes circumdata (Redtenbacher, 1842)

Material examined: NTPPM: **Ankara:** Çubuk, Ömürdede, 30.VI.1980, leg. Y. Özdemir, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ankara province. **Chorotype:** Turano-Mediterranean.

Psylliodes cuprea (Redtenbacher, 1842)

Material examined: HE: **Aksaray:** Belisırma, 1280m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Melendiz, Gölü Mountain, 1680m, 27.VI.1997, leg. H. Özdikmen, 1 specimen; **Ordu:** leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Niğde and Ordu provinces. **Chorotype:** Palaearctic.

Psylliodes hyoscyami (Linnaeus, 1758)

Material examined: HE: **Adana:** Pozanti-İçel highway, 950-1050m, 27.VI.2000, leg. H. Özdikmen, 1 specimen; **Aksaray:** Hasan Mountain, Aşağı Dikmen, 1020m, 17.V.1997, leg. H. Özdikmen, 1 specimen; Aksaray-Ulukışla road, 1135m, 29.V.2001, leg. H. Özdikmen, 1 specimen; **İçel:** Silifke, Yeniçiftlik, 1065m, 01.VI.2001, leg. H. Özdikmen, 1 specimen; **Karaman:** Karaman-Ereğli road, Yeşildere turn, 1020m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Niğde:** Bor, Üstünkay, 07.VI.1997, leg. H. Özdikmen, 5 specimens; Bor, Bor-Altunhisar road, Pınarbaşı, 1100m, 17.VII.1997, leg. H. Özdikmen, 1 specimen. **AD:** **Hatay:** Akbez, 527 m, N 36 51 10 E 36 32 13, 18.05.2007, 1 specimen; **Osmaniye:** Düziçi, Yarbaşı, 376 m, N 37 11 01 E 36 25 04, 02.06.2007, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It was new to Adana, Aksaray, Hatay, İçel, Karaman, Niğde and Osmaniye provinces. Since the materials were published by Özdikmen & Aslan (2009). **Chorotype:** Sibero-European.

Psylliodes instabilis Foudras, 1860

Material examined: NTPPM: **Burdur:** Bucak, Keçili village, 13.IV.1983, *Triticum*, leg. A. İliden, 2 specimens; Yeşilova, Bayırbaşı village, 14.IV.1983, *Triticum*, leg. H. Uysal, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Burdur province. **Chorotype:** Mediterranean + E-European.

Psylliodes luteola (Müller, 1776)

Material examined: HE: **Kayseri:** Yahyalı, Derebaşı, Şelale district, 1280m, 02.VI.1997, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kayseri province. **Chorotype:** W-Palaearctic.

Psylliodes napi (Fabricius, 1792)

Material examined: HE: **Adana:** 10. km of Pozanti-Mersin highway, 1025m, 29.V.2001, leg. H. Özdikmen, 1 specimen; Pozanti-Adana highway, Çamlıyayla turn, 690m, 30.V.2001, leg. H. Özdikmen, 5 specimens; **İçel:** Erdemli-Güzeloluk road, 25. km from Erdemli, 920m, 30.V.2001, leg. H. Özdikmen, 46 specimens; 12 km later from Exit of Fındıkpınarı, 945m, 31.V.2001, leg. H. Özdikmen, 2 specimens; **Kayseri:** Yahyalı, Derebaşı, Şelale district, 1280m, 02.VI.1997, leg. H. Özdikmen, 5 specimens; **Ordu:** Perşembe, Çaytepe, 300m, 15.VII.1997, leg. H. Özdikmen, 1 specimen. **NTPPM: Manisa:** Tire, 24.V.1968, leg. N. Aysev, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Adana, İçel, Kayseri, Manisa and Ordu provinces.
Chorotype: W-Palaearctic + Nearctic.

***Psylliodes picina* (Marsham, 1802) (new to Turkey)**

Material examined: HE: İçel: Exit of Fındıklı, 945m, 31.V.2001, leg. H. Özdikmen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** W-Palaearctic.

***Psylliodes tricolor* Weise, 1888**

Material examined: HE: **Aksaray:** Güzelyurt, Sivrihisar, 1710m, 18.V.1997, leg. H. Özdikmen, 2 specimens; Hasan Mountain, Aşağı Dikmen, 1100m, 01.VI.1997, leg. H. Özdikmen, 124 specimens; Belisırma, 1280m, 03.VI.1997, leg. H. Özdikmen, 5 specimens; Ağaören, Yenişabanlı, Velipınarı, 1340m, 21.VI.1997, leg. H. Özdikmen, 2 specimens; **Konya:** Kulu, Tavşançalı, 1000m, 31.V.1997, leg. H. Özdikmen, 17 specimens; 30. km of Ayrancı-Ereğli road, 1010m, 02.VI.2001, leg. H. Özdikmen, 2 specimens; **Neveşehir:** Tilköy, 1270m, 25.VI.1997, Leg. H. Özdikmen, 6 specimens; **Niğde:** Ulukışla, Altunhisar, 1200m, 01.VI.1997, Leg. H. Özdikmen, 4 specimens; Altunhisar, Akçaören, 1280m, 01.VI.1997, leg. H. Özdikmen, 2 specimens; Bor, Üstünkay, 07.VI.1997, leg. H. Özdikmen, 10 specimens; Çamardı, 1550m, 24.VI.1996, leg. H. Özdikmen, 2 specimens; Bor, Okçu village, 06.VII.1997, leg. H. Özdikmen, 2 specimens. **NTPPM:** **Eskişehir:** Kaymaz, 23.VI.1997, leg. Y. Özdemir, 2 specimens. **AD: Osmaniye:** Castabala Ören Yeri, 100m, N 36 10 E 36 11, 17.V.2006, leg. H. Özdikmen, 6 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Eskişehir, Niğde and Osmaniye provinces. **Chorotype:** Palaearctic or Centralasiatic-Mediterranean + Sibero-European.

Subgenus *Minicnema* Nadein, 2007

[Type sp.: *Psylliodes elliptica* Allard, 1861]

***Psylliodes elliptica* Allard, 1861**

Material examined: NTPPM: **Burdur:** Düven, 14.I.1971, leg. G. Altınay, 26 specimens; Karamanlı, Kılavuzlar village, 14.I.1971, leg. G. Altınay, 23 specimens; **Kütahya:** İkizhöyük, 16.III.1971, leg. G. Altınay, 41 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now.
Chorotype: E-Mediterranean (Palaestino-Taurian).

Subfamily HISPINAE Gyllenhal, 1813

Genus *Hispa* Linnaeus, 1767

[Type sp.: *Hispa atra* Linnaeus, 1767]

***Hispa atra* Linnaeus, 1767**

Material examined: HE: **Aksaray:** Eski, Eşmekaya, 1040m, 31.V.1997, leg. H. Özdikmen, 2 specimens; Güzelyurt, Sivrihisar, 02.VI.1997, 1710m, leg. H. Özdikmen, 1 specimen; Doğanstepe, Yalnızagaç, 1150m, 03.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Soğuksu National Park, 1250-1400m, 03.07.1991 and 07.06.1997, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Yukarı Çanlı, 1250-1540m, 28.V.1997, 14.VI.1997 and 11.VII.1997, leg. H. Özdikmen, 3 specimens; Kızılcahamam, Aköz Village, 1150m, 28.05.1997 and 26.06.1997, leg. H. Özdikmen, 3 specimens; **Karaman:** Karaman-Ereğli road, Entry of Ayrancı, 1065m, 02.VI.2001, leg. H. Özdikmen, 1 specimen; **Kayseri:** Yahyalı, Derebağı, Şelale district, 1280m, 02.VI.1997 and 25.VI.1997, leg. H. Özdikmen, 3 specimens; Yahyalı, Yeşilköy, 1380m, 26.VI.1997, leg. H. Özdikmen, 2 specimens; Konya: Beyşehir, 1144 m, 12.VI.2007, leg. H. Özdikmen, 1 specimen; **Niğde:** Niğde Bağları, Kayaardı, 17.VI.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor, Derbent district, 06.07.1997, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Ankara:** Lalahan, 16.VIII.1967, leg. A. Kalkandelen, 1 specimen; Ayaş, 09.VII.1987, *Quercus*, leg. Y. Özdemir, 1 specimen; **Tokat:** Niksar, 30.V.1974, *Triticum*, leg. A. Kalkandelen, 2 specimens. **BK: Bolu:** Yeniçağa, 1025m, 19.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Bolu, Karaman, Kayseri, Niğde and Tokat provinces.
Chorotype: Sibero-European.

Genus *Di cladispa* Gestro, 1897[Type sp.: *Hispa testacea* Linnaeus, 1767]***Di cladispa testacea* (Linnaeus, 1767)**

Material examined: HE: **İçel:** Exit of Fındıkpinarı, 31.V.2001, 945m, leg. H. Öz dikmen, 60 specimens. **NTPPM:** **İzmir:** Torbalı, 27.IX.1968, leg. N. Aysev, 1 specimen. **AD: Osmaniye:** Hasanbeyli, Kalecik, 660m, N 37 09 E 36 28, 03.VI.2007, leg. H. Öz dikmen, 9 specimens. **GV: Antalya:** Gündoğmuş (Güzelsu), 15.VIII.2007, leg. H. Öz dikmen, 29 specimens; Güzelsu road, Akseki, Mur tiçi return, 977m, 09.VI.2008, leg. H. Öz dikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Antalya, İçel and Osmaniye provinces. **Chorotype:** Mediterranean.

Subfamily CASSIDINAE Gyllenhal, 1813**Genus *Pilemostoma* Desbrochers des Loges, 1891**[Type sp.: *Cassida vittata* Fabricius, 1798 = *Cassida fastuosa* Schaller, 1783]***Pilemostoma fastuosum* (Schaller, 1783)**

Material examined: BK: **Bartın:** Bartın-Çaycuma road, Çiftlik village, 19.V.2004, leg. H. Öz dikmen, 1 specimen; Bartın-Çaycuma road, Çamlık village, 19.V.2004, leg. H. Öz dikmen, 1 specimen; **Karabük:** Safranbolu, Balkuşu village, 275m, 13.V.2003, leg. H. Öz dikmen, 1 specimen. **K: Kahramanmaraş:** Afşin, Tanır, Farta place, N 38° 25' E 36° 55', 1230m, 17.VII.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Bartın, Kahramanmaraş and Karabük provinces. **Chorotype:** Sibero-European.

Genus *Hypocassida* Weise, 1893[Type sp.: *Cassida subferruginea* Schrank, 1776]***Hypocassida meridionalis* (Suffrian, 1844)**

Material examined: HE: **Ordo:** Central, leg. H. Öz dikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Ordu province. **Chorotype:** Mediterranean.

***Hypocassida subferruginea* (Schrank, 1776)**

Material examined: HE: **Adana:** Pozantı-Mersin road, Çamlıyayla turn, 690m, 30.V.2001, leg. H. Öz dikmen, 2 specimens; **Aksaray:** Eskil, Eşmekaya, 1040m, 31.V.1997, leg. H. Öz dikmen, 1 specimen; **Ankara:** Kızılcahamam, Aköz Village, 1150m, 28.V.1997 and 26.VI.1997, leg. H. Öz dikmen, 6 specimens; Kızılcahamam, Yukarı Çanlı, 1250m, 28.V.1997, leg. H. Öz dikmen, 1 specimen; Kızılcahamam, Salın Village, 1300m, 14.VI.1997, leg. H. Öz dikmen, 1 specimen; **Çorum:** Kargı, Karaköse district, 580m, 24.IV.2003, leg. H. Öz dikmen, 1 specimen; **İçel:** Silifke-Mut road, 100m, 30.VI.2000, leg. H. Öz dikmen, 6 specimens; Mut-Karaman, 1140-1430m, 30.VI.2000, leg. H. Öz dikmen, 1 specimen; Erdemli-Güzeloluk road, Hatıra Forest, 1340m, 30.V.2001, leg. H. Öz dikmen, 1 specimen; Silifke-Mut road, 145m, 26.VI.2001, leg. H. Öz dikmen, 1 specimen; **Kayseri:** Yeşilhisar, Güzelöz, 1260m, 02.VI.1997, leg. H. Öz dikmen, 1 specimen; **Niğde:** Ulukışla-Exit of Adana, 1300m, 23.VI.1997, leg. H. Öz dikmen, 1 specimen; Değir menli-Ovacık, E of Melendiz Mountain, 1500m, 24.VI.1997, leg. H. Öz dikmen, 1 specimen; **Turkey:** 25.VII.1999, leg. H. Öz dikmen, 1 specimen. **NTPPM:** **Ankara:** Ayaş, Ilıca, 11.VI.1987, leg. A. Kalkandelen, 1 specimen; Ayaş, 16.VII.1987, *Helianthus*, leg. A. Kalkandelen, 1 specimen; Polatlı, 08.V.1996, *Medicago*, leg. M. Ayedmir, 1 specimen; **Aydın:** Çine, 27.VII.1967, leg. N. Çağatay, 1 specimen; **Bolu:** Çilimli, 29.IX.1993, leg. A. Kalkandelen, 1 specimen; **Düzce:** Akçakoca-Akkaya, 27.IV.1989, *Corylus*, leg. Ö. Ataç, 1 specimen; **Eskişehir:** Mihalgazı, 25.VI.1997, leg. Y. Özdemir, 1 specimen; **Konya:** Beysşehir, Üstünler, 14.V.1991, *Medicago*, leg. M. Aydemir, 5 specimens; Ereğli, 17.V.2001, *Cerasus*, leg. M. Özdemir, 1 specimen; **Turkey:** without locality label, 1 specimen. **BK:** **Düzce:** Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Öz dikmen, 1 specimen; Yiğilca, Aydın village – Dutlar village, 200m, 12.V.2003, leg. H. Öz dikmen, 1 specimen; **Karabük:** Safranbolu, Bulak village, in front of Mencilis Cave, 720m, 14.V.2003, leg. H. Öz dikmen, 1 specimen; Eflani–Daday road, Karlı village, 1040m, 15.V.2003, leg. H. Öz dikmen, 1 specimen; Eflani–Daday, Karaağaç village, 1080m, 15.V.2003, leg. H. Öz dikmen, 1 specimen; Üçevler, 1000m, 14.VI.2003, leg. H. Öz dikmen, 1 specimen; **Kastamonu:** Kastamonu–Araç road, 960m, 16.V.2003, leg. H. Öz dikmen, 1 specimen; Araç road, Kastamonu, 975m, 16.V.2003, leg. H. Öz dikmen, 1 specimen; between Azdavay–Pınarbaşı, 885m, 18.VI.2003, leg. H. Öz dikmen, 1 specimen; Ulus–Pınarbaşı road, Uzuncam, 14.VIII.2003, leg. H. Öz dikmen, 1 specimen; Daday–Araç road, Akılçalmaz village, 958m, 19.VI.2004, leg. H. Öz dikmen 7 specimens; **Samsun:** Alaçam, Dürtmen hill, 1460m, 16.VI.2004, leg. H. Öz dikmen, 1 specimen; Bafra, 5 km West of Bafra, 75m, 16.VI.2004, leg. H. Öz dikmen, 1 specimen; **Zonguldak:** Özbacı–Çıplaklar

village, 160m, 13.V.2003, leg. H. Özdikmen, 2 specimens. **K: Kahramanmaraş:** Göksun, A. Türkiye excursion spot place- Mehmet Beyli, N 38° 03' E 36° 27', 1488m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen; Göksun, Göksun-Çardak, N 38° 1' E 36° 33', 1498m, 25.VI.2003, leg. A. Y. Okutaner, 1 specimen. **AD: Osmaniye:** Hınzırlı plateau, Kalaycıbatıran, 1465m, N 36 58 E 36 27, 25.VI.2006, leg. H. Özdikmen, 1 specimen; Boğaz plateau, 713m, N 37 04 E 36 22, 17.V.2006, leg. H. Özdikmen, 1 specimen; Kalecik, Hasanbeyli road, 689m, N 37 03 E 36 30, 19.V.2006, leg. H. Özdikmen, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Aksaray, Çorum, Düzce, Eskişehir, Kahramanmaraş, Karabük, Kastamonu, Niğde and Osmaniye provinces. **Chorotype:** Palaearctic.

Genus *Cassida* Linnaeus, 1758

[Type sp.: *Cassida nebulosa* Linnaeus, 1758]

Cassida algerica Lucas, 1849

Material examined: **HE: Ordu:** leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from both Anatolia for Turkey until now. It is new to Ordu province. **Chorotype:** Mediterranean.

Cassida atrata Fabricius, 1787

Material examined: **HE: Niğde:** Çamardı, 29.VI.1996, leg. H. Özdikmen, 1 specimen; Melendiz, Hançerli- Küçükköy, 03.VII.1996, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Niğde province. **Chorotype:** European.

Cassida bella Faldermann, 1837

Material examined: **BK: Düzce:** Karakaş village, 510m, 12.V.2003, leg. H. Özdikmen, 4 specimens; **Karabük:** Safranbolu, Bulak village, Mağaradüzü district, 21.V.2004, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Kastamonu: Hanönü, 387m, 17.VI.2004, leg. H. Özdikmen, 1 specimen; Doğanıyurt- Dağyurdu, 727m, 18.VI.2004, leg. H. Özdikmen, 1 specimen; Doğanıyurt-Şenpazar road, 7 km to Şenpazar, 687m, 18.VI.2004, leg. H. Özdikmen, 1 specimen; Doğanıyurt-Dağyurdu, 950m, 18.VI.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Düzce, Karabük and Kastamonu provinces. **Chorotype:** SW-Asiatic (Anatolo-Caucasian).

Cassida brevis Weise, 1884

Material examined: **BK: Kastamonu:** Hanönü, 387m, 17.VI.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Kastamonu province. **Chorotype:** Centralasiatic + SW-Asiatic.

Cassida elongata Weise, 1893 (new to Turkey)

Material examined: **GV: Konya:** Entry of Gevne, 80 km to Alanya (Şeker district), 1482m, 18.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** E-European.

Cassida fausti Spaeth & Reitter, 1926

Material examined: **HE: Adana:** Pozantı, Tekir Plateau, 1300m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Aköz Village, 1150m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Çubuk, leg. H. Özdikmen, 1 specimen; **Karaman:** Sertavul Pass, 1410m, 26.VI.2001, leg. H. Özdikmen, 1 specimen; **Konya:** Kulu, Tavşançalı, 1000m, 17.V.1997 and 31.05.1997, leg. H. Özdikmen, 3 specimens; **Nevşehir:** Avanos, 1000m, 20.07.1992, leg. H. Özdikmen, 1 specimen; Göre, 1260m, 19.V.1997, leg. H. Özdikmen, 1 specimen; **Niğde:** Azatlı-Tepeköy road, 21.VIII.1996, leg. H. Özdikmen, 1 specimen; Niğde Bağları, Kayaardı, 17.VI.1997, leg. H. Özdikmen, 6 specimens; Niğde-Bor, Derbent district, 06.VII.1997, leg. H. Özdikmen, 6 specimens; Çiftlik road, Tepeköy Plateau-Altunhisar, 29.VII.1997, leg. H. Özdikmen, 4 specimens; **Turkey:** leg. H. Özdikmen, 1 specimen. **BK: Bolu:** between Yeniçağa-Gerede, exit of Yeniçağa, 1045m, 17.V.2003, leg. H. Özdikmen, 1 specimen; Yeniçağa Lake, 27.IV.2004, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Araç road, Kastamonu Polis Ormanı, 975m, 16.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Bolu, Karaman, Kastamonu, Konya, Nevşehir and Niğde provinces. **Chorotype:** Turano-Mediterranean (Balkano-Anatolian).

***Cassida flaveola* Thunberg, 1794 (new to Turkey)**

Material examined: NTPPM: **Ankara:** Polatlı, 25.V.1967, leg. A. Kalkandelen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. Sekerka (2008) stated that "I found that *C. pallida* sensu Thunberg is conspecific with *C. flaveola* of the present sense and *C. flaveola* sensu Thunberg is conspecific with *C. nobilis*. **Chorotype:** Palaearctic.

***Cassida hablitziae* Motschulsky, 1838**

Material examined: **HE: Bolu:** Yedigöller, 11.VIII.2001, leg. H. Özdikmen, 5 specimens. **NTPPM: Bolu:** Yedigöller, 01.VI.1999, leg. Y. Özdemir, 5 specimens. **BK: Zonguldak:** Entry of Ulus, 600m, 19.VI.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia: Trabzon province for Turkey until now (Kısmalı & Sassi, 1994). So, it is new to Bolu and Zonguldak province. **Chorotype:** SW-Asiatic (Anatolo-Caucasian).

***Cassida inquinata* Brullé, 1832**

Material examined: NTPPM: **Kırklareli:** Demirköy, 09.VII.1994, leg. A. Kalkandelen, 1 specimen; **Sinop:** Mertoğlu, 26.VI.1971, leg. S. Kornoşor, 2 specimens.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Sinop province. **Chorotype:** W-Palaearctic.

Cassida murraea* Linnaeus, 1767**Cassida murraea murraea* Linnaeus, 1767**

Material examined: NTPPM: **Sakarya:** Adapazarı, Karasu, 22.VII.1993, *Salix* sp., leg. A. Kalkandelen, 2 specimens. **BK: Bartın:** Bartın-Çaycuma road, Çiftlik village, 19.V.2004, leg. H. Özdikmen, 3 specimens; **Karabük:** Safranbolu, Balkuşu village, 275m, 13.V.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** between Devrekani-Yaralığöz, 15.VIII.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Bartın, Karabük and Sakarya provinces. It is represented only by the nominotypical subspecies. **Chorotype:** Sibero-European.

***Cassida nebulosa* Linnaeus, 1758**

Material examined: NTPPM: **Ankara:** Etlik, 04.V.1939, 2 specimens; **Düzce:** Akçakoca-Akkaya, 27.IV.1989, *Corylus*, leg. Ö. Ataç, 1 specimen; **Sakarya:** Adapazarı, Kartepe turn, 16.VI.1994, Wild herb, leg. A. Kalkandelen, 2 specimens; **Yozgat:** Kazankaya, 28.VII.1987, Wild herb, leg. Y. Özdemir, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Ankara, Düzce, Sakarya and Yozgat provinces. **Chorotype:** Sibero-European.

***Cassida nobilis* Linnaeus, 1758**

Material examined: NTPPM: **Tokat:** Niksar, Erbaa, 06.VI.1995, leg. A. Kalkandelen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. **Chorotype:** Sibero-European.

***Cassida palaestina* Reiche, 1858**

Material examined: NTPPM: **Diyarbakır:** Bismil, 06.IV.1967, leg. N. Adıgüzel, 3 specimens; Karacadağ, 10.IV.1967, leg. N. Adıgüzel, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. **Chorotype:** Centralasiatic + SW-Asiatic.

***Cassida pannonica* Suffrian, 1844**

Material examined: **HE: Adana:** Pozantı-Mersin road, Çamlıyayla turn, 285m, 30.V.2001, leg. H. Özdikmen, 1 specimen; **Ankara:** Kızılcahamam, Aköz Village, 1150m, 28.V.1997, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 1 specimen. **NTPPM: Turkey:** without locality data, 1 specimen. **BK: Çorum:** Kargı, Göletdere, Karagöl village, 1120m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Düzce:** Yiğilca, Gavrur Pınarı, between İğneler-Dibektaş, 435m, 12.V.2003, leg. H. Özdikmen, 1 specimen; **Karabük:** Eflani, Yağlıca village, 975m, 15.V.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Hanönü, 387m, 17.VI.2004, leg. H. Özdikmen, 2 specimens; **Samsun:** Alaçam, Dürtmen hill, 1460m, 16.VI.2004, leg. H. Özdikmen, 1 specimen. **AD: Gaziantep:** Fevziye-İslahiye road, 515m, N 37 05 E 36 37, 19.V.2006, leg. H. Özdikmen, 3 specimens; **Hatay:** Arsuz, Akçalı, 103m, N 36 24 E 35 57, 07.IV.2006, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Boğaz plateau, 713m, N 37 04 E 36 22,

18.V.2006, leg. H. Özdikmen, 2 specimens; Entry of Yarpuz, 930m, N 37 03 E 36 25, 18.V.2006, leg. H. Özdikmen, 1 specimen; Bahçe, 551m, N 37 11 E 36 33, 18.V.2006, leg. H. Özdikmen, 1 specimen; Zorkun road, Çiftmazi, 223m, N 37 01 E 36 17, 20.V.2006, leg. H. Özdikmen, 5 specimens; Mitisin plateau, 1402m, N 36 58 E 36 21, 20.V.2006, leg. H. Özdikmen, 5 specimens. **GV: Konya:** Seydişehir, Fasıllar village, 1215m, 13.V.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Adana, Çorum, Düzce, Gaziantep, Hatay, Karabük, Kastamonu, Osmaniye and Samsun provinces. **Chorotype:** Centralasiatic-European.

Cassida parvula Boheman, 1854 (new to Turkey)

Material examined: **GV: Antalya:** Akseki, Irmasan road, 1473m, 12.VI.2007, leg. H. Özdikmen, 1 specimen; **Konya:** Entry of Gevne, 80 km to Alanya (Şeker district), 1482m, 18.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** Sibero-European.

Cassida prasina Illiger, 1798

Material examined: **NTPPM: Bolu:** Seben, 26.IV.2001, leg. M. Özdemir, 1 specimen. **BK: Düzce:** Karakaş village, 510m, 12.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Düzce province. **Chorotype:** Sibero-European.

Cassida rubiginosa Müller, 1776

Cassida rubiginosa rubiginosa Müller, 1776

Material examined: **BK: Karabük:** Safranbolu, Hızır Yanı place, 740m, 14.V.2003, leg. H. Özdikmen, 1 specimen; **Üçevler,** 1000m, 14.VI.2003, leg. H. Özdikmen, 1 specimen; **Zonguldak:** Özbağı-Çıplaklar village, 160m, 13.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been reported by Tuatay et al. (1972) from İzmir province (Menemen). Unfortunately, the specimen did not find in the museum. It has been known from both European Turkey and Anatolia for Turkey until now. It is new to Karabük and Zonguldak provinces. **Chorotype:** Holarctic.

Cassida sanguinolenta Müller, 1776

Material examined: **K: Kahramanmaraş:** Püren pass, N 37° 55' E 36° 35', 1600m, 28.V.2003, leg. A. Y. Okutaner, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kahramanmaraş province. **Chorotype:** W-Palaearctic.

Cassida sanguinosa Suffrian, 1844 (new to Turkey)

Material examined: **BK: Bartın:** Bartın-Çaycuma road, Çiftlik village, 19.V.2004, leg. H. Özdikmen, 2 specimens; **Kastamonu:** Ilgaz-Tosya road, Entry of Tosya, 16.V.2005, leg. H. Özdikmen, 1 specimen; Taşköprü-Kastamonu road, Bukkarşı village, 17.V.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species is recorded from Turkey for the first time. **Chorotype:** Palaearctic.

Cassida saucia Weise, 1889

Material examined: **NTPPM: Ankara:** Elmadag, 24.V.1987, leg. A. Kalkandelen, 1 specimen. **BK: Düzce:** Yiğilca, exit of Dutlar village, 170m, 12.V.2003, leg. H. Özdikmen, 1 specimen; Yiğilca, Aydın village – Dutlar village, 200m, 12.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Düzce province. **Chorotype:** SW-Asiatic (Anatolo-Caucasian + Irano-Caucasian + Irano-Anatolian).

Cassida seraphina Ménétrés, 1836

Material examined: **HE: Ankara:** Eryaman, 05.I.2000, leg. H. Özdikmen, 1 specimen. **NTPPM: Ankara:** Polatlı, 25.V.1967, leg. A. Kalkandelen, 2 specimens; Ayaş, Güneyce, 31.VII.1987, leg. A. Kalkandelen, 1 specimen; Ayaş, 01.VI.1988, leg. A. Kalkandelen, 2 specimens; Ayaş, 01.VI.1988, leg. Y. Özdemir, 1 specimen; **Kırşehir:** Dinekbağı, 22.IX.1992, *Malus* orchard, leg. A. Kalkandelen, 1 specimen; **Konya:** Ilgın, 29.V.1984, leg. A. Kalkandelen, 1 specimen. **BK: Düzce:** Karakaş village, 510m, 12.V.2003, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Düzce, Kırşehir and Konya provinces. **Chorotype:** SW-Asiatic (Anatolo-Caucasian).

***Cassida stigmatica* Suffrian, 1844**

Material examined: **HE:** **Ankara:** Kızılcahamam, Soğuksu National Park, 1400m, 03.VII.1991, leg. H. Özdikmen, 2 specimens; Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 4 specimens; Kızılcahamam, Aköz Village, 1150m, 30.VIII.1997, leg. H. Özdikmen, 1 specimen. **BK:** **Bolu:** Gerede-Bolu road, 710m, 17.V.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Pazarköy-Eskipazar, Kayılar village, 20.V.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Kastamonu province. **Chorotype:** Palaearctic.

***Cassida subreticulata* Suffrian, 1844**

Material examined: **BK:** **Karabük:** Safranbolu, Kırıklar village, 830m, 14.V.2003, leg. H. Özdikmen, 1 specimen. **GV:** **Konya:** between Hadim-Bozkır, 1000m, 19.VII.2006, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Karabük province. **Chorotype:** Sibero-European.

***Cassida vibex* Linnaeus, 1767**

Material examined: **HE:** **İçel:** Çağlayan-Fındıkpınarı road, 1070m, 25.VI.2001, leg. H. Özdikmen, 1 specimen; **Niğde:** Niğde Bağları, Kayaardı, 17.VI.1997, leg. H. Özdikmen, 1 specimen; Niğde-Bor, Derbent district, 17.VI.1997, leg. H. Özdikmen, 2 specimens; Çamardı, Yelatan village, 1280m, 23.VI.1997, leg. H. Özdikmen, 1 specimen; Exit of Ulukışla, 1145m, 29.V.2001, leg. H. Özdikmen, 1 specimen; **Turkey:** leg. H. Özdikmen, 1 specimen. **NTPPM:** **Ankara:** Güdül, 30.V.1990, leg. Y. Özdemir, 1 specimen; Altınova, 27.VII.1993, *Malus* orchard, leg. Y. Özdemir, 1 specimen; **Nevşehir:** Avanos, 26.V.1998, leg. Y. Özdemir, 1 specimen. **BK:** **Bartın:** Bartın-Çaycuma road, Çiftlik village, 19.V.2004, leg. H. Özdikmen, 2 specimens; **Bolu:** Mengen, Devrek-Mengen, entry of Mengen, 650m, 19.VI.2003, leg. H. Özdikmen, 1 specimen; **Çorum:** Tosya-Kargı road, 655m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; Kargı, Göletdere, Karagöl village, 1120m, 16.VI.2003, leg. H. Özdikmen, 1 specimen; **Kastamonu:** Kastamonu-Araç road, 1000m, 16.V.2003, leg. H. Özdikmen, 1 specimen; Doğanyurt-Dağyurdu, 727m, 18.VI.2004, leg. H. Özdikmen, 1 specimen.

Remarks: The species has been known from both European Turkey and Anatolia for Turkey until now. It is new to Ankara, Bartın, Bolu, Çorum, İçel, Kastamonu, Nevşehir and Niğde provinces. **Chorotype:** Centralasiatic-European.

***Cassida viridis* Linnaeus, 1758**

Material examined: **HE:** **Aksaray:** Exit of Ankara, 1020m, 20.V.1997, leg. H. Özdikmen, 2 specimens; **Ankara:** Kızılcahamam, Güvem, 1100m, 28.V.1997, leg. H. Özdikmen, 1 specimen; Kızılcahamam, Aköz Village, 1150m, 30.08.1997, leg. H. Özdikmen, 1 specimen; **Nevşehir:** 12.VI.1998, 1 specimen; **Niğde:** Exit of Ulukışla, 1350m, 29.V.2001, leg. H. Özdikmen, 1 specimen. **NTPPM:** **Sakarya:** Adapazarı, Kırkpınar, 28.IX.1993, Graminae, leg. A. Kalkandelen, 1 specimen. **BK:** **Zonguldak:** between Yedigöller-Devrek, 205m, 13.V.2003, leg. H. Özdikmen, 5 specimens. **K:** **Kahramanmaraş:** Gökşun, Değirmendere, N 37° 55' E 36° 29', 1500m, 24.VI.2003, leg. A. Y. Okutaner, 1 specimen. **AD:** **Hatay:** Serinyol, 115m, N 36 21 E 36 13, 30.III.2007, leg. H. Özdikmen, 18 specimens; Harbiye-Yayladağı road, 275m, N 36 07 E 36 08, 30.III.2007, leg. H. Özdikmen, 1 specimen; Erzin, Gököl, 600m, N 36 57 E 36 17, leg. H. Özdikmen, 1 specimen; **Osmaniye:** Issızca, 17.V.2007, leg. H. Özdikmen, 1 specimen; Zorkun, Erzin road, 989m, N 36 58 E 36 17, leg. H. Özdikmen, 1 specimen; Zorkun plateau, 04.VI.2007, leg. H. Özdikmen, 1 specimen. **GV:** **Konya:** Bozkır-Kuruçay, Ahırlı, 1270m, 28.III.2007, leg. H. Özdikmen, 4 specimens.

Remarks: The species has been known only from Anatolia for Turkey until now. It is new to Aksaray, Hatay, Kahramanmaraş, Nevşehir, Niğde, Osmaniye and Zonguldak provinces. **Chorotype:** Palaearctic.

***Cassida vittata* Villers, 1789**

Material examined: **HE:** **İçel:** Erdemli-Güzeloluk road, 450m, 30.V.2001, leg. H. Özdikmen, 1 specimen; **Nevşehir:** 12.VI.1998, leg. H. Özdikmen, 1 specimen; **Niğde:** Exit of Ulukışla-Pozantı, 1290m, 24.VI.2001, leg. H. Özdikmen, 1 specimen.

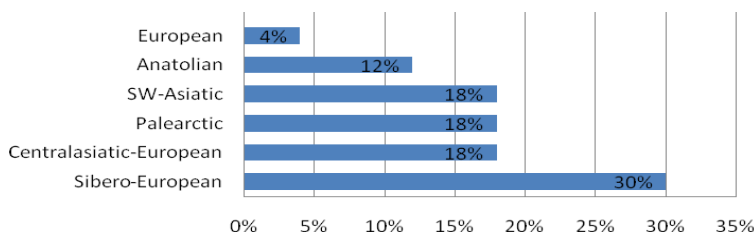
Remarks: The species has been known only from Anatolia for Turkey until now. It is new to İçel, Nevşehir and Niğde provinces. **Chorotype:** Palaearctic.

ZOOGEOGRAPHICAL ANALYSIS FOR ALL TURKISH LEAF BEETLES FAUNA

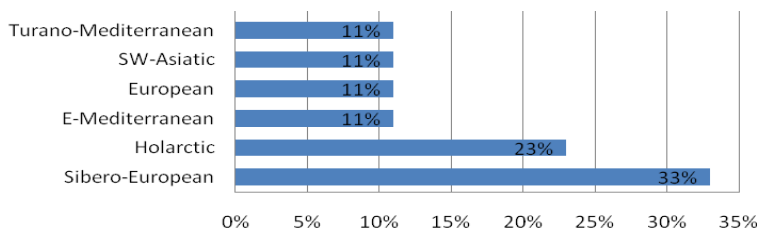
The Turkish leaf beetles fauna includes about 700 species, 90 genera and 10 subfamilies. Endemic species (Anatolian chorotype) are 12.5 % of the fauna. Dominant chorotypes for the fauna of Turkey are determined with the present work as Sibero-European for Donaciinae; Sibero-European for Criocerinae; SW-Asiatic for Clytrinae; Anatolian and Sibero-European for Cryptocephalinae; Anatolian for Eumolpinae; Sibero-European for Chrysomelinae; SW-Asiatic for Galerucinae; Anatolian for Alticinae; Mediterranean and Sibero-European for Hispinae and Sibero-European and Palaearctic for Cassidinae. Under this circumstances, at first view, Sibero-European is dominant chorotype for the fauna of Turkey. Anatolian and SW-Asiatic chorotypes follow it.

According to the subfamilies, zoogeographical distributions for the species are presented as follows:

In Turkey, the subfamily Donaciinae has been represented by 2 genera as *Donacia* and *Plateumaris*. Löbl & Smetana (2010) gave 16 species of the genera for Turkey. In the present work, 7 species of the genera are examined. So, Turkish fauna includes 17 species of 2 genera. Among them, 5 species have Sibero-European, 3 species have Centralasiatic-European, 3 species have Palaearctic, 3 species have SW-Asiatic, 2 species have Anatolian and 1 species has European chorotypes. So, Sibero-European is dominant chorotype for Turkey. Centralasiatic-European, Palaearctic and SW-Asiatic chorotypes achieve an important contribution to the fauna.

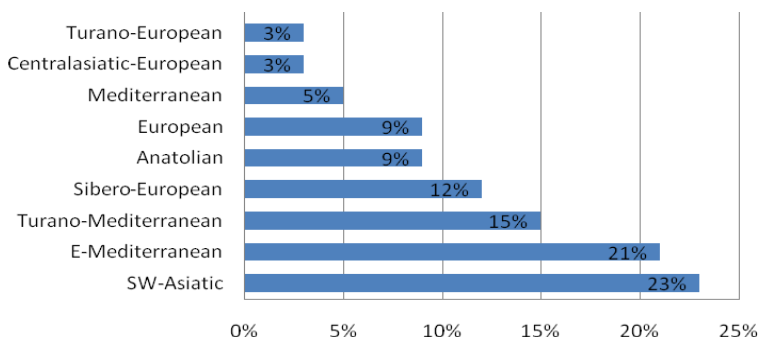


In Turkey, the subfamily Criocerinae has been represented by 3 genera as *Crioceris*, *Lilioceris* and *Oulema*. Löbl & Smetana (2010) gave 4 species of the genera *Crioceris* and *Lilioceris* for Turkey. In the present work, 9 species of all genera are examined. So, Turkish fauna includes 9 species of 3 genera. Among them, 3 species have Sibero-European, 2 species have Holarctic, 1 species has E-Mediterranean, 1 species has European, 1 species has SW-Asiatic and 1 species has Turano-Mediterranean chorotypes. So, Sibero-European is dominant chorotype for Turkey. Holarctic chorotype achieves an important contribution to the fauna.

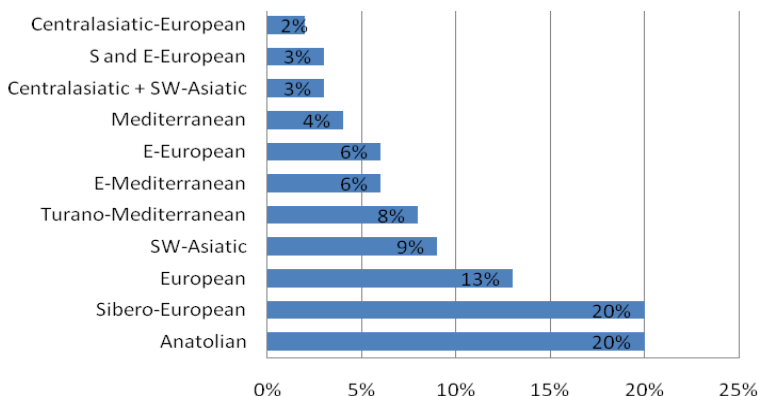


In Turkey, the subfamily Clytrinae has been represented by 8 genera as *Cheilotoma*, *Clytra*, *Coptocephala*, *Labidostomis*, *Lachnaia*, *Macrolenes*, *Smaragdina* and *Tituboea*. Löbl & Smetana (2010) gave 61 species of the genera for Turkey. In the present work, 40 species of 7 genera, except the genus *Macrolenes*, are examined. So, Turkish fauna includes 66 species of 8 genera. Among them, 15 species have SW-Asiatic, 14 species have E-Mediterranean, 10 species have Turano-Mediterranean, 8 species have Sibero-European, 6

species have Anatolian, 6 species have European, 3 species have Mediterranean, 2 species have Centralasiatic-European and 2 species have Turano-European chorotypes. So, SW-Asiatic is dominant chorotype for Turkey. E-Mediterranean chorotype follows it. Then, Turano-Mediterranean and Sibero-European chorotypes achieve an important contribution to the fauna.

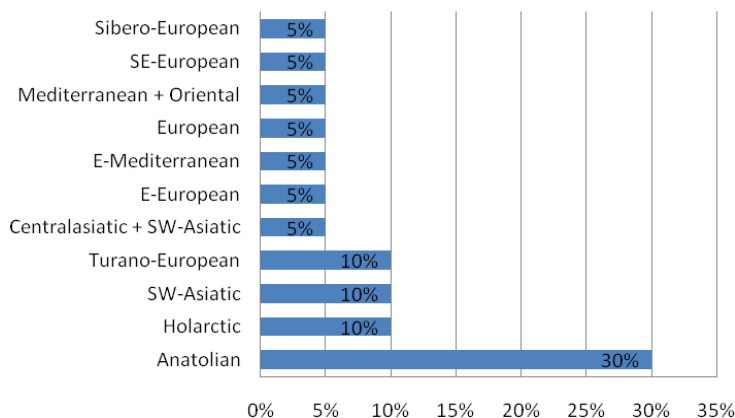


In Turkey, the subfamily Cryptocephalinae has been represented by 4 genera as *Acolastus*, *Cryptocephalus*, *Pachybrachis* and *Stylosomus*. Löbl & Smetana (2010) gave 95 species of the genera for Turkey. In the present work, 43 species of 2 genera as *Cryptocephalus* and *Pachybrachis* are examined. So, Turkish fauna includes 97 species of 4 genera. Among them, 19 species have Anatolian, 19 species have Sibero-European, 12 species have European, 9 species have SW-Asiatic, 8 species have Turano-Mediterranean, 6 species have E-Mediterranean, 6 species have E-European, 4 species have Mediterranean, 3 species have Centralasiatic + SW-Asiatic, 3 species have S and E-European, 2 species have Centralasiatic-European, 2 species have SW-Asiatic + Turanian, 2 species have Turano-European and 2 species have W-Palaearctic. So, Anatolian and Sibero-European are dominant chorotypes for Turkey. Then, European chorotype achieves an important contribution to the fauna.

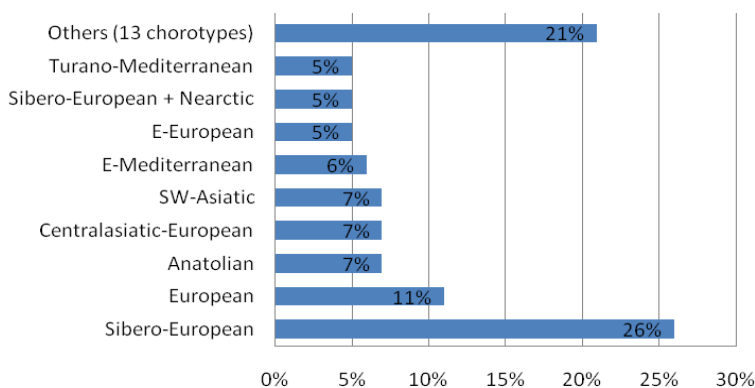


In Turkey, the subfamily Eumolpinae has been represented by 9 genera as *Bedelia*, *Bromius*, *Chrysoschus*, *Colaspinella*, *Damasus*, *Eupales*, *Macrocoma*, *Malegia* and *Pachnephorus*. Löbl & Smetana (2010) gave 20 species of the genera for Turkey. In the present work, 7 species of 4 genera as *Bromius*, *Colaspinella*, *Macrocoma* and *Pachnephorus* are examined. So, Turkish fauna includes 20 species of 9 genera. Among them, 6 species have Anatolian, 2 species have Holarctic, 2 species have SW-Asiatic, 2 species have Turano-European, 1 species has Centralasiatic + SW-Asiatic, 1 species has E-European, 1 species has E-Mediterranean, 1 species has European, 1 species has

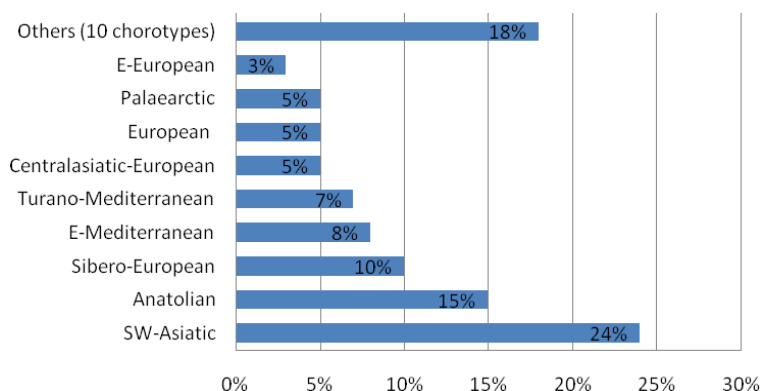
Mediterranean + Oriental, 1 species has SE-European, 1 species has Sibero-European and 1 species has Turano-Mediterranean chorotypes. So, Anatolian is dominant chorotype for Turkey. Then, Holarctic, SW-Asiatic and Turano-European chorotypes achieve contributions to the fauna.



In Turkey, the subfamily Chrysomelinae has been represented by 16 genera as *Chrysolina*, *Chrysomela*, *Colaphellus*, *Cyrtanastes*, *Entomoscelis*, *Gastrophysa*, *Goniocetena*, *Leptinotarsa*, *Neophaedon*, *Phaedon*, *Phratora*, *Plagioderia*, *Plagiosterna*, *Prasocuris*, *Timarcha* and *Zygogramma*. Löbl & Smetana (2010) gave 77 species of the genera for Turkey. In the present work, 42 species of 13 genera, except the genera *Cyrtanastes*, *Plagiosterna* and *Zygogramma*, are examined. So, Turkish fauna includes 83 species of 16 genera. Among them, 21 species have Sibero-European, 10 species have European, 6 species have Anatolian, 6 species have Centralasiatic-European, 6 species have SW-Asiatic, 5 species have E-Mediterranean, 4 species have E-European, 4 species have Sibero-European + Nearctic, 4 species have Turano-Mediterranean, 2 species have Centralasiatic + SW-Asiatic, 2 species have Holarctic, 2 species have S-European, 2 species have W-Palaearctic, 1 species has C, E-European + Mediterranean, 1 species has Centralasiatic-European + Oriental or Sibero-European + Oriental, 1 species has European + Nearctic, 1 species has Mediterranean, 1 species has Palaearctic + Oriental, 1 species has S and E-European, 1 species has SE-European, 1 species has Sibero-European + Australian and 1 species has Turanian + SW-Asiatic chorotypes. So, Sibero-European is dominant chorotype for Turkey. Then, European chorotype achieves a contribution to the fauna.

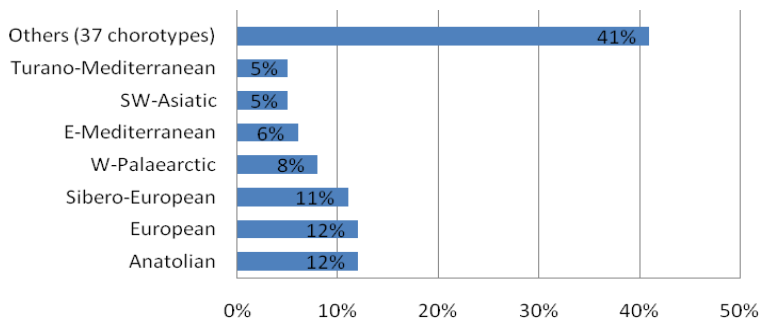


In Turkey, the subfamily Galerucinae has been represented by 16 genera as *Agelastica*, *Aulacophora*, *Calomicrus*, *Diorhabda*, *Euluperus*, *Exosoma*, *Galeruca*, *Galerucella*, *Lochmaea*, *Luperus*, *Monolepta*, *Nymphius*, *Phyllobrotica*, *Radymna*, *Sermylassa* and *Xanthogaleruca*. Löbl & Smetana (2010) gave 55 species of 16 genera, except *Monolepta*, for Turkey. In the present work, 29 species of 13 genera, except the genera *Euluperus*, *Lochmaea* and *Sermylassa*, are examined. So, Turkish fauna includes 59 species of 17 genera. Among them, 14 species have SW-Asiatic, 9 species have Anatolian, 6 species have Sibero-European, 5 species have E-Mediterranean, 4 species have Turano-Mediterranean, 3 species have Centralasiatic-European, 3 species have European, 3 species have Palaearctic, 2 species have E-European, 1 species has Centralasiatic-Mediterranean, 1 species has Centralasiatic + SW-Asiatic, 1 species has Centralasiatic + SW-Asiatic + Nearctic, 1 species has E-Palaearctic + SW-Asiatic, 1 species has Mediterranean, 1 species has Mediterranean + African + Arabian + Oriental, 1 species has Mediterranean + Nearctic, 1 species has S and E-European, 1 species has Sibero-European + Oriental and 1 species has Turanian chorotypes. So, SW-Asiatic is dominant chorotype for Turkey. Then, Anatolian chorotype achieves an important contribution to the fauna.

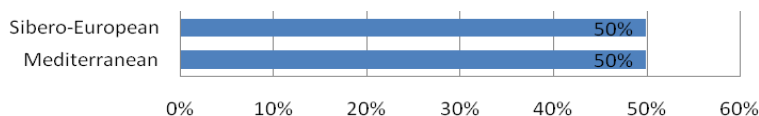


In Turkey, the subfamily Alticinae has been represented by 22 genera as *Aeschrocnemis*, *Altica*, *Anthobiodes*, *Aphthona*, *Batophila*, *Chaetocnema*, *Crepidodera*, *Derocrepis*, *Dibolia*, *Epitrix*, *Hermaeophaga*, *Hippuriphila*, *Longitarsus*, *Mantura*, *Mniophila*, *Neocrepidodera*, *Ochrosis*, *Orestia*, *Phyllotreta*, *Podagrica*, *Psylliodes* and *Sphaeroderma*. Löbl & Smetana (2010) gave 295 species of the genera for Turkey. In the present work, 80 species of 15 genera, except the genera *Anthobiodes*, *Batophila*, *Epitrix*, *Hippuriphila*, *Mantura*, *Mniophila* and *Orestia*, are examined. So, Turkish fauna includes 299 species of 22 genera. Among them, 38 species have Anatolian, 36 species have European, 33 species have Sibero-European, 25 species have W-Palaearctic, 17 species have E-Mediterranean, 16 species have SW-Asiatic, 14 species have Turano-Mediterranean, 12 species have Centralasiatic-European, 11 species have Centralasiatic-Mediterranean, 11 species have E-European, 11 species have Palaearctic, 10 species have Centralasiatic + SW-Asiatic, 10 species have Mediterranean, 6 species have Sibero-European + Nearctic, 4 species have Holarctic, 4 species have SE-European, 3 species have Mediterranean + African, 3 species have S and E-European, 3 species have Sibero-European + Oriental, 2 species have Centralasiatic-European + Sibero-European, 2 species have Centralasiatic-Mediterranean + African, 2 species have European + Nearctic, 2 species have S-European, 2 species have Sibero-European + Nearctic + Australian, 2 species have Turanian + SW-Asiatic, 2 species have W-Palaearctic + Nearctic, 1 species has E-European + Nearctic, 1 species has Holarctic + Australian, 1 species has Mediterranean + E-European, 1 species has Palaearctic + African, 1 species has Palaearctic + African + Oriental, 1 species has Palaearctic + Australian, 1 species has Palaearctic + Oriental, 1 species has SE-European + Nearctic + Neotropical, 1 species has Sibero-European + African, 1 species has Sibero-European + African + Nearctic, 1 species has Sibero-European + African + Nearctic + Oriental + Australian or subcosmopolitan, 1 species has Sibero-European + Australian, 1 species has Sibero-

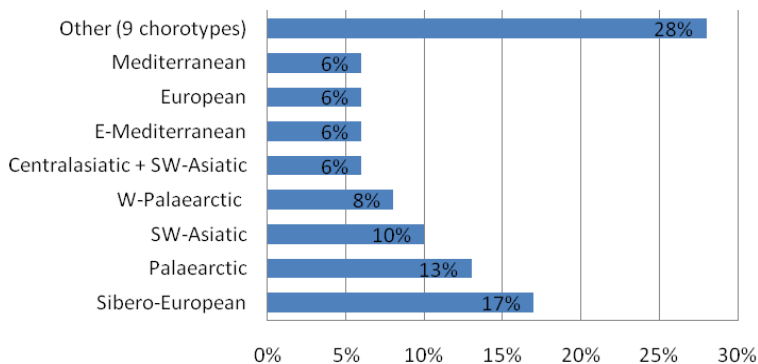
European + Centralasiatic-Mediterranean, 1 species has Turano-European, 1 species has W-Palaeartic + African, 1 species has W-Palaeartic + African + Australian, 1 species has W-Palaeartic + African + Nearctic and 1 species has W-Palaeartic + Nearctic + African chorotypes. So, Anatolian is dominant chorotype for Turkey. European and Sibero-European chorotypes follow it. Then, W-Palaeartic chorotype achieves an important contribution to the fauna.



In Turkey, the subfamily Hispinae has been represented by 2 genera as *Dicladyspa* and *Hispa*. Both Löbl & Smetana (2010) and the present work give 2 species of the genera for Turkey. So, Turkish fauna includes 2 species of 2 genera. One of them has Mediterranean chorotype and the other has Sibero-European chorotype.



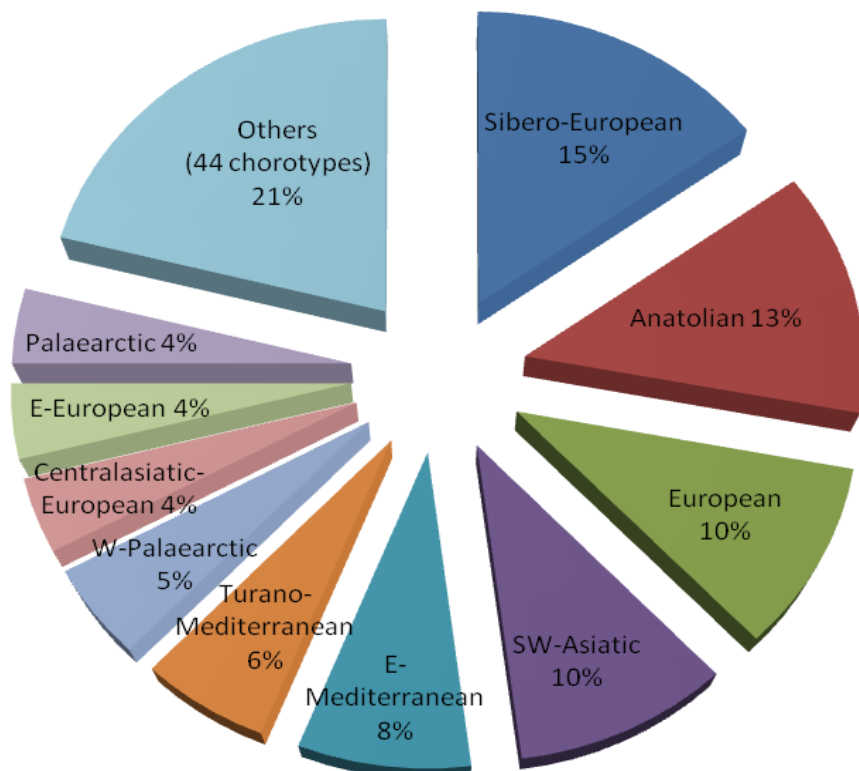
In Turkey, the subfamily Cassidinae has been represented by 6 genera as *Cassida*, *Hypocassida*, *Ischyronota*, *Macromonycha*, *Oxylepus* and *Pilemostoma*. Löbl & Smetana (2010) gave 42 species of the genera for Turkey. In the present work, 29 species of 3 genera as *Cassida*, *Hypocassida* and *Pilemostoma* are examined. So, Turkish fauna includes 46 species of 6 genera. Among them, 8 species have Sibero-European, 8 species have Palaeartic, 5 species have SW-Asiatic, 4 species have W-Palaeartic, 3 species have Centralasiatic + SW-Asiatic, 3 species have E-Mediterranean, 3 species have European, 3 species have Mediterranean, 2 species have Anatolian, 2 species have Centralasiatic-European, 1 species has Centralasiatic-E-European, 1 species has E-European, 1 species has Holarctic, 1 species has Mediterranean + African and 1 species has Turano-Mediterranean chorotypes. So, Sibero-European and Palaeartic are dominant chorotypes for Turkey. Then, Palaeartic and SW-Asiatic chorotypes achieve an important contribution to the fauna.



Consequently, zoogeographical analysis for all Turkish leaf beetles fauna (696 species) is given as follows:

15 % of all known Turkish species, namely 105 species have Sibero-European; 12.5 % of all known Turkish species, namely 87 species have Anatolian; 10 % of all known Turkish species, namely 72 species have European; 10 % of all known Turkish species, namely 71 species have SW-Asiatic, 7.5 % of all known Turkish species, namely 52 species have E-Mediterranean, 6 % of all known Turkish species, namely 43 species have Turano-Mediterranean, about 5 % of all known Turkish species, namely 33 species have W-Palaeartic, about 4.5 % of all known Turkish species, namely 30 species have Centralasiatic-European, 3.5 % of all known Turkish species, namely 25 species have E-European, 3.5 % of all known Turkish species, namely 25 species have Palaeartic, about 3.5 % of all known Turkish species, namely 23 species have Mediterranean, about 3 % of all known Turkish species, namely 20 species have Centralasiatic + SW-Asiatic, about 2 % of all known Turkish species, namely 12 species have Centralasiatic-Mediterranean, 1.5 % of all known Turkish species, namely 11 species have Holarctic, about 1.5 % of all known Turkish species, namely 10 species have Sibero-European + Nearctic and the others (21 % of all known Turkish species namely 77 species have 39 different chorotypes).

As a result of this, Sibero-European is dominant chorotype for the fauna of Turkey. Anatolian chorotype follows it. Then, European and SW-Asiatic chorotypes achieve so important contributions for the fauna.



A CHECK-LIST OF CHRYSOMELIDAE OF TURKEY**Subfamily DONACIINAE Kirby, 1837**

(2 genera, 17 species)

- Donacia aquatica* (Linnaeus, 1758)
Donacia bicolora Zschach, 1788
 Donacia bicolora bicolora Zschach, 1788
Donacia cinerea Herbst, 1784
Donacia clavipes Fabricius, 1792
 Donacia clavipes clavipes Fabricius, 1792
Donacia delagrangei Pic, 1896
Donacia impressa Paykull, 1799
Donacia jacobsoni Semenov & Reichardt, 1927
Donacia kraatzii Weise, 1881
Donacia marginata Hoppe, 1795
Donacia microcephala Daniel, 1904
Donacia mistshenkoi Jakobson, 1910
Donacia simplex Fabricius, 1775
Donacia thalassina Germar, 1811
 Donacia thalassina thalassina Germar, 1811
Donacia tomentosa Ahrens, 1810
Donacia vulgaris Zschach, 1788
 Donacia vulgaris vulgaris Zschach, 1788
Plateumaris consimilis (Schränk, 1781)
Plateumaris sericea (Linnaeus, 1760)
 Plateumaris sericea sericea (Linnaeus, 1760)

Subfamily CRIOCERINAE Latreille, 1804

(3 genera, 9 species)

- Crioceris asparagi* (Linnaeus, 1758)
Crioceris bicrucata (Shalberg, 1823)
Crioceris duodecimpunctata (Linnaeus, 1758)
Crioceris sokolowi Jakobson, 1894
Lilioceris faldermanni (Guérin-Ménéville, 1844)
Lilioceris merdigera (Linnaeus, 1758)
Oulema duftschmiedi (Redtenbacher, 1874)
Oulema gallaeciana Heyden, 1870
Oulema melanopus (Linnaeus, 1758)

Subfamily CLYTRINAE Kirby, 1837

(8 genera, 66 species)

- Cheilotoma beldei* Kasap, 1984
Cheilotoma erythrostoma Faldermann, 1837
 Cheilotoma erythrostoma erythrostoma Faldermann, 1837
Cheilotoma musciformis (Goeze, 1777)
 Cheilotoma musciformis musciformis (Goeze, 1777)
Cheilotoma voriseki Medvedev & Kantner, 2003
Clytra aliena Weise, 1897
Clytra binominata Monros, 1953
Clytra bodemeyeri Weise, 1900
 Clytra bodemeyeri bodemeyeri Weise, 1900
Clytra laeviuscula Ratzeburg, 1837
Clytra atraphaxidis (Pallas, 1773)
 Clytra atraphaxidis atraphaxidis (Pallas, 1773)
Clytra nigrocincta Lacordaire, 1848
 Clytra nigrocincta nigrocincta Lacordaire, 1848
Clytra novempunctata Olivier, 1808
Clytra ovata Lacordaire, 1848
 Clytra ovata ovata Lacordaire, 1848
Clytra quadripunctata (Linnaeus, 1758)
 Clytra quadripunctata quadripunctata (Linnaeus, 1758)
Clytra valeriana Ménétériés, 1832
 Clytra valeriana valeriana Ménétériés, 1832
 Clytra valeriana taurica Medvedev, 1961
Clytra weisei Monros, 1953
Coptocephala destinoi Fairmaire, 1884

- Coptocephala fallaciosa* Fairmaire, 1884
Coptocephala simillima Lodewyckx, 1995
Coptocephala unifasciata (Scopoli, 1763)
Coptocephala unifasciata unifasciata (Scopoli, 1763)
Labidostomis asiatica Faldermann, 1837
Labidostomis axillaris (Lacordaire, 1848)
Labidostomis basanica Sahlberg, 1913
Labidostomis brevipennis Faldermann, 1837
Labidostomis cyanicornis (Germar, 1822)
Labidostomis decipiens Faldermann, 1837
Labidostomis diversifrons Lefevre, 1872
Labidostomis elegans Lefevre, 1876
Labidostomis humeralis Schneider, 1792
Labidostomis karamanica Weise, 1900
Labidostomis kaszabi Medvedev, 1962
Labidostomis korbi Weise, 1902
Labidostomis longimana (Linnaeus, 1760)
Labidostomis lucida (Germar, 1824)
Labidostomis maculipennis Lefevre, 1870
Labidostomis mesopotamica Heyden, 1886
Labidostomis oertzeni Weise, 1889
Labidostomis pallidipennis (Gebler, 1830)
Labidostomis peregrina Weise, 1900
Labidostomis propinqua Faldermann, 1837
Labidostomis rufa (Waltl, 1838)
Labidostomis subfasciata Weissee, 1885
Labidostomis sulcicollis (Lacordaire, 1848)
Labidostomis testaceipes Pic, 1900
Lachnaia sexpunctata (Scopoli, 1763)
Macrolenes dentipes (Olivier, 1808)
Smaragdina amasina (Pic, 1897)
Smaragdina aurita (Linnaeus, 1767)
Smaragdina aurita aurita (Linnaeus, 1767)
Smaragdina biornata (Lefevre, 1872)
Smaragdina biornata biornata (Lefevre, 1872)
Smaragdina biornata angorensis (Lopatin, 2002) HE NTPPM
Smaragdina chloris (Lacordaire, 1848)
Smaragdina chloris chloris (Lacordaire, 1848)
Smaragdina djebellina (Lefevre, 1872)
Smaragdina flavicollis (Charpentier, 1825)
Smaragdina graeca (Kraatz, 1872)
Smaragdina hypocrita (Lacordaire, 1848)
Smaragdina judaica (Lefevre, 1872)
Smaragdina laeviceps (Abeille de Perrin, 1895)
Smaragdina limbata (Steven, 1806)
Smaragdina salicina (Scopoli, 1763)
Smaragdina scutellaris (Lefevre, 1872)
Smaragdina tibialis (Brullé, 1832)
Smaragdina unipunctata (Olivier, 1808)
Smaragdina vaulogeri (Pic, 1895)
Smaragdina viridana (Lacordaire, 1848)
Smaragdina viridana viridana (Lacordaire, 1848)
Smaragdina xanthaspis (Germar, 1824)
Tituboea arabica (Olivier, 1808)
Tituboea macropus (Illiger, 1800)
Tituboea sexmaculata (Fabricius, 1781)

Subfamily CRYPTOCEPHALINAE Gyllenhal, 1813

(4 genera, 97 species)

- Acolastus glabratus* (Lopatin, 1985)
Acolastus iranicus (Lopatin, 1980)
Cryptocephalus amasiensis Weise, 1894
Cryptocephalus androgyne Marseul, 1875
Cryptocephalus androgyne androgyne Marseul, 1875
Cryptocephalus angorensis Pic, 1908
Cryptocephalus anticus Suffrian, 1848
Cryptocephalus apicalis Gebler, 1830

- Cryptocephalus aureolus* Suffrian, 1847
Cryptocephalus aureolus aureolus Suffrian, 1847
Cryptocephalus aywazi Gök & Sassi, 2002
Cryptocephalus bameuli Duhaldeborde, 1999
Cryptocephalus bicolor Eschscholz, 1818
Cryptocephalus biguttatus (Scopoli, 1763)
Cryptocephalus biledjekensis Pic, 1903
Cryptocephalus bilineatus (Linnaeus, 1767)
Cryptocephalus bipunctatus (Linnaeus, 1758)
Cryptocephalus bipunctatus bipunctatus (Linnaeus, 1758)
Cryptocephalus concolor Suffrian, 1847
Cryptocephalus connexus Olivier, 1807
Cryptocephalus cordiger (Linnaeus, 1758)
Cryptocephalus crassus Olivier, 1791
Cryptocephalus cribratus Suffrian, 1847
Cryptocephalus curda Jacobson, 1897
Cryptocephalus duplicatus Suffrian, 1847
Cryptocephalus elegantulus Gravenhorst, 1807
Cryptocephalus exiguus Schneider, 1792
Cryptocephalus exiguus amicus Baly, 1873
Cryptocephalus exiguus variceps Weise, 1884
Cryptocephalus fausti Weise, 1882
Cryptocephalus flavipes Fabricius, 1781
Cryptocephalus fulvus (Goeze, 1777)
Cryptocephalus fulvus fulvus (Goeze, 1777)
Cryptocephalus fulvus schatzmayri Burlini, 1969
Cryptocephalus gloriosus Mulsant & Wachanru, 1853
Cryptocephalus ilicis Olivier, 1808
Cryptocephalus imperialis Laicharting, 1781
Cryptocephalus infraniger Pic, 1915
Cryptocephalus janthinus Germar, 1824
Cryptocephalus labiatus (Linnaeus, 1761)
Cryptocephalus lederi Weise, 1889
Cryptocephalus loebli Sassi, 1997
Cryptocephalus macellus Suffrian, 1860
Cryptocephalus moraei (Linnaeus, 1758)
Cryptocephalus ocellatus Drapiez, 1819
Cryptocephalus ocellatus ocellatus Drapiez, 1819
Cryptocephalus octomaculatus Rossi, 1790
Cryptocephalus octopunctatus (Scopoli, 1763)
Cryptocephalus octopunctatus octopunctatus (Scopoli, 1763)
Cryptocephalus paphlagonius Sassi & Kismali, 2000
Cryptocephalus paradisiacus Weise, 1900
Cryptocephalus parvulus Müller, 1776
Cryptocephalus peyroni Marseul, 1875
Cryptocephalus phaleratus Tappes, 1871
Cryptocephalus populi Suffrian, 1848
Cryptocephalus praticola Weise, 1889
Cryptocephalus prusias Suffrian, 1853
Cryptocephalus pseudoreitteri Tomov, 1976
Cryptocephalus pusillus Fabricius, 1777
Cryptocephalus pygmaeus Fabricius, 1792
Cryptocephalus pygmaeus vittula Suffrian, 1848
Cryptocephalus quadriguttatus Richter, 1820
Cryptocephalus quatuordecimmaculatus Schneider, 1792
Cryptocephalus rufipes (Goeze, 1777)
Cryptocephalus rugicollis Olivier, 1791
Cryptocephalus schaefferi Schrank, 1789
Cryptocephalus schaefferi moehringi Weise, 1884
Cryptocephalus sericeus (Linnaeus, 1758)
Cryptocephalus sexpunctatus (Linnaeus, 1758)
Cryptocephalus sexpunctatus sexpunctatus (Linnaeus, 1758)
Cryptocephalus signatifrons Suffrian, 1847
Cryptocephalus solivagus Leonardi & Sassi, 2001
Cryptocephalus strigosus Germar, 1824
Cryptocephalus sultani Pic, 1920
Cryptocephalus surdus Rapilly, 1980

- Cryptocephalus tappesi* Marseul, 1868
Cryptocephalus testaceitarsis Pic, 1915
Cryptocephalus trimaculatus Rossi, 1790
Cryptocephalus tshorumae Tomov, 1984
Cryptocephalus turcicus Suffrian, 1847
Cryptocephalus violaceus Laicharting, 1781
Cryptocephalus violaceus violaceus Laicharting, 1781
Cryptocephalus virens Suffrian, 1847
Cryptocephalus volkovitshi Lopatin, 1976
Cryptocephalus wehnkei Weise, 1881
Pachybrachis adaliensis (Weise, 1886)
Pachybrachis albicans (Weise, 1882)
Pachybrachis anaticolicus Lopatin, 1985
Pachybrachis bodemeyeri Weise, 1906
Pachybrachis cordatus Sassi & Schöller, 2003
Pachybrachis excisus (Weise, 1897)
Pachybrachis fimbriolatus (Suffrian, 1848)
Pachybrachis glycyrrhizae (Olivier, 1808)
Pachybrachis hieroglyphicus (Laicharting, 1781)
Pachybrachis humeralis Burlini, 1956
Pachybrachis laticollis (Suffrian, 1860)
Pachybrachis leonardii Sassi & Schöller, 2003
Pachybrachis limbatus (Menetries, 1836)
Pachybrachys mardinensis (Weise, 1900)
Pachybrachis mendax (Suffrian, 1860)
Pachybrachis mendax mendax (Suffrian, 1860)
Pachybrachis nigropunctatus (Suffrian, 1854)
Pachybrachis pentheri Ganglbauer, 1905
Pachybrachis scripticollis Faldermann, 1837
Pachybrachis scriptidorsum Marseul, 1875
Pachybrachis sinuatus (Mulsant & Rey, 1859)
Pachybrachis tessellatus (Olivier, 1791)
Pachybrachis tessellatus tauricus (Suffrian, 1848)
Pachybrachis velarum Warchalowski, 1998
Stylosomus flavus Marseul, 1875
Stylosomus flavus flavus Marseul, 1875
Stylosomus subelongatus Pic, 1913
Stylosomus tamaricis (Herrich-Schaeffer, 1836)

Subfamily EUMOLPINAE Hope, 1840

(9 genera, 20 species)

- Bedelia insignis* Lefevre, 1875
Bromius obscurus (Linnaeus, 1758)
Chrysochus asclepiadeus (Pallas, 1773)
Chrysochus asclepiadeus asiaeminoris Demonte, 1948
Colaspinella grandis (Frigalszky, 1880)
Damasus albicans Chapuis, 1874
Eupales ulema (Germar, 1813)
Macrocoma brunnipes (Olivier, 1808)
Macrocoma brunnipes obscuricolor (Pic, 1905)
Macrocoma delagrangi (Pic, 1898)
Macrocoma dimorpha (Medvedev, 1956)
Macrocoma doboszi Borowiec, 2005
Macrocoma fortidens (Berti & Rapilly, 1973)
Macrocoma korbi (Pic, 1901)
Macrocoma rubripes (Schaufuss, 1862)
Macrocoma rubripes rubripes (Schaufuss, 1862)
Malegia colchica Reitter, 1912
Pachnephorus bistratus Mulsant & Wachanru, 1852
Pachnephorus canus Weise, 1882
Pachnephorus pilosus (Rossi, 1790)
Pachnephorus robustus Desbrochers, 1870
Pachnephorus tessellatus (Duftschmid, 1825)
Pachnephorus villosus (Duftschmid, 1825)

Subfamily CHRYSOMELINAE Latreille, 1802

(16 genera, 83 species)

- Chrysolina abchasica* (Weise, 1892)
Chrysolina adzhariae Lopatin, 1988
Chrysolina americana (Linnaeus, 1758)
Chrysolina analis (Linnaeus, 1767)
Chrysolina anatolica (Dahlgren, 1984)
Chrysolina anceyi (Marseul, 1868)
 Chrysolina anceyi anceyi (Marseul, 1868)
Chrysolina blanchei (Fairmaire, 1865)
 Chrysolina blanchei blanchei (Fairmaire, 1865)
Chrysolina cerealis (Linnaeus, 1767)
 Chrysolina cerealis cerealis (Linnaeus, 1767)
 Chrysolina cerealis cyaneoaurata (Motschulsky, 1860)
Chrysolina chalcites (Germar, 1824)
Chrysolina coerulans (Scriba, 1791)
 Chrysolina coerulans coerulans (Scriba, 1791)
Chrysolina cuprina (Duftschmid, 1825)
 Chrysolina cuprina cuprina (Duftschmid, 1825)
 Chrysolina cuprina staneki Bechyne, 1949
Chrysolina didymata (Scriba, 1791)
 Chrysolina didymata didymata (Scriba, 1791)
Chrysolina differens (Franz, 1952)
Chrysolina fastuosa (Scopoli, 1763)
 Chrysolina fastuosa fastuosa (Scopoli, 1763)
 Chrysolina fastuosa inexplicabilis (Brancsik, 1910)
Chrysolina geminata (Paykull, 1799)
Chrysolina grata (Faldermann, 1837)
 Chrysolina grata grata (Faldermann, 1837)
Chrysolina gypsophilae (Küster, 1845)
Chrysolina graminis (Linnaeus, 1758)
 Chrysolina graminis graminis (Linnaeus, 1758)
Chrysolina haemoptera (Linnaeus, 1758)
 Chrysolina haemoptera haemoptera (Linnaeus, 1758)
 Chrysolina haemoptera byzantia Jolivet, 1951
Chrysolina halysa Bechyne, 1950
Chrysolina herbacea (Duftschmid, 1825)
 Chrysolina herbacea herbacea (Duftschmid, 1825)
 Chrysolina herbacea alacris Bechyne, 1950
 Chrysolina herbacea recticollis (Motschulsky, 1860)
Chrysolina hyperici (Forster, 1950)
 Chrysolina hyperici hyperici (Forster, 1950)
Chrysolina impavida Bechyne, 1949
Chrysolina kataevi Lopatin, 2000
Chrysolina limbata (Fabricius, 1775)
Chrysolina marginata (Linnaeus, 1758)
 Chrysolina marginata marginata (Linnaeus, 1758)
 Chrysolina marginata unificans Bechyne, 1950
Chrysolina olivieri (Bedel, 1892)
 Chrysolina olivieri olivieri (Bedel, 1892)
 Chrysolina olivieri azurea Bechyne, 1946
Chrysolina oricalcia (Müller, 1776)
Chrysolina orientalis (Olivier, 1807)
 Chrysolina orientalis orientalis (Olivier, 1807)
 Chrysolina orientalis thraeissa Bechyne, 1950 (new to Turkey)
Chrysolina palmirensis (Bechyne, 1955)
 Chrysolina palmirensis assurensis (Bechyne, 1955)
Chrysolina planicollis (Breit, 1919)
Chrysolina polita (Linnaeus, 1758)
 Chrysolina polita polita (Linnaeus, 1758)
Chrysolina reitteri (Weise, 1884)
 Chrysolina reitteri pseudolurida Roubal, 1917
Chrysolina sacarum (Weise, 1890)
Chrysolina sahlbergi (Ménétriés, 1832)
Chrysolina salviae (Germar, 1824)
 Chrysolina salviae compuncta (Weise, 1898)
Chrysolina sanguinolenta (Linnaeus, 1758)

- Chrysolina sellata* (Weise, 1894)
Chrysolina songarica (Gebler, 1843)
Chrysolina staphylae (Linnaeus, 1758)
 Chrysolina staphylae staphylae (Linnaeus, 1758)
Chrysolina sturmi (Westhoff, 1882)
Chrysolina tesari (Roubal, 1936)
 Chrysolina tesari tesari (Roubal, 1936)
Chrysolina turca (Fairmaire, 1865)
Chrysolina varians (Schaller, 1783)
Chrysolina vernalis (Brullé, 1832)
 Chrysolina vernalis ottomana (Weise, 1906)
Chrysolina wittmeri Medvedev, 1975
Chrysomela collaris Linnaeus, 1758
Chrysomela populi Linnaeus, 1758
Chrysomela saliceti (Weise, 1884)
 Chrysomela saliceti saliceti (Weise, 1884)
Chrysomela tremula Fabricius, 1787
 Chrysomela tremula tremula Fabricius, 1787
Chrysomela vigintipunctata (Scopoli, 1763)
 Chrysomela vigintipunctata vigintipunctata (Scopoli, 1763)
Colaphellus apicalis (Menetries, 1849)
Colaphellus sophiae (Schaller, 1783)
 Colaphellus sophiae transsylvanicus Machatschke, 1954
 Colaphellus sophiae amasiae Machatschke, 1954
Cyrtanastes confusus Berti & Daccordi, 1974
Cyrtanastes grandis Lopatin, 1994
Entomoscelis adonidis (Pallas, 1771)
Entomoscelis sacra (Linnaeus, 1758)
Entomoscelis suturalis Weise, 1882
Gastrophysa polygona (Linnaeus, 1758)
 Gastrophysa polygona polygona (Linnaeus, 1758)
Gastrophysa viridula (DeGeer, 1775)
 Gastrophysa viridula viridula (DeGeer, 1775)
Gonioctena decemnotata (Marsham, 1802)
Gonioctena fornicata (Brüggemann, 1873)
Gonioctena linnaeana (Schränk, 1781)
 Gonioctena linnaeana linnaeana (Schränk, 1781)
Gonioctena viminalis (Linnaeus, 1758)
 Gonioctena viminalis viminalis (Linnaeus, 1758)
Leptinotarsa decemlineata (Say, 1824)
Neophaedon pyritosus (Rossi, 1792)
Phaedon armoraciae (Linnaeus, 1758)
Phaedon cochleariae (Fabricius, 1792)
 Phaedon cochleariae cochleariae (Fabricius, 1792)
Phratora horioni (Mohr, 1968)
Phratora laticollis (Suffrian, 1851)
Phratora tibialis (Suffrian, 1851)
 Phratora tibialis tibialis (Suffrian, 1851)
Phratora vitellinae (Linnaeus, 1758)
Phratora vulgatissima (Linnaeus, 1758)
Plagiodera versicolora (Laicharting, 1781)
Plagiosterna aenea (Linnaeus, 1758)
 Plagiosterna aenea aenea (Linnaeus, 1758)
Prasocuris flavocincta (Brullé, 1832)
Prasocuris glabra (Herbst, 1783)
Prasocuris junci (Brahm, 1790)
Prasocuris phellandrii (Linnaeus, 1758)
Timarcha hummelii Faldermann, 1837
 Timarcha hummeli hummelii Faldermann, 1837
Timarcha olivieri Fairmaire, 1868
 Timarcha olivieri olivieri Fairmaire, 1868
Timarcha tenebricosa (Fabricius, 1775)
Zygogramma suturalis (Fabricius, 1775)

Subfamily GALERUCINAE Latreille, 1802

(17 genera, 59 species)

- Agelastica alni* (Linnaeus, 1758)
Agelastica alni alni (Linnaeus, 1758)
Atysa diversicornis (Pic, 1931)
Aulacophora foveicollis (Lucas, 1849)
Calomicrus angorensis (Pic, 1912)
Calomicrus apicalis Demaison, 1891
Calomicrus azureus (Fairmaire, 1884)
Calomicrus lividus (Joannis, 1866)
Calomicrus malkini Warchalowski, 1991
Calomicrus pinicola (Duftschmid, 1825)
Calomicrus syriacus (Weise, 1924)
Calomicrus turcicus (Medvedev, 1975)
Diorhabda carinata (Faldermann, 1837)
Diorhabda elongata (Brullé, 1836)
Euluperus major Weise, 1886
Exosoma flavipes (Heyden, 1878)
Exosoma neglectum Mohr, 1968
Exosoma thoracicum (Redtenbacher, 1843)
Galeruca armeniaca Weise, 1886
Galeruca circassica Reitter, 1889
Galeruca impressicollis Pic, 1934
Galeruca interrupta (Illiger, 1802)
Galeruca jucunda (Faldermann, 1837)
Galeruca melanocephala (Ponza, 1805)
Galeruca pomonae (Scopoli, 1763)
Galeruca pomonae pomonae (Scopoli, 1763)
Galeruca rufa Germar, 1824
Galeruca spectabilis (Faldermann, 1837)
Galeruca spectabilis orientalis (Osculati, 1844)
Galeruca tanacetii (Linnaeus, 1758)
Galeruca tanacetii tanacetii (Linnaeus, 1758)
Galerucella californiensis (Linnaeus, 1767)
Galerucella grisea (Joannis, 1866)
Galerucella lineola (Fabricius, 1781)
Galerucella lineola lineola (Fabricius, 1781)
Galerucella nymphaea (Linnaeus, 1758)
Galerucella pusilla (Duftschmid, 1825)
Galerucella tenella (Linnaeus, 1760)
Lochmaea caprea (Linnaeus, 1758)
Lochmaea limbata Pic, 1898
Lochmaea machulkai Roubal, 1926
Luperus armeniacus Kiesenwetter, 1878
Luperus discolor Faldermann, 1837
Luperus flavipes (Linnaeus, 1767)
Luperus flavipes flavipes (Linnaeus, 1767)
Luperus floralis Faldermann, 1837
Luperus perlucidus Iablokoff-Khnzorian, 1956
Luperus rectangulus Weise, 1898
Luperus xanthopoda (Schränk, 1781)
Luperus viridipennis (Germar, 1824)
Monolepta anatolica Bezdek, 1998
Nymphius ensifer (Weise, 1900)
Nymphius forcipifer (Weise, 1900)
Nymphius lydius (Weise, 1886)
Nymphius stylifer (Weise, 1899)
Nymphius stylifer stylifer (Weise, 1899)
Nymphius stylifer ogloblini Bogatchev, 1947
Nymphius stylifer kadlecii Bezdek, 2008
Phyllobrotica adusta (Creutzer, 1799)
Phyllobrotica adusta adusta (Creutzer, 1799)
Phyllobrotica binotata Ogloblin, 1936
Phyllobrotica elegans Kraatz, 1866
Phyllobrotica frontalis Weise, 1886
Radymna fischeri (Faldermann, 1837)
Radymna nigrifrons (Labbossiere, 1914)

Radymna persica (Faldermann, 1837)
Sermylassa halensis (Linnaeus, 1767)
Xanthogaleruca luteola (Müller, 1766)
Xanthogaleruca subcoerulescens (Weise, 1884)

Subfamily ALTICINAE Newman, 1835

(22 genera, 298 species)

Aeschrocnemis anatolica (Heikertinger, 1922)
Aeschrocnemis serbica (Kutschera, 1860)
Aeschrocnemis turcica Nadein & Gök, 2009
Aeschrocnemiswhiteheadi (Warchalowski, 1998)
Altica ancylensis (Weise, 1897)
Altica bicarinata (Kutschera, 1860)
Altica brevicollis Foudras, 1861
Altica brevicollis brevicollis Foudras, 1861
Altica bulgharensis Kral, 1969
Altica carduorum Guérin-Ménéville, 1858
Altica cornivorax Kral, 1969
Altica deserticola (Weise, 1889)
Altica globicollis (Weise, 1889)
Altica graeca Kral, 1966
Altica hampei (Allard, 1867)
Altica impressicollis (Reiche, 1862)
Altica jarmilae Kral, 1979
Altica lythri Aubé, 1843
Altica oleracea (Linnaeus, 1758)
Altica oleracea oleracea (Linnaeus, 1758)
Altica palustris (Weise, 1888)
Altica pontica (Ogloblin, 1925)
Altica quercetorum Foudras, 1861
Altica quercetorum quercetorum Foudras, 1861
Altica tamaricis Schrank, 1785
Altica tamaricis tamaricis Schrank, 1785
Anthobiodes turcicus (Medvedev, 1975)
Aphtona abdominalis (Duftschmid, 1825)
Aphtona aeneomicans (Allard, 1875)
Aphtona alanyensis Fritzlar, 2004
Aphtona atrovirens (Förster, 1849)
Aphtona bergeali Fritzlar, 2001
Aphtona bergealoides Fritzlar, 2004
Aphtona bonvouloiri Allard, 1861
Aphtona carbonaria Rosenhauer, 1856
Aphtona crassicornis Lopatin, 1990
Aphtona cyparissiae (Koch, 1803)
Aphtona euphorbiae (Scrank, 1781)
Aphtona flava Guillebeau, 1895
Aphtona flaviceps Allard, 1859
Aphtona franzi Heikertinger, 1944
Aphtona fuentei Reitter, 1901
Aphtona gracilis Faldermann, 1837
Aphtona konstantinovi Lopatin, 1998
Aphtona kuntzei Roubal, 1931
Aphtona lacertosa Rosenhauer, 1847
Aphtona lutescens (Gyllenhal, 1813)
Aphtona maculata (Allard, 1876)
Aphtona nigriceps (Redtenbacher, 1842)
Aphtona nigriscutis Foudras, 1860
Aphtona nonstriata (Goeze, 1777)
Aphtona ovata Foudras, 1861
Aphtona pygmaea (Kutschera, 1861)
Aphtona rhodiensis Heikertinger, 1944
Aphtona semicyanea Allard, 1859
Aphtona syriaca Heikertinger, 1944
Aphtona venustula Kutschera, 1861
Aphtona violacea (Koch, 1803)
Aphtona warchalowskii Fritzlar, 2001
Batophila fallax Weise, 1888

- Batophila olexai* Kral, 1964
Chaetocnema aerea (Letzner, 1847)
Chaetocnema arenacea (Allard, 1860)
Chaetocnema arida Foudras, 1860
Chaetocnema aridula (Gyllenhal, 1827)
Chaetocnema breviscula (Motschulsky, 1845)
Chaetocnema chlorophana (Duftschmid, 1825)
Chaetocnema concinna (Marsham, 1802)
Chaetocnema conducta (Motschulsky, 1838)
Chaetocnema confusa (Boheman, 1851)
Chaetocnema coyei (Allard, 1864)
Chaetocnema delarouzei (Brisout de Barneville, 1884)
Chaetocnema hortensis (Geoffroy, 1785)
Chaetocnema major (Jacquelin du Val, 1852)
Chaetocnema mannerheimii (Gyllenhal, 1827)
Chaetocnema montenegrina Heikertinger, 1912
Chaetocnema obesa (Boieldieu, 1859)
Chaetocnema orientalis (Bauduer, 1874)
Chaetocnema procerula (Rosenhauer, 1856)
Chaetocnema sahlbergii (Gyllenhal, 1827)
Chaetocnema scheffleri (Kutschera, 1864)
Chaetocnema semicoerulea (Koch, 1803)
Chaetocnema semicoerulea semicoerulea (Koch, 1803)
Chaetocnema tibialis (Illiger, 1807)
Chaetocnema turhala Iyriboz, 1934
Crepidodera aurata (Marsham, 1802)
Crepidodera aurea (Geoffroy, 1785)
Crepidodera fulvicornis (Fabricius, 1792)
Crepidodera lamina (Bedel, 1901)
Crepidodera plutus (Latreille, 1804)
Derocrepis rufipes (Linnaeus, 1758)
Dibolia carpathica Weise, 1893
Dibolia cryptocephala (Koch, 1803)
Dibolia cynoglossi (Koch, 1803)
Dibolia depressiuscula Letzner, 1847
Dibolia femoralis Redtenbacher, 1849
Dibolia femoralis femoralis Redtenbacher, 1849
Dibolia kralii Mohr, 1981
Dibolia occultans (Koch, 1803)
Dibolia phoenicia Allard, 1866
Dibolia rufofemorata Reitter, 1896
Dibolia rugulosa Redtenbacher, 1849
Dibolia schillingii Letzner, 1847
Dibolia timida (Illiger, 1807)
Dibolia tricolor Reitter, 1898
Dibolia zangezurica Iablokoff-Khnzorian, 1968
Epitrix atropae Foudras, 1861
Epitrix caucasica (Heikertinger, 1950)
Epitrix dieckmanni (Mohr, 1968)
Epitrix hirtipennis (Melsheimer, 1847)
Epitrix intermedia Foudras, 1861
Epitrix pubescens (Koch, 1803)
Hermaphysa mercurialis (Fabricius, 1792)
Hermaphysa ruficollis (Lucas, 1849)
Hippuriphila modeeri (Linnaeus, 1760)
Longitarsus absynthii Kutschera, 1862
Longitarsus aeneicollis (Faldermann, 1837)
Longitarsus albineus (Foudras, 1860)
Longitarsus alfieri Pic, 1923
Longitarsus alfieri alfieri Pic, 1923
Longitarsus alfieri antineae (Peyerimhof, 1929)
Longitarsus alfieri furthi Gruev, 1982
Longitarsus allotrophus Furt, 1979
Longitarsus almora Maulik, 1926
Longitarsus anatolicus Weise, 1900
Longitarsus anchusae (Paykull, 1799)
Longitarsus angelicae Fritzlar, 2001

- Longitarsus aramaicus* Leonardi, 1979
Longitarsus artvinus Gruiev & Aslan, 1998
Longitarsus atricillus (Linnaeus, 1760)
Longitarsus aubozaorum Biondi, 1997
Longitarsus audisioi Biondi, 1992
Longitarsus australis (Mulsant & Rey, 1874)
Longitarsus baeticus Leonardi, 1979
Longitarsus ballotae (Marshall, 1802)
Longitarsus barbarae Doguet & Bergeal, 2002)
Longitarsus bertii Leonardi, 1973
Longitarsus brisouti Heikertinger, 1912
Longitarsus bytinskii Furt, 1979
Longitarsus callidus Warchalowski, 1967
Longitarsus celticus Leonardi, 1975
Longitarsus cerinthes (Schränk, 1798)
Longitarsus corpulentus Weise, 1887
Longitarsus echii (Koch, 1803)
Longitarsus eminus Warchalowski, 1967
Longitarsus exsoletus (Linnaeus, 1758)
Longitarsus exsoletus exsoletus (Linnaeus, 1758)
Longitarsus exsoletus rufulus (Foudras, 1860)
Longitarsus fallax Weise, 1888
Longitarsus foudrasi Weise, 1893
Longitarsus fuscoaeneus Redtenbacher, 1849
Longitarsus fuscoaeneus fuscoaeneus Redtenbacher, 1849
Longitarsus ganglbaueri Heikertinger, 1912
Longitarsus ganglbaueri ganglbaueri Heikertinger, 1912
Longitarsus georgianus (Allard, 1866)
Longitarsus gracilis Kutschera, 1864
Longitarsus hermonensis Furt, 1979
Longitarsus hittita Biondi, 1996
Longitarsus iconiensis Weise, 1900
Longitarsus jacobaeae (Waterhouse, 1858)
Longitarsus jailensis Heikertinger, 1913
Longitarsus juncicola (Foudras, 1860)
Longitarsus karlheini Warchalowski, 1972
Longitarsus kopdagiensis Gruiev & Aslan, 1998
Longitarsus kutcherai (Rye, 1872)
Longitarsus latens Warchalowski, 1998
Longitarsus lateripunctatus Rosenhauer, 1856
Longitarsus lateripunctatus personatus Weise, 1893
Longitarsus lederi Weise, 1889
Longitarsus ledouxii Doguet, 1979
Longitarsus lewisii (Baly, 1874)
Longitarsus linnaei (Duftschmid, 1825)
Longitarsus longipennis Kutschera, 1863
Longitarsus luridus (Scopoli, 1763)
Longitarsus luridus luridus (Scopoli, 1763)
Longitarsus lycopi (Foudras, 1860)
Longitarsus manfredi Fritzlar, 2004
Longitarsus medvedevi Shapiro, 1956
Longitarsus melanocephalus (De Geer, 1775)
Longitarsus membranaceus (Foudras, 1860)
Longitarsus meridionalis Weise, 1888
Longitarsus minimus Kutschera, 1864
Longitarsus minusculus (Foudras, 1860)
Longitarsus nanus (Foudras, 1860)
Longitarsus nasturtii (Fabricius, 1792)
Longitarsus niger (Koch, 1803)
Longitarsus nigrofasciatus (Goeze, 1777)
Longitarsus nigrofasciatus nigrofasciatus (Goeze, 1777)
Longitarsus nimrodi Furth, 1979
Longitarsus noricus Leonardi, 1976
Longitarsus obliterated (Rosenhauer, 1847)
Longitarsus ochroleucus (Marshall, 1802)
Longitarsus ochroleucus ochroleucus (Marshall, 1802)
Longitarsus ozbek Aslan & Warchalowski, 2005

Longitarsus parvulus (Paykull, 1799)
Longitarsus pellucidus (Foudras, 1860)
Longitarsus picicollis Weise, 1900
Longitarsus pinguis Weise, 1888
Longitarsus pratensis (Panzer, 1794)
Longitarsus pulmonariae Weise, 1893
Longitarsus quadriguttatus (Pontoppidan, 1763)
Longitarsus rectilineatus (Foudras, 1860)
Longitarsus reichei (Allard, 1860)
Longitarsus rubiginosus (Foudras, 1860)
Longitarsus salviae Gruev, 1975
Longitarsus scutellaris (Mulsant & Rey, 1874)
Longitarsus solaris Gruev, 1977
Longitarsus stragulatus (Foudras, 1860)
Longitarsus stragulatus dichrous Iablokoff-Khnzorian, 1962
Longitarsus strigicollis Wollaston, 1864
Longitarsus substriatus Kutschera, 1864
Longitarsus succineus (Foudras, 1860)
Longitarsus suturellus (Duftschmid, 1825)
Longitarsus tabidus (Fabricius, 1775)
Longitarsus trepidus Warchalowski, 1973
Longitarsus truncatellus Weise, 1890
Longitarsus violentus Weise, 1893
Longitarsus weisei Guillebeau, 1895
Mantura chrysanthemi (Koch, 1803)
Mantura chrysanthemi chrysanthemi (Koch, 1803)
Mantura cylindrica Miller, 1881
Mantura mathewsii (Curtis, 1833)
Mantura rustica (Linnaeus, 1767)
Mniophila muscorum (Koch, 1803)
Mniophila muscorum turcica Medvedev, 1970
Neocrepidodera crassicornis (Faldermann, 1837)
Neocrepidodera ferruginea (Scopoli, 1763)
Neocrepidodera impressa (Fabricius, 1801)
Neocrepidodera impressa obtusangula (Daniel, 1904)
Neocrepidodera motschulskii (Konstantinov, 1991)
Neocrepidodera nigririta (Gyllenhal, 1813)
Neocrepidodera transversa (Marsham, 1802) HE
Ochrosis ventralis (Illiger, 1807)
Orestia delagrangei Pic, 1909
Orestia loebli Biondi, 1992
Orestia olympica Frivaldszky, 1884
Orestia oselliana Leonardi, 1977
Phyllotreta acutecarinata Heikertinger, 1941
Phyllotreta astrachanica Lopatin, 1977
Phyllotreta atra (Fabricius, 1775)
Phyllotreta balcanica Heikertinger, 1909
Phyllotreta bolognai Biondi, 1992
Phyllotreta caucasicola Heikertinger, 1941
Phyllotreta corrugata Reiche & Saulcy, 1858
Phyllotreta cruciferae (Goeze, 1777)
Phyllotreta dacica Heikertinger, 1941
Phyllotreta diademata Foudras, 1860
Phyllotreta egridirensis Gruev & Kasap, 1985
Phyllotreta erysimi Weise, 1900
Phyllotreta erysimi erysimi Weise, 1900
Phyllotreta fallaciosa Gök, 2005
Phyllotreta judaea Pic, 1901
Phyllotreta latevittata Kutschera, 1860
Phyllotreta maculicornis Pic, 1906
Phyllotreta nemorum (Linnaeus, 1758)
Phyllotreta nigripes (Fabricius, 1775)
Phyllotreta nigripes nigripes (Fabricius, 1775)
Phyllotreta nodicornis (Marshaam, 1802)
Phyllotreta ochripes (Illiger, 1803)
Phyllotreta oltuensis Gruev & Aslan, 1998
Phyllotreta ozbeki Gruev & Aslan, 1998

- Phyllotreta pallidipennis* Reitter, 1891
Phyllotreta pontoaegica Gruev, 1982
Phyllotreta praticola Weise, 1887
Phyllotreta procera (Redtenbacher, 1849)
Phyllotreta punctulata (Marshall, 1802)
Phyllotreta reitteri Heikertinger, 1911
Phyllotreta sisymbrii Weise, 1888
Phyllotreta striolata (Illiger, 1803)
Phyllotreta tetrastigma (Comolli, 1837)
Phyllotreta toelgi Heikertinger, 1941
Phyllotreta undulata Kutschera, 1860
Phyllotreta variipennis (Boieldieu, 1859)
Phyllotreta variipennis variipennis (Boieldieu, 1859)
Phyllotreta vilis Weise, 1888
Phyllotreta vittula (Redtenbacher, 1849)
Phyllotreta wiseana Jakobson, 1901
Podagrica fuscicornis (Linnaeus, 1767)
Podagrica malvae (Illiger, 1807)
Podagrica malvae malvae (Illiger, 1807)
Podagrica menetriesii (Faldermann, 1837)
Psylliodes affinis (Paykull, 1799)
Psylliodes anatolica Gök & Çilbiroğlu, 2004
Psylliodes arista Iablokoff-Khnzorian, 1962
Psylliodes attenuata (Koch, 1803)
Psylliodes brisouti Bedel, 1898
Psylliodes cerenae Gök, Doguet & Çilbiroğlu, 2003
Psylliodes chalconera (Illiger, 1807)
Psylliodes chrysocephala (Linnaeus, 1758)
Psylliodes chrysocephala chrysocephala (Linnaeus, 1758)
Psylliodes circumdata (Redtenbacher, 1842)
Psylliodes cuprea (Redtenbacher, 1842)
Psylliodes diversicolor Nadein, 2006
Psylliodes dogueti Warchalowski, 1993
Psylliodes dulcamarae Koch, 1803
Psylliodes elliptica Allard, 1861
Psylliodes gibbosa Allard, 1860
Psylliodes gibbosa gibbosa Allard, 1860
Psylliodes hyoscyami (Linnaeus, 1758)
Psylliodes illyrica Leonardi & Gruev, 1993
Psylliodes inflata Reiche & Saulcy, 1858
Psylliodes instabilis Foudras, 1860
Psylliodes isatidis Heikertinger, 1913
Psylliodes kasnakensis Gök & Aslan, 2007
Psylliodes kiesewetteri Kutschera, 1864
Psylliodes littoralis Biondi, 1997
Psylliodes luteola (Müller, 1776)
Psylliodes magnifica Gruev, 1975
Psylliodes marcida (Illiger, 1807)
Psylliodes milleri Kutschera, 1864
Psylliodes milleri milleri Kutschera, 1864
Psylliodes napi (Fabricius, 1792)
Psylliodes ozisiki Leonardi & Arnold, 1995
Psylliodes pallidicolor Pic, 1903
Psylliodes picina (Marshall, 1802)
Psylliodes reitteri Weise, 1888
Psylliodes reitteri reitteri Weise, 1888
Psylliodes ridenda Nadein, 2008
Psylliodes saulcyi Allard, 1867
Psylliodes taurica Leonardi, 1971
Psylliodes testaceoconcolor Heikertinger, 1926
Psylliodes thlaspi Foudras, 1860
Psylliodes tricolor Weise, 1888
Psylliodes valida Weise, 1889
Psylliodes vindobonensis Heikertinger, 1914
Psylliodes wachsmanni Csiki, 1903
Psylliodes yalvacensis Gök, 2005
Sphaeroderma rubidum (Graells, 1858)

Subfamily HISPINAE Gyllenhal, 1813

(2 genera, 2 species)

Dicladispa testacea (Linnaeus, 1767)*Hispa atra* Linnaeus, 1767**Subfamily CASSIDINAE Gyllenhal, 1813**

(6 genera, 46 species)

Cassida algerica Lucas, 1849*Cassida atrata* Fabricius, 1787*Cassida azurea* Fabricius, 1801*Cassida bella* Faldermann, 1837*Cassida berolinensis* Suffrian, 1844*Cassida brevis* Weise, 1884*Cassida canaliculata* Laicharting, 1781*Cassida elongata* Weise, 1893*Cassida fausti* Spaeth & Reitter, 1926*Cassida flaveola* Thunberg, 1794*Cassida hablitziae* Motschulsky, 1838*Cassida hemisphaerica* Herbst, 1799*Cassida inquinata* Brullé, 1832*Cassida linnavuorii* Borowiec, 1986*Cassida margaritacea* Schaller, 1783*Cassida murraea* Linnaeus, 1767*Cassida murraea murraea* Linnaeus, 1767*Cassida nebulosa* Linnaeus, 1758*Cassida nobilis* Linnaeus, 1758*Cassida palaestina* Reiche, 1858*Cassida pannonica* Suffrian, 1844*Cassida parvula* Boheman, 1854*Cassida prasina* Illiger, 1798*Cassida reitteri* Weise, 1892*Cassida rubiginosa* Müller, 1776*Cassida rubiginosa rubiginosa* Müller, 1776*Cassida rufovirens* Suffrian, 1844*Cassida sanguinolenta* Müller, 1776*Cassida sanguinosa* Suffrian, 1844*Cassida saucia* Weise, 1889*Cassida seladonia* Gyllenhal, 1827*Cassida seraphina* Ménétériés, 1836*Cassida strejceki* Sekerka, 2006*Cassida stigmatica* Suffrian, 1844*Cassida subreticulata* Suffrian, 1844*Cassida vibex* Linnaeus, 1767*Cassida viridis* Linnaeus, 1758*Cassida vittata* Villers, 1789*Hypocassida cornea* (Marseul, 1868)*Hypocassida meridionalis* (Suffrian, 1844)*Hypocassida subferruginea* (Schränk, 1776)*Ischyronota deserterum* (Gebler, 1833)*Ischyronota jordanensis* Borowiec, 1986*Macromonycha anatolica* (Weise, 1900)*Macromonycha apicalis* (Gebler, 1845)*Macromonycha kantnerorum* Sekerka, 2008*Oxylepus deflexicollis* (Boheman, 1862)*Pilemostoma fastuosum* (Schaller, 1783)

* The preparation of the list is used Löbl & Smetana (2010) as the main references.

ACKNOWLEDGEMENTS

Thank to my student Gamze KAYA (Turkey) for her helps. This work supported by the projects by GAZİ UNIVERSITY (projects number BAP-05/2003-68 and 05/2006-52).

LITERATURE CITED

- Löbl, I. & Smetana, A. 2010. Catalogue of Palearctic Coleoptera, Volume 6, Chrysomeloidea, Apollo books, Stenstrup, Denmark, pp. 354-643.
- Özdikmen, H., Güven, M. & Turgut, S. 2007a. A review of the genus *Cheilotoma* Chevrolat, 1837 (Coleoptera: Chrysomelidae: Clytrinae) in Turkey with a new record, *Cheilotoma erythrostoma* Faldermann, 1837. Munis Entomology & Zoology, 2 (2): 525-532.
- Özdikmen, H., Güven, M. & Turgut, S. 2007b. Three interesting and unknown species for Turkish *Cryptocephalus* Geoffroy, 1762 (Chrysomelidae: Cryptocephalinae) with zoogeographical remarks. Munis Entomology & Zoology, 2 (2): 450-454.
- Özdikmen, H., Güven, M. & Turgut, S. 2007c. A study on *Cryptocephalus pseudoreitteri* Tomov, 1976 (Chrysomelidae: Cryptocephalinae) with allotype designation. Munis Entomology & Zoology, 2 (2): 493-498.
- Özdikmen, H., Güven, M. & Turgut, S. 2007d. Poorly known taxa for Turkish leaf beetles (Coleoptera: Chrysomelidae) with zoogeographical remarks. Munis Entomology & Zoology, 2 (2): 469-480.
- Özdikmen, H. & Okutaner, A. Y. 2007. Two interesting and unknown species for Turkish Clytrinae (Chrysomelidae) with zoogeographical remarks. Munis Entomology & Zoology, 2 (2): 445-449.
- Özdikmen, H. & Turgut, S. 2008. The subfamily Criocerinae of Turkey (Coleoptera: Chrysomelidae) with two new records and zoogeographical remarks. Munis Entomology & Zoology, 3 (1): 239-250.
- Özdikmen, H. 2009. First records of some leafbeetles for Mediterranean region in Turkey and south Turkey (Coleoptera: Chrysomelidae). Munis Entomology & Zoology, 4 (1): 276-279.
- Özdikmen, H., Turgut, S., Özbek, H. & Çalamak, S. 2010. A synopsis on Turkish *Clytra* Laicharting, 1781 (Coleoptera: Chrysomelidae). Munis Entomology & Zoology, 5 (1): 73-84.

**MURZINIA KARATAUENSIS, N. GEN., N. SP. (COLEOPTERA:
CERAMBYCIDAE: LAMIINAE: MONOCHAMINI)
FROM KAZAKHSTAN**

Maxim A. Lazarev*

* Bolshaia Serpuhovskaia str. 34, building 4, apartment 79, Moscow 115093 RUSSIA. E-mail: cerambycidae@fromru.com

[**Lazarev, M. A.** 2011. *Murzinia karatauensis*, n. gen., n. sp. (Coleoptera: Cerambycidae: Lamiini: Monochamini) from Kazakhstan. *Munis Entomology & Zoology*, 6 (2): 639-641]

ABSTRACT: *Murzinia*, gen. nov. is similar to *Monochamus* Dejean, 1821, but strongly differs by the presence of a row of semierect strong setae along ventral side of 3rd-4th antennal joints. *M. karatauensis*, sp. n. from north Karatau Ridge (South Kazakhstan) is totally brown with irregular white spots.

KEY WORDS: Coleoptera, Cerambycidae, *Murzinia*, new genus, new species, Kazakhstan.

The discovery of a new big Cerambycidae in Kazakhstan is quite unexpected and very interesting. *Murzinia karatauensis*, gen. nov., sp. nov. from North Karatau Ridge (South Kazakhstan) is not similar to any other taxon. The unique animal was preserved for many years in the collection of S. Murzin (Moscow) and now generously presented to the Zoological Museum of Moscow University.

DESCRIPTION

***MURZINIA*, gen. nov.**

Type species: ***Murzinia karatauensis*, sp. n.**

Eyes deeply emarginated, finally faceted (similar to *Monochamus*); apical palpi joints strongly elongated; female antennae longer than body; cicatrix strongly developed, totally closed; 3rd antennal joint is longer than 4th and much longer than 1st; 3rd-4th joints with a row of semierect strong short setae along ventral side (Fig. 2); a group of similar setae is situated near the apex of 1st joint; several scattered semierect setae present along ventral side of 5th-7th joints; apical 11th joint with a distinct distal contraction; prothorax transverse with very long and stout lateral spines not curved backwards; pronotum with well developed post-medial tubercle and two anterior convexities; prothoracic intercoxal process regularly convex; anterior coxal cavities closed; mesothoracic intercoxal process rounded apically, parallelsided; each elytron independently rounded apically; metathoracic episternae elongated, strongly narrowed; middle and hind tibiae with distinct lateral grooves; tarsal claws simple, without teeth, not divaricate.

One species known.

***Murzinia karatauensis*, sp. n.**

(Figs. 1-2)

Type locality. Kzyl-Orda Region, Chiili District, North Karatau Ridge, Daut Mountain.

Diagnosis. A single female known (Fig. 1); body totally red-brown including antennae and legs; head and thorax a little darker; head, thorax, abdomen and legs with fine white pubescence and scattered big dots surrounded by glabrous rings; frons subquadrate; genae about two times shorter than ventral eye lobe; the distance between dorsal eye lobes about equal to the width of the base of 1st antennal joint; antennae surpassing body by 4 apical joints; 1st joint strongly dilated apically, covered with fine white pubescence, with several big dots surrounded by glabrous rings; other joints without big dots and glabrous circles; prothorax about 1.3 times wider at base than long; pronotum with two big anterior spots of dense yellow setae, two small posterior spot and irregular lateral yellow areas; post-medial pronotal tubercle glabrous; scutellum triangular with very dense yellow pubescens; elytra about 2.1 times longer than wide; shining; with scattered regular punctation; dots are partly longitudinally arranged, without glabrous circles; fine pubescence partly condensed forming irregular white areas; two oblique diffused yellow stripes present near humery; 1st joint of hind tarsi about as long as 2nd and 3rd together and about equal to the last joint; 3rd joint about as long as wide, emarginated to about base, with elongated lobes; abdominal tergite slightly emarginated; last abdominal sternite truncated; body length: 28.3 mm; body width: 6.1 mm.

Distribution. Only one locality known in South Kazakhstan: Kzyl-Orda Region, Chiili District, North Karatau Ridge, Daut Mountain.

Material. Holotype, female with 2 labels: 1) [Kzyl-Orda Reg., Chiili Distr., North Karatau Ridge, near Daut Mt., 19.09.1964, I. Sukacheva] [in Russian]; 2) *Monochamus* sp. det. S. Murzin. The holotype is preserved in Zoological Museum of Moscow State University.

Etymology. The name of the new genus is dedicated to a well known Russian entomologist Sergey Murzin, who supplied me with the specimen for description. The species name formed on the base of the name of the native mountain system - Karatau.

ACKNOWLEDGEMENT

I am very grateful to Sergey Murzin for providing me with the specimen for study.



Figures 1-2. *Murzinia karatauensis*, **sp. n.** 1 - female, holotype; 2 - basal antennal joints.

AN ASSAY ON ZOOGEOGRAPHIC REGIONS OF THE EARTH: PALAEARCTIC LONGHORNED AND LEAF BEETLES SAY THAT ...

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE. E-mail: ozdikmen@gazi.edu.tr

[**Özdikmen, H.** 2011. An assay on zoogeographic regions of the Earth: Palaearctic longhorned and leaf beetles say that.... Munis Entomology & Zoology, 6 (2): 642-662]

ABSTRACT: The paper presents a different perspective on familiarities of zoogeographic regions of the earth based on Palaearctic Chrysomeloidea. Consequently, Manchurian subregion proposed as a separate zoogeographic region from Palaearctic.

KEY WORDS: Zoogeography, Manchurian, Palaearctic Chrysomeloidea.

Different parts of the earth are inhabited by different kinds of animals, or, in other words, by different faunas. At the present, the most widely accepted units of zoogeographic regionalization are realm, region, subregion, province, district and sector. In many cases, these differences, at any rate, are not due to differences of temperature, humidity or climate. It is true that temperature and humidity within the limits of the different zoological regions have had an important influence on the distribution of animals, and has resulted in certain cases in the formation of life-zones. However, the laws of temperature and humidity do not define transcontinental zones. These zones are secondary divisions of vertical life areas. These local restrictions of range have nothing to do with the wider problems of distribution.

The differences also do not depend on the distance of one place from another. When the boundaries are based on certain physcogeographic characteristics, sharp boundaries between these divisions occur, for example, the barriers formed by mountain ranges, the boundary between water and dry land, and sharp boundaries between natural regions. The greatest barriers of all are formed by the ocean and the larger rivers. Thus, zoological regions coincide to a considerable extent with the main geographical divisions of the earth. Hence it results that oceanic islands are usually devoid of such forms of life. The conditions of existence and the composition of the fauna in the sea and on land are so different. The distribution of freshwater fauna, however, is generally similar to that of terrestrial fauna. Hence it is subdivided according to the system used for terrestrial fauna. In the zoogeographic regionalization of the ocean, separate systems have been adopted, on the one hand, for the water strata and the sea bottom and, on the other hand, for each vertical zone.

As a general rule, the existence of nearly allied types of terrestrial animals in countries now separated by stretches of sea implies a former land connexion between them. In many cases, however, there are great difficulties in determining the nature of such connexions. Transitional areas that are different widths in general, between zoogeographic regions, and here the faunal elements such as species and species groups mix and overlap. So, the barriers to the free dispersal of terrestrial animals may be grouped under two main titles, namely, climatic and geographical, of which the second is more important. Also, the case with regard to geographical barriers to the free dispersal of terrestrial animals is very different. It

should be observed, however, that even these act with different degrees of intensity in the case of different groups.

The large and small faunal areas identified by zoogeographic regionalization differ in rank and in degree of endemism, as well as in the historical development of their faunas. The largest subdivisions (realms) are characterized by endemism of orders and by a large proportion of endemic forms, the regions by endemism of families, the subregions by endemism of genera, and the provinces by the presence of endemic species.

On the other side, the zoological regions indicated by the present geographical distribution of the former groups are very different from those suggested by the distribution of the earlier groups. In this case, the first question is that which animals (higher or lower animals) must be used for exact zoogeographic regionalization? As known, the lower animals (e.g. arthropods) are earlier than higher animals (e.g. birds or mammals). Some zoologists are argued that if zoological regions are based on the evidence of the existing distribution of animals, groups with a relatively late radiation are clearly to be preferred to those the dispersal of which was earlier. The higher animals, therefore, are of greater value from this point of view than the lower animals. But, further testimony in the same direction is afforded by the distribution of certain other groups, more especially spiders (Arachnida). It is also noteworthy that the distribution of the three main divisions of the human race accords to a certain extent with the boundaries of some of the zoological regions based on the distribution of the lower animals.

Zoogeography intimately connected with geography and geology. The division of earth into zoogeographical areas is based on zoogeographic data. Therefore, we can expect to understand and explain the present distribution of terrestrial animals only by taking into account what geology teaches us as to past changes in the configuration of the earth's lands, accompanied by investigations into the past history of animals themselves, as revealed by their fossil remains. It is essential to study fossil faunas to understand the reason of many facts in the present distribution of animals.

In the division of land on the earth into zones, the highest zoogeographic categories, the vertebrates (chiefly mammals) form the main groups according to the traditional acception. Three realms are usually distinguished, according to the presence or absence of representatives of certain subclasses of mammals: Notogea (comprising Australian region, with oviparous mammals, many marsupials, and few placental mammals); Neogea (consisting of Neotropical region, with no oviparous mammals and few marsupials) and Arctogea (comprising all other regions, with only placental mammals). This case is agreed with the findings in the present text.

Many different systems of zoogeographic subdivision of land into regions have been proposed from time to time.

In 1858, Dr. P. L. Sclater, who in a paper on the geographical distribution of birds, was enabled to define and name six of such zoological regions firstly. Two years later Dr. A. Rassel Wallace discussed in some detail the problems presented by the distribution of animals in the Malay Archipelago and Australasia. With some slight modifications, the names proposed for the six zoological regions by Dr. Sclater were adopted by Dr. Wallace. Certain changes in regard to the limits and number of the zoological regions adopted by Sclater and Wallace have been proposed. T. H. Huxley who has proposed more or less important modifications of the original scheme special mention may be made of Dr. W. T. Blanford, Dr. A. Heilprin, Prof. P. Matschie and Prof. Max Weber. The zoological regions proposed

by Dr. Sclater were based mainly on the distribution of the perching birds; but in the writings of Dr. Wallace and of later authors mammals were very largely taken into consideration, and in later schemes there has been a similarly extensive use of the evidence afforded by mammalian distribution.

The zoological regions recognized by Dr. A. R. Wallace in 1876, which are in the main identical with those proposed by Dr. P. L. Sclater in 1858, and are chiefly Regions, based on the distribution of birds and mammals, are as follows:

1. Palearctic, which includes Europe to the Azores and Iceland, temperate Asia from the high Himalaya and west of the Indus, with Japan, and China from Ningpo and to the north of the watershed of the Yang-tse-kiang; also North Africa and Arabia, to about the line of the tropic of Cancer.
2. Ethiopian, including Africa south of the tropic of Cancer, as well as the southern part of Arabia, with Madagascar and the adjacent islands.
3. Oriental or Indo-Malay, comprising India and Ceylon, the Indo-Chinese countries and southern China, and the Malay Archipelago as far as the Philippines, Borneo and Java.
4. Australian, composed of the remainder of the Malay Archipelago, Australia, New Zealand and all the tropical islands of the Pacific, as far east as the Marquesas and the Low Archipelago.
5. Neotropical, which comprises South America and the adjacent islands, the West Indies or Antilles, and Central America and Mexico?
6. Nearctic, consisting of temperate and arctic North America, with Greenland.

Emendations on the original scheme also included modifications in the limits of the regions themselves. In 1878, for instance, Dr. A. Heilprin (in accordance with a suggestion of Prof. A. Newton) proposed to unite the Nearctic with the Palearctic region under the name of Holarctic.

After all, it is clear that the main problem is "origin of life". With regard to the theory of the polar, the gradual dispersal of animals from the arctic regions, it may be briefly stated that the presumed series of radiations of life southward from the northern pole can have nothing to do with the present geographical distribution of animals. Since, we have abundant evidence that mammals have been spread over the whole of the warmer parts of the earth since, at any rate, the commencement of the Tertiary period, while the radiation of reptiles commenced at a much earlier epoch. The same problem is in the question also for equatorial approaches.

As known, multicellular life appeared firstly at the end of Proterozoic era in Precambrian Time (in Vendian period 560 million years ago) after primitive life in our planet. The radiations of these life forms and new multicellular life forms also appeared in Palaeozoic era. Shortly, the Palaeozoic era ("time of ancient life") lasted from 544 to 245 million years ago. It is divided into six periods as Cambrian (544 to 505 mya - Most major animal groups appear), Ordovician (505 to 440 mya - Massive marine life diversification), Silurian (440 to 410 mya - Life gains a foothold on land), Devonian (410 to 360 mya - "The Age of Fishes" - Colonization of the land), Carboniferous (360 to 286 mya - "The Age of Plants" - Reptiles and the amniotic egg appear) and Permian (286 to 245 mya - The formation of the supercontinent of Pangea). These 300 million years of the Paleozoic era realized many critical events, including the development of most invertebrate groups, life's conquest of land, the emergence of fish, reptiles, insects

(including grasshoppers, cockroaches, silverfish, termites, **beetles** and giant dragonflies) and vascular plants, the formation of the supercontinent of Pangea. Also importantly, there were also no less than two ice ages in the Palaeozoic. The Palaeozoic era was ended by the greatest mass extinction event in geologic history, the Permian/Triassic extinction, when some 95% of all marine species and 70% of all terrestrial organisms met extinction.

It is clear that the accumulated changes along the 300 million years and eventually the happened changes due to the formation of the supercontinent of Pangea caused major extinction of invertebrates (95% of all marine species and 70% of all terrestrial organisms). Therefore, I think that we must be urged the studies on events after the formation of Pangea to understand the reason of many facts in the present distribution of animals.



Map 1. Pangea (235 mya) (from: [http://en.wikipedia.org/wiki/File:Pangaea_\(230_million_years_ago\).png](http://en.wikipedia.org/wiki/File:Pangaea_(230_million_years_ago).png)).

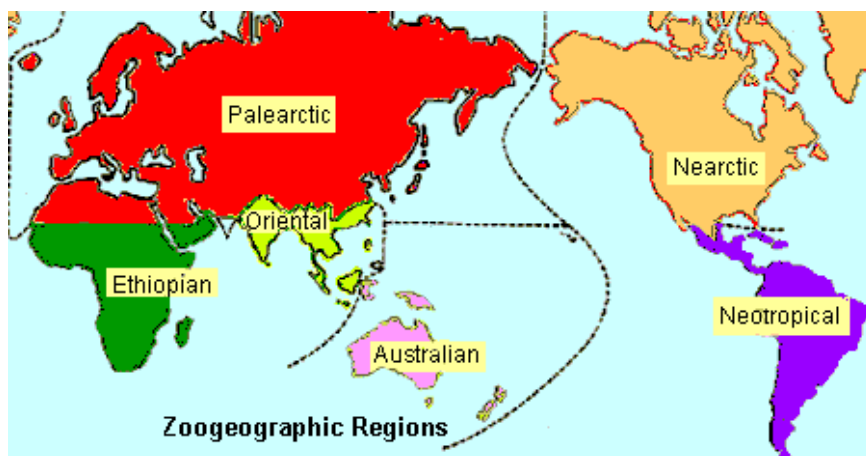
With respect to many facts, the mammals are the most useful among nonvolant terrestrial animals for exact zoogeographic regionalization on the earth. Since the first mammals appeared in Triassic period (245-208 mya) that was the beginning of the Mesozoic era. The second period of Mesozoic era is Jurassic period (208-146 mya) which was the first period to have birds. Simultaneously, modern insect forms and early mammals (placental animals) radiated in Crataceous period (146-65 mya) that is the third period of Mesozoic era. Tertiary period (65-1.8 mya) that is the first period of Cenezoic era, is split into 5 epochs. This period called as “mammals’ era”. Importantly, towards the end of this period, the ancestors of humans appeared in Africa. Quaternary is the last period (1.8 mya - today) of Cenezoic era. This period (modern time) called as “insects’ era”. They are dominant animal group today due to their accumulated

diversities on the earth over the millions years. It is believed there may be some 10.000.000 species of insects on Earth today (with beetles predominating).

Consequently, six zoogeographic regions are more or less generally accepted now:

1. Australian region (Australia and the Pacific islands)
2. Neotropical region (South and Central America)
3. Ethiopian region (Africa below the Sahara and Madagascar)
4. Oriental or Indo-Malay region (Hindustan, Indochina, Malay Archipelago)
5. Holarctic region (North America, Asia, excluding the area occupied by the Indo-Malay region, Europe, and North Africa, including the Sahara). The Holarctic region is sometimes divided into two regions:
 - 5.1. Nearctic (North America) and
 - 5.2. Palaearctic (the remaining parts)
6. Antarctic region (Antarctica and adjacent islands)

Among them, Holarctic fauna is the youngest, preserves features of the Pleistocene, while, the fauna of Australian region is the most ancient, preserves features of the Cretaceous.



Map 2. Zoogeographic regions.

The above map is based on animals, so it is a "zoogeographic" map. It shows the zoogeographic regions on earth according to traditional acceptance.

This time, however, is called "Insect era". When consider diversities of insects, they (nonvolant insects) are undoubtedly the most useful animal group to determine of real zoogeographic regions on earth. Unfortunately, whole insects of our planet have not been determined until now. On the other hands, some regional works on the earth have been published related to different insect orders. One of the studies was published by Löbl & Smetana (2010) for Palaearctic Region. In the present text, some zoogeographic remarks will present based on given information in Löbl & Smetana (2010) on Cerambycidae and Chrysomelidae.

Under these circumstances, we have to accept the traditional approaches about zoogeographic regions now.

So, to match my requirements, I have divided “Zoogeographic Regions” in 7 areas on the earth in accordance with the traditional acceptance:

- Australian
- Ethiopian
- Nearctic
- Neotropical
- Oriental
- Palaearctic
- Antarctic

Löbl & Smetana (2010) regarded Palaearctic region as larger than the traditional acceptance. Thereby, some parts of Ethiopian and Oriental regions according to the traditional acceptance were regarded by them in Palaearctic region. Australian, Nearctic and Neotropical regions are the same areas with the traditional acceptance.

According to Löbl & Smetana (2010), Palaearctic region is larger than the traditional acceptance. For the Palaearctic Catalogue, it includes European (whole Europe), Mediterranean (Southern Europe, Turkey, Caucasus, Iran, Afghanistan, Middle East, Saudi Arabia and Northern Africa), Siberian (whole Asia except China and Japan), Manchurian (China and Japan) areas and Pakistan, China, Nepal, Bhutan, Tibet, Southern Japanese Islands and Taiwan.

So, they gave 942 species of 9 subfamilies for Cerambycidae and 4149 species of 13 subfamilies for Chrysomelidae from Palaearctic-all other zoogeographic regions in their catalogue.

Palaearctic-all other zoogeographic regions (for Cerambycidae):

9 subfamilies, 942 species:

- subfamily Philinae** 3 species
- subfamily Disteniinae** 2 species
- subfamily Parandrinae** 1 species
- subfamily Prioninae** 54 species
- subfamily Lepturinae** 39 species
- subfamily Spondylidinae** 7 species
- subfamily Necydalinae** 1 species
- subfamily Cerambycinae** 347 species
- subfamily Lamiinae** 488 species

Palaearctic-all other zoogeographic regions (for Chrysomelidae):

13 subfamilies, 4149 species:

- subfamily Donaciinae** 12 species
- subfamily Criocerinae** 154
- subfamily Cryptocephalinae** 449 species
- subfamily Lamprosomatinae** 18 species
- subfamily Eumolpinae** 418 species
- subfamily Chrysomelinae** 215 species
- subfamily Galerucinae** 1008 species
- subfamily Alticinae** 1046 species
- subfamily Cassidinae** 506 species
- subfamily Sagrinae** 9 species
- subfamily Bruchinae** 254 species
- subfamily Zeugophorinae** 29 species
- subfamily Megalopodinae** 32 species

To match my requirements, I have divided the Palearctic Region in 4 areas now:

- European (whole Europe)
- Mediterranean (Southern Europe, Turkey, Caucasus, Iran, Afghanistan, Middle East, Saudi Arabia and Northern Africa)
- Siberian (whole Asia except China and Japan)
- Manchurian (China and Japan)

With regard to this, I determined 881 species of 9 subfamilies for Cerambycidae from Palearctic-all other zoogeographic regions according to the catalogue of Löbl & Smetana (2010).

Palearctic-all other zoogeographic regions (for Cerambycidae):

9 subfamilies, 881 species:

- subfamily Philinae** 4 species
- subfamily Parandrinae** 2 species
- subfamily Prioninae** 31 species
- subfamily Lepturinae** 82 species
- subfamily Spondylidinae** 18 species
- subfamily Necydalinae** 1 species
- subfamily Apatophyseinae** 3 species
- subfamily Cerambycinae** 304 species
- subfamily Lamiinae** 436 species

Also, I determined 1272 species of 13 subfamilies for Chrysomelidae from Palearctic-all other zoogeographic regions according to the catalogue of Löbl & Smetana (2010).

Palearctic-all other zoogeographic regions (for Chrysomelidae):

13 subfamilies, 1272 species:

- subfamily Donaciinae** 7 species
- subfamily Criocerinae** 41 species
- subfamily Cryptocephalinae** 96 species
- subfamily Lamprosomatinae** 5 species
- subfamily Eumolpinae** 107 species
- subfamily Chrysomelinae** 70 species
- subfamily Galerucinae** 319 species
- subfamily Alticinae** 337 species
- subfamily Cassidinae** 99 species
- subfamily Sagrinae** 4 species
- subfamily Bruchinae** 173 species
- subfamily Zeugophorinae** 5 species
- subfamily Megalopodinae** 10 species

The separation to the zoogeographic regions of the taxa is presented as follows:

I. AUSTRALIAN REGION:

Australian region is the same area according to both traditional acceptance and Löbl & Smetana (2010). So, they gave 13 species of 11 genera of 2 subfamilies for Cerambycidae and 35 species of 19 genera of 5 subfamilies for Chrysomelidae from Australian-Palearctic regions in their catalogue.

Australian-Palaeartic (for Cerambycidae): 2 subfamilies, 11 genera, 13 species:

subfamily Cerambycinae 5 genera 6 species

subfamily Lamiinae 6 genera 7 species

Australian-Palaeartic (for Chrysomelidae): 5 subfamilies, 19 genera, 35 species:

subfamily Chrysomelinae 1 genus 2 species

subfamily Alticinae 8 genera 16 species

subfamily Cassidinae 2 genera 2 species

subfamily Sagrinae 1 genus 1 species

subfamily Bruchinae 7 genera 14 species

To match my requirements, I have divided the Australian Region in 4 areas:

- Austro-Malayan
- Australian
- Polynesian
- New Zealand

According to the traditional acceptance, totally 7 species of 6 genera distributes in Australian region but not in Palaeartic region. So, only 6 species of 5 genera of 2 subfamilies for Cerambycidae are distributed in both Palaeartic and Australian regions.

Australian-Palaeartic (for Cerambycidae): 2 subfamilies, 5 genera, 6 species:

subfamily Cerambycinae 4 genera 5 species

subfamily Lamiinae 1 genera 1 species

For Chrysomelidae, the number of taxa is the same with that in Löbl & Smetana (2010) according to the traditional acceptance.

II. ETHIOPIAN (=AFROTROPICAL) REGION:

According to Löbl & Smetana (2010), the Afrotropical region (=Ethiopian region) includes only Africa and Madagascar except South of Saudi Arabia, Yemen, Oman and Arab Emirates. So, they gave 40 species of 28 genera of 3 subfamilies for Cerambycidae and 212 species of 73 genera of 8 subfamilies for Chrysomelidae from Ethiopian region (=Afrotropical region)-Palaeartic Region in their catalogue.

Ethiopian (=Afrotropical)-Palaeartic (for Cerambycidae):

3 subfamilies, 28 genera, 40 species:

subfamily Prioninae 6 genera 6 species

subfamily Cerambycinae 12 genera 15 species

subfamily Lamiinae 10 genera 19 species

Ethiopian (=Afrotropical)-Palaeartic (for Chrysomelidae):

8 subfamilies, 73 genera, 212 species:

subfamily Criocerinae 2 genera 2 species

subfamily Cryptocephalinae 11 genera 30 species

subfamily Eumolpinae 11 genera 22 species

subfamily Chrysomelinae 2 genera 2 species

subfamily Galerucinae 9 genera 14 species

subfamily Alticinae 18 genera 69 species

subfamily Cassidinae 9 genera 12 species

subfamily Bruchinae 11 genera 61 species

To match my requirements, I have divided the Ethiopian Region in 4 areas:

- East African (Central and East Africa + South of Saudi Arabia, Yemen, Oman and Arab Emirates)
- West African
- South African
- Malagasy (Madagascar)

With regard to this, I determined 73 species of 45 genera of 3 subfamilies for Cerambycidae and 141 species of 55 genera of 8 subfamilies for Chrysomelidae from Ethiopian (=Afrotropical)-Palearctic regions according to the catalogue of Löbl & Smetana (2010).

Ethiopian (=Afrotropical)-Palearctic (for Cerambycidae):

3 subfamilies, 45 genera, 73 species:

subfamily Prioninae 6 genera 7 species

subfamily Cerambycinae 21 genera 30 species

subfamily Lamiinae 18 genera 36 species

Ethiopian (=Afrotropical)-Palearctic (for Chrysomelidae):

8 subfamilies, 55 genera, 141 species:

subfamily Criocerinae 1 genus 1 species

subfamily Cryptocephalinae 11 genera 17 species

subfamily Eumolpinae 6 genera 11 species

subfamily Chrysomelinae 2 genera 2 species

subfamily Galerucinae 4 genera 6 species

subfamily Alticinae 14 genera 46 species

subfamily Cassidinae 6 genera 8 species

subfamily Bruchinae 11 genera 50 species

On the other side, totally 11 species of 10 genera distributes in Ethiopian region according to the traditional acceptance, but not in Palearctic region for Cerambycidae. So, 62 species of 35 genera of 3 subfamilies are distributed both Palearctic and Ethiopian regions.

Ethiopian (=Afrotropical)-Palearctic (for Cerambycidae):

3 subfamilies, 35 genera, 62 species:

subfamily Prioninae 6 genera 6 species

subfamily Cerambycinae 12 genera 21 species

subfamily Lamiinae 17 genera 35 species

III. NEARCTIC REGION:

Nearctic region is the same area according to both traditional acceptance and Löbl & Smetana (2010). So, they gave 31 species of 28 genera of 6 subfamilies for Cerambycidae and 92 species of 45 genera of 8 subfamilies for Chrysomelidae from Nearctic-Palearctic regions in their catalogue.

Nearctic-Palearctic (for Cerambycidae): 6 subfamilies, 28 genera, 31 species:

subfamily Parandrinae 1 genus 1 species

subfamily Prioninae 1 genus 1 species

subfamily Lepturinae 3 genera 3 species

subfamily Spondylidinae 2 genera 3 species

subfamily Cerambycinae 16 genera 18 species

subfamily Lamiinae 5 genera 5 species

Nearctic-Palaearctic (for Chrysomelidae): 8 subfamilies, 45 genera, 92 species:

- subfamily Criocerinae** 3 genera 3 species
- subfamily Eumolpinae** 3 genera 3 species
- subfamily Chrysomelinae** 11 genera 18 species
- subfamily Galerucinae** 3 genera 5 species
- subfamily Alticinae** 10 genera 33 species
- subfamily Cassidinae** 1 genus 2 species
- subfamily Bruchinae** 13 genera 28 species
- subfamily Zeugophorinae** 1 genus 1 species

To match my requirements, I have divided the Nearctic Region in 4 areas:

- Californian (only Western part of North America)
- Rocky Mountain (Central and Southern parts of North America)
- Allechamy (Central and Eastern parts of North America)
- Canadian (only whole Northern part of North America)

According to the traditional acceptance, all above mentioned taxa are distributed both Palaearctic and Nearctic regions.

IV. NEOTROPICAL REGION:

Neotropical region is the same area according to both traditional acceptance and Löbl & Smetana (2010). So, they gave 15 species of 14 genera of 4 subfamilies for Cerambycidae and 29 species of 16 genera of 3 subfamilies for Chrysomelidae from Neotropical-Palaearctic regions in their catalogue.

Neotropical-Palaearctic (for Cerambycidae): 4 subfamilies, 14 genera, 15 species:

- subfamily Spondylidinae** 1 genus 1 species
- subfamily Lepturinae** 1 genus 1 species
- subfamily Cerambycinae** 9 genera 10 species
- subfamily Lamiinae** 3 genera 3 species

Neotropical-Palaearctic (for Chrysomelidae): 3 subfamilies, 16 genera, 29 species:

- subfamily Chrysomelinae** 1 genus 1 species
- subfamily Alticinae** 3 genera 4 species
- subfamily Bruchinae** 12 genera 24 species

To match my requirements, I have divided the Neotropical Region in 4 areas:

- Ohilian (only Southern part of South America)
- Brazilian (Central and Northern parts of South America)
- Mexican (Western part of Central America)
- Antillean Eastern part of Central America)

On the other side, totally 1 species of 1 genus distributes in Neotropical region but not in Palaearctic region for Cerambycidae according to the traditional acceptance. So, 14 species of 13 genera of 4 subfamilies are distributed both Palaearctic and Neotropical regions.

Neotropical-Palaearctic (for Cerambycidae): 4 subfamilies, 13 genera, 14 species:

- subfamily Spondylidinae** 1 genus 1 species
- subfamily Lepturinae** 1 genus 1 species

subfamily Cerambycinae 8 genera 9 species

subfamily Lamiinae 3 genera 3 species

V. ORIENTAL REGION:

According to Löbl & Smetana (2010), the Oriental region includes India, Ceylon, Bangladesh, Myanmar (=Burma), Thailand, Laos, Vietnam, Cambodia, Malaysia, Philippines, Indonesia except Pakistan, China, Nepal, Bhutan, Thibet, Southern Japanese Islands and Taiwan. So, they gave 843 species of 248 genera of 8 subfamilies for Cerambycidae and 3781 species of 422 genera of 13 subfamilies for Chrysomelidae from Oriental-Palaeartic regions in their catalogue.

Oriental-Palaeartic (for Cerambycidae): 8 subfamilies, 248 genera, 843 species:

subfamily Philinae 1 genus 3 species

subfamily Disteniinae 1 genus 2 species

subfamily Prioninae 23 genera 47 species

subfamily Lepturinae 23 genera 35 species

subfamily Spondylidinae 3 genera 3 species

subfamily Necydalinae 1 genus 1 species

subfamily Cerambycinae 45 genera 298 species

subfamily Lamiinae 151 genera 454 species

Oriental-Palaeartic (for Chrysomelidae): 13 subfamilies, 422 genera, 3781 species:

subfamily Donaciinae 3 genera 12 species

subfamily Criocerinae 6 genera 149 species

subfamily Cryptocephalinae 27 genera 419 species

subfamily Lamprosomatinae 2 genera 18 species

subfamily Eumolpinae 48 genera 393 species

subfamily Chrysomelinae 26 genera 192 species

subfamily Galerucinae 130 genera 989 species

subfamily Alticinae 107 genera 924 species

subfamily Cassidinae 46 genera 490 species

subfamily Sagrinae 1 genus 8 species

subfamily Bruchinae 21 genera 127 species

subfamily Zeugophorinae 2 genera 28 species

subfamily Megalopodinae 3 genera 32 species

To match my requirements, I have divided the Oriental Region in 4 areas:

- Indian (Pakistan and India)
- Ceylonese (Southern India and Ceylon)
- Indo-Chinese (Bangladesh, Myanmar (=Burma), Thailand, Laos, Vietnam, Cambodia, Nepal, Bhutan, Southern Chinese provinces (North-West: Gansu, Nei Mongol, Xinjiang; South-West: Guizhou, Sichuan, Yunnan; South: Fujian, Guandong, Guangxi, Hainan), Southern Japanese Islands and Taiwan.)).
- Indo-Malayan (Malaysia, Philippines, Indonesia)

With regard to this, I determined 768 species of 304 genera of 9 subfamilies for Cerambycidae and 975 species of 240 genera of 13 subfamilies for Chrysomelidae from Oriental-Palaeartic regions in the catalogue of Löbl & Smetana (2010) according to the traditional acceptance.

Oriental-Palaeartic (for Cerambycidae): 9 subfamilies, 304 genera, 768 species:

- subfamily **Philinae** 2 genus 4 species
- subfamily **Parandrinae** 1 genus 1 species
- subfamily **Prioninae** 10 genera 24 species
- subfamily **Lepturinae** 39 genera 78 species
- subfamily **Spondylidinae** 7 genera 14 species
- subfamily **Necydalinae** 1 genus 1 species
- subfamily **Apatophyseinae** 1 genus 3 species
- subfamily **Cerambycinae** 97 genera 251 species
- subfamily **Lamiinae** 146 genera 392 species

Oriental-Palaeartic (for Chrysomelidae): 13 subfamilies, 240 genera, 975 species:

- subfamily **Donaciinae** 2 genera 7 species
- subfamily **Criocerinae** 5 genera 37 species
- subfamily **Cryptocephalinae** 14 genera 79 species
- subfamily **Lamprosomatinae** 1 genus 5 species
- subfamily **Eumolpinae** 29 genera 93 species
- subfamily **Chrysomelinae** 17 genera 47 species
- subfamily **Galerucinae** 74 genera 308 species
- subfamily **Alticinae** 53 genera 238 species
- subfamily **Cassidinae** 23 genera 87 species
- subfamily **Sagrinae** 1 genus 3 species
- subfamily **Bruchinae** 18 genera 57 species
- subfamily **Zeugophorinae** 1 genus 4 species
- subfamily **Megalopodinae** 2 genera 10 species

Among them, totally 393 species of 188 genera of 6 subfamilies for Cerambycidae distributes in Oriental region and only China in Palaeartic region.

China-Oriental (for Cerambycidae): 6 subfamilies, 188 genera, 393 species:

- subfamily **Philinae** 2 genus 4 species
- subfamily **Prioninae** 5 genera 9 species
- subfamily **Lepturinae** 21 genera 28 species
- subfamily **Spondylidinae** 4 genera 4 species
- subfamily **Cerambycinae** 67 genera 140 species
- subfamily **Lamiinae** 99 genera 248 species

Also among them, totally 569 species of 154 genera of 11 subfamilies for Chrysomelidae distributes in Oriental region and only China in Palaeartic region.

China-Oriental (for Chrysomelidae): 11 subfamilies, 154 genera, 569 species:

- subfamily **Donaciinae** 2 genera 2 species
- subfamily **Criocerinae** 3 genera 18 species
- subfamily **Cryptocephalinae** 7 genera 44 species
- subfamily **Lamprosomatinae** 1 genus 4 species
- subfamily **Eumolpinae** 18 genera 62 species
- subfamily **Chrysomelinae** 9 genera 21 species
- subfamily **Galerucinae** 64 genera 254 species
- subfamily **Alticinae** 33 genera 112 species
- subfamily **Cassidinae** 14 genera 40 species
- subfamily **Zeugophorinae** 1 genus 3 species
- subfamily **Megalopodinae** 2 genera 9 species

With respect to this, I determined 335 species of 8 subfamilies for Cerambycidae and 546 species of 13 subfamilies for Chrysomelidae from Oriental-Palaeartic regions except above mentioned China-Oriental taxa in the catalogue of Löbl & Smetana (2010) according to the traditional acceptance. So, ratio of the

species for Cerambycidae and Chrysomelidae is 51 % and 60 % of all determined species from Oriental-Palaeartic regions in the catalogue of Löbl & Smetana (2010) according to the traditional acceptance respectively. As a result of this, it is a clear that China is a specific area between Palaeartic and Oriental regions.

Oriental-Palaeartic except China-Oriental (for Cerambycidae):

8 subfamilies, 335 species:

- subfamily Parandrinae** 1 species
- subfamily Prioninae** 15 species
- subfamily Lepturinae** 50 species
- subfamily Spondylidinae** 10 species
- subfamily Necydalinae** 1 species
- subfamily Apatophyseinae** 3 species
- subfamily Cerambycinae** 111 species
- subfamily Lamiinae** 144 species

Oriental-Palaeartic except China-Oriental (for Chrysomelidae):

13 subfamilies, 546 species:

- subfamily Donaciinae** 5 species
- subfamily Criocerinae** 19 species
- subfamily Cryptocephalinae** 35 species
- subfamily Lamprosomatinae** 1 species
- subfamily Eumolpinae** 31 species
- subfamily Chrysomelinae** 26 species
- subfamily Galerucinae** 254 species
- subfamily Alticinae** 126 species
- subfamily Cassidinae** 47 species
- subfamily Sagrinae** 3 species
- subfamily Bruchinae** 57 species
- subfamily Zeugophorinae** 1 species
- subfamily Megalopodinae** 1 species

Consequently, shared taxa between Palaeartic region and all other zoogeographic regions according to the traditional acceptance can give chiefly as follows:

FOR CERAMBYCIDAE:

Australian-Palaeartic: 2 subfamilies, 5 genera, 6 species:

- subfamily Cerambycinae** 4 genera 5 species
- subfamily Lamiinae** 1 genus 1 species

Ethiopian (=Afrotropical)-Palaeartic: 3 subfamilies, 35 genera, 62 species:

- subfamily Prioninae** 6 genera 6 species
- subfamily Cerambycinae** 12 genera 21 species
- subfamily Lamiinae** 17 genera 35 species

Neartic-Palaeartic: 6 subfamilies, 28 genera, 31 species:

- subfamily Parandrinae** 1 genus 1 species
- subfamily Prioninae** 1 genus 1 species
- subfamily Lepturinae** 3 genera 3 species
- subfamily Spondylidinae** 2 genera 3 species
- subfamily Cerambycinae** 16 genera 18 species
- subfamily Lamiinae** 5 genera 5 species

Neotropical-Palaeartic: 4 subfamilies, 13 genera, 14 species:

- subfamily Spondylidinae** 1 genus 1 species
- subfamily Lepturinae** 1 genus 1 species
- subfamily Cerambycinae** 8 genera 9 species
- subfamily Lamiinae** 3 genera 3 species

Oriental-Palaeartic: 9 subfamilies, 304 genera, 768 species:

- subfamily **Philinae** 2 genera 4 species
- subfamily **Parandrinae** 1 genus 1 species
- subfamily **Prioninae** 10 genera 24 species
- subfamily **Lepturinae** 39 genera 78 species
- subfamily **Spondylidinae** 7 genera 14 species
- subfamily **Necydalinae** 1 genus 1 species
- subfamily **Apatophyseinae** 1 genus 3 species
- subfamily **Cerambycinae** 97 genera 251 species
- subfamily **Lamiinae** 146 genera 392 species

Among the zoogeographic regions, Oriental region shared the most number of **subfamilies** with Palaeartic region. Nearctic, Neotropical, Ethiopian and Australian regions follow it respectively.

Oriental-Palaeartic: 9 subfamilies, 304 genera, 768 species

Nearctic-Palaeartic: 6 subfamilies, 28 genera, 31 species

Neotropical-Palaeartic: 4 subfamilies, 13 genera, 14 species

Ethiopian (=Afrotropical)-Palaeartic: 3 subfamilies, 35 genera, 62 species

Australian-Palaeartic: 2 subfamilies, 5 genera, 6 species

Among the zoogeographic regions, Oriental region shared also the most number of **genera** and **species** with Palaeartic region. Ethiopian, Nearctic, Neotropical and Australian regions follow it respectively.

Oriental-Palaeartic: 9 subfamilies, 304 genera, 768 species

Ethiopian (=Afrotropical)-Palaeartic: 3 subfamilies, 35 genera, 62 species

Nearctic-Palaeartic: 6 subfamilies, 28 genera, 31 species

Neotropical-Palaeartic: 4 subfamilies, 13 genera, 14 species

Australian-Palaeartic: 2 subfamilies, 5 genera, 6 species

FOR CHRYSOMELIDAE:

Australian-Palaeartic: 5 subfamilies, 19 genera, 35 species:

- subfamily **Chrysomelinae** 1 genus 2 species
- subfamily **Alticinae** 8 genera 16 species
- subfamily **Cassidinae** 2 genera 2 species
- subfamily **Sagrinae** 1 genus 1 species
- subfamily **Bruchinae** 7 genera 14 species

Ethiopian (=Afrotropical)-Palaeartic: 8 subfamilies, 55 genera, 141 sp.:

- subfamily **Criocerinae** 1 genus 1 species
- subfamily **Cryptocephalinae** 11 genera 17 species
- subfamily **Eumolpinae** 6 genera 11 species
- subfamily **Chrysomelinae** 2 genera 2 species
- subfamily **Galerucinae** 4 genera 6 species
- subfamily **Alticinae** 14 genera 46 species
- subfamily **Cassidinae** 6 genera 8 species
- subfamily **Bruchinae** 11 genera 50 species

Nearctic-Palaeartic: 8 subfamilies, 45 genera, 92 species:

- subfamily **Criocerinae** 3 genera 3 species
- subfamily **Eumolpinae** 3 genera 3 species
- subfamily **Chrysomelinae** 11 genera 18 species
- subfamily **Galerucinae** 3 genera 5 species
- subfamily **Alticinae** 10 genera 33 species
- subfamily **Cassidinae** 1 genus 2 species
- subfamily **Bruchinae** 13 genera 28 species
- subfamily **Zeugophorinae** 1 genus 1 species

Neotropical-Palaeartic: 3 subfamilies, 16 genera, 29 species:

subfamily **Chrysomelinae** 1 genus 1 species

subfamily **Alticinae** 3 genera 4 species

subfamily **Bruchinae** 12 genera 24 species

Oriental-Palaeartic: 13 subfamilies, 240 genera, 975 species:

subfamily **Donaciinae** 2 genera 7 species

subfamily **Criocerinae** 5 genera 37 species

subfamily **Cryptocephalinae** 14 genera 79 species

subfamily **Lamprosomatinae** 1 genus 5 species

subfamily **Eumolpinae** 29 genera 93 species

subfamily **Chrysomelinae** 17 genera 47 species

subfamily **Galerucinae** 74 genera 308 species

subfamily **Alticinae** 53 genera 238 species

subfamily **Cassidinae** 23 genera 87 species

subfamily **Sagrinae** 1 genus 3 species

subfamily **Bruchinae** 18 genera 57 species

subfamily **Zeugophorinae** 1 genus 4 species

subfamily **Megalopodinae** 2 genera 10 species

Among the zoogeographic regions, Oriental region shared the most number of subfamilies, genera and species with Palaeartic region. Ethiopian, Nearctic, Australian and Neotropical regions follow it respectively.

Oriental-Palaeartic: 13 subfamilies, 240 genera, 975 species:

Ethiopian (=Afrotropical)-Palaeartic: 8 subfamilies, 55 genera, 141 species

Nearctic-Palaeartic: 8 subfamilies, 45 genera, 92 species:

Australian-Palaeartic: 5 subfamilies, 19 genera, 35 species:

Neotropical-Palaeartic: 3 subfamilies, 16 genera, 29 species:

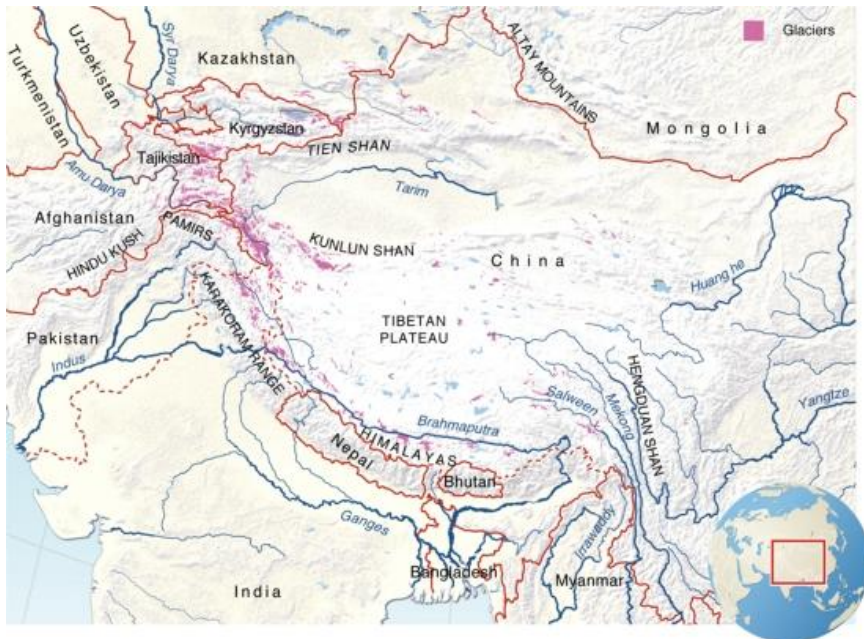
Normally, it should be expected that number of shared taxa must be the most between Nearctic region and Palaeartic region according to the traditional acception (Holarctic approach). However, Nearctic region situated in third line (mostly) or second line (one time) among the all other zoogeographic regions in our findings for Palaeartic longhorned and leaf beetles as seen above. It never situated in the first line.

Oriental-Palaeartic taxa even except Chinese taxa are still the first on account of taxa number (subfamilies, genera and species) among the other zoogeographic regions for both Palaeartic longhorned and leaf beetles.

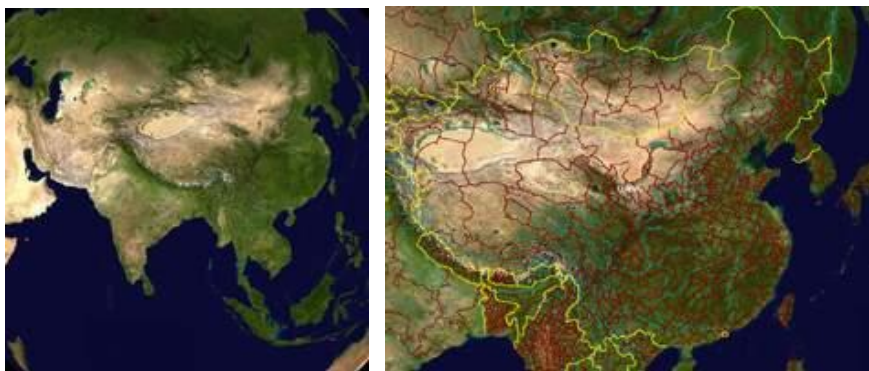
Finally, Palaeartic longicorn beetles say that “***we are the closest relatives with the taxa in Oriental region from the other regions (according to the number of subfamilies, genera and species). Nearctic, Neotropical, Ethiopian and Australian regions follow it (according to the number of subfamilies). Also Ethiopian, Nearctic, Neotropical and Australian regions follow it (according to the number of genera and species)***”.

Similarly, Palaeartic leaf beetles say that “***we are the closest relatives with the taxa in Oriental region from the other regions (according to the number of subfamilies, genera and species). Ethiopian, Nearctic, Australian and Neotropical regions follow it (according to the number of subfamilies, genera and species)***”.

After all, with regard to our findings, China has a very specific and important status in relationship between Palaearctic and Oriental regions as seen above. Since, there is no any good zoogeographic barrier between Palaearctic China and Oriental region such as Himalayas in Western Oriental region.



Map 3. Oriental-Palaearctic area (from <http://maps.grida.no/go/graphic/water-towers-of-asia-glaciers-water-and-population-in-the-greater-himalayas-hindu-kush-tien-shan-tib>).



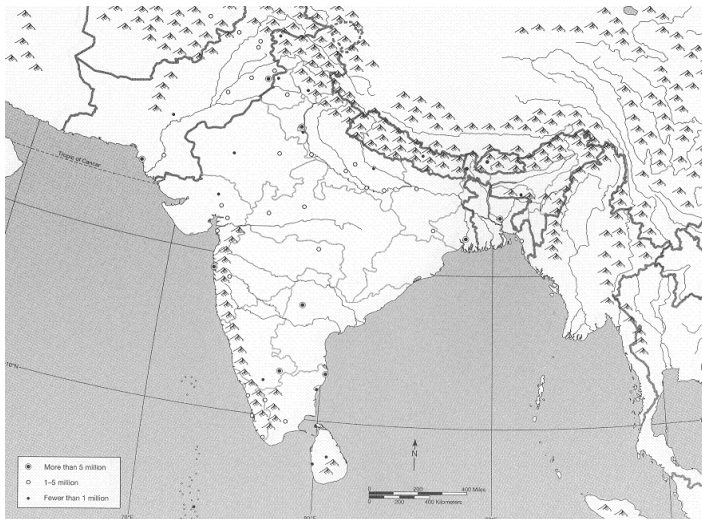
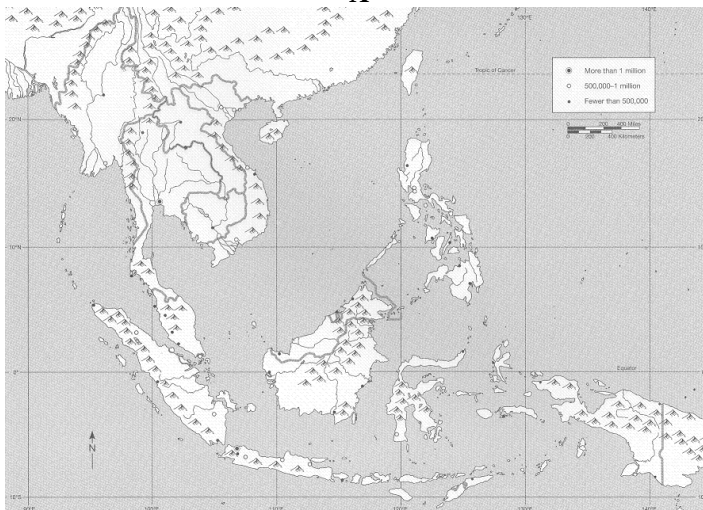
A

B

Map 4. A. Satellite map of Asia, B. Satellite map of China (from <http://www.motherplanet.com/satellite-map.htm>).

As known, Himalayas is a good zoogeographic barrier between Palaearctic and Oriental regions. Himalayas (Himalaya range or Himalaya Mountains) are connected with the countries Bhutan, China (Tibet), India, Nepal, Pakistan, Burma and Afghanistan. It separates the Indian subcontinent from the Tibetan

Plateau. By extension, it is also the name of a massive mountain system that includes the Karakoram, the Hindu Kush, and other, lesser, ranges that extend out from the Pamir Knot. However, Himalayas does not extend to whole territory of Southern China. On the other side, some of the world's major rivers feed by Himalayan glaciers as Ganges, Indus, Brahmaputra, Yangtze, Mekong, Salween, Red River (Asia), Xunjiang, Chao Phraya, Irrawaddy River, Amu Darya, Syr Darya, Tarim River and Yellow River. Some of them and others that are in China can be expected as barriers between Palaearctic China and Oriental region. Unfortunately, it is clear that they are not enough for an effective isolation between both regions.

**A****B**

Map 5. A. Western parts of Oriental region, B. Eastern parts of Oriental region (from: <http://www.uvm.edu/~cemorse/geography050/syllabus.html>)

Anyway, it is the question that **“Is China a transition zone between Palaearctic and Oriental regions?”** or ...

With respect to our findings, China and near have a very specific status for Palaearctic region. As known, the Palaearctic region shows wide fluctuations in physical and climatic features. So, it supports a good fauna. Palaearctic region has been divided into 4 subregions.

1. **European subregion:** Northern, Central and East Europe; Black Sea and Caucasus. It is represented by 85 families of vertebrates. Amphibians and Reptiles are represented with six families each. Myogale, only one genus of mammal is present. Bird like Tits, wagtails, mammals like wolf and moles are common in this subregion.
2. **Mediterranean subregion:** Remaining parts of Europe; North Africa and Arabian portions. 124 families of terrestrial vertebrates are present. Birds like Upupa and Pastor, mammals like elephant scurew, Hyaena and porcupine are seen in this subregion.
3. **Siberian subregion:** Northern Asia, Himalayas. 94 families of vertebrates are included in it. Families of Musk deer and Moles are confined to this subregion.
4. **Manchurian subregion:** Mongolia, Japan, Korea and Manchuria (China). Mammals like Tibetan Langur, Great Panda, Tufted deer, Chinese water deer are common.

After all, here is the real problem that **“Are China and near, namely, Manchurian zone a subregion or region?”** Interestingly, our findings in the text and known other evidences enforce to say us that China and near, namely, Manchurian zone which includes whole territory of China, Mongolia, Korea and Japan, can be evaluated as a separate region with respect to the Palaearctic Chrysomeloidea.

This approach supports the above “Satellite map of Asia and China” (Map 4). For this region, the main geographic barriers that form by mountain ranges are Himalayas, Tian Shan, Altai and probably Yablonovy, Stanovoy and Dzhugdzhur which last three are in South-Eastern parts of Russia. Baikal Lake probably is another natural barrier for the region. With the regard of geographic barriers, therefore, a small part of SE Russia and even Sakhalin and Kunashir islands can be in Manchurian region.

With regard to our subject, I believe that only a single understandable example about naturalness of our approach will suffice for the present work.

Dorcadiini, a group of nonvolant insects, majority of which are endemics for their inhabiting areas, and, can easily be accepted a rather characteristic animal group for Palaearctic region, can readily be supported this approach.

As known, this tribe includes 6 genera as *Dorcadion* Dalman, 1817; *Neodorcadion* Ganglbauer, 1884; *Trichodorcadion* Breuning, 1942; *Iberodorcadion* Breuning, 1943; *Eodorcadion* Breuning, 1947 and *Politorcadion* Danilevsky (1996) now. The genus *Trichodorcadion* from India

and Nepal in Oriental region was transferred in Dorcadiini by Danilevsky & Kasatkin (2006) on the base of endophallic characters.

The tribe Dorcadiini have Palaearctic (N Africa to China) and Oriental (India to Nepal) chorotypes now. Since, *Dorcasion* has Palaearctic chorotype (N Africa to China), *Neodorcasion* has W-Palaearctic chorotype (Italy to Turkey, Ukraine and Moldova), *Trichodorcasion* has Oriental chorotype (India and Nepal), *Iberodorcasion* has European (chiefly Iberian) chorotype (Spain to Poland and Latvia), *Eodorcasion* has E-Palaearctic chorotype (Russia, Siberia, Mongolia, and China) and *Politodorcasion* has Asian chorotype (Kazakhstan, W Siberia and China).

In consequence four genera, namely, *Dorcasion*, *Trichodorcasion*, *Eodorcasion* and *Politodorcasion* occur also out of Palaearctic region when we accept Manchurian zone as a separate region. Dorcadiini is represented only by 1 genus as *Trichodorcasion* in Oriental region (only in India and Nepal), and by three genera as *Dorcasion*, *Eodorcasion* and *Politodorcasion* in Manchurian region (only in Mongolia and China).

Dorcadiini, on the other side, is represented only by 1 genus as *Eodorcasion* and its 2 species in Far East Russia normally.

It is represented only by 1 genus as *Eodorcasion* in Mongolia too.

It is represented by 2 genera as *Dorcasion* and *Eodorcasion* in China (mostly in NW China related with Kazakhstan).

Conspicuously, Korea, Japan and, Sakhalin and Kunashir islands, in which absent any member of Dorcadiini, are still accepted in Palaearctic region now.

Hence, it should be stated that the tribe Dorcadiini originated in Palaearctic region, and happened a rather characteristic animal group for the region. Then, their distribution areas enlarged over time. Later, they overcame the natural barriers, and finally they evolved and changed more or less in their new habitats within the other regions. So, they became into new species and even new genera like *Trichodorcasion* and, *Eodorcasion*.

Accordingly, *Eodorcasion* originated in Manchurian region, while *Trichodorcasion* originated in Oriental region.

Politodorcasion occurs only in China among the Manchurian countries. It is represented only by a few species in China. Most of the species of the genus are distributed in Kazakhstan. So, *Politodorcasion* has still Palaearctic chorotype chiefly.

Finally, I propose the Manchurian zone as a new zoogeographic region not subregion now. Anyway, the Manchurian region has natural boundaries and separates by geographic barriers that are the mountain ranges as Himalayas, Tian Shan, Altai and probably Yablonovy, Stanovoy and Dzhugdzhur, and probably Baikal Lake (please see Map 4 and the following maps).

Hence Manchurian region probably includes the whole territories of Mongolia, Korea, Japan, China, Sakhalin island, Kunashir island and a small part of SE Russian Far East (including Buryatia, Chita, Amur and S Khabarovsk).

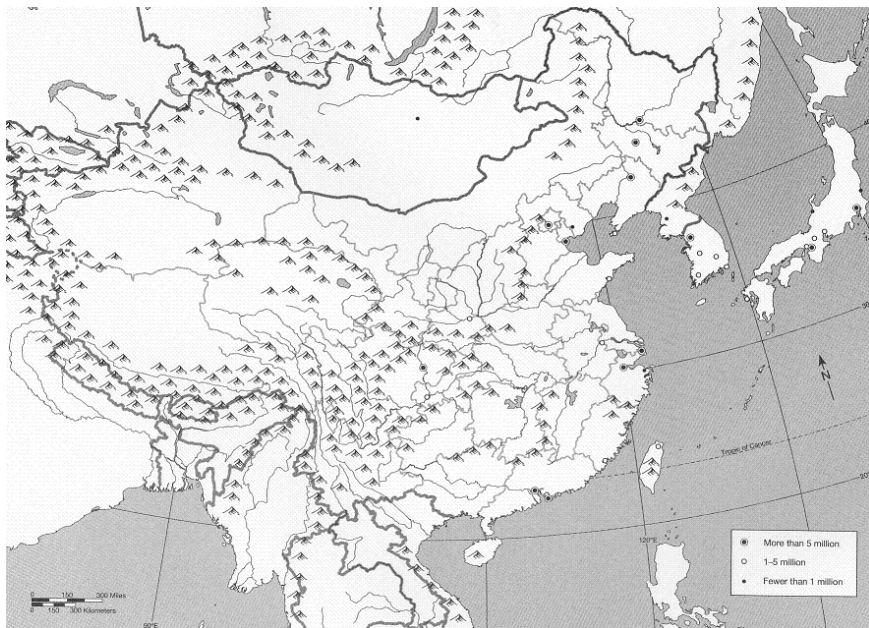


A



B

Map 6. Manchurian region (from: http://maps.google.com/maps?hl=tr&biw=1003&bih=371&rlz=1W1SUNC_tr&q=Asia+topographic+map&wrapid=tlif129759376901531&um=1&ie=UTF-8&hq=&hnear=Asia&gl=tr&t=p&ei=p7VXTb_IFcnHsgb92bWlCw&sa=X&oi=geocode_result&ct=image&resnum=1&ved=0CBsQ8gEwAA).



Map 7. Manchurian region (from: <http://www.uvm.edu/~cemorse/geography050/syllabus.html>).

ACKNOWLEDGEMENTS

Thank to my student Gamze KAYA (Turkey) for her helps.

LITERATURE CITED

- Danilevsky, M. L. & Kasatkin, D. G.** 2006. Further investigation of Dorcadionini (Coleoptera: Cerambycidae) endophallus with a revision of taxonomical position of the genus *Trichodorcadion* Breuning, 1942. *Russian Entomol. J.*, 15 (4): 401-407.
- Löbl, I. & Smetana, A.** 2010. Catalogue of Palearctic Coleoptera, Volume 6, Chrysomeloidea, Apollo boks, Stenstrup, Denmark, pp. 354-643.

**REMARKS ON THE TYPE MATERIAL OF SOME
CERAMBYCIDAE FROM IRAN DESCRIBED BY M. PIC
(COLEOPTERA: CERAMBYCIDAE)**

Gianfranco Sama*

* Via Raffaello Sanzio 84, I-47023 Cesena, ITALY. E-mail: francosama@gmail.com

[Sama, G. 2010. Remarks on the type material of some Cerambycidae from Iran described by M. Pic (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 6 (2): 663-672]

ABSTRACT: The type series of *Apatophysis* (*Angustephysis*) *richteri* Pic, 1956, *Osphranteria lata* Pic, 1956 (= *O. richteri* Heyrovský, 1959), *Purpuricenus schauffelei* Pic, 1956 and *Derolus mauritanicus iranensis* Pic, 1956 (= *Derolus mauritanicus iranensis* Lepesme & Breuning, 1958) (lectotype and paralectotypes designated) are examined and depicted. *Apatophysis richteri* is regarded as a synonym of *A. modica* Gahan, 1906.

KEY WORDS: Cerambycidae, Iran, *Apatophysis*, *Osphranteria*, *Purpuricenus*, *Derolus*, new synonymy, lectotype, paralectotypes.

During two expeditions to Iran (1954 and 1956) (Richter, 1956, 1961; Roselaar & Aliabadian, 2007) the German zoologist Willi Richter together with Friedrich Schäuffele collected, among others, some interesting beetles belonging to the family Cerambycidae. This material, preserved in the entomological collection of the Staatliches Museum für Naturkunde in Stuttgart (Germany) was entrusted for identification to Stephan Breuning, the well known specialist of Cerambycidae Lamiinae, who submitted a part of the Cerambycinae to Marcel Pic. This is proved by the sentence written by the French specialist M. Pic in a paper where he described five new taxa based on this material ("*Cette espèce [Apatophysys richteri n. sp.] et les longicornes suivants m'ont été communiqués par le Dr. Breuning. Les types sont au Musée de Stuttgart*") (Pic, 1956). However, the material was also studied, at least in part, by Breuning himself who, in collaboration with the French entomologist Pierre Lepesme, described a new species of *Derolus* Gahan, 1891 (Lepesme & Breuning, 1958). The Czech Cerambycid specialist Leo Heyrovský (Heyrovský, 1959) revised the previous identifications and described a new subspecies of the prionine beetle *Acanthophorus rugiceps* (Gahan, 1906) and a new species of *Osphranteria* Redtenbacher, 1850; both the new *Derolus* and the new *Osphranteria* are currently recognized as synonyms of taxa previously described by Pic. Finally, all specimens were studied and correctly identified by C. Holzschuh who, however, did not publish any remark on this proposal. Thanks to Dr. W. Schawaller I was able to study the Cerambycidae which will be discussed in the present paper. It should be noted that most of total length measurements of beetles given by Pic for the new taxa are wrong as well as those of antennal segments. This may be due to the age of Pic who, at that time, was 91 years old (he died in 1957).

***Apatophysis* (*Angustephysis*) *richteri* Pic, 1956
(Fig. 1, 2, 10)**

Apatophysis (*Angustephysis*) *richteri* Pic, 1956, Echange, 72, n° 543: 2. Type locality: Iran, Belouchistan: Kuh-I-Taftan Ostseite.

Apatophysis richteri: Danilevsky, 2006: 8.

Apatophysis (*Angustephysis*) *richteri*: Danilevsky, 2008: 36.

= *Apatophysis modica* Gahan, 1906 (**syn. n.**).

Original description

"Étroit et allongé, peu brillant, revêtu d'une pubescence fine et courte grisâtre, de coloration générale testacée avec l'avant-corps un peu roussâtre. Tête avec les yeux nettement olus large que le thorax, yeux grands et saillants, un peu écartés, celle-ci densément ponctué. Antennes grêles, bien plus longues que le corps, filiformes, à articles 3 et 4 longs, à peu près égaux, les suivants diversement plus longs. Thorax assez court et peu large, plus étroit en avant, nettement angulé de chaque côté près du milieu, inégal en dessus, plutôt densément ponctué. Elytres bien plus larges que le thorax, assez longs, atténué postérieurement, subarrondis à l'apex, très finement et densément ponctués. Pattes longues et grêles, tarsi compris. Long. 15 mill. Iran, Belouchistan (W. Richter). Se rapproche vaguement de *tonkinea* Pic par la structure de son thorax, mais avec une forme tout autre, très étroite et une coloration plus claire. Sans doute voisin de *modica* Gahan ". Espèce pouvant se classer dans un s.g. nouveau (*Angustephysis*) caractérisé par sa forme étroite, sa tête tout à fait large par rapport au thorax qui est court et assez étroit et les tarsi tout à fait grêle".

Type material

The original description did not mention the type series which, however, was evidently based on a single specimen. The holotype is a male (Fig. 1, 2), 12 mm in length (not 15 mm as given by Pic), in good condition and corresponding to the description except the body length and the length ratio of 3rd and 4th antennal segments, which are not similar in length as written ("à peu près égaux"), but the 4th is evidently longer than 3rd. The specimen bears the following labels (Fig. 10): "Kuft i Taftan Osteite / 2300–3000m, 10-12.VI.1954 / W. Richter leg." [blue, printed]; "Apatophysis / richteri n.sp." [whitish, handwritten by Pic]; "Holotypus" [recent, printed]; "Apatophysis modica / det. Dr. L. / Heyrovský" [white handwritten]; "Compared with ♂ type / Apatophysis / modica Gahan / ex coll. British Museum / det. C. Holzschuh 1987" [white, original, handwritten].

DISCUSSION

According to Danilevsky (2006), who evidently was unable to study the type specimen (he gave 15,7–15,8 as the body length of specimens examined by him and 15 mm for the original description), *A. richteri* is a distinct species similar to *A. farsicola* Sama, Fallahzadeh & Rapuzzi, 2005 and to *A. danczenkoi* Danilevsky, 2006. This is not correct: as already stated by Heyrovský and Holzschuh (see labels, Fig. 10), *A. richteri* is an obvious synonym of *A. modica* Gahan, 1906 (Fig. 3), which strongly differs from *A. farsicola* by head with much bigger eyes, pronotum distinctly longer than wide, elytra elongate (2,5 times longer than wide at its base), tarsi conspicuously elongate and slender (2nd segment of front tarsi 2,5 times longer than wide), antennae slender and much longer than body, surpassing elytral apices with 3,5 segments. In *A. farsicola* (Fig. 4) the body is much stouter and the appendages much shorter; it has pronotum transverse, elytra much shorter (about 1,5 times longer than wide at its base), tarsi very short (the 2nd segment of front tarsi is 1,4 times longer than wide), antennae slightly longer than body. The only character shared by these species is a brush of short setae clothing the internal side of tibiae (see Danilevsky, 2008, fig. 16k), which, however, is very distinct in *A. modica* but reduced and sometimes indistinct in *A. farsicola*.

Regarding the new subgenus *Angustephysis*, introduced by Pic for the new species *A. richteri* (= *A. modica*), it has been regarded of doubtful value by Danilevsky (2006) ("I am not ready to accept the new subgenus because generally *A. richteri* is not far from *A. farsicola* and *A. danczenkoi* being a transition to *A. modica*"), but it was accepted by Danilevsky (2008) who included

in it, besides the Iranian species *A. farsicola* and *A. danczenkoi*, also *A. margiana* Semenov & Shchegoleva-Barovskaya, 1936 from Central Asia (Kazakhstan, Turkmenistan and Uzbekistan). The Russian specialist, in a key to the *Apatophysis* of Russia and adjacent regions (Danilevsky, 2008: 41) proposed to distinguish *Angustephysis* from *Apatophysis* s. str. by “all tibiae with setae brushes along internal side – distinct structure of very short and dense; middle and hind tibiae more or less curved and dilated distally”. The true value of this subgenus is rather doubtful and it is evidently not natural. The brush on tibiae (see Danilevsky, 2008: fig. 16, 16k) occurs in species (*A. farsicola* and *A. modica*) which are evidently unrelated to each other and, as written above, it is sometimes indistinct. The middle and hind tibiae are distinctly curved and dilated distally only in *A. margiana* (Danilevsky, 2008, fig. 16j), but certainly not curved and not dilated in *A. farsicola* and very slightly dilated in *A. modica*. Moreover, as written by Danilevsky (2008: 9) middle and tibiae are sometimes curved also in *A. sieversi* Ganglbauer, 1887, referred by him to *Apatophysis* s. str..

***Osphranteria lata* Pic, 1956**

(Fig. 5, 11)

Osphranteria lata Pic, 1956, Echange, 72, n° 543: 2. Type locality. Iran, Belouchistan: 36 km nördl. Iranshahr, Hang d. Kalang, 900m, leg. Richter & Schäuffele.
= *Osphranteria richteri* Heyrovský, 1959, Stuttg. Beitr. Naturk., 25: 4. Loc.typ.: Belutschistan, 36 km nördl. Iranshar, Hängen d. Kalang m. 900, synonymy in Podany, 1978.

Pic's Original description of *O. lata*

"Un peu large, atténué à l'extrémité, légèrement brillant, à fine et courte pubescence grise, bleu, un peu verdâtre par places, membres noirs. Tête à museau assez court, à ponctuation ruguleuse forte et dense, yeux écartés; antennes filiformes, un peu plus longues que le corps, à 3e article très long. Thorax plus long que large, rétréci en avant et en arrière, à ponctuation granuleuse dense et forte, plus étroit que les élytres. Ecusson triangulaire. Elytres pas très longs, progressivement atténués postérieurement, subarrondis à l'apex, à ponctuation dense et très fine, sauf sur la base, où elle est plus forte, avec des traces de costules discales. Pattes longues, les antérieures plus courtes avec les cuisses un peu épaissies. Long. 25mill. Iran (Richter et Schäuffelé). – Diffère de *coerulescens* Redt. par la forme plus robuste et l'aspect moins terne“.

Heyrovský's original description of *O. richteri*

“*Osphranteria richteri* n. sp. (*lata* Pic in litt.).

♀. Dunkel blaugrün mit violetten Schein, Fühler und Füße schwarz. Oberseite des Körpers, besonders des Halsschildes, glänzend, sehr fein, dicht anliegend silberweiss behaart. Kopf dicht, stark runzelig, punktiert, Augenoben voneinander entfernt, die unteren Loben gross, kugelig, sehr fein facettiert. Wangen sehr kurz. Halsschild nach hinten stumpf abgerundet, hinter der mitte am breitesten, mit stumpfem Seitenhöcker, dann plötzlich verengt, hinter dem Vorder- und vor dem Hinterrand mässig eigenschnurt, an der Oberfläche gross, ziemlich dicht runzelig punktiert, die Zwischenräume in der Mitte breiter als die Punkte selbst, an der Basis und vor der Spitze quengerunzelt. Schildchen dreieckig, dicht und ziemlich gross punktiert, mit einer feinen Mittelfurche, Flügeldecken 3 ½ länger als an der Basis breit, da merklich breiter als der Halsschild an breiter Stelle, im Basalviertel dicht, gross runzelig, nach hinten allmählich viel feiter punktiert, an der Spitze einzeln abgerundet, sehr fein, dicht anliegend grau behaart, an der Spitze dicht, kurz, dunkel bewimpert, mit zwei sehr feinen Längslinien in der Mitte der Decke. Vorderbrust dicht runzelig, die übrige Unterseite sehr fein und dicht punktiert. Pygidium lang bewinpert. Fühler erreichen die Flügeldeckenspitze, ihr erstes Glied ist gross runzelig punktiert, glänzend und spärlich bewimpert, vom dritten Glied angefangen sind sie sehr fein und dicht grau anliegend behaart. Hinterschenkel erreichen nicht die Spitze der Flügeldecken.

Länge 18mm, Breite 4mm. ♂ unbekannt.

1 Exemplar aus Iran: Belutschistan, 36 km nördlich von Iranshar, an den Hängen des Kalang in 900 m Höhe, 14.IV.1954 von W. Richter und Dr. Schäuffele erbeutet. Holotyp in den Sammlungen des Staatlichen Museums für Naturkunde in Stuttgart. Zu Ehren des Herrn Willi Richter benannt“.

Type material

As usual, Pic's original description did not mention the type series which, however, was evidently based on a single specimen. The holotype is a male (Fig. 5), 19 mm in length (not 25 mm as given by Pic), in very good condition, but hind legs missing, labelled as follows (Fig. 11): "Iran, Belutschistan / 36 km nördl. Iranshar / Hang d. Kalang, 900m / 19.IV.1954 / Richter u. Schäuffele [blue, printed] "Osphranteria / lata n. sp. " [whitish, handwritten by Pic]; "Osphranteria / richteri m. / Typus ♀" / det. dr. L. / Heyrovský".

This specimen is, in fact, also the holotype of *Osphranteria richteri* Heyrovský, 1959, who, maybe deceived by the relatively short antennae, regarded the holotype as a female.

Purpuricenus schauffelei Pic, 1956

(Fig. 6, 7, 12, 13)

Purpuricenus schauffelei Pic, 1956, Echange, 1956, Echange, 8 n° 543: 3. Type locality: Iran, Belutschistan, 36km nördl. Iranshar: Hang d. Kalang.

= *Purpuricenus zarudnianus* Semenov 1903, Rev. Russe Entom., 3: 358.

Original description

"Assez robuste, peu allongé, presque opaque, noir, tête en partie rouge postérieurement, thorax entièrement rouge, élytres rouges ayant une bande basale noire peu large et presque droite, postérieurement avec la partie apicalement largement noire et subarquée antérieurement. Tête plus étroite que le corps. Thorax peu long et assez large, très faiblement tuberculé, à ponctuation ruguleuse forte et dense. Elytres peu plus large que le thorax, assez courts, un peu élargis vers les épaules, à apex faiblement subtronqué, à ponctuation granuleuse peu forte et dense. Long. 15 mill. Iran. Voisin de *Haussknechti* White, en diffère par le thorax entièrement rouge, les dessins noirs des élytres différents, non prolongés sur la suture".

Type material

The Staatliches Museum für Naturkunde in Stuttgart sent to me 3 specimens: 2 males, 16,5 mm and 12 mm long respectively, and 1 female, 12 mm long. The original description did not mention the type series, but Pic gave a single body length (15 mm, a wrong size as usual in this paper) therefore it is clear that he studied only the bigger male specimen. The holotype is a male, 16,5 mm long, well preserved and recognizable, two last segments of the left antennae missing, labelled as follows (Fig. 12): "Iran, Belutschistan / 36km nördl. Iranshar / Hang d. Kalang, 900m / 19.IV.1954 / Richter u. Schäuffele" [blue, printed] "*Purpuricenus / schauffelei* n. sp." [whitish, handwritten by Pic]; "*Purpuricenus / zarudnianus* / a. *bicoloriceps* / Sem. / det. dr. L. / Heyrovský" [white, handwritten by Heyrovský]; " ? type" [red, handwritten by ?]. The second male bears the following labels (Fig. 13): "Iran, Belutschistan / südöstl. Iranshar / Hamant Kuh / 12.III.1954 leg. / Richter u. Schäuffele [blue, printed]; "*Purpuricenus / schauffelei* / Pic / Paratyp / Breuning det." [handwritten by Breuning]; "*Purpuricenus / zarudnianus* / a. *bicoloriceps* / Sem." [handwritten by Heyrovský]; "*Purpuricenus / zarudnianus* / Sem. / C. Holzschuh det. 1983" [handwritten by Holzschuh]; this specimen cannot obviously be regarded as paratype despite the Breuning's label. The female is labelled as follows: "S. O. Iran [Djiroft] Anbar

Abad / 21.-30.IV.1956 / W. Richter leg." [blue, printed]; "*Purpuricenus / zarudnianus* / Sem. ♀ / det. dr. L. / Heyrovský" [handwritten by Heyrovský].

***Derolus iranensis* Pic, 1956**

(Fig. 8, 9, 14, 15)

Derolus mauritanicus subspec. *iranensis* Pic, 1956, Echange, 8 n° 543: 3. Type locality: Iran: Granshar [= Iranshar].

= *Derolus mauritanicus* sbspec. *iranensis* var. *angustior* Pic, 1956, Echange, 8 n° 543: 3. Type locality: Iran: Makran (not available, infrasubspecific).

= *Derolus mauritanicus* ssp. *iranensis* Lepesme & Breuning, 1958, Proc. 10th Int. Congr. Entomol., 1 (1956): 179 (foot note). Type loc.: Iran, Makran, Sud-est de Nahu (Mus. Stuttgart) (synonymy in Holzschuh, 1993).

Derolus mauretanicus iranensis: Fuchs, 1967: 433.

Derolus iranensis Pic: Holzschuh, 1993, Fauna Saudi Arabia, 13 : 118.

Derolus zarudnyi Sem. et Plav. in litt.: Heyrovský, 1940: 846.

Pic's original description

"Allongé, assez étroit, brillant, revêtu d'une fine pubescence soyeuse grise, noir à transparence roussâtre sur la majeure partie du corps, membres roux. Tête avec les yeux un peu plus large que la partie antérieure du thorax, diversement granuleuse ou ponctuée, sillonnée entre les yeux; antennes pas plus longues que le corps, à 4^e article plus court que 3 et 5, les premiers étant un peu noduleux au sommet et les suivants un peu élargis et subangulés au sommet extérieurement. Thorax long, plus étroit en avant, sinué latéralement, faiblement, mais nettement incisé près de la base de chaque côté, inégal en dessus et orné de quelques plis raccourcis, sillonné transversalement en avant, en partie impressionné sur son milieu et sur les côtés, bien plus étroit que les élytres. Elytres assez longs, subparallèles, un peu atténués à l'extrémité, faiblement tronqués au sommet. Long. 20-21 mill. Iran, à Granshar (Richter et Schauffele). Un paratype dans ma collection. Distinct de *mauretanicus* Buq. par la forme plus allongée, le thorax plus étroit, la taille moindre.

La var. nouvelle *angustior* (ex unique de Makran) est très étroite, plus petite de taille, en ayant la tête sans sillon apparent et le prothorax à échancrure postérieure nulle. Long. 14 mill. "

Lepesme & Breuning's original description

"[...] Differt de la forme typique par le disque du pronotum plus faiblement ridé et la ponctuation élytrale très fine mais pourtant beaucoup plus distincte. Type d'Iran: Makran, Sud-est de Nahu, 1300 m., 29 et 26.III.54, leg. Richter et Schäuffele au Musée de Stuttgart. Quatre paratypes de même provenance, ou de Belutschistan, Iranshahr, 800 m, 11-18-III-54, leg. Richter et Schäuffele au Musée de Stuttgart et dans la coll. Lepesme ".

It is uncertain how many specimens there were in total, but it is clear that at least three were examined by Pic: one must be a female ("*antennes pas plus longues que le corps*"), a second specimen (sex not stated) retained in his personal collection and a smaller one described as "*var. nouvelle angustior, ex. unique de Makran*". Moreover, Pic gave three different (wrong) measures (20, 21 and 16 mm as body length).

I received the following six specimens, four males and two females, all in good condition, none of them bearing Pic's identification label and only one bearing the Breuning's label.

1♂: 18 mm long, "Iran Belutschistan / Iranshahr 800m. / 1.10.III.1954 / Richter & Schäuffele (blue, printed); "*Derolus / mauritanicus / iranensis* Br. / et Lep. dr. L. Heyrovský det. [handwritten by Heyrovský]; "? type" (red, handwritten by ?) (Fig. 9, right, 15);

1 ♂: 15 mm long, left antennae glued to the head: "Iran Belutschistan / Iranshahr 800m. / 11.21.IV.1954 / Richter & Schäuffele (blue, printed); "? type" (red, handwritten by ?];

1 ♂: 16 mm long, middle left leg and last three segments of left antenna missing: "Iran Belutschistan / Iranshahr 800m. / 11.21.IV.1954 / Richter & Schäuffele (blue, printed); "? type" (red, handwritten by ?];

1 ♀: 17 mm long: "Iran Belutschistan / Iranshahr 800m. / 1.10.III.1954 / Richter & Schäuffele ♂ (blue, printed); "? type" (red, handwritten by ?] (Fig. 8, left, 14);

1 ♀: 19 mm long: "Iran Makran / Südlöstlich Nahu, 1300m. / 19 u.26.III.1954 / Richter & Schäuffele (blue, printed; "S. Breuning det. / *Derolus* / *mauritanicus* / ssp. *iranensis* / Pic (handwritten by Breuning) (Fig. 9, left);

1 ♂: 11 mm long: "Iran Makran / Südlöstlich Nahu, 1300m. / 19 u.26.III.1954 / Richter & Schäuffele (blue, printed); "? type" [red, handwritten by ?]; this is the specimen described by Pic as var. *angustior* (Fig. 8, right).

Only the female from Iranshahr, 17 mm long (Fig. 8, A), can be regarded as eligible for designation as the lectotype of *Derolus mauritanicus* ssp. *iranensis* Pic and I have added a red label to that effect. The last male of the list above is the specimen described by Pic as *Derolus mauritanicus* ssp. *iranensis* var. *angustior*), obviously not available since infrasubspecific (fourth name). It can be regarded as the Paralectotype male of *D. m. iranensis* (Fig. 8, B). Lepesme & Breuning (1958) listed five specimens as the type series of their *Derolus mauritanicus iranensis*, among which they selected one specimen from "Makran, Sud-est de Nahu" as "type"; only the second female of the list (19 mm long, bearing the Breuning's label) (Fig. 9, A) can be regarded as the holotype of this taxon. The remaining three males together with one (sex not stated) belonging to the Lepesme's collection are the paratypes (Fig. 9, B). It should be noted that the collecting date ("29 et 26.III.54") is an evident mistake for "19 e 26.III.54".

ACKNOWLEDGEMENTS

I wish to thank Wolfgang Schawaller, Staatliches Museum für Naturkunde in Stuttgart (Germany) for the loan of the type material discussed in this paper and Geoff Hancock, The Hunterian (Zoology Museum) University of Glasgow, for the revision of the English text.

LITERATURE CITED

- Danilevsky, M. L.** 2006. A revue of genus *Apatophysis* Chevrolat, 1860 of Iran. Cahier Magellanes, 59: 1-11.
- Danilevsky, M. L.** 2008. *Apatophysis* Chevrolat, 1860 of Russia and adjacent regions. Studies & Reports of District Museum Prague East, Taxonomica, Series, 4 (1-2): 7-56.
- Fuchs, E.** 1967. Österreichische entomologische Expeditionen nach Persien und Afghanistan. Annalen des naturhistorischen Museums in Wien, 70: 431-433.
- Heyrovský, L.** 1940. Vierter Beitrag zur verbreitung der palaearktischen Cerambyciden. Mitteilungen der Münchner Entomologischen Gesellschaft, 30 (3): 844-848.
- Heyrovský, L.** 1959. Beitrag zur Kenntnis der Cerambycidenfauna Südost-Irans. Stuttgarter Beiträge zur Naturkunde, 25: 1-6.

Holzschuh, C. 1993. Cerambycidae of Saudi Arabia: part II. Prioninae and Cerambycinae. Fauna of Saudi Arabia, 13: 110-129.

Lepesme, P. & Breuning, S. 1958: Les *Derolus* africains. Proc. 10th Int. Congress of Entomology, 1 (1956): 171-182.

Pic, M. 1956: Coléoptères du globe (suite). L'Echange, Revue linnéenne, 72, n° 543 : 1-4.

Podany, C. 1978.: Studien über Callichromini der palaearktischen und orientalischen Region. III. Ent. Abhandl. staatl. Mus. Dresden, 42 (11): 363-381.

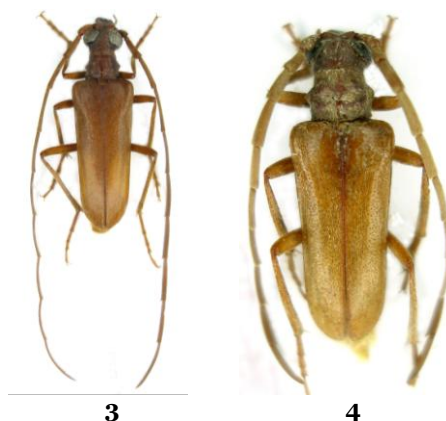
Richter, W. 1956. Reisebericht über die Entomologische Reise in Südost-Iran 1954. Jahreshefte des vereins für vaterländische Naturkunde in Württemberg, 111 (1): 57-67.

Richter, W. 1961. Reisebericht über eine Reise in den Südwest- und Südost-Iran 1956. Stuttgarter Beiträge zur Naturkunde, 76: 1-13.

Roselaar, C. S. (Kees) & Aliabadian, M. 2007. A century of breeding bird assessment by western travellers in Iran, 1876-1977. Podoces, 2 (2): 77-96.



Figures 1, 2. *Apatophysis (Angustephysis) richteri* Pic, 1956. Holotype male, dorsal (1) and ventral view (2).



Figures 3, 4. *Apatophysis modica* Gahan 1906, male, Iran, Hormozgan: Beshagerd (3), *Apatophysis farsicola* Sama, Fallahzadeh & Rapuzzi, 2005. Holotype male (4).



Figure 5. *Osphranteria lata* Pic, 1956 and *O. richteri* Heyrovský, 1959. Holotype male.



6



7

Figures 6, 7. *Purpuricenus schauffelei* Pic, 1956. Holotype male (6), *Purpuricenus schauffelei* Pic, 1956. Female (7).

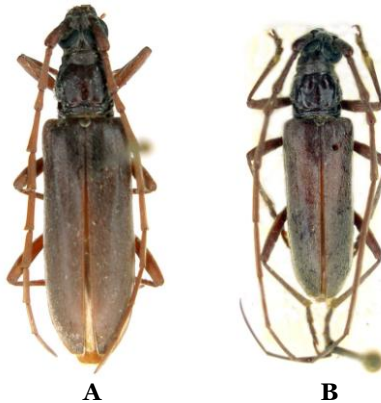


A

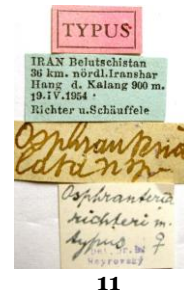
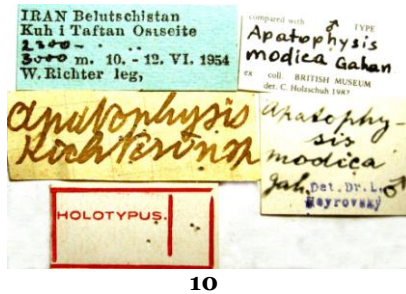


B

Fig. 8. *Derolus mauritanicus iranensis* Pic, 1956. Lectotype female (A), Paralectotype male (var. *angustior* Pic) (B).



Figures 9. *Derolus mauritanicus iranensis* Lepesme & Breuning, 1958 (= *D. mauritanicus iranensis* Pic, 1956). Lectotype female (A), Paralectotype male from Belutschistan / Iranshahr (B).



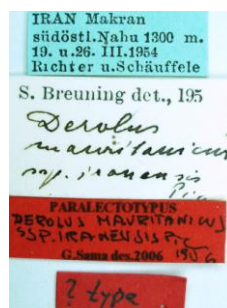
Figures 10, 11. *Apatophysis* (*Angustephysis*) *modica* Gahan, 1906. Holotype. Original labels (10), *Osphranteria lata* Pic, 1956. Holotype. Original labels (11).



Figures 12, 13. *Purpuricenus schaufelei* Pic, 1956 (= *P. zarudnianus* Semenov, 1903). Holotype. Original labels (12), *Purpuricenus schaufelei* Pic, 1956 (= *P. zarudnianus* Semenov, 1903). Male. Original labels (13).



14



15

Figures 14, 15. *Derolus mauritanicus iranensis* Pic, 1956. Lectotype female. Original labels (14), *Derolus mauritanicus iranensis* Lapesme & Breuning, 1958. Paralectotype male. Original labels (15).

**DESCRIPTION OF A NEW SPECIES OF
POECILIUM FAIRMAIRE, 1864 FROM SYRIA
(COLEOPTERA: CERAMBYCIDAE)**

Pierpaolo Rapuzzi*, Gianfranco Sama and Tomas Tichy*****

* Via Cialla 48, I-33040 Prepotto (UD), ITALY. E-mail: info@ronchidicialla.it

** Via Raffaello Sanzio, 84 I-47521 Cesena (FC), ITALY. E-mail: francosama@gmail.com

*** Sokolská třída 33, 70121 Ostrava 1, CZECH REPUBLIC. E-mail: tomas.tichy@vsb.cz

[Rapuzzi, P., Sama, G. & Tichy, T. 2011. Description of a new species of *Poecilium* Fairmaire, 1864 from Syria. Munis Entomology & Zoology, 6 (2): 673-675]

ABSTRACT: *Poecilium antonini* n. sp. in described from NW Syria. The new species is closely related to *Poecilium alni* (Linnaeus, 1767) from Europe, Caucasus and Iran from which it can be easily distinguished by the reddish colored pronotum and the shining body.

KEY WORDS: Cerambycidae, Cerambycinae, Callidiini, *Pocilium*, new species, Syria.

The aim of the present paper is to describe a new species belonging to the genus *Poecilium* Fairmaire, 1864, closely related to *P. alni* (Linnaeus, 1767), identified among the Cerambycidae collected in north-western Syria (Slinfah) by our colleague and friend Antonin Wrzecionko (Horní Sucha, Czech Republic) and by one of us (Tomas Tichy).

***Poecilium antonini* n. sp.
(Fig. 1, 2)**

Material examined

Holotype ♂: Syria, Jabal An Nusaynyah, Slinfah,, 1300-1800 m., 18.IV.2010, A. Wrzecionko lgt.; paratypes 2 ♂♂ and 3 ♀♀ same collecting data like the holotype. Holotype in coll. P. Rapuzzi, paratypes in coll. A. Wrzechionko (Horní Sucha, Czech Republic), T. Tichy, P. Rapuzzi and G. Sama.

Etimology

The new species is dedicated with pleasure to our colleague and friend Antonin Wrzecionko who collected the most type specimens.

Description of the holotype

Body length: 6 mm. Body black except reddish pronotum, basal third of elytra, legs and antennae. Head short, with sparse punctures, with several long erect black hairs between the eyes. Pronotum reddish, shining, slightly wider than long, moderately convex on the disc, strongly constricted toward the base; its discal surface sparsely punctate and covered with many long black erect hairs mainly at base and on the sides. Elytra relatively short, black except the basal third and with two ivory-colored stripes on each elytron, analogously to *P. alni*; elytral surface shining on the basal third (which is sparsely covered with setigerous points in correspondence to the reddish color) and on the apical third (which is almost unpunctate), and densely, shallowly, microsculptured in the middle, between the ivory stripes. Elytrae sparsely clothed with moderately long erect black hairs on the discal surface, with short black setae at sides chiefly on the basal third, and with a tuft of dense erect black hairs behind the scutellum. Antennae short, hardly

extended beyond the middle of elytra, reddish, all segments, from the 3rd, blackened at apex. Legs reddish with the clubs of femora darker on the upper side.

Variability

The specimens of the type series shows a different extension of the reddish colour on elytra and pronotum. One specimen is completely black except the club of middle femora which are dark-brown. Female differs from male by the usual sexual dimorphism of the genus: shorter antennae, thinner legs and more parallel-sided elytra. The length of paratypes varies from 4 to 5 mm in males and from 5 to 6 mm in females.

Discussion

Poecilium antonini n. sp. is closely related to *Poecilium alni* (Linnaeus, 1767) from which it can be easily distinguished by the shining body, more sparsely punctate pronotum and elytra, shorter elytra, antennae end legs, and the reddish color of pronotum. Moreover *P. antonini* n. sp. has shorter pronotum and denser black hairs on the post-scutellar tuft.

Range and biology

The genus *Poecilium* Fairmaire, 1864 (sensu Sama, 2002) is represented in the south-eastern Mediterranean area by four species: *Poecilium lividum* (Rossi, 1794) (southern Turkey, Syria, Lebanon, Israel), *P. magnanii* Sama & Rapuzzi, 1999 (southern Turkey), *P. rufipes syriacum* (Pic, 1891) (from southern Turkey to northern Israel) and *Poecilium alni* (Linnaeus, 1767). The former, which is the more closely related to *P. antonini* n. sp., is recorded from Europe, Caucasus [here represented by *P. alni alnoides* (Aurivillius, 1912)], Transcaucasia and northern Iran (here as *P. alni elburzense* Holzschuh, 1977). In Turkey it is known especially from the northern provinces (Bolu, Istanbul, Osmaniye, Sakarya and Trabzon), but it has also been recorded from Adana: Nurdagi geçidi (Holzschuh, 1977; Adlbauer, 1988) and from Kuşçubeli pass (Gaziantep border) (Özdikmen et al., 2010); specimens collected in these localities are regarded as not different from *P. alni alni* ("aus Eichenästen geschlüpft, besitze ich jedoch 6 Exemplare, die eindeutig der Stammform *P. alni alni* zuzurechnen sind") (Holzschuh, 1977).

All specimens of the type series of *P. antonini* n. sp. were obtained from larvae feeding in dead branches of Oak (*Quercus* sp.).

ACKNOWLEDGEMENTS

The authors wish to thank Antonin Wrzecionko who entrusted the material for study and Hüseyin Özdikmen (Gazi University, Ankara) for his help.

LITERATURE CITED

- Adlbauer, K. 1988. Neues zur Taxonomie und Faunistik der Bockkäferfauna der Türkei (Coleoptera, Cerambycidae). Entomofauna, 9: 257-297.
- Holzschuh, C. 1977. Neue Bockkäfer aus Anatolien und Iran (Col., Cerambycidae). Koleopterologische Rundschau, 53: 127-136.
- Özdikmen, H., Güven, M. & Gören, C. 2010. Longhorned beetles fauna of Amanos Mountains, Southern Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 5, suppl.: 1141-1167.
- Sama, G. 2002. Atlas of the Cerambycidae of Europe and the Mediterranean Area. I: Northern, Western, Central and Eastern Europe. British Isles and Continental Europe from France (excl. Corsica) to Scandinavia and Urals. Kabourek, Zlin: 173 pp., 36 col. plates.



Figure 1. *Poecilium antonini* n. sp.. Holotype male .



Figure 2. *Poecilium antonini* n.sp.. Paratype female.

**SPECIES COMPOSITION AND HABITAT SELECTION
OF GROUND BEETLES (CARABIDAE, COLEOPTERA)
COLLECTED BY PITFALL TRAPS IN BOZDAĞLAR MT.,
WESTERN TURKEY**

Serdar Tezcan *, Sinan Anlaş **, and Claude Jeanne***

* Department of Plant Protection, Faculty of Agriculture, University of Ege, 35100 Bornova, Izmir/TURKEY. E-mail: serdar.tezcan@ege.edu.tr

** Department of Biology, Faculty of Science, University of Ege, 35100 Bornova, Izmir/TURKEY. E-mail: sinan.anlas@gmail.com

*** 37, Cours du General Leclerc, 33210 Langon/FRANCE.

[Tezcan, S., Anlaş, S. & Jeanne, C. 2011. Species composition and habitat selection of Ground beetles (Carabidae, Coleoptera) collected by pitfall traps in Bozdağlar Mt., Western Turkey. Munis Entomology & Zoology, 6 (2): 676-685]

ABSTRACT: Carabidae specimens collected by pitfall traps in Bozdağlar Mountain, Western Turkey during the years of 2003-2006 have been evaluated. It has been recorded a total of 1.462 specimens of 45 species belonging to nine subfamilies of Carabidae. *Calathus* (s. str.) *libanensis* Putzeys, 1873 and *Carabus* (*Procrustes*) *coriaceus cerisyi* Dejean, 1826 were the most abundant species in the study with percentages of 22.91 % and 11.49 %, respectively. Seasonal dynamics of *Calathus libanensis* was presented. The majority of the specimens were collected from oaks biotope (384) and meadow biotope (302).

KEYWORDS: Ecology, faunistics, pitfall trap, seasonal dynamics, habitat preferences, Turkey, Carabidae.

The beetle family Carabidae, or ground beetles, represent one of the taxonomically and ecologically best known groups of insects. Carabidae is a rather big family belonging to Coleoptera, with over 40.000 species worldwide. More than 1.100 carabid species have been recorded from Turkey (Casale & Taglianti, 1999).

Ground beetles are usually predator and as well as important biological control agents in agroecosystems and generally regarded as beneficials in field ecosystems (Luff, 1996; Döring et al., 2003; Pearce & Venier, 2006). They are being able to use a wide range of foods, e.g. soil dwelling insects, maggots, wireworms, ants, and other small invertebrates, also feed on carrion and sometimes even on plant material. They occur in many places, the majority of the species are free-living, as well as most often in decaying animal or plant matter, under stones or bark and in leaf litter.

Up to now, the publications of Avgin (2006a, b), Tezcan et al. (2007), Aslan et al. (2008) and Avgin & Luff (2009) are the studies focusing on ecology of ground beetles of Turkey.

The aim of this study is to evaluate the Carabidae fauna in Bozdağlar mountain in Western Turkey by pitfall traps. The results of this study also provide some ecological data of ground beetles in Turkey.

MATERIAL AND METHODS

Study Area

Studies have been conducted at two counties (Dağmarmara and Çıkrıkçı) at Bozdağlar Mountain (2157 m), western Turkey (Figure 1) (also see Anlaş et al., 2010). Type of vegetation determination the environment found in the counties:

Chestnuts biotopes: Aged 40 to 70 years *Castanea sativa* Miller is the common plant species. There are also *Trifolium bocconeii* Savi, *Salvia fruticosa* Miller, *Anthemis tinctoria* L., *Rubia tinctorum* L., *Medicago xvaria* Martyn, *Prunella vulgaris* L., *Juniperus oxycedrus* L., *Spartium junceum* L., *Rosa canina* L., *Rubus canescens* Dc., *Polypodium vulgare* L., *Cistus salviifolius* L. and *Styrax* sp. as they are rarely seen in the study area.

Pines biotopes: *Pinus brutia* Ten. and *Pinus nigra* (Arnold) are the common plant species in the biotopes. There are also occur *Cistus laurifolius* L. and *Polypodium* sp.

Oaks biotopes: Being the abundant plant species aged 10-35 years is *Quercus ithaburensis* Dacne. subsp. *macrolepis* (Kotschy) and *Quercus infectoria* Olivier. There are also rare ones as *Cistus creticus* L., *Stachys cretica* L. ssp. *smyrnaea* Rech., *J. oxycedrus*, *Pyrus amygdaliformis* Vill., *R. canina* and *Astragalus* sp.

Meadow biotopes: *Euphorbia anacampseros* Boiss, *Coridothymus capitatus* (L.), *P. vulgare*, and *J. oxycedrus*, are the common plant species in meadow biotopes.

Maquis biotopes: *Q. infectoria*, *C. salviifolius*, *R. canina*, *J. oxycedrus*, *Sarcopoterium spinosum* L., and *C. capitatus*, are the common plant species in the biotopes.

Semiaquatic biotopes: *Salix* sp., *Alnus glutinosa* (L.), *R. canescens*, *R. canina*, *Lythrum salicaria* L., *Urtica* sp., *Mentha* sp. are abundant species. In the biotopes, grasses cover the surface of soil. Pitfall traps were placed on sandy and grassy sides of running water.

Fire-influenced biotopes: Once being an oak forest, this habitat that was burnt in July 2000. *J. oxycedrus*, *P. amygdaliformis*, *R. canina*, *Cistus laurifolius* L., *Thymus longicaule* C. Presl and *Verbascum* sp. are common plant species. In the biotope, there are also occur burnt wood pieces and trees.

The material referred to in this study is deposited in the Lodos Entomological Museum (LEMT), and in the private collection of S. Anlaş. Material were identified by C. Jeanne and S. Anlaş. Classification and nomenclature of Carabidae suggested by Löbl & Smetana (2003) have been followed. Material have been collected by pitfall traps method.

Sampling

A total of 6 pitfall traps were placed in each biotope. Pitfall traps consisted of 200 ml cups buried in the soil in such a way that the lip of the trap would be at ground level. They were half filled with ethylen glycol and water mixture at 1:1 ratio. Traps were cleared in two weeks intervals from beginning of April to end of October and then collected material were determined.

Detailed information on the biotopes of pitfall trapping is given in Table 1.

RESULTS

Species composition

In this study, a total of 1.462 specimens of 45 species belonging to nine subfamilies of Carabidae have been recorded by pitfall traps in Bozdağlar Mountain, western Turkey during the years of 2003-2006 have been evaluated (Table 2).

Including the recorded species, the most abundant are the members of subfamily Pterostichinae with 738 specimens (50.47 %) of 12 species. Members of subfamilies Carabinae and Harpalinae followed them with 352 (24.07 %), 207 (14.16 %), specimens and percentages, respectively. Members of the other

subfamilies were rarely found: Lebiinae (76 specimens), Trechinae (62 specimens), Nebriinae (15 specimens), Broscinae (7 specimens), Brachininae (4 specimens), Callistinae (1 specimen).

Five carabid species, *Calathus* (s. str.) *libanensis* Putzeys, 1873 (22.91 %), *Carabus* (*Procrustes*) *coriaceus cerisyi* Dejean, 1826 (11.49 %), *Calathus* (s. str.) *longicollis* Motschulsky, 1864 (9.44 %), *Calathus* (s. str.) *erythroderus* Gemminger & Harold, 1868 (7.87 %) and *Carabus* (*Pachystus*) *graecus morio* Mannerheim, 1830 (7.80 %) comprising ca. 60 % of the total collected, were considered dominant species. In addition, 15 species were present between 1.09-4.51 % and 25 species were accidental (< 1 %) as percentage of the total catch. The most abundant species is *Calathus libanensis* with 335 specimens and this species was found in both Dağmarmara (213) and Çıkrıkçı (122) counties.

The total number of the specimens collected during two years' collection in Dağmarmara was 891 (60.94 %) and in Çıkrıkçı was 571 (39.06 %). From the species evaluated in present study, 8 were recorded only from Dağmarmara and only 16 were recorded from Çıkrıkçı. In addition these, 21 of 45 were reported both Dağmarmara and Çıkrıkçı counties.

Among the biotopes, the majority of the specimens were collected from oaks biotope (384), meadow biotope (302), chestnuts biotope (230) and fire-influenced biotope (167); the least specimens were collected from pines (182), maquis (121) and semiaquatic biotope (76) (Figure 3). The number of species was 27 at meadow biotopes; 23 at oak; 14 at chestnuts and at maquis, 11 at fire-influenced, 8 at semiaquatic; only 5 species at pines biotopes.

We also evaluated that the diversity of carabid species in biotopes according to dominance value for per trapping (Table 3.). The majority of the specimens were collected from chestnuts and oaks biotopes (22.48 and 18.77 %) and after fire-influenced and meadow biotopes (16.32 and 14.76 %). According to our study, the ground beetles were dominant in forest (chestnuts and oaks biotopes) and open-area habitats (fire-influenced and meadow biotopes). On the contrary, carabid species were less abundant in semiaquatic and pines biotopes.

Seasonal dynamics

Of the 45 species recorded during present study, the predominant species, *Calathus libanensis* was collected in higher numbers of specimens in both counties. We evaluated the seasonal dynamics of this species according to localities (Figure 2). Average temperature and rainfall amounts in Manisa province were given in Figure 4.

In Dağmarmara County, *Calathus libanensis* occurred during the whole period of sampling, but it was showing low abundance in August, the peaks were recorded during in June and in autumn (September to October). Phenology of this species is similar in Çıkrıkçı county, the species was recorded in the whole period of sampling too, but it was absent in August. The peak was noticed in October.

We obtained some information of three studies about seasonal dynamics of the ground beetles. In the first study, it was observed the seasonal dynamic of the ground beetles in Poland. It was revealed two appreciable peaks of activity density. The first period of mass activity was noted in the end of July, and the second in second half of August (Aleksandrowicz et al., 2009). The phenology of ground beetles in the study is not similar with our study. It should depend on differences of the studied areas and climatic factors among Poland and Turkey. According to the other studies of Avgin (2006a and b), the carabid species occurred during to whole period of sampling but it was absent or showing low

abundance in summer period, especially in August and the peaks was recorded as identically with present study.

DISCUSSION

In this study, determination of the Carabidae fauna of Bozdağlar Mountain by pitfall traps was aimed for the first time. It was recorded a total of 45 species belonging to nine subfamilies of Carabidae.

According to the study of Aslan et al. (2008), a total of nine species were determined by pitfall traps. Two species (*Calathus longicollis* and *Nebria brevicollis*) recorded in this study are identical with those of present study. Carabid species is collected as most abundant in meadow biotopes in this study.

In other study, Aleksandrowicz et al. (2009) recorded 23 species in Poland. According to this study, the dominant group was open-area species (20 species and 98.83% of specimens) and most of the species were belonging to the genera of *Harpalus* and *Calathus*.

In the similar result were obtained by Avgin (2006a) in Ahır Mountain, Kahramanmaraş province, Turkey. According to this study, the diversity of ground beetles was significantly higher in forest edge and grassland than in the interior part of forest. There was no significant difference in the diversity of ground beetles of the grassland and the forest edge in Ahır Mountain. *Calathus libanensis pluriseriatus* Putzeys, 1873 was the most abundant species among recorded species. Other study was carried out in Baskonus Mountain National Park (Kahramanmaraş, Turkey) by Avgin (2006b) and 31 species of ground beetles were recorded by pitfall traps. The results of present study are identical with results of Avgin (2006a).

Using pitfall traps, a total of 30 species were collected from ecologically managed cherry orchards by Tezcan et al. (2007). 18 of these species were also recorded in present study. The rate of collected specimens of cherry orchards was 87.72%, and it was 67.44% in present study. Among those *Carabus coriaceus cerisyi* was a dominant species and it was collected at both of two studies.

In present study, most of the collected species were collected in forest habitats and their abundance were low in pine and semiaquatic biotopes. Pitfall traps are very useful tools for monitoring ground beetles in agricultural, forested and unforested ecosystems. It is expected that our knowledge on carabid beetles will chiefly rise with further studies in Turkey.

ACKNOWLEDGEMENTS

Authors would like to express their gratitudes to Dr. Memiş Kesdek for his valuable contributions of this study.

LITERATURE CITED

- Aleksandrowicz, O., Pakula, B. & Grabiec, E. 2009. Environment. Technology. Resources Proceedings of the 7th International Scientific and Practical Conference, 1: 147-153.
- Anlaş, S., Haas, F. & Tezcan, S. 2010. Dermaptera (Insecta) fauna of Bozdağlar Mountain, Western Turkey. Linzer biologische Beiträge, 42 (1): 389-399.
- Aslan, B., Aslan, E. G., Karaca, I. & Kaya, M. 2008. Kasnak Meşesi Tabiati Koruma Alanında (Isparta) farklı habitatlarda çukur tuzak yöntemi ile yakalanan Carabidae ve Tenebrionidae (Coleoptera) türleri ile Biyolojik çeşitlilik parametrelerinin karşılaştırılması. Süleyman Demirel Üniversitesi, Fen Edebiyat Fakültesi, Fen Dergisi, 3 (2): 122-132. (In Turkish).

Avgin, S. 2006a. Habitat selection and diversity of Ground beetles (Coleoptera: Carabidae) on Ahır Mountain (Kahramanmaraş, Turkey), in Mediterranean Region. *Munis Entomology & Zoology*, 1 (2): 257-266.

Avgin, S. 2006b. Distribution and diversity of Ground Beetles in Başkonuş Mountain National Park of Turkey. *Journal of Environmental Biology*, 27 (3): 515-521.

Avgin, S. & Luff, M. L. 2009. Biodiversity of Carabid Beetles (Coleoptera: Carabidae) from Crops in Turkey. *Proceedings of the Entomological Society of Washington*, 111 (2): 326-334.

Casale, A. & Vigna Taglianti, A. 1999. Caraboid Beetles (excl. Cicindelidae) of Anatolia, and Their Biogeographical Significance (Coleoptera, Caraboidea). *Biogeographia. Parte I. Biogeografia Dell'Anatolia*. Pubblicato Sotto Gli Auspici Del Ministero Dei Beni Culturali Ed Ambientali. Siena, Italy, 277-406.

Döring, T. F., Hiller, A., Wehke, S., Schulte G. & Broll G. 2003. Biotic indicators of carabid species richness on organically and conventionally managed arable fields. *Agriculture, Ecosystems & Environment*, 98 (1-3): 133-139.

Löbl, I. & Smetana, A. 2003. Catalogue of Palaearctic Coleoptera. Volume I. Archostemata-Myxophaga- Adephaga. Apollo Books. Stenstrup, Denmark. 819 pp.

Luff, M. L. 1996. Use of Carabids as environmental indicators in grasslands and cereals. *Annales Zoologici Fennici*, Helsinki, 33: 185-195.

Pearce, J. L. & Venier, L. A. 2006. The use of ground beetles (Coleoptera: Carabidae) and spiders (Araneae) as bioindicators of sustainable forest management: A Review *Ecological Indicators*, 6 (4): 780-793.

Tezcan, S., Jeanne, C. & Keskin, B. 2007. Ground beetles (Coleoptera, Caraboidea) of the ecologically managed cherry orchards of Western Anatolia (Turkey) along with some new additional data. *Anadolu Üniversitesi Bilim ve Teknoloji Dergisi*, 8 (1): 53-63.

Table 1. Detailed information on biotopes of pitfall trap method.

Region	Prov.	County	Period	Biotopes	Coordinate	Altitude (m)
1	Manisa	Dağmarmara	2003 & 2006	Oak forest	38°22'14"N/ 27°50'39"E	980
				Fire-influenced biotopes	38°22'07"N/ 27°50'16"E	960
				Pine forest	38°22'49"N/ 27°52'12"E	930
				Meadow	38°22'39"N/ 28°04'56"E	880
				Chestnut forest	38°23'37"N/ 27°49'09"E	620
2	Manisa	Çikrikçi	2005 & 2006	Oak forest	38°28'19"N/ 27°49'44"E	220
				Meadow	38°28'19"N/ 27°49'38"E	200
				Pine forest	38°28'23"N/ 27°49'47"E	180
				Semiaquatic biotopes	38°28'24"N/ 27°49'17"E	110
				Maqui forest	38°28'24"N/ 27°49'20"E	150

Table 2. Number of specimens collected by pitfall traps in different counties and their percent dominance values.

Species	Location and year				Sum	Dominance Value (%)
	Dağmarmara		Çıkrıkçı			
	2003	2006	2005	2006		
1. Subfamily Brachinae Bonelli, 1810						
Tribus Brachinini Bonelli, 1810						
<i>Brachinus explodens</i> (<i>Brachynidius</i>) Dufschmid, 1812	0	0	3	1	4	< 1
2. Subfamily Broscinae Hope, 1838						
Tribus Broscini Hope, 1838						
<i>Broscus</i> (s. str.) <i>nobilis</i> (Dejean, 1831)	0	0	0	7	7	< 1
3. Subfamily Callistinae Bonelli, 1810						
Tribus Chlaeniini Brulle, 1834						
<i>Chlaeniellus</i> (s. str.) <i>vestitus</i> (Paykull, 1790)	1	0	0	0	1	< 1
4. Subfamily Carabinae Latreille, 1802						
Tribus Carabini Latreille, 1802						
<i>Calsoma</i> (<i>Acalosoma</i>) <i>inquisitor</i> (Linnaeus, 1758)	1	0	0	0	1	< 1
<i>Calosoma</i> (s. str.) <i>sycophanta</i> (Linnaeus, 1758)	2	0	1	0	3	< 1
<i>Carabus</i> (<i>Procrustes</i>) <i>cortaceus cerisyi</i> Dejean, 1826	48	67	21	32	168	11.49
<i>Carabus</i> (<i>Pachystus</i>) <i>graeus morio</i> Mannerheim, 1830	45	37	15	17	114	7.80
<i>Carabus</i> (<i>Tomocarabus</i>) <i>microderus</i> Chaudoir, 1867	22	27	10	7	66	4.51
5. Subfamily Harpalinae Bonelli, 1810						
Tribus Harpalini Bonelli, 1810						
<i>Carterus</i> (s. str.) <i>dama</i> (Rossi, 1792)	1	2	4	4	11	< 1
<i>Dixus</i> (s. str.) <i>eremita</i> (Dejean, 1825)	6	3	6	7	22	1.50
<i>Dixus</i> (s. str.) <i>obscurus</i> (Dejean, 1825)	8	14	7	9	38	2.60
<i>Harpalus</i> (s. str.) <i>attenuatus</i> Stephens, 1828	17	21	5	0	43	2.94
<i>Harpalus</i> (s. str.) <i>distinguendus</i> (Dufschmid, 1812)	0	0	12	4	16	1.09
<i>Harpalus</i> (<i>Pseudophonus</i>) <i>griseus</i> (Panzer, 1796)	0	0	9	5	14	< 1
<i>Harpalus</i> (<i>Pseudophonus</i>) <i>rufipes</i> (Degeer, 1774)	17	8	16	12	53	3.63
<i>Harpalus</i> (s. str.) <i>smaragdinus</i> (Dufschmid, 1812)	0	0	4	5	9	< 1
<i>Ophonus</i> (s. str.) <i>subquadratus</i> (Dejean, 1829)	0	0	0	1	1	< 1
6. Subfamily Lebiinae Bonelli, 1810						
Tribus Lebiini Bonelli, 1810						
<i>Cymindis</i> (s. str.) <i>axillaris palliata</i> Waldheim, 1823	9	6	11	16	42	2.87
<i>Lionychnus</i> (s. str.) <i>orientalis</i> K. Daniel, 1900	1	4	0	0	5	< 1
<i>Syntomus</i> (s. str.) <i>pallipes</i> (Dejean, 1825)	7	10	0	0	17	1.16
<i>Syntomus</i> (s. str.) <i>fuscocomaculatus</i> (Motschulsky, 1844)	1	4	0	7	12	< 1

7. Subfamily Nebrinae Laporte, 1834						
Tribus Nebrini Laporte, 1834						
<i>Leistus</i> (s. str.) <i>caucasicus</i> Chaudoir, 1867	4	0	0	0	4	< 1
<i>Nebria</i> (s. str.) <i>brevicollis</i> (Fabricius, 1792)	5	4	2	0	11	< 1
8. Subfamily Pterostichinae Bonelli, 1810						
Tribus Platynini Bonelli, 1810						
<i>Calathus</i> (s. str.) <i>erythroderus</i> Gemminger & Harold, 1868	31	35	27	22	115	7.87
<i>Calathus</i> (<i>Neocalathus</i>) <i>leptodactylus</i> Putzeys, 1873	1	4	0	0	5	< 1
<i>Calathus</i> (s. str.) <i>libanensis</i> Putzeys, 1873	116	97	78	44	335	22.91
<i>Calathus</i> (s. str.) <i>longicollis</i> Motschulsky, 1864	43	66	12	17	138	9.44
<i>Laemostenus</i> (<i>Pristonychus</i>) <i>conspicius</i> (Waltl, 1838)	10	12	3	1	26	1.78
<i>Olisthopus</i> (s. str.) <i>glabricollis</i> (Germar, 1817)	0	0	2	7	9	< 1
Tribus Zabriini Bonelli, 1810						
<i>Amara</i> (s. str.) <i>aenea</i> (DeGeer, 1774)	14	7	5	5	31	2.12
<i>Amara</i> (<i>Paracelata</i>) <i>dalmatina</i> Dejean, 1828	6	10	0	0	16	1.09
<i>Amara</i> (s. str.) <i>eurynota</i> (Panzer, 1797)	8	8	4	1	21	1.44
<i>Amara</i> (s. str.) <i>ovata</i> (Fabricius, 1792)	6	0	4	7	17	1.16
<i>Zabrus</i> (s. str.) <i>asiaticus</i> Castelnau, 1834	1	1	0	0	2	< 1
<i>Zabrus</i> (<i>Pelor</i>) <i>graecus orientalis</i> Apfelbeck, 1904	6	4	8	5	23	1.57
9. Subfamily Trechinae Bonelli, 1810						
Tribus Bembidiini Stephens, 1827						
<i>Bembidion</i> (<i>Metallina</i>) <i>leucoscelis</i> Chaudoir, 1850	0	3	11	18	32	2.19
<i>Bembidion</i> (<i>Metallina</i>) <i>properans</i> (Stephens, 1828)	0	0	2	7	9	< 1
<i>Bembidion</i> (s. str.) <i>quadripustulatum</i> Audinet - Serville, 1821	0	0	3	8	11	< 1
<i>Ocydromus</i> (<i>Peryphus</i>) <i>atlanticus megaspilus</i> (Walker, 1871)	0	0	1	1	2	< 1
<i>Ocydromus</i> (<i>Bembidionetolitzkyi</i>) <i>concoeruleus</i> (Netolitzky, 1942)	0	0	2	0	2	< 1
<i>Ocydromus</i> (<i>Peryphus</i>) <i>cruciatus liberus</i> (Netolitzky, 1937)	0	0	1	0	1	< 1
<i>Ocydromus</i> (<i>Peryphus</i>) <i>femoratus</i> (Sturm, 1825)	0	0	0	2	2	< 1
<i>Ocydromus</i> (<i>Peryphus</i>) <i>subcostatus propevau</i> Fassati, 1944	0	0	1	0	1	< 1
<i>Tachys</i> (<i>Paratachys</i>) <i>bistriatus</i> (Dufschmid, 1812)	0	0	0	1	1	< 1
Tribus Trechini Bonelli, 1810						
<i>Pterleptus</i> (s. str.) <i>areolatus</i> (Creutzer, 1799)	0	0	1	0	1	< 1
TOTAL	437	454	291	280	1.462	100
	891		571			

Table 3. The first three dominant species and their percentages in each biotope (A: Total number of specimens, B: Dominance Value (%), C: Number of avarege specimens for per trapping, D: Dominance Value (%) for per trapping).

Biotores	First three dominant species	A	B %	C	D %
Oaks biotope (both Dağmarmara and Çıkırıkçı: four pitfall trapping)	<i>Carabus coriaceus cerisyi</i> <i>Calathus libanensis</i> <i>Carabus graecus morio</i>	384	26.27	96	18.77
Meadow biotope (both Dağmarmara and Çıkırıkçı: four pitfall trapping)	<i>Calathus libanensis</i> <i>Carabus coriaceus cerisyi</i> <i>Calathus longicollis</i>	302	20.66	75.5	14.76
Chestnuts biotope (only Dağmarmara: two pitfall trapping)	<i>Carabus graecus morio</i> <i>Carabus microderus</i> <i>Calathus libanensis</i>	230	15.73	115	22.48
Pines biotope (both Dağmarmara and Çıkırıkçı: four pitfall trapping)	<i>Calathus libanensis</i> <i>Calathus longicollis</i> <i>Harpalus rufipes</i>	182	12.45	45.5	8.90
Fire-influenced biotope (only Dağmarmara: two pitfall trapping)	<i>Calathus erythroderus</i> <i>Laemostenus conspicuus</i> <i>Calathus libanensis</i>	167	11.42	83.5	16.32
Maquis biotope (only Çıkırıkçı: two pitfall trapping)	<i>Calathus libanensis</i> <i>Bembidion leucoscelis</i> <i>Calathus erythroderus</i>	121	8.28	60.5	11.83
Semiaquatic biotope (only Çıkırıkçı: two pitfall trapping)	<i>Cyminidis axillaris palliata</i> <i>Amara aenea</i> <i>Calathus libanensis</i>	76	5.20	35.5	6.94
TOTAL		1462	100 %	511.5	100 %

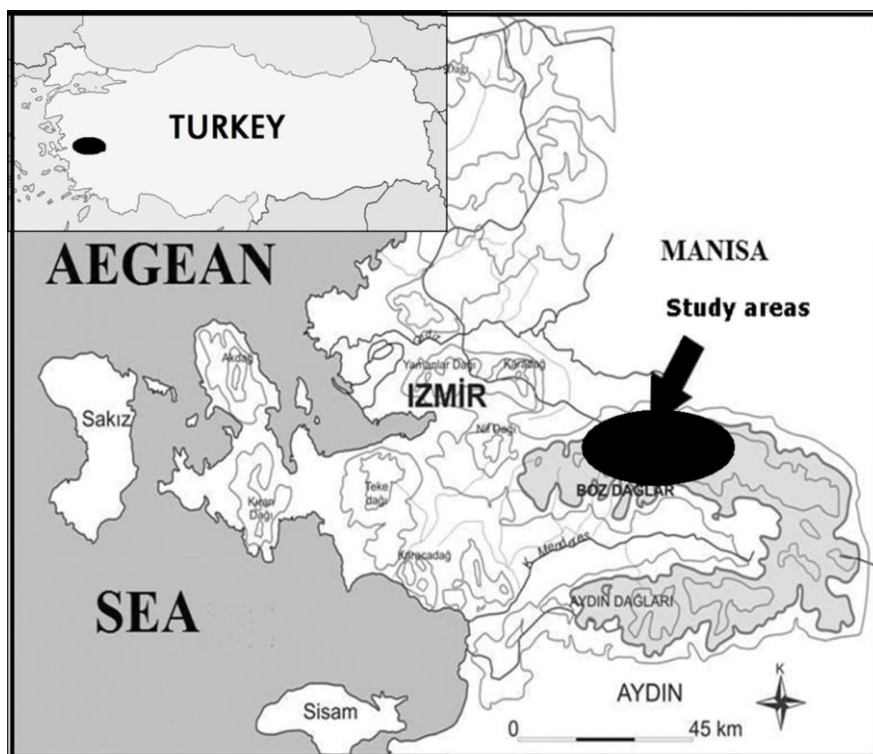


Figure 1. Location of trapping study area and neighbouring fields at Bozdağlar Mountain, western Turkey.

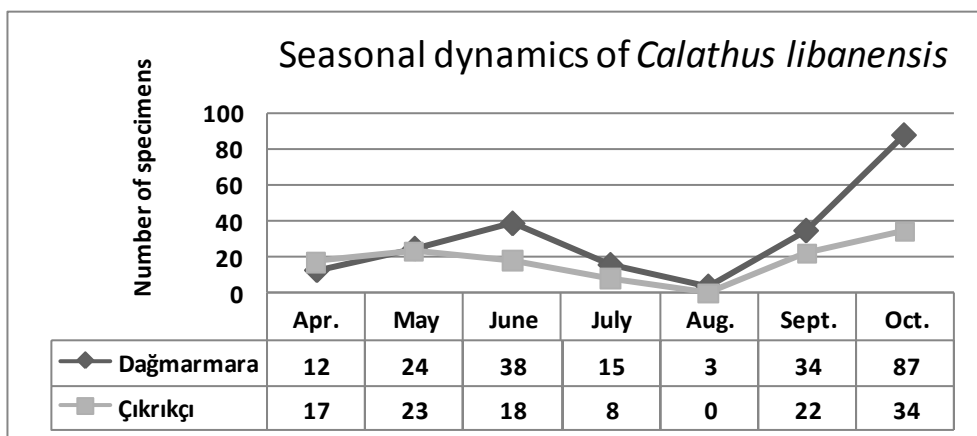


Figure 2. Seasonal dynamics of most abundant species, *Calathus libanensis* during sampling period, April to October, by pitfall traps both in Dağmarmara and Çıkrıkçı counties.

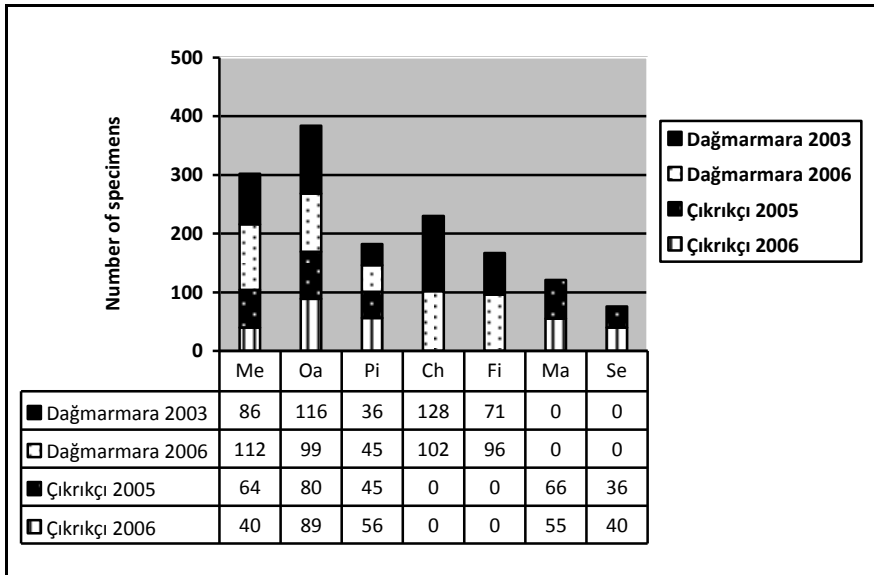


Figure 3. Total number of specimens collected by pitfall traps in different biotopes and counties (Me: Meadow; Oa: Oaks; Pi: Pines; Ch: Chestnut; Fi: Fire-influenced; Ma: Maquis and Se: Semiaquatic biotopes).

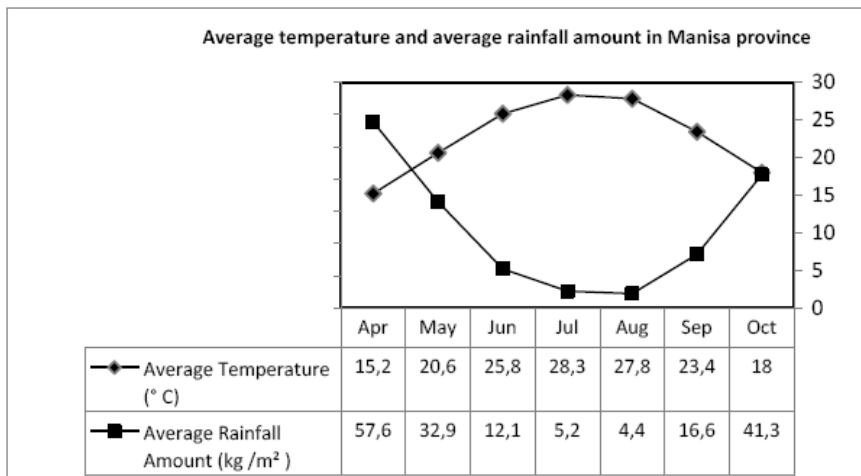


Figure 4. Average temperature and average rainfall amount in Manisa province, W Anatolia ([http://www.dmi.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?m= Manisa](http://www.dmi.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?m=Manisa)).

**ADDITIONS AND CORRECTIONS TO THE NEW CATALOGUE
OF PALAEARCTIC CERAMBYCIDAE (COLEOPTERA) EDITED
BY I. LÖBL AND A. SMETANA (2010) FOR TURKISH TAXA**

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE. E-mail: ozdikmen@gazi.edu.tr

[**Özdikmen, H.** 2011. Additions and corrections to the new Catalogue of Palaearctic Cerambycidae (Coleoptera) edited by I. Löbl and A. Smetana (2010) for Turkish taxa. *Munis Entomology & Zoology*, 6 (2): 686-734]

ABSTRACT. For Volume 6 of Catalogue of Palaearctic beetles [2010] more than 150 misprints, wrong geographical records, wrong status of certain names, wrong synonyms, and so on are fixed. Missing names, geographical data and references are added.

KEY WORDS: Additions, corrections, Catalogue of Palaearctic Cerambycidae.

As known, Turkish longhorned beetles have a rather rich fauna. The new Catalogue of Palaearctic Cerambycidae (Coleoptera) edited by I. Löbl and A. Smetana (2010) was prepared with the participation of 11 authors: K. Adlbauer, M. L. Danilevsky, A. Drumont, L. Hubweber, Z. Komiya, I. Löbl, J. Morati, P. Rapuzzi, G. Sama, A. Smetana and A. Weigel. Danilevsky (2010) stated that “the system of the authorship was rather complicated” and “The taxa of Western Palaearctic were arranged by G. Sama” who published many articles on Turkish fauna (over 2 genera, 25 species, 6 subspecies until 2009). However, it is clear that he has erroneous approaches on Turkish fauna and the system of some taxa in general. Hence the Catalogue included many mistakes and insufficiencies on Turkish fauna as seen below. The authors for Turkish taxa are M. L. Danilevsky for the data of Dorcadiini and G. Sama & I. Löbl for the data of other Turkish taxa in the Catalogue.

The main purpose of the present publication is to fix direct mistakes on taxonomy and geography. Moreover the system of some taxa was accepted by editors on the base on the position by G. Sama, which was not natural and so not acceptable. The natural system of such groups is proposed below. Some of them were presented by Danilevsky (2010). So, they are not mentioned in the present text again.

The references to the present article include only the publications absent in the references to the Catalog. All changes (additions, corrections and etc.) are underlined.

As another so important problem for the Catalogue, published and unpublished data are mixed in the Catalogue. In this form, it is impossible that given information in the Catalogue were based on published or unpublished data (originated from collections of authors). Therefore, if there is any mistake on the base of such data, it cannot be controled by readers. Consequently, unpublished data should be marked an available signal or only published data should be given in it. For example,

desfontainii inhumeralis Pic, 1891b: 24 **E:** GR TR* **A:** JO IS SY TR

In this case, the record of Asian Turkey is based on published data, while, that of European Turkey is stated unpublished data.

1. PAGE 52**PRINTED:**

Phytoecia (Blepisanis) vittipennis inhumeralis (Pic, 1900) and *Phytoecia (Blepisanis) vittipennis samai* Özdikmen & Turgut, 2008 **syn. nov.** of *Phytoecia (Blepisanis) vittipennis leuthneri* (Ganglbauer, 1885). According to Özdikmen & Turgut, 2008c, who raised the variety *inhumeralis* to subspecies rank, the distribution range of this population is restricted “a local area in S Turkey” listing four specimens collected in the provinces of Kaiseri, İçel and Adana. According to the same authors, the type series of *B. samai* was collected in the Amanos mountains. However, both *B. samai* and *B. vittipennis inhumeralis* only represent an extreme color form (“coloration élytrale noire étendue ce qui fait que la tache humérale claire est plus ou moins oblitérée, indistincte ou complètement nulle”) of *Blepisanis vittipennis leuthneri* Ganglbauer, 1886 (type locality: “bei Akbes (Syrien)”, in the Amanus mountains) (elytra black except for a light humeral spot), later on redescribed under the name *Phytoecia akbesiana* Pic, 1900 (type locality: “Haute Syrie, Akbès”).

NOTE:

Phytoecia (Blepisanis) samai was described by Özdikmen & Turgut (2008c) from Amanos Mountains in SC Turkey on the base of 25 males and 18 females specimens (not 4 specimens) and the differences of general morphologies, as well as, the male genital form from *Phytoecia (Blepisanis) vittipennis vittipennis* and *Phytoecia (Blepisanis) vittipennis inhumeralis* as a separate species, not subspecies of *Phytoecia (Blepisanis) vittipennis* (please see Özdikmen & Turgut, 2008 for details) However, *Phytoecia (Blepisanis) vittipennis* is the closest species to it. So the position of G. Sama was not natural and so not acceptable. It is a distinct species.

Secondly, *Phytoecia (Blepisanis) vittipennis inhumeralis* (Pic, 1900) is a valid subspecies. Since, it differs from others described varieties by not only elytral coloration, but also the coloration of femora. With regard to Breuning (1951), only the variety *inhumeralis* has black femora, neither *leuthneri* nor *akbesiana*. Anyway, Özdikmen & Turgut (2008) stated that “*Phytoecia (Blepisanis) vittipennis* is variable. M. L. Ganglbauer (1886) has already been described a variety in which a great part of elytra is black colored with only shoulders spotted more or less long distinct spots, under the name var. *leuthneri*. Then, a new variety, var. *inhumeralis*, was described by Pic (1900) based on examples that have more black colored elytra. In these samples, humeral spots are more or less obliterated, indistinct or even entirely disappeared. Another variety, var. *pallidior* was described by Pic (1901) from Anatolia. Elytral coloration of this variety is clearer than the type form and presutural band is not dark. A great part of legs is testaceous and at least tarsi and bases of femora are dark. Finally, var. *tokatensis* was described by Pic (1933) from Tokat province in N Turkey. In this variety, elytra testaceous with narrow and thin black margins. At the first sight, it resembles var. *pallidior* Pic, 1901 by the absence of a dark spot at the end of elytra.

The necessary corrections in this part are given below.

2. PAGE 53**PRINTED:**

Stictoleptura gevneensis Özdikmen & Turgut, 2008 **syn. nov.** of *Stictoleptura rufa rufa* (Brullé, 1832) based on the description, the type locality and on examination of the holotype illustration of *S. gevneensis*, as well as a long series of specimens from several counties of southern Turkey, including the type locality of *S. gevneensis*. The distinguishing characters used in the description based on a single male, fall within the variability of *S. rufa*.

NOTE:

Also the position of G. Sama was not natural and so not acceptable. *Stictoleptura gevneensis* Özdikmen & Turgut, 2008 that also was described on the base a single male specimen, is a distinct and unique species. It, most particularly, is not a synonym of *Stictoleptura rufa rufa* (Brullé, 1832) based on the description, the type locality and on examination of the holotype illustration.

Even it can easily be seen by examination of the holotype illustration in Özdikmen & Turgut (2008b), the species has no any elytral black spot (neither on elytral apex nor on middle of elytra) uniquely (see the reference). As stated by Özdikmen & Turgut (2008b),

this species is in the species group *erythroptera* clearly and without any black spot at elytral apex. Only *S. erythroptera* (Hagenbach, 1822) is in the species group *erythroptera* without black spot of elytral apex. At least, coloration of legs of *S. erythroptera* is completely different from *S. gevneensis*. Anyway, it is a separate species, not synonym of *S. rufa rufa*, *S. rufa dimidiata* or *Leptura attaliensis*. The later was described from Antalya province like *S. gevneensis*. But, they are not synonym due to *L. attaliensis* has a distinct black spot at the elytral apex like *S. rufa dimidiata*.

The necessary corrections in this part are given below.

3. PAGE 53

PRINTED:

Tetrops anatolicus Özdikmen & Turgut, 2008 **syn. nov.** of *Tetrops praeustus* (Linnaeus, 1758), based on the original description and a long series of topotypical specimens.

NOTE:

The position of G. Sama was not natural and so not acceptable too. It is clear that *anatolicus* Özdikmen & Turgut, 2008e was described as a new subspecies of *T. praeustus*, not a separate species. Mainly, the subspecies *T. praeustus anatolicus* is a color form of *T. praeustus praeustus* like *T. praeustus algiricus*. The later was regarded as a valid subspecies, but *T. praeustus anatolicus* was regarded as invalid. However, this taxon resembles *T. praeustus praeustus* and *T. praeustus algiricus* in terms of colour of elytra and colour of legs respectively. The subspecies can be easily distinguished from *Tetrops praeustus praeustus* (Linnaeus, 1758) by coloration of legs, and elytral punctuation which is more or less stronger than the nominative subspecies. Also the subspecies can be easily distinguished from *Tetrops praeustus algiricus* Chobaut, 1893 by dark spot on elytral apex. So the subspecies should be accepted as valid.

The necessary corrections in this part are given below.

4. PAGE 53-54

PRINTED:

Cortodera discolor var. *differens* Pic, 1898 as synonym of *Cortodera discolor* Fairmaire, 1866, based on the original description..... Pic confused three or four different species under the name *C. discolor*, as proved by the distribution given as "Grèce, Mésopotamie, Bosdagh, Amasie". While the name *differens* can refer only to a taxon occurring in the Asian part of Turkey, Özdikmen & Turgut (2008) considered the Greek *C. steineri* Sama, 1996 to be conspecific with *differens* Pic, 1898.

NOTE:

Thirdly, I think that Sama's approach on this subject is entirely arbitrary. The details about this subject can find in Özdikmen & Turgut (2008d). So, *C. differens* is not a synonym of *C. discolor*. *C. steineri*, on the other side, is a synonym of *C. differens*.

The necessary corrections are given below.

5. PAGE 54

PRINTED:

Necydalis hadullai Szallies, 1995, resurrected from synonymy with *N. ulmi* (Chevrolat, 1838), published unfounded by Özdikmen & Turgut (2006).

NOTE:

The position of G. Sama is unfounded essentially. The synonymy is based on the original description and illustrations of Szallies (1995) (see Özdikmen & Turgut, 2006 for details).

The necessary corrections are given below.

6. PAGE 58

PRINTED:

Several species of Cerambycidae were recorded from Turkey by elder authors, such as Akatay, 1948 and Schmitschek, 1944, based on obvious misidentifications. They were

reported in subsequent articles and books (e. G., Alkan, 2000; Gül-Zümreoğlu, 1975; Lodos, 1998 and others) until nowadays. Most of these wrong records, still repeated without control by some modern authors (Özdikmen & Turgut, 2006; Özdikmen, 2007), are omitted in the Catalogue.

NOTE:

This approach of Sama is erroneous basically. However, it includes some judicious facts. With regard to this approach, on the other hand, some older references on Turkish fauna should be overlooked completely. Since, in question references included the some wrong information that were sorted out by me as possible as with control over years. I think that Sama's approach is shortcuts in one sense. According to me, instead of this, the correct information in any reference should be evaluated. Thus, accumulated data over years should not be ignored. From this point of view, I think some mistakes and insufficiencies on Turkish fauna in the Catalogue originated from the acceptance by editors of the G. Sama's position.

7. PAGE 101

PRINTED:

abdominalis Stephens, 1831: 262 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CZ DE FR GB GE GG GR HU IR IT MC NL PL PT RO SK SL SP ST SV SZ UK A: IN TR

MUST BE:

abdominalis Stephens, 1831: 262 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CZ DE FR GB GE GG GR HU IR IT MC NL PL PT RO SK SL SP ST SV SZ TR UK A: IN TR

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

8. PAGE 101

PRINTED:

ruficornis ruficornis Fabricius, 1781: 247 (*Leptura*) [NP] E: AL AU BE BH BU BY CR CZ DE EN FR GB GE GR HU IR IT LA LS LT MC MD NL NR PL PT RO SK SL SP ST SV SZ UK YU A: TR

atra Fabricius, 1775: 197 (*Leptura*) [NO]

clavipes Geoffroy, 1785: 87 (*Stenocorus*)

laevis Herbst, 1784: 103 (*Leptura*)

pallipes Stephens, 1831: 264 (*Leptura*)

parisina Thunberg, 1784: 16 (*Leptura*)

pumila Schaller, 1783: 299 (*Leptura*)

rufipes Goeze, 1777: 501 (*Leptura*) [NO]

MUST BE:

ruficornis ruficornis Fabricius, 1781: 247 (*Leptura*) [NP] E: AL AU BE BH BU BY CR CZ DE EN FR GB GE GR HU IR IT LA LS LT MC MD NL NR PL PT RO SK SL SP ST SV SZ TR UK YU A: TR

atra Fabricius, 1775: 197 (*Leptura*) [NO]

clavipes Geoffroy, 1785: 87 (*Stenocorus*)

laevis Herbst, 1784: 103 (*Leptura*)

pallipes Stephens, 1831: 264 (*Leptura*)

parisina Thunberg, 1784: 16 (*Leptura*)

pumila Schaller, 1783: 299 (*Leptura*)

rufipes Goeze, 1777: 501 (*Leptura*) [NO]

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

9. PAGE 101**PRINTED:**

ustulata Schaller, 1783: 298 (*Leptura*) **E:** AB AL AR AU BE BH BU BY CR CT CZ DE
FR GB GE GR HU IR IT MC MD NL NR PL PT RO SK SL SP ST SV SZ UK YU **A:** IN TR

MUST BE:

ustulata Schaller, 1783: 298 (*Leptura*) **E:** AB AL AR AU BE BH BU BY CR CT CZ DE FR GB
GE GR HU IR IT MC MD NL NR PL PT RO SK SL SP ST SV SZ TR UK YU **A:** IN TR

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

10. PAGE 103**PRINTED:**

aethiops Poda von Neuhaus, 1761: 38 **E:** AR AB AL AU BE BH BY CH CT CZ DE EN FR GE
GG GR HU IT LA LS LT LU MD NL NT PL RO SK SL SP ST SZ UK YU **A:** ES FE FUJ
GUX HEB HEI JA JIL JIX KZ MG NC QIN SC WS YUN

MUST BE:

aethiops Poda von Neuhaus, 1761: 38 **E:** AR AB AL AU BE BH BY CH CT CZ DE EN FR GE
GG GR HU IT LA LS LT LU MD NL NT PL RO SK SL SP ST SZ UK YU **A:** ES FE FUJ
GUX HEB HEI JA JIL JIX KZ MG NC QIN SC TR WS YUN

NOTE:

The record for Asian Turkey see Özdikmen [2007].

11. PAGE 108**PRINTED:**

cerambyciformis Schrank, 1781a: 154 (*Leptura*) **E:** AB AL AR AU BE BH BU BY CR CT CZ
DE EN FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NT PL PT RO SK SL SP ST
SZ UK YU

MUST BE:

cerambyciformis Schrank, 1781a: 154 (*Leptura*) **E:** AB AL AR AU BE BH BU BY CR CT CZ
DE EN FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NT PL PT RO SK SL SP ST
SZ UK YU **A:** TR

NOTE:

The record for Asian Turkey see Svacha & Danilevsky [1989], Özdikmen [2007].

12. PAGE 110**PRINTED:**

revestita Linnaeus, 1767: 638 (*Leptura*) **E:** AL AU BE BH BU CR CZ DE FR FR FR GB GE
GR HU IT MD NL PL PT RO SK SL SP SV SZ TR UK YU

MUST BE:

revestita Linnaeus, 1767: 638 (*Leptura*) **E:** AL AU BE BH BU CR CZ DE FR FR FR GB GE
GR HU IT MD NL PL PT RO SK SL SP SV SZ TR UK YU **A:** TR

NOTE:

The record for Asian Turkey see Özdikmen [2007 and 2011a].

13. PAGE 113**PRINTED:**

bifasciata bifasciata O. F. Müller, 1776: 93 (*Leptura*) **E:** AB AL AR AU BE BH BU BY CR
CT CZ EN FR GE GG GR HU IT LA LS LT LU MC MD NL NT PL PT RO SK SL SP ST SZ
TR UK YU **A:** ES IN IQ KZ TR WS XIN

...
bifasciata limbiventris Reitter, 1898a: 21 (*Strangalia*) E: GG A: TR
bifasciata nigrosuturalis Reitter, 1895a: 88 (*Strangalia*) A: LE SY TR

MUST BE:

bifasciata bifasciata O. F. Müller, 1776: 93 (*Leptura*) E: AB AL AR AU BE BH BU BY CR
 CT CZ EN FR GE GG GR HU IT LA LS LT LU MC MD NL NT PL PT RO SK SL SP ST SZ
 TR UK YU A: ES IN IQ KZ TR WS XIN

...
bifasciata limbiventris Reitter, 1898a: 21 (*Strangalia*) E: GG A: TR
bifasciata nigrosuturalis Reitter, 1895a: 88 (*Strangalia*) A: LE SY TR
bifasciata safronovi Danilevsky, 2011: 2 A: TR

NOTE:

The record for Asian Turkey see Danilevsky [2011a].

14. PAGE 113

PRINTED:

novercalis Reitter, 1901b: 78 E: GG ST A: TR
samai Rapuzzi, 1995: 618 E: BU GR TR

MUST BE:

novercalis Reitter, 1901b: 78 E: GG ST A: TR
pamphylae Rapuzzi & Sama, 2009: 182 A: TR
samai Rapuzzi, 1995: 618 E: BU GR TR

NOTE:

The record for Turkey see Rapuzzi & Sama [2009].

15. PAGE 114

PRINTED:

septempunctata suturata Reiche & Saulcy, 1858: 22 (*Strangalia*) E: AR BU GG A: TR

MUST BE:

septempunctata suturata Reiche & Saulcy, 1858: 22 (*Strangalia*) E: AR BU GG TR A: TR

NOTE:

The records for European Turkey see Özdikmen [2008a and 2010c].

16. PAGE 114

PRINTED:

rubra rubra Linnaeus, 1758: 397 (*Leptura*) E: AL AU BE BH BU BY CR CT CZ DE EN FI
 FR GB GE GR HU IR IT LA LS LT LU MD NL NR NT PL PT RO SK SL SP ST SV SZ UK
 YU A: ES KZ NC SC WS

MUST BE:

rubra rubra Linnaeus, 1758: 397 (*Leptura*) E: AL AU BE BH BU BY CR CT CZ DE EN FI
 FR GB GE GR HU IR IT LA LS LT LU MD NL NR NT PL PT RO SK SL SP ST SV SZ TR
 UK YU A: ES KZ NC SC TR WS

NOTE:

The records for Turkey see Özdikmen [2007, 2008a and 2010c].

17. PAGE 114

PRINTED:

cordigera anojaensis Sláma, 1982: 207 E: GR (Kriti) A: TR

cordigera cordigera Fuessly, 1775: 14 (*Leptura*) E: AB AR BE BU DE FR GE GG GR (north-east) IT RO SP SZ RO UK N: LB A: CY IN IQ IS LE SY TR

MUST BE:

cordigera anojaensis Sláma, 1982: 207 E: GR (Kriti) A: TR

cordigera cordigera Fuessly, 1775: 14 (*Leptura*) E: AB AR BE BU DE FR GE GG GR (north-east) IT RO SP SZ RO TR UK N: LB A: CY IN IQ IS LE SY TR

NOTE:

The records for European Turkey see Özdikmen [2008a and 2010c].

18. PAGE 115

PRINTED:

fulva DeGeer, 1775: 137 (*Leptura*) E: AL AU BE BH BU BY CR CZ FR GB GE GR HU IR IT LS LU MC NL PT RO SK SL SP ST SZ TR UK YU A: TR

affinis Marsham, 1802: 353 (*Leptura*)

apicalis Motschulsky, 1875: 142 (*Leptura*)

corsica Pic, 1894k: 206 (*Leptura*)

lutescens Geoffroy, 1785: 87 (*Stenocorus*)

tomentosa Fabricius, 1792b: 340 (*Leptura*)

gladiatrix Sama, 2008: 220 N: MO

...

rufa dimidiata K. Daniel & J. Daniel, 1891: 11 (*Leptura*) A: IN IQ TR

attaliensis K. Daniel & J. Daniel, 1891: 11 (*Leptura*)

rufa rufa Brullé, 1832: 263 (*Leptura*) E: AB AL AR BH BU CR GG GR IT MC RO ST YU A: TR

excelsa A. Costa, 1863: 24 (*Leptura*)

gevneensis Özdikmen & Turgut, 2008b: 549

nigropicta Fairmaire, 1866b: 278 (*Leptura*)

MUST BE:

fulva DeGeer, 1775: 137 (*Leptura*) E: AL AU BE BH BU BY CR CZ FR GB GE GR HU IR IT LS LU MC NL PT RO SK SL SP ST SZ TR UK YU A: TR

affinis Marsham, 1802: 353 (*Leptura*)

apicalis Motschulsky, 1875: 142 (*Leptura*)

corsica Pic, 1894k: 206 (*Leptura*)

lutescens Geoffroy, 1785: 87 (*Stenocorus*)

tomentosa Fabricius, 1792b: 340 (*Leptura*)

gevneensis Özdikmen & Turgut, 2008b: 549 A: TR

gladiatrix Sama, 2008: 220 N: MO

...

rufa dimidiata K. Daniel & J. Daniel, 1891: 11 (*Leptura*) A: IN IQ TR

attaliensis K. Daniel & J. Daniel, 1891: 11 (*Leptura*)

rufa rufa Brullé, 1832: 263 (*Leptura*) E: AB AL AR BH BU CR GG GR IT MC RO ST YU A: TR

excelsa A. Costa, 1863: 24 (*Leptura*)

nigropicta Fairmaire, 1866b: 278 (*Leptura*)

NOTE:

The necessary explanations are given in **2. PAGE 53**.

19. PAGE 117

PRINTED:

bipunctata mulsantiana Plavilstshikov, 1936: 341 (*Leptura*) E: MD RO ST UK

MUST BE:

bipunctata mulsantiana Plavilstshikov, 1936: 341 (*Leptura*) E: MD RO ST TR UK

NOTE:

The records for European see Özdikmen [2010c], Özdikmen & Turgut [2009a].

20. PAGE 117**PRINTED:**

bisignata bisignata Brullé, 1832: 264 (*Leptura*) **E:** BU GR **TR A:** TR

MUST BE:

bisignata bisignata Brullé, 1832: 264 (*Leptura*) **E:** BU GR TR **A:** TR

NOTE:

The records for European and Asian Turkey see Özdikmen [2010c], Özdikmen & Turgut [2009a].

21. PAGE 118**PRINTED:**

cursor Linnaeus, 1758: 393 (*Cerambyx*) **E:** AL AN AU BE BH BU BY CR CT CZ DE EN FI
FR GE HU IT LA LS LT MC MD NL NR NT PL RO SK SL SP ST SV SZ UK YU **A:** SHX
WS

MUST BE:

cursor Linnaeus, 1758: 393 (*Cerambyx*) **E:** AL AN AU BE BH BU BY CR CT CZ DE EN FI
FR GE HU IT LA LS LT MC MD NL NR NT PL RO SK SL SP ST SV SZ UK YU **A:** SHX
TR WS

NOTE:

The record for Turkey see Turgut et al. [2010], Özdikmen [2010a].

22. PAGE 119**PRINTED:**

quercus quercus Götze, 1783: 74 (*Cerambyx*) **E:** AU BE BH BU BY CR CT CZ DE FR GE GG
GR HU IT MC MD PL RO SK SL SP ST SZ UK YU **A:** ES MG TR WS

MUST BE:

quercus quercus Götze, 1783: 74 (*Cerambyx*) **E:** AU BE BH BU BY CR CT CZ DE FR GE GG
GR HU IT MC MD PL RO SK SL SP ST SZ TR UK YU **A:** ES MG TR WS

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

23. PAGE 122**PRINTED:**

alpina umbripennis Reitter, 1890e: 245 **E:** AB AR GG ST **A:** IN
armeniaca Pic, 1898k: 114
flavipennis Ganglbauer, 1897a: 53
rosinae Pic, 1902c: 8
xanthoptera Pic, 1898k: 115

MUST BE:

alpina umbripennis Reitter, 1890e: 245 **E:** AB AR GG ST **A:** IN TR
armeniaca Pic, 1898k: 114
alpina xanthoptera Pic, 1898k: 115 **A:** SY TR
flavipennis Ganglbauer, 1897a: 53
rosinae Pic, 1902c: 8

NOTE:

The record for Asian Turkey see Plavilstshikov [1936], Özdikmen [2007 and 2011a].

24. PAGE 122-123**PRINTED:**

colchica kalashiani Danilevsky, 2000b: 39 **E:** AR
discolor Fairmaire, 1866b: 277 **A:** TR
differens Pic, 1898g: 50
prescutellaris Pic, 1933d: 5
testaceipes Pic, 1898k: 112

...

simulatrix Holzschuh, 1975: 83 **A:** TR
steineri Sama, 1997b: 112 **E:** GR

MUST BE:

colchica kalashiani Danilevsky, 2000b: 39 **E:** AR
differens Pic, 1898g: 50 **E:** GR **A:** TR
prescutellaris Pic, 1933d: 5
steineri Sama, 1997b: 112
discolor Fairmaire, 1866b: 277 **A:** TR
testaceipes Pic, 1898k: 112

...

simulatrix Holzschuh, 1975: 83 **A:** TR

NOTE:

The necessary explanations are given in **3. PAGE 53-54.**

25. PAGE 124**PRINTED:**

transcaspica Plavilstshikov, 1936: 290 **E:** AB AR **A:** IN TM

MUST BE:

transcaspica Plavilstshikov, 1936: 290 **E:** AB AR **A:** IN TM TR

NOTE:

The record for Asian Turkey see Danilevsky [2011b].

26. PAGE 125**PRINTED:**

elegans Faldermann, 1837: 319 (*Grammoptera*) **E:** AB AR CT GG ST **A:** IN TR

MUST BE:

elegans Faldermann, 1837: 319 (*Grammoptera*) **E:** AB AR CT GG ST TR **A:** IN TR

NOTE:

The record for Asian Turkey see Özdikmen [2007, 2008a, 2010c and 2011b].

27. PAGE 132**PRINTED:**

caucasicum caucasicum Reitter, 1889e: 287 **E:** AB AR GG ST

MUST BE:

caucasicum caucasicum Reitter, 1889e: 287 **E:** AB AR GG ST **A:** TR

NOTE:

The record for Asian Turkey see Özdikmen [2007], Özdikmen & Turgut [2010c].

28. PAGE 132**PRINTED:**

mordax DeGeer, 1775: 124 (*Leptura*) **E:** AL AU BE BH BU BY CR CT CZ DE EN FI FR GB
GE GR HU IR IT LA LT LU LS MC MD NL NR NT PL RO SK SL SP ST SV SZ UK YU **A:**
ES KZ WS

MUST BE:

mordax DeGeer, 1775: 124 (*Leptura*) **E:** AL AU BE BH BU BY CR CT CZ DE EN FI FR GB
GE GR HU IR IT LA LT LU LS MC MD NL NR NT PL RO SK SL SP ST SV SZ UK YU **A:**
ES KZ TR WS

NOTE:

The record for Asian Turkey see Özdikmen [2007], Özdikmen & Turgut [2010c].

29. PAGE 132**PRINTED:**

pygmaeum Ganglbauer, 1882: 718 **E:** AB **A:** IN
pygmaeum Ganglbauer, 1886d: 234 (*Stenocorus*)
rostri Pic, 1898b: 18
sycophanta Schrank, 1781a: 137 (*Cerambyx*) **E:** AL AU BE BH BU BY CR CT CZ DE FI FR
GB GE GR HU IR IT LA LT MC MD NL PL PT RO SK SL SP ST SV SZ TR UK YU **A:** WS
grandiceps C. G. Thomson, 1866: 50
scrutator Olivier, 1795: 10 (*Stenocorus*)
syriacum Pic, 1892s: cxi [= 1893d: 414] **A:** SY TR
phrygium K. Daniel, 1906b: 176

MUST BE:

phrygium K. Daniel, 1906b: 176 **A:** TR
pygmaeum Ganglbauer, 1882: 718 **E:** AB **A:** IN
pygmaeum Ganglbauer, 1886d: 234 (*Stenocorus*)
rostri Pic, 1898b: 18
sycophanta Schrank, 1781a: 137 (*Cerambyx*) **E:** AL AU BE BH BU BY CR CT CZ DE FI FR
GB GE GR HU IR IT LA LT MC MD NL PL PT RO SK SL SP ST SV SZ TR UK YU **A:** WS
grandiceps C. G. Thomson, 1866: 50
scrutator Olivier, 1795: 10 (*Stenocorus*)
syriacum Pic, 1892s: cxi [= 1893d: 414] **A:** SY TR

NOTE:

The synonymy between *R. syriacum* Pic, 1892 (from Amanos Mts.) and *R. phrygium* Daniel, 1906 (from Taurus Mts.) is a polemic. These taxa are not synonym. Since, *R. syriacum* has the same coloration and pubescent especially on the pronotum and elytra with *R. sycophanta* except posterior parts of elytra. *R. phrygium* easily distinguished from *R. syriacum* and *R. sycophanta* by stronger pronotal and elytral pubescence especially except other diagnostic characters (see Özdikmen & Turgut, 2010 for details).

The records for Turkey see Özdikmen & Turgut [2010c], Özdikmen [2011a].

30. PAGE 133**PRINTED:**

inquisitor inquisitor Linnaeus, 1758: 393 (*Cerambyx*) **E:** AL AU BE BH BU BY CR CT CZ
DE EN FI FR GB GE GR HU IR IT LA LS LT MD NE NL NR NT PL PT RO SK SL SP ST
SV SZ TR UK YU **A:** ES KZ MG WS **NAR**

MUST BE:

inquisitor inquisitor Linnaeus, 1758: 393 (*Cerambyx*) **E:** AL AU BE BH BU BY CR CT CZ
DE EN FI FR GB GE GR HU IR IT LA LS LT MD NE NL NR NT PL PT RO SK SL SP ST
SV SZ TR UK YU **A:** ES KZ MG TR WS **NAR**

NOTE:

The record for Asian Turkey see Özdikmen [2007], Özdikmen & Turgut [2010c].

31. PAGE 135

PRINTED:

bicolor bicolor Schrank, 1781a: 132 (*Cerambyx*) E: AL AU BE BH BU BY CR CT CZ EN FI
FR GE GR HU IT LA LT LU MC MD NL NT PL RO SK SL SP ST SZ UK YU A: KZ

MUST BE:

bicolor bicolor Schrank, 1781a: 132 (*Cerambyx*) E: AL AU BE BH BU BY CR CT CZ EN FI
FR GE GR HU IT LA LT LU MC MD NL NT PL RO SK SL SP ST SZ UK YU A: KZ TR

NOTE:

The record for Asian Turkey see Cebeci & Özdikmen [2010], Özdikmen & Turgut [2010d].

32. PAGE 135

PRINTED:

graecum graecum Schaufuss, 1862: 311 E: AB AR GG GR A: TR
limbatum Pic, 1901h: 31
graecum italicum G. Müller, 1966: 4 E: IT
juglandis Fairmaire, 1866b: 276 E: AB AR GG UK ST A: IN SY TR
anatolicum Pic, 1901h: 31
delagrangei Pic, 1901h: 31
geniculatum Pic, 1901h: 30
mesmini Pic, 1931c: 6
obscuripes Pic, 1903p: 163
praeustum Reitter, 1895a: 85
rufotibiale Pic, 1917g: 3
testaceipenne Pic, 1897p: 299

MUST BE:

graecum graecum Schaufuss, 1862: 311 E: AB AR GG GR TR A: IN SY TR
delagrangei Pic, 1901h: 31
geniculatum Pic, 1901h: 30
juglandis Fairmaire, 1866b: 276
limbatum Pic, 1901h: 31
praeustum Reitter, 1895a: 85
graecum italicum G. Müller, 1966: 4 E: IT
testaceipenne Pic, 1897p: 299 E: AB AR GG UK ST A: IN SY TR
anatolicum Pic, 1901h: 31
mesmini Pic, 1931c: 6
obscuripes Pic, 1903p: 163
rufotibiale Pic, 1917g: 3

NOTE:

It is a problematic group. The system of G. Sama was given in the Catalogue and it was published for the first time. With regard to me the old system is more reasonable.

For the records see Cebeci & Özdikmen [2010].

33. PAGE 136

PRINTED:

caucasicola caucasicola Plavilstshikov, 1936: 496 E: GG ST
caucasicola kadleci Miroshnikov, 2000a: 38 A: TR

MUST BE:

caucasicola caucasicola Plavilstshikov, 1936: 496 E: GG ST A: TR
caucasicola kadleci Miroshnikov, 2000a: 38 A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2007 and 2010c].

34. PAGE 137

PRINTED:

spinolae Frivaldszky von Frivald, 1837: 180 E: AU BH BU CR IT MC RO SL YU

MUST BE:

spinolae Frivaldszky von Frivald, 1837: 180 E: AU BH BU CR IT MC RO SL TR YU

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

35. PAGE 137

PRINTED:

ferus Mulsant, 1839: 64 (*Criocephalus*) E: AB AR AU BE BH BU BY CR CT CZ DE EN FR
GB GE GG GR HU IR IT LA LT LU MA MC MD NL NT PL PT RO SK SL SP ST SV SZ
UK N: AG MO MR TU A: ES CY FE IS JO KZ TR WS

MUST BE:

ferus Mulsant, 1839: 64 (*Criocephalus*) E: AB AR AU BE BH BU BY CR CT CZ DE EN FR
GB GE GG GR HU IR IT LA LT LU MA MC MD NL NT PL PT RO SK SL SP ST SV SZ
UK N: AG MO MR TR TU A: ES CY FE IS JO KZ TR WS

NOTE:

The record for European Turkey see Özdikmen & Turgut [2006b], Özdikmen [2010c].

36. PAGE 137

PRINTED:

rusticus Linnaeus, 1758: 395 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL RO SK SL SP ST SV
SZ UK N: MO A: ES FE FUJ GAN GUI HAI HEB HEI HUB JA JIL JIX KZ LIA MG
NMO NC SC SCH SHA SHN TR WS YUN ZHE

MUST BE:

rusticus Linnaeus, 1758: 395 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL RO SK SL SP ST SV
SZ TR UK N: MO A: ES FE FUJ GAN GUI HAI HEB HEI HUB JA JIL JIX KZ LIA MG
NMO NC SC SCH SHA SHN TR WS YUN ZHE

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

37. PAGE 139

PRINTED:

castaneum Linnaeus, 1758: 396 (*Cerambyx*) E: AB AL AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MD NL NR NT PL RO SK SL SP ST SV SZ
UK YU A: ES FE FUJ GAN HEB HEI JA JIL KZ MG NIN NMO QIN SC SHA SHX WS
XIN YUN ZHE

MUST BE:

castaneum Linnaeus, 1758: 396 (*Cerambyx*) E: AB AL AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MD NL NR NT PL RO SK SL SP ST SV SZ
UK YU A: ES FE FUJ GAN HEB HEI JA JIL KZ MG NIN NMO QIN SC SHA SHX TR
WS XIN YUN ZHE

NOTE:

According to the position of G. Sama, there is no any member of the genus *Tetropium* in Turkey. So the old records which were completely belong to older Turkish authors, were overlooked by him. This approach of Sama was not natural and so not acceptable. Why it does not occur, for example, *T. castaneum* in Turkey, while, the species occurs in Bulgaria, Greece, Azerbaijan, Georgia?...

The record for Asian Turkey see Özdikmen & Turgut [2006b], Özdikmen [2007].

38. PAGE 139

PRINTED:

fuscum Fabricius, 1787: 154 (*Callidium*) E: AU BE BH BU BY CR CT CZ DE EN FI FR GE GG HU IT LA LS LT MD NL NR NT PL RO SK SL ST SV SZ UK YU A: KZ WS XIN
NAR

MUST BE:

fuscum Fabricius, 1787: 154 (*Callidium*) E: AU BE BH BU BY CR CT CZ DE EN FI FR GE GG HU IT LA LS LT MD NL NR NT PL RO SK SL ST SV SZ UK YU A: KZ TR WS XIN
NAR

NOTE:

This species occurs in Caucasus (Georgia). In NE Turkey, it is recorded from Artvin province that is very close the Georgia.

The record for Asian Turkey see Özdikmen & Turgut [2006b], Özdikmen [2007].

39. PAGE 141

PRINTED:

hadullai Szallies, 1994: 260 A: TR
hirayamai flava Niisato, 2008a: 261 A: YUN

...

ulmi Chevrolat, 1838: [unnumb.] [NP] E: AB AR AU BH BU BY CR CZ FR GE GG GR HU IT LA LT MC MD PL RO SK SP ST SZ TR UK YU A: TR
annulata L. Petagna, 1819: 19 (*Melorchus*) [NO]
mesembrina Plavilstshikov, 1936: 467
panzeri Harold, 1876c: 174

MUST BE:

hirayamai flava Niisato, 2008a: 261 A: YUN

...

ulmi Chevrolat, 1838: [unnumb.] [NP] E: AB AR AU BH BU BY CR CZ FR GE GG GR HU IT LA LT MC MD PL RO SK SP ST SZ TR UK YU A: TR
annulata L. Petagna, 1819: 19 (*Melorchus*) [NO]
hadullai Szallies, 1994: 260
mesembrina Plavilstshikov, 1936: 467
panzeri Harold, 1876c: 174

NOTE:

The necessary explanations are given in **5. PAGE 54**

40. PAGE 142

PRINTED:

caspica Semenov, 1901: 31 E: AB GG ST A: AF IN KZ TM UZ

MUST BE:

caspica Semenov, 1901: 31 E: AB GG ST A: AF IN KZ TM TR UZ

NOTE:

The record for Asian Turkey see Danilevsky [2008], Özdikmen & Turgut [2006a].

41. PAGE 143**PRINTED:**

arabicus Küster, 1847c: 95 (*Clytus*) E: AB AR GG ST A: IN TR

MUST BE:

arabicus Küster, 1847c: 95 (*Clytus*) E: AB AR GG ST TR A: IN TR

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

42. PAGE 144**PRINTED:**

danilevskii Miroshnikov, 2000b: 77 E: AB AR GG

MUST BE:

danilevskii Miroshnikov, 2000b: 77 E: AB AR GG A: IN TR

NOTE:

The record for Asian Turkey see Miroshnikov [2000].

43. PAGE 144**PRINTED:**

ganglbaueri Reitter, 1886: 67 E: AB A: IN

MUST BE:

ganglbaueri Reitter, 1886: 67 E: AB A: IN TR

NOTE:

The record for Asian Turkey see Miroshnikov [2000a].

44. PAGE 146-147**PRINTED:**

moschata ambrosiaca Steven, 1809: 40 E: AB AR GG IT PT SP ST N: AG MO TU A: IN IQ

JO LE SY

melancholica Reitter, 1895d: 210

notaticollis Pic, 1928c: 9

rosarum P. H. Lucas, 1849: 488

rosarum A. Costa, 1855: 26 [HN]

thoracica Fischer von Waldheim, 1824: 236 (*Cerambyx*)

moschata cruenta Bogdanov, 1962: 96 A: KI TD

moschata jankovskii Danilevsky, 2007d: 48 A: KI

moschata moschata Linnaeus, 1758: 391 (*Cerambyx*) E: AL AU BE BU BY CR CT CZ DE

EN FI FR GB GE GG GR HU IR IT KZ LA LT LU MC MD NL NR NT PL RO SK SL SP ST

SV SZ TR UK YU A: ES KZ MG WS

MUST BE:

moschata ambrosiaca Steven, 1809: 40 E: AB AR GG IT PT SP ST N: AG MO TU A: IN IQ

JO LE SY TR

melancholica Reitter, 1895d: 210

notaticollis Pic, 1928c: 9

rosarum P. H. Lucas, 1849: 488

rosarum A. Costa, 1855: 26 [HN]

thoracica Fischer von Waldheim, 1824: 236 (*Cerambyx*)

moschata cruenta Bogdanov, 1962: 96 A: KI TD

moschata jankovskii Danilevsky, 2007d: 48 A: KI

moschata moschata Linnaeus, 1758: 391 (*Cerambyx*) E: AL AU BE BU BY CR CT CZ DE
EN FI FR GB GE GG GR HU IR IT KZ LA LT LU MC MD NL NR NT PL RO SK SL SP ST
SV SZ TR UK YU A: ES KZ MG TR WS

NOTE:

The records for Asian Turkey see Özdikmen [2007, 2008a,e, 2010c and 2011a], Turgut & Özdikmen [2010], Özdikmen et al. [2010].

45. PAGE 151

PRINTED:

violaceum Fabricius, 1775: 395 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CR CT CZ DE
EN FI FR GB GE GG HU IR IT LA LS LT LU MD NL NR NT PL RO SK SL ST SV SZ UK
YU A: ES FE HEI JA JIL KZ MG NC NMO SC TAI WS XIN

MUST BE:

violaceum Fabricius, 1775: 395 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CR CT CZ DE
EN FI FR GB GE GG HU IR IT LA LS LT LU MD NL NR NT PL RO SK SL ST SV SZ UK
YU A: ES FE HEI JA JIL KZ MG NC NMO SC TAI TR WS XIN

NOTE:

The record for Asian Turkey see Cebeci et al. [2011].

46. PAGE 152

PRINTED:

femoralis demelti Heyrovský, 1962a: 41 A: TR

MUST BE:

femoralis demelti Heyrovský, 1962a: 41 E: TR A: TR

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

47. PAGE 154

PRINTED:

pusillum pusillum Fabricius, 1787: 155 (*Callidium*) E: AU BE BH BU CR CZ FR GE GR HU
IT MD NR PL RO SL SP SV SZ UK

MUST BE:

pusillum pusillum Fabricius, 1787: 155 (*Callidium*) E: AU BE BH BU CR CZ FR GE GR HU
IT MD NR PL RO SL SP SV SZ TR UK A: TR

NOTE:

The record for European Turkey see Bodemeyer [1900], Özdikmen [2008a and 2010c].

48. PAGE 155

PRINTED:

insubricus insubricus Germar, 1824: 154 (*Callidium*) E: AL AU BH BU CR FR HU IT RO SL
SP YU

MUST BE:

insubricus insubricus Germar, 1824: 154 (*Callidium*) E: AL AU BH BU CR FR HU IT RO SL
SP YU A: TR

NOTE:

The record for Asian Turkey see Bodemeyer [1906], Özdikmen [2008a], Cebeci et al. [2011].

49. PAGE 155**PRINTED:**

lederi Ganglbauer, 1882: 747 (*Rhopalopus*) E: AB AR GG ST TR UK

MUST BE:

lederi Ganglbauer, 1882: 747 (*Rhopalopus*) E: AB AR GG ST TR UK A: TR

NOTE:

The record for Asian Turkey see Adlbauer [1992], Sama [1996c], Özdikmen [2007].

50. PAGE 159**PRINTED:**

dux Faldermann, 1837: 264 (*Hammaticherus*) E: AB AR BU GG MC ST UK A: IN IS JO LE SY

MUST BE:

dux Faldermann, 1837: 264 (*Hammaticherus*) E: AB AR BU GG MC ST TR UK A: IN IS JO LE SY TR

NOTE:

The record for Asian Turkey see Özdikmen [2008e and 2011a], Özdikmen & Turgut [2009b].

51. PAGE 159**PRINTED:**

heinzianus Demelt, 1976: 65 E: GG

MUST BE:

heinzianus Demelt, 1976: 65 A: TR

NOTE:

This species was described from Turkey. It is not represented in Caucasus. Georgia record of Sama should belong to *C. klinzigi*. However, this taxon was accepted as a synonym of *C. cerdo* in the Catalogue (p. 46).

The record for Asian Turkey see Özdikmen & Turgut [2009b].

52. PAGE 159**PRINTED:**

nodulosus Germar, 1817: 220 E: AB AL AR BH BU CR GG GR IT MA MC RO SL ST TR UK YU A: CY LE SY

MUST BE:

nodulosus Germar, 1817: 220 E: AB AL AR BH BU CR GG GR IT MA MC RO SL ST TR UK YU A: CY LE SY TR

NOTE:

The record for Asian Turkey see Özdikmen & Turgut [2009b].

53. PAGE 159**PRINTED:**

welensii Küster, 1845a: 44 (*Hammaticherus*) E: AL AB BH BU CR FR GG GR HU IT PT RO SK SL SP UK YU A: CY IN IS JO LE SY TR

MUST BE:

welensii Küster, 1845a: 44 (*Hammaticherus*) E: AL AB BH BU CR FR GG GR HU IT PT RO SK SL SP TR UK YU A: CY IN IS JO LE SY TR

NOTE:

The record for European Turkey see Özdikmen & Turgut [2009b].

54. PAGE 166

PRINTED:

figuratus Scopoli, 1763: 55 (*Cerambyx*) E: AB AL AR AU BH BU BY CD CR CT CZ EN FR
GE GG GR HU IT LA LS LT LU MC MD NT PL PT RO SK SL SP ST SZ UK YU A: ES IN
JIA JIX KZ LIA

MUST BE:

figuratus Scopoli, 1763: 55 (*Cerambyx*) E: AB AL AR AU BH BU BY CD CR CT CZ EN FR
GE GG GR HU IT LA LS LT LU MC MD NT PL PT RO SK SL SP ST SZ TR UK YU A: ES
IN JIA JIX KZ LIA TR

NOTE:

The record for Turkey see Özdikmen [2007, 2008a,e and 2010c], Özdikmen & Turgut [2009e].

55. PAGE 170

PRINTED:

arietis arietis Linnaeus, 1758: 399 (*Leptura*) E: AL AU BE BH BU BY CR CT CZ DE ES FI
FR GB GE GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SP ST SV SZ
TR UK YU N: MR
arcuatus Sulzer, 1761: 12 (*Leptura*)
bichhardti Pic, 1913c: 98
bourdilloni Mulsant, 1839: 81
chapmani Pic, 1937c: 13
cloueti Théry, 1893: ccxiii
gazella Fabricius, 1792b: 333 (*Callidium*)
heyrowskyi Pic, 1931c: 14
quadrfasciatus DeGeer, 1775: 81 (*Cerambyx*)
arietis lederi Ganglbauer, 1882: 730 [= 1886: 232] E: AB A: IN TM

MUST BE:

arietis arietis Linnaeus, 1758: 399 (*Leptura*) E: AL AU BE BH BU BY CR CT CZ DE ES FI
FR GB GE GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SP ST SV SZ
TR UK YU N: MR A: TR
arcuatus Sulzer, 1761: 12 (*Leptura*)
bichhardti Pic, 1913c: 98
bourdilloni Mulsant, 1839: 81
chapmani Pic, 1937c: 13
cloueti Théry, 1893: ccxiii
gazella Fabricius, 1792b: 333 (*Callidium*)
heyrowskyi Pic, 1931c: 14
quadrfasciatus DeGeer, 1775: 81 (*Cerambyx*)
arietis lederi Ganglbauer, 1882: 730 [= 1886: 232] E: AB A: IN TM TR

NOTE:

The records for Asian Turkey see Özdikmen [2007, 2008e and 2010c], Özdikmen & Turgut [2009c].

56. PAGE 176

PRINTED:

genus *Plagionotus* Mulsant, 1842b: 1 type species *Leptura detrita* Linnaeus, 1758
Echinocerus Mulsant, 1862: 143 type species *Cerambyx floralis* Pallas, 1773
Neoplagonotus Kasatkin, 2005: 51 type species *Clytus bobelayei* Brullé, 1832
Paraplagonotus Kasatkin, 2005: 51 [unnecessary RN]

Platynotus Mulsant, 1839: 71 [HN] type species *Leptura detrita* Linnaeus, 1758

NOTE:

The system of Sama was not natural and cannot be accepted. The position of the genus that was proposed by Danilevsky (2010) is more reasonable. Anyway, Özdikmen & Turgut (2009) was given *Echinocerus* Mulsant, 1862 and *Neoplagonotus* Kasatkin, 2005 which was regarded as separate genera by Danilevsky (2010), as subgenera of the genus *Plagonotus*.

See Özdikmen & Turgut [2009d], Danilevsky [2010].

57. PAGE 177

PRINTED:

scalaris Brullé, 1832: 254 (*Clytus*) E: GR IT N: AG MO TU

MUST BE:

scalaris Brullé, 1832: 254 (*Clytus*) E: GR IT N: AG MO TU A: TR

NOTE:

The record for Asian Turkey see Özdikmen & Turgut [2009d].

58. PAGE 177

PRINTED:

brunnescens Pic, 18970: 262 (*Clytus*) E: GG ST

MUST BE:

brunnescens Pic, 18970: 262 (*Clytus*) E: GG ST A: TR

NOTE:

The record for Asian Turkey see Danilevsky & Miroshnikov [1985].

59. PAGE 179

PRINTED:

rusticus Linnaeus, 1758: 398 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CT CZ DE EN FI
FR GE GG GR HU IT LA LT MC MD NR NT PL PT RO SK SL SP ST SV SZ UK YU N:
AG MO A: ES FE IN KZ MG NC SC TD TM TR WS

MUST BE:

rusticus Linnaeus, 1758: 398 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CT CZ DE EN FI
FR GE GG GR HU IT LA LT MC MD NR NT PL PT RO SK SL SP ST SV SZ TR UK YU
N: AG MO A: ES FE IN KZ MG NC SC TD TM TR WS

NOTE:

The record for European Turkey see Özdikmen [2007, 2008a and 2010c].

60. PAGE 183

PRINTED:

stebbingi Gahan, 1906a: 244 E: FR GR IT SL SZ N: TU A: AF BT IS NP PA SD TD XIZ
ORR

MUST BE:

stebbingi Gahan, 1906a: 244 E: FR GR IT SL SZ N: TU A: AF BT IS NP PA SD TD TR XIZ
ORR

NOTE:

The record (Isparta province) is based on personal communication.

61. PAGE 186**PRINTED:**

holosericeus Rossi, 1790: 153 (*Callidium*) E: AB AR GG ST UK N: AG LB MO TU

MUST BE:

holosericeus Rossi, 1790: 153 (*Callidium*) E: AB AR GG ST TR UK N: AG LB MO TU A: TR

NOTE:

The records for European and Asian Turkey see Özdikmen [2008a,e and 2010c].

62. PAGE 187**PRINTED:**

spartii G. Müller, 1948: 67 (*Hesperophanes*) E: AL CR GR IT

MUST BE:

spartii G. Müller, 1948: 67 (*Hesperophanes*) E: AL CR GR IT A: TR

NOTE:

The record for Asian Turkey see Tezcan & Rejzek [2002].

63. PAGE 187**PRINTED:**

kiesenwetteri hircus Abeille de Perrin, 1881: 133 (*Molorchus*) E: AB AR GG ST A: IN TR

MUST BE:

kiesenwetteri hircus Abeille de Perrin, 1881: 133 (*Molorchus*) E: AB AR GG ST TR A: IN TR

NOTE:

The record for European Turkey see Althoff & Danilevsky [1997], Özdikmen [2008a and 2010c].

64. PAGE 191**PRINTED:**

minor minor Linnaeus, 1758: 421 (*Necydalis*) E: AL AU BE BH BU BY CR CT CZ DE EN FI
FR GB GE GR HU IR IT LA LS LT LU MD NL NR NT PL RO SK SL ST SV SZ UK YU A:
ES FE GAN HEI LIA KZ MG NC QIN SC SHA TR WS XIN
ceramboides DeGeer, 1775: 151 (*Leptura*)
dimidiatus Fabricius, 1775: 199 (*Leptura*)
medius Schrank, 1798: 688 (*Gymnopteron*)
monticola Plavilstshikov, 1931a: 38
rufescens Kiesenwetter, 1878: 316 [= 1879: 60]
monticola Plavilstshikov, 1931a: 38 E: AB AR GG A: IN TM

MUST BE:

minor minor Linnaeus, 1758: 421 (*Necydalis*) E: AL AU BE BH BU BY CR CT CZ DE EN FI
FR GB GE GR HU IR IT LA LS LT LU MD NL NR NT PL RO SK SL ST SV SZ UK YU A:
ES FE GAN HEI LIA KZ MG NC QIN SC SHA TR WS XIN
ceramboides DeGeer, 1775: 151 (*Leptura*)
dimidiatus Fabricius, 1775: 199 (*Leptura*)
medius Schrank, 1798: 688 (*Gymnopteron*)
monticola Plavilstshikov, 1931a: 38
rufescens Kiesenwetter, 1878: 316 [= 1879: 60]
monticola Plavilstshikov, 1931a: 38 E: AB AR GG A: IN TM

NOTE:

The writing error.

65. PAGE 191**PRINTED:**

brevipennis Mulsant, 1839: 105 (*Leptidea*) **E:** AB AR AU AZ BE BH BU CR CT CZ DEi Fli
GE GG HU IR IT MA MC MD NL Nri PL PT RO SK ST SL SP SVi SZ UK YU **N:** AG EG
LB MO TU **A:** CY IN IS KZ LE SHX SY TR **NARi NTRi**

MUST BE:

brevipennis Mulsant, 1839: 105 (*Leptidea*) **E:** AB AR AU AZ BE BH BU CR CT CZ DE FI GE
GG HU IR IT MA MC MD NL NR PL PT RO SK ST SL SP SV SZ TR UK YU **N:** AG EG
LB MO TU **A:** CY IN IS KZ LE SHX SY TR **NAR NTR**

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

66. PAGE 192**PRINTED:**

cantharinum cantharinum Linnaeus, 1767: 637 (*Cerambyx*) **E:** AB AR AU BE BH BU BY
CR CT CZ EN FI FR GB GE GG HU IR IT LA LT LU MD NE NL NT PL PL RO SK SP ST
SV SZ UK YU **A:** ES FE KZ MG WS XIN **NTRi**

MUST BE:

cantharinum cantharinum Linnaeus, 1767: 637 (*Cerambyx*) **E:** AB AR AU BE BH BU BY
CR CT CZ EN FI FR GB GE GG HU IR IT LA LT LU MD NE NL NT PL PL RO SK SP ST
SV SZ UK YU **A:** ES FE KZ MG TR WS XIN **NTR**

NOTE:

The record for Asian Turkey see Özdikmen [2007 and 2011a].

67. PAGE 199**PRINTED:**

wachanrui Levrat, 1858: 261 **E:** AB **A:** IN IQ

MUST BE:

wachanrui Levrat, 1858: 261 **E:** AB **A:** IN IQ TR

NOTE:

The records for Asian Turkey see Özdikmen [2011a].

68. PAGE 202**PRINTED:**

alpina alpina Linnaeus, 1758: 392 (*Cerambyx*) **E:** AB AL AU AR BH BU BY CR CT CZ FR
GE GG GR HU LS MC PL RO SK SL SP ST SV SZ UK YU **A:** TR

MUST BE:

alpina alpina Linnaeus, 1758: 392 (*Cerambyx*) **E:** AB AL AU AR BH BU BY CR CT CZ FR
GE GG GR HU LS MC PL RO SK SL SP ST SV SZ TR UK YU **A:** TR

NOTE:

The record for European Turkey see Özdikmen [2008a and 2010c].

69. PAGE 203**PRINTED:**

gracilis Brullé, 1832: 257 (*Stenopterus*) **E:** AB AR BH BU CR GG GR HU MC RO SK SL ST
UK YU **A:** IN TM

MUST BE:

gracilis Brullé, 1832: 257 (*Stenopterus*) E: AB AR BH BU CR GG GR HU MC RO SK SL ST
UK YU A: IN TM TR

NOTE:

The record for Asian Turkey see Adlbauer [1988], Özdikmen [2008e].

70. PAGE 205**PRINTED:**

semicyaneus Pic, 1905m: 187 (*Callimus*) E: GR

MUST BE:

semicyaneus Pic, 1905m: 187 (*Callimus*) E: GR A: TR

NOTE:

The record for Asian Turkey see Adlbauer [1988], Özdikmen [2011a] (and according to personal communication with Tauzin in 2007).

71. PAGE 205**PRINTED:**

flavicornis Küster, 1846b: 75 E: AL AU BU CR CZ GR HU IT MC RO SK SL TR YU A: IS
JO SY

MUST BE:

flavicornis Küster, 1846b: 75 E: AL AU BU CR CZ GR HU IT MC RO SK SL TR YU A: IS
JO SY TR

NOTE:

The record for Asian Turkey see Özdikmen [2008e and 2011a].

72. PAGE 207**PRINTED:**

rufus geniculatus Kraatz, 1863: 104 E: AL BU CR GR MC RO SL TR YU A: IN

MUST BE:

rufus geniculatus Kraatz, 1863: 104 E: AL BU CR GR MC RO SL TR YU A: IN TR

NOTE:

The record for Asian Turkey see Özdikmen [2007].

73. PAGE 214**PRINTED:**

amitina Holzschuh, 1989a: 174 A: IN

MUST BE:

amitina Holzschuh, 1989a: 174 A: IN TR

NOTE:

The record for Asian Turkey see Özdikmen [2011a].

74. PAGE 214**PRINTED:**

cardui Linnaeus, 1767: 632 (*Cerambyx*) E: AL AR AU BE BH BU CR CT CZ FR GE GR HU
IT MC PL PT RO SK SL SP ST SZ UK YU

MUST BE:

cardui Linnaeus, 1767: 632 (*Cerambyx*) E: AL AR AU BE BH BU CR CT CZ FR GE GR HU
IT MC PL PT RO SK SL SP ST SZ TR UK YU A: TR

NOTE:

The position of Gama cannot be accepted. Since it is clear that there are two distinct taxons in specimens routinely determined as *A. cardui* (Linnaeus, 1767) from Turkey. Hence I regard them as *A. cardui* that probably is distributed only in N Turkey and *A. suturalis* that is distributed remaining parts of Turkey now.

The record for Asian Turkey see Özdikmen [2007].

75. PAGE 214**PRINTED:**

maculicornis maculicornis Gyllenhal, 1817, app.: 189 (*Saperda*) E: BH GR HU KZ MC MD
RO SL ST UK A: KZ WS

MUST BE:

maculicornis maculicornis Gyllenhal, 1817, app.: 189 (*Saperda*) E: BH GR HU KZ MC MD
RO SL ST UK A: KZ TR WS

NOTE:

The records for Asian Turkey see Özdikmen [2011a].

76. PAGE 214**PRINTED:**

persicola Reitter, 1894d: 146 E: AB AR GG A: IN TM

MUST BE:

persicola Reitter, 1894d: 146 E: AB AR GG A: IN TM TR

NOTE:

The records for Asian Turkey see Demelt [1967], Önalp [1988].

77. PAGE 215**PRINTED:**

annularis Olivier, 1795: 11 (*Saperda*) E: PT SP N: AG EG LB MO TU

MUST BE:

annularis Olivier, 1795: 11 (*Saperda*) E: PT SP N: AG EG LB MO TR TU

NOTE:

The records for Asian Turkey see Özdikmen [2011a].

78. PAGE 215**PRINTED:**

cynarae cynarae Germar, 1817: 222 (*Saperda*) E: AB AL AR BH BU CR CZ GE GR GG HU
IT MC SL RO SK ST TR UK YU

MUST BE:

cynarae cynarae Germar, 1817: 222 (*Saperda*) E: AB AL AR BH BU CR CZ GE GR GG HU
IT MC SL RO SK ST TR UK YU A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2008a and 2011a].

79. PAGE 215**PRINTED:**

dahli C. F. W. Richter, 1820: pl. 12 (*Saperda*) **E:** AL AU BH BU BY CR CT CZ FR GE GR GG
HU MC MD RO SK SL SL SP ST SZ UK YU **A:** CH ES MG KZ NC TD UZ WS

MUST BE:

dahli C. F. W. Richter, 1820: pl. 12 (*Saperda*) **E:** AL AU BH BU BY CR CT CZ FR GE GR GG
HU MC MD RO SK SL SL SP ST SZ UK YU **A:** CH ES MG KZ NC TD TR UZ WS

NOTE:

The record for Asian Turkey see Özdikmen [2007 and 2011a].

80. PAGE 215**PRINTED:**

detrita Kraatz, 1882c: 336 **A:** KI KZ TD UZ

MUST BE:

detrita Kraatz, 1882c: 336 **A:** KI KZ TD TR UZ

NOTE:

The interesting records for Asian Turkey see Özdikmen [2011a]. Perhaps it may be new taxon due to impossible for Turkey at first view.

81. PAGE 215**PRINTED:**

fadli Sama & Rapuzzi, 2006: 186 **N:** EG
frivaldzskyi Ganglbauer, 1884: 546 **E:** BU
hirsuticornis Holzschuh, 1975: 86 **A:** IN

MUST BE:

fadli Sama & Rapuzzi, 2006: 186 **N:** EG
hirsuticornis Holzschuh, 1975: 86 **A:** IN

NOTE:

From twice writing of *frivaldzskyi* Ganglbauer, 1884.

82. PAGE 215**PRINTED:**

irrorata Fabricius, 1787: 147 (*Saperda*) **E:** FR (Corse) IT PT SP **N:** AG MO TU

MUST BE:

irrorata Fabricius, 1787: 147 (*Saperda*) **E:** FR (Corse) IT PT SP TR **N:** AG MO TU **A:** TR

NOTE:

The interesting records for Turkey see Öymen [1987]. It is impossible for Turkey at first view. However, the species is very characteristic among the other species of the genus *Agapanthia*. *A. soror* that is distributed only in Central Asia, is the closest species it. Therefore, the record of Öymen should be correct.

83. PAGE 215**PRINTED:**

kirbyi Gyllenhal, 1817: 186 (*Saperda*) **E:** AB AL AR BH BU CR FR GG GR HU IT MC MD
RO SK SP ST TR UK YU **A:** IN IS SY TM

MUST BE:

kirbyi Gyllenhal, 1817: 186 (*Saperda*) **E:** AB AL AR BH BU CR FR GG GR HU IT MC MD
RO SK SP ST TR UK YU **A:** IN IS SY TM TR

NOTE:

The records for Asian Turkey see Özdikmen [2008a,e, 2010c and 2011a].

84. PAGE 216**PRINTED:**

lateralis Ganglbauer, 1884: 541 **E:** TR

MUST BE:

lateralis Ganglbauer, 1884: 541 **E:** TR **A:** TR

NOTE:

The records for Asian Turkey see Özdikmen [2007, 2008a,e and 2011a].

85. PAGE 216**PRINTED:**

subchalybaea Reitter, 1898c: 134 **E:** AB GG ST

MUST BE:

subchalybaea Reitter, 1898c: 134 **E:** AB GG ST **A:** TR

NOTE:

The record for Asian Turkey see Demelt [1963], Danilevsky & Miroshnikov [1985].

86. PAGE 216**PRINTED:**

villosoviridescens DeGeer, 1775: 76 (*Cerambyx*) **E:** AL AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SL SP
ST SV SZ UK YU **A:** ES KZ MG NC WS

MUST BE:

villosoviridescens DeGeer, 1775: 76 (*Cerambyx*) **E:** AL AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SL SP
ST SV SZ TR UK YU **A:** ES KZ MG NC TR WS

NOTE:

The records for European and Asian Turkey see Özdikmen [2008a,e and 2011a].

87. PAGE 217**PRINTED:**

leucaspis Steven, 1817: 184 (*Saperda*) **E:** AB AR AU BH BU CR CT CZ GG GR HU MC MD
RO SK ST TR UK YU **A:** ES KI KZ MG TD UZ WS

MUST BE:

leucaspis Steven, 1817: 184 (*Saperda*) **E:** AB AR AU BH BU CR CT CZ GG GR HU MC MD
RO SK ST TR UK YU **A:** ES KI KZ MG TD TR UZ WS

NOTE:

The records for Asian Turkey see Tauzin [2000], Özdikmen [2007].

88. PAGE 221**PRINTED:**

testacea testacea Fabricius, 1781: 235 (*Saperda*) E: AL AN AU BE BH BU BY CR CT CZ FR
EN GE GR HU IT LU MD NL PL RO SK SL SP ST SV SZ UK YU A: CY KZ TR

MUST BE:

testacea testacea Fabricius, 1781: 235 (*Saperda*) E: AL AN AU BE BH BU BY CR CT CZ FR
EN GE GR HU IT LU MD NL PL RO SK SL SP ST SV SZ TR UK YU A: CY KZ TR

NOTE:

The records for Asian Turkey see Özdikmen [2007 and 2008a].

89. PAGE 242**PRINTED:**

aethiops Scopoli, 1763: 53 (*Cerambyx*) E: AL AU BU CR CZ GR HU MC MD RO SK SL UK
YU

MUST BE:

aethiops Scopoli, 1763: 53 (*Cerambyx*) E: AL AU BU CR CZ GR HU MC MD RO SK SL TR
UK YU A: TR

NOTE:

The records for Turkey see Özdikmen [2010b].

90. PAGE 242**PRINTED:**

carinatum carinatum Pallas, 1771: 465 (*Cerambyx*) E: CT KZ ST UK A: KZ
pigrum Schoenherr, 1817a: 398 (*Lamia*)
carinatum cylindraceum Reitter, 1886: 69 E: AB ST

MUST BE:

carinatum carinatum Pallas, 1771: 465 (*Cerambyx*) E: CT KZ ST UK A: KZ
pigra Schoenherr, 1817a: 398 (*Lamia*)
morio Fischer von Waldheim, 1824: 240
carinatum cylindraceum Reitter, 1886: 69 E: AB ST A: TR

NOTE:

The records for Asian Turkey see Özdikmen [2010b].

91. PAGE 242**PRINTED:**

fulvum fulvum Scopoli, 1763: 53 (*Cerambyx*) E: AU CZ HU SK SL UK
freyi Tippmann, 1958b: 158
frontale Mulsant & Rey, 1863: 154
kulzeri Tippmann, 1958b: 158
nigripennis Fleischer, 1894: 121
sanguinolentum Scopoli, 1772: 99 (*Prionus*)

MUST BE:

fulvum fulvum Scopoli, 1763: 53 (*Cerambyx*) E: AU CZ HU SK SL TR UK
freyi Tippmann, 1958b: 158
frontale Mulsant & Rey, 1863: 154
kulzeri Tippmann, 1958b: 158
nigripennis Fleischer, 1894: 121
sanguinolentus Scopoli, 1772: 99 (*Prionus*)

NOTE:

The records for European Turkey see Özdikmen [2010b].

92. PAGE 243**PRINTED:**

albanicum Heyrovský, 1934b: 135 **E:** AL

iconiense K. Daniel, 1900: 140 **A:** TR

albicolle Breuning, 1943b: 89

albolineatum Küster, 1847a: 86 **A:** TR

MUST BE:

albanicum Heyrovský, 1934b: 135 **E:** AL

albolineatum Küster, 1847a: 86 **A:** TR

NOTE:

iconiense K. Daniel, 1900 should be removed from twice writing.

93. PAGE 243**PRINTED:**

albolineatum Küster, 1847a: 86 **A:** TR

MUST BE:

albolineatum Küster, 1847a: 86 **E:** TR **A:** TR

NOTE:

The records for European Turkey see Özdikmen [2010b].

94. PAGE 243 and 247**PRINTED:**

ariannae Pesarini & Sabbadini, 2008: 115 **E:** GR

atticum Kraatz, 1873a: 72 **E:** GR

...

funestum Ganglbauer, 1884: 501 **E:** GR

gallipolitanum atritarse Pic, 1931c: 10 **E:** GR

gallipolitanum gallipolitanum J. Thomson, 1867: 59 **E:** GR TR

MUST BE:

ariannae Pesarini & Sabbadini, 2008: 115 **E:** GR

atritarse Pic, 1931c: 10 **E:** GR TR **A:** TR

atticum Kraatz, 1873a: 72 **E:** GR

...

funestum Ganglbauer, 1884: 501 **E:** GR

gallipolitanum gallipolitanum J. Thomson, 1867: 59 **E:** GR TR

NOTE:

The species, *D. atritarse*, was regarded as a subspecies of *D. gallipolitanum* in the Catalogue. In this case, however, both taxa are distributed in the same area in Turkey. This status does not fit the rule of allotropic distribution of subspecies. So the taxon should be regarded as a separate species.

The records for European and Asian Turkey see Özdikmen [2010b].

95. PAGE 244 and 248**PRINTED:**

basale Kraatz, 1873a: 86 **A:** TR

kagyzmanicum Suvorov, 1915: 120

...

johannisfranci Pesarini & Sabbadini, 2007b: 40 E: GR A: TR
kaimakcalanum Jureček, 1929: 143 E: GR MC

MUST BE:

basale Kraatz, 1873a: 86 E: AR

...

johannisfranci Pesarini & Sabbadini, 2007b: 40 E: GR A: TR
kagyzmanicum Suvorov, 1915: 120 A: TR
kaimakcalanum Jureček, 1929: 143 E: GR MC

NOTE:

D. kagyzmanicum was regarded as a synonym of *D. basale* in the Catalogue. The synonymy does not accept. Since, it differs from *D. basale* by at least humeral and dorsal bands on elytra. On the other hand, type locality of *D. basale* was given as "Armenia". It is not clear that the type locality is absolutely meaning Turkish Armenia. So it should be regarded as Armenia.

The records for Asian Turkey see Özdikmen [2010b].

96. PAGE 244

PRINTED:

beckeri beckeri Kraatz, 1873a: 71 E: AB ST

MUST BE:

beckeri beckeri Kraatz, 1873a: 71 E: AB ST A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

97. PAGE 244

PRINTED:

bistriatum Pic, 1898h: 55 E: AB AR

MUST BE:

bistriatum Pic, 1898h: 55 E: AB AR A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

98. PAGE 245

PRINTED:

complanatum Ganglbauer, 1884: 485 A: IN

MUST BE:

complanatum Ganglbauer, 1884: 485 A: IN TR

NOTE:

The record for Asian Turkey see Plavilstshikov [1958a], Özdikmen [2010b].

99. PAGE 245 and 253

PRINTED:

crassicolle Pesarini & Sabbadini, 2007b: 57 E: GR
crux Billberg, 1817: 175 (*Lamia*) A: TR
bifidum Chevrolat, 1882: 60
büinterruptum Pic, 1901d: 19
brevedisjunctum Pic, 1929b: 9
cruciator Gistel, 1848a: 131
graecum Walzl, 1838: 470

grandevittatum Pic, 1904b: 7
integrofasciatum K. Daniel, 1900: 140
lateargenteum Pic, 1929b: 9
lunulatum Pic, 1900g: 12
niveopictum K. Daniel, 1900: 140
subfurcatum Pic, 1914c: 9
culminicola J. Thomson, 1867: 122 A: TR
 ...
sisianense Lazarev, 2009: 210 E: AR
sodale blumenthali Breuning, 1966b: 20 A: TR

MUST BE:

crassicolle Pesarini & Sabbadini, 2007b: 57 E: GR
culminicola J. Thomson, 1867: 122 A: TR

...

sisianense Lazarev, 2009: 210 E: AR
smyrnense Linnaeus, 1757: 411 (*Cerambyx*) A: TR
bifidum Chevrolat, 1882: 60
biinterruptum Pic, 1901d: 19
brevedisjunctum Pic, 1929b: 9
cruciator Gistel, 1848a: 131
crux Billberg, 1817: 175 (*Lamia*)
graecum Walth, 1838: 470
grandevittatum Pic, 1904b: 7
integrofasciatum K. Daniel, 1900: 140
lateargenteum Pic, 1929b: 9
lunulatum Pic, 1900g: 12
niveopictum K. Daniel, 1900: 140
subfurcatum Pic, 1914c: 9
sodale blumenthali Breuning, 1966b: 20 A: TR

NOTE:

See Özdikmen [2010b].

100. PAGE 245-246

PRINTED:

dimidiatum dimidiatum Motschulsky, 1838: 186 E: AB AR GG A: IN TR
degaullei Pic, 1948: 13
erivanicum Pic, 1901s: 91
kelkiticum Özdikmen & Hasbenli, 2004: 23
transitorium Pic, 1948: 13
dimidiatum korgei Breuning, 1966b: 21 A: TR

MUST BE:

dimidiatum dimidiatum Motschulsky, 1838: 186 E: AB AR GG A: IN TR
degaullei Pic, 1948: 13
erivanicum Pic, 1901s: 91
transitorium Pic, 1948: 13
dimidiatum kelkiticum Özdikmen & Hasbenli, 2004: 23 A: TR
dimidiatum korgei Breuning, 1966b: 21 A: TR

NOTE:

Özdikmen (2010b) stated that "This species has 3 subspecies or no subspecies. It is distributed in NE Anatolia for Turkey and represented by all subspecies in Turkey. The nominotypical subspecies (eastern phenotype) occurs in Caucasus (Armenia), Iran and NE Turkey, and *D. dimidiatum korgei* Breuning, 1976 and *D. dimidiatum kelkiticum* Özdikmen & Hasbenli, 2004 (western phenotype) occurs only in Turkey. According to Danilevsky in Löbl & Smetana (2010), *D. dimidiatum kelkiticum* is a synonym of the nominotypical

subspecies. Breuning (1966) described *D. dimidiatum korgei* using by only the characters: the punctuation of pronotal disc is a little less dense and lateral tubercles of pronotum are less obtuse than typical form. In this status, *D. dimidiatum kelkiticum* is not a synonym of the nominotypical subspecies. Since, the punctuation of pronotal disc is denser than typical form and *korgei*, and lateral tubercles of pronotum are less obtuse than nominative subspecies. Besides, the distribution area of *D. dimidiatum korgei* is closer to nominative subspecies than *D. dimidiatum kelkiticum*. Also *D. dimidiatum kelkiticum* is distributed west point of the distribution area of the species. Therefore, this species do not includes any subspecies according to the approach of Danilevsky in Löbl & Smetana (2010). The described taxa fall in variations of the species. Consequently, the real status of these taxa needs to be clarified for final decision".

See Özdikmen [2010b].

101. PAGE 247

PRINTED:

gallipolitanum gallipolitanum J. Thomson, 1867: 59 E: GR TR

MUST BE:

gallipolitanum gallipolitanum J. Thomson, 1867: 59 E: GR TR A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

102. PAGE 247

PRINTED:

haemorrhoidale Hampe, 1852b: 313 A: IN TR
hampii aureovittatum Kraatz, 1873a: 81 A: TR
hampii hampii Mulsant & Rey, 1863: 157 A: TR
halepense Kraatz, 1873a: 72 A: SY TR
 internenotatum Pic, 1931c: 9
 internesignatum Pic, 1914f: 79
 latealbum Pic, 1926d: 13
 latebivittatum Pic, 1931c: 1
heinzi Breuning, 1964b: 1 A: TR

MUST BE:

haemorrhoidale Hampe, 1852b: 313 A: IN TR
halepense Kraatz, 1873a: 72 A: SY TR
 internenotatum Pic, 1931c: 9
 internesignatum Pic, 1914f: 79
 latealbum Pic, 1926d: 13
 latebivittatum Pic, 1931c: 1
hampii aureovittatum Kraatz, 1873a: 81 A: TR
hampii hampii Mulsant & Rey, 1863: 157 A: TR
heinzi Breuning, 1964b: 1 A: TR

NOTE:

Missprints or writing errors.

103. PAGE 248

PRINTED:

insulare Kraatz, 1873a: 62 E: GR
irakense Al-Ali & Ismail, 1987: 1 A: IQ

MUST BE:

insulare Kraatz, 1873a: 62 **E:** GR
investitum Breuning, 1970: **A:** TR
irakense Al-Ali & Ismail, 1987: 1 **A:** IQ

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

104. PAGE 248**PRINTED:**

ispartense Breuning, 1962a: 394 **A:** IN

MUST BE:

ispartense Breuning, 1962a: 394 **A:** TR

NOTE:

The possible writing error.

The record for Asian Turkey see Özdikmen [2010b].

105. PAGE 248**PRINTED:**

johannisfranci Pesarini & Sabbadini, 2007b: 40 **E:** GR **A:** TR

MUST BE:

johannisfranci Pesarini & Sabbadini, 2007b: 40 **E:** GR TR

NOTE:

The possible writing error.

The record for European Turkey see Özdikmen [2010b].

106. PAGE 249**PRINTED:**

kykladicum Breuning, 1944a: 13 **E:** GR
laeve laeve Faldermann, 1837: 278 **A:** IN
pernudum Reitter, 1913d: 665
persicum Faldermann, 1837: 282
plasoni Ganglbauer, 1884: 491
laeve hyrcanum Jakovlev, 1900b: 64 **A:** IN
laeve micula Plavilstshikov, 1937a: 26 **A:** TR
laeve vladimiri Danilevsky & Murzin, 2009a: 13 **A:** AR
ladikanum Braun, 1976b: 173 **A:** TR
ladikense Breuning, 1975c: 10
paraladikense Breuning, 1977a: 60
lameerei Théry, 1896: 109 **A:** TR

MUST BE:

kykladicum Breuning, 1944a: 13 **E:** GR
ladikanum Braun, 1976b: 173 **A:** TR
ladikense Breuning, 1975c: 10
paraladikense Breuning, 1977a: 60
laeve laeve Faldermann, 1837: 278 **A:** IN
pernudum Reitter, 1913d: 665
persicum Faldermann, 1837: 282
plasoni Ganglbauer, 1884: 491
laeve hyrcanum Jakovlev, 1900b: 64 **A:** IN
laeve micula Plavilstshikov, 1937a: 26 **A:** TR
laeve vladimiri Danilevsky & Murzin, 2009a: 13 **A:** AR

lameerei Théry, 1896: 109 **A: TR**

NOTE:

The possible writing error.

107. PAGE 249

PRINTED:

lugubre Kraatz, 1873a: 41 **E: AL BU GR MC**

MUST BE:

lugubre Kraatz, 1873a: 41 **E: AL BU GR MC TR A: TR**

NOTE:

The records for European and Asian Turkey see Özdikmen [2010b].

108. PAGE 249

PRINTED:

margheritae Breuning, 1964c: 32 **E: GR**

MUST BE:

margheritae Breuning, 1964c: 32 **E: GR TR A: TR**

NOTE:

The records for European and Asian Turkey see Özdikmen [2010b].

109. PAGE 250

PRINTED:

mimarenarium Breuning, 1974g: 152 **E: GR**

minkovae Heyrovský, 1962b: 225 **E: BU**

MUST BE:

mimarenarium Breuning, 1974g: 152 **E: GR**

miminfernale Breuning, 1970: **A: TR**

minkovae Heyrovský, 1962b: 225 **E: BU**

NOTE:

The records for Asian Turkey see Özdikmen [2010b].

110. PAGE 250

PRINTED:

obenbergeri Heyrovský, 1940: 58 **E: GR**

marani Heyrovský, 1940: 59

obtusicolle Pic, 1926d: 2 **A: XIN**

...

olympicum olympicum Kraatz, 1873a: 78 **A: TR**

graecum Kraatz, 1873a: 78 [HN]

obsoletum Kraatz, 1873a: 78

oreophilum Ganglbauer, 1884: 500

subalpinum Kraatz, 1873a: 78

MUST BE:

obenbergeri Heyrovský, 1940: 58 **E: GR**

marani Heyrovský, 1940: 59

obsoletum Kraatz, 1873a: 78 **A: TR**

obtusicolle Pic, 1926d: 2 **A: XIN**

...

olympicum olympicum Kraatz, 1873a: 78 **A: TR**

graecum Kraatz, 1873a: 78 [HN]
oreophilum Ganglbauer, 1884: 500
subalpinum Kraatz, 1873a: 78

NOTE:

According to Sama (1999), *Dorcadion olympicum* = *D. obsoletum*. According to Steiner (2003), *D. obsoletum* is a separate species.

See Özdikmen [2010b].

111. PAGE 250

PRINTED:

olympicum olympicum Kraatz, 1873a: 78 A: TR

MUST BE:

olympicum olympicum Kraatz, 1873a: 78 E: TR A: TR

NOTE:

The record for European Turkey see Özdikmen [2010b].

112. PAGE 251

PRINTED:

petrovitzi Heyrovský, 1964b: 97 E: GR

MUST BE:

petrovitzi Heyrovský, 1964b: 97 A: TR

NOTE:

The possible writing error.

The record for Turkey see Özdikmen [2010b].

113. PAGE 251

PRINTED:

poleti Breuning, 1948c: 59 A: TR

praetermissum Pesarini & Sabbadini, 1999: 47 A: TR

preissi Heyden, 1894b: 86 A: TR

MUST BE:

poleti Breuning, 1948c: 59 A: TR

praetermissum praetermissum Pesarini & Sabbadini, 1999: 47 A: TR

praetermissum mikhaili Özdikmen, 2010b: 457 A: TR

preissi Heyden, 1894b: 86 A: TR

NOTE:

The records for Turkey see Özdikmen [2010b].

114. PAGE 252

PRINTED:

rolandmenradi Peks, 1992: 197 A: TR

rosti Pic, 1900s: 82 E: GG A: TR

MUST BE:

rolandmenradi Peks, 1992: 197 A: TR

rosinae Daniel, 1900: 127 A: TR

rosti Pic, 1900s: 82 E: GG A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

115. PAGE 252**PRINTED:**

rufoapicipenne Breuning, 1946: 125 **A:** TR
rufoapicale Breuning, 1943b: 91 [HN]

MUST BE:

rufoapicale Breuning, 1943b: 91 **A:** TR
rufoapicipenne Breuning, 1946: 125

NOTE:

Breuning (1962) stated that "I described it from Bayburt under the name "*rufoapicale*" which then I altered even in "*rufoapicipenne*". Because the name *D. rufoapicale* Breuning, 1943 is a homonym of *D. septemlineatum* v. *rufoapicale* Pic, 1942 that is a synonym of *D. apicale* Thomson, 1865. In this case, the senior name *D. rufoapicale* Breuning, 1943 must be valid. This approach firstly proposed in Özdikmen (2007).

See Özdikmen [2010b].

116. PAGE 253**PRINTED:**

semilucens Kraatz, 1873a: 84 **E:** AB AR

MUST BE:

semilucens Kraatz, 1873a: 84 **E:** AB AR **A:** TR

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

117. PAGE 253**PRINTED:**

seminudum Kraatz, 1873a: 83 **E:** AB AR

MUST BE:

seminudum Kraatz, 1873a: 83 **E:** AB AR **A:** TR

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

118. PAGE 253**PRINTED:**

striolatum Kraatz, 1873a: 93 **E:** AR GG IN TR

MUST BE:

striolatum Kraatz, 1873a: 93 **E:** AR GG IN **A:** TR

NOTE:

The possible writing error.

The record for Asian Turkey see Özdikmen [2010b].

119. PAGE 253**PRINTED:**

sturmii Frivaldszky von Frivald, 1837: 179 **E:** BU

MUST BE:

sturmii Frivaldszky von Frivald, 1837: 179 **E:** BU TR

NOTE:

The record for European Turkey see Özdikmen [2010b].

120. PAGE 253**PRINTED:**

sturmii Frivaldszky von Frivald, 1837: 179 **E:** BU

MUST BE:

sturmii Frivaldszky von Frivald, 1837: 179 **E:** BU TR

NOTE:

The record for European Turkey see Özdikmen [2010b].

121. PAGE 254**PRINTED:**

subinterruptum Pic, 1900g: 12 **A:** TR

MUST BE:

subinterruptum Pic, 1900g: 12 **E:** TR **A:** TR

NOTE:

The record for European Turkey See Sama et al. [2010].

122. PAGE 254**PRINTED:**

syriense Breuning, 1943b: 94 **A:** SY

MUST BE:

syriense Breuning, 1943b: 94 **A:** TR

NOTE:

This species is endemic to SC Turkey. It has been known only from type locality until now. The type locality was given as Syria: Amanos Mts. by Breuning. Amanos Mts. is in S Turkey, not Syria.

See Özdikmen [2010b].

123. PAGE 254**PRINTED:**

tauricum Waltl, 1838: 468 **E:** BU GR RO TR UK

MUST BE:

tauricum Waltl, 1838: 468 **E:** BU GR RO TR UK **A:** TR

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

124. PAGE 254**PRINTED:**

wagneri Küster, 1846b: 87 **E:** AR GG TR

MUST BE:

wagneri Küster, 1846b: 87 **E:** AR GG **A:** TR

NOTE:

The possible writing error.

The record for Asian Turkey see Özdikmen [2010b].

125. PAGE 255**PRINTED:**

weyersii Fairmaire, 1866b: 271 **E: TR**

MUST BE:

weyersii Fairmaire, 1866b: 271 **A: TR**

NOTE:

The possible writing error.

The record for Asian Turkey see Özdikmen [2010b].

126. PAGE 256**PRINTED:**

quadrimaculatum nodicorne Tournier, 1872: 287 **E: GR TR**

MUST BE:

quadrimaculatum nodicorne Tournier, 1872: 287 **E: GR TR A: TR**

NOTE:

The record for Asian Turkey see Özdikmen [2010b].

127. PAGE 256**PRINTED:**

escherichi Ganglbauer, 1897b: 54 **A: TR**

angorensis Ganglbauer, 1897b: 57

egregium Ganglbauer, 1897b: 56

obliquesignatum Pic, 1900g: 12

postcedisjunctum Pic, 1909b: 99

MUST BE:

angorensis Ganglbauer, 1897b: 57 **A: TR**

postcedisjunctum Pic, 1909b: 99

escherichi Ganglbauer, 1897b: 54 **A: TR**

egregium Ganglbauer, 1897b: 56

obliquesignatum Pic, 1900g: 12

NOTE:

According to Breuning (1962), this species is a morpho of *D. escherichi* Ganglbauer, 1897. He stated that this taxon is similar to *D. escherichi*. It differs from *D. escherichi* by backward freely ending dorsal band. Pesarini & Sabbadini (1998) gave it as a separate species for Turkey.

See Özdikmen [2010b].

128. PAGE 263**PRINTED:**

bilineatum Germar, 1824: 485 (*Lamia*) **E: AL BH BU CR GR HU MC MD RO SK UK YU**

MUST BE:

bilineatum Germar, 1824: 485 (*Lamia*) **E: AL BH BU CR GR HU MC MD RO SK TR UK YU**

NOTE:

The record for European Turkey see Özdikmen [2010b].

129. PAGE 267**PRINTED:**

textor Linnaeus, 1758: 239 (*Cerambyx*) **E:** AB AL AR AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LT LU MC MD NL NR NT PL RO SK SL SP ST SV SZ
UK YU **A:** ES FE HEB HEI JA JIL KZ MG NC NMO SC SHN TAI WS XIN

MUST BE:

textor Linnaeus, 1758: 239 (*Cerambyx*) **E:** AB AL AR AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LT LU MC MD NL NR NT PL RO SK SL SP ST SV SZ
TR UK YU **A:** ES FE HEB HEI JA JIL KZ MG NC NMO SC SHN TAI TR WS XIN

NOTE:

The records for European and Asian Turkey see Özdikmen [2007, 2008a and 2010c].

130. PAGE 268**PRINTED:**

genus *Morimus* Brullé, 1832: 258 type species *Lamia lugubris* Fabricius, 1792 (= *Cerambyx asper* Sulzer, 1776)
Morinus Brullé, 1832: 258 [original incorrect spelling]
asper asper Sulzer, 1776: 44 (*Cerambyx*) **E:** AL CR FR GR IT SP SZ YU
ganglbaueri Reitter, 1894b: 44
lugubris Fabricius, 1792b: 283 (*Lamia*)
asper funereus Mulsant, 1862: 279 **E:** AL AU BH BU CR CZ GR HU IT MC MD RO SK SL
UK YU
asper verecundus Faldermann, 1836: 396 (*Lamia*) **E:** AB AR GG ST UK **A:** IN TM TR
ficitor Bogatchev, 1949: 183
assamensis Breuning, 1936: 285 **A:** XIZ **ORR**
lethalis J. Thomson, 1857: 182 **A:** SCH SHG YUN **ORR**
morimoides A. White, 1858a: 266 (*Leprodera*)
quadrinaculatus Pic, 1925a: 17 (*Trachystola*)
trinotatus Pic, 1925a: 17 (*Trachystola*)
whitei Lacordaire, 1869: 298
orientalis Reitter, 1894b: 43 **E:** BU TR **A:** TR

MUST BE:

genus *Morimus* Brullé, 1832: 258 type species *Lamia lugubris* Fabricius, 1792 (= *Cerambyx asper* Sulzer, 1776)
Morinus Brullé, 1832: 258 [original incorrect spelling]
asper Sulzer, 1776: 44 (*Cerambyx*) **E:** AL FR GR IT RO SP SZ TR **A:** TR
lugubris Fabricius, 1792b: 283 (*Lamia*)
assamensis Breuning, 1936: 285 **A:** XIZ **ORR**
funereus Mulsant, 1862: 279 **E:** AL AU BH BU CR CZ GR HU IT MC MD RO SK SL TR UK
YU **A:** TR
ganglbaueri Reitter, 1894b: 44 **E:** AL BH CR GR IT ?MC ME SB TR **A:** TR
lethalis J. Thomson, 1857: 182 **A:** SCH SHG YUN **ORR**
morimoides A. White, 1858a: 266 (*Leprodera*)
quadrinaculatus Pic, 1925a: 17 (*Trachystola*)
trinotatus Pic, 1925a: 17 (*Trachystola*)
whitei Lacordaire, 1869: 298
orientalis Reitter, 1894b: 43 **E:** BU TR **A:** TR
verecundus Faldermann, 1836: 396 (*Lamia*) **E:** AB AR GG ST UK **A:** IN TM TR
ficitor Bogatchev, 1949: 183

NOTE:

The position of *Sama* was not natural and does not accepted. First of all, I think that the genus *Morimus* needs to be revised. According to Sama (1988 and 2002), *M. funereus* (Mulsant, 1863) that includes *M. ganglbaueri* as a synonym, and *M. verecundus* (Faldermann, 1836) are subspecies of *M. asper* (Sulzer, 1776). However, Sama's proposal

does not seem useful to take into consideration both morphological differences and distribution areas of the taxons (see Özdikmen, 2007 for details). The present proposal has also been supported by Danilevsky [2011a] except *M. funereus*.

See Simonetta [1989], Özdikmen [2007].

131. PAGE 272

PRINTED:

obscuricornis Pic, 1894b: 44 E: AB A: IN

MUST BE:

obscuricornis Pic, 1894b: 44 E: AB A: IN TR

NOTE:

The record for Asian Turkey see Özdikmen [2007], Özdikmen & Turgut [2006c].

132. PAGE 283

PRINTED:

sartor Fabricius, 1787: 137 (*Lamia*) E: AU BH BU BY CR CZ EN FR GB GE HU IT LA LS LT
PL RO SK SL SZ UK YU

MUST BE:

sartor Fabricius, 1787: 137 (*Lamia*) E: AU BH BU BY CR CZ EN FR GB GE HU IT LA LS LT
PL RO SK SL SZ UK YU A: TR

NOTE:

The records for Asian Turkey see Özdikmen [2007]. However, these records need to be controlled for Turkey.

133. PAGE 290

PRINTED:

pontocircassica Danilevsky & Miroshnikov, 1985: 289 E: AB AR GG ST TR UK

MUST BE:

pontocircassica Danilevsky & Miroshnikov, 1985: 289 E: AB AR GG ST UK A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2007].

134. PAGE 292

PRINTED:

compacta sancta Reiche, 1877b: cxxxvi A: IS JO LE SY

MUST BE:

compacta sancta Reiche, 1877b: cxxxvi A: IS JO LE SY TR

NOTE:

The record for Asian Turkey see Özdikmen et al. [2005], Özdikmen [2011a].

135. PAGE 294

PRINTED:

herminae Reitter, 1890d: 241 E: AB A: IN

MUST BE:

herminae Reitter, 1890d: 241 E: AB A: IN TR

NOTE:

The record for Asian Turkey see Özdikmen [2007].

136. PAGE 294

PRINTED:

scovitzii Faldermann, 1837: 284 (*Saperda*) E: AB AR GG

MUST BE:

scovitzii Faldermann, 1837: 284 (*Saperda*) E: AB AR GG A: TR

NOTE:

The record for Asian Turkey see Adlbauer [1988].

137. PAGE 299

PRINTED:

pupillata Gyllenhal, 1817: 185 E: AU BE BH BY CR CT CZ EN FR GE GR HU IT LA LS LT
MC MD NT PL RO SL SK SP ST SZ UK YU

MUST BE:

pupillata Gyllenhal, 1817: 185 E: AU BE BH BY CR CT CZ EN FR GE GR HU IT LA LS LT
MC MD NT PL RO SL SK SP ST SZ UK YU A: TR

NOTE:

The record for Asian Turkey see Bodemeyer [1906], Özdikmen [2008a].

138. PAGE 301

PRINTED:

coerulescens Scopoli, 1763: 49 (*Leptura*) E: AB AL AR AU BE BH BU CR CT CZ FR GE GG
GR HU IT LS LU MC MD NL PL PT RO SK SL SP ST SZ TR UK YU N: AG MO TU A:
IN IQ IS JIA JO KI KZ LE NE TD SY UZ WS

MUST BE:

coerulescens Scopoli, 1763: 49 (*Leptura*) E: AB AL AR AU BE BH BU CR CT CZ FR GE GG
GR HU IT LS LU MC MD NL PL PT RO SK SL SP ST SZ TR UK YU N: AG MO TU A:
IN IQ IS JIA JO KI KZ LE NE TD TR SY UZ WS

NOTE:

The record for Asian Turkey see Özdikmen [2007, 2008a,e and 2011a].

139. PAGE 302

PRINTED:

uncinata W. Redtenbacher, 1842: 25 (*Saperda*) E: AU BH BU CR CT CZ FR GE HU MD PL
RO SK ST UK YU A: TM

MUST BE:

uncinata W. Redtenbacher, 1842: 25 (*Saperda*) E: AU BH BU CR CT CZ FR GE HU MD PL
RO SK ST UK YU A: TM TR

NOTE:

The record for Asian Turkey see Özdikmen [2008e], Özdikmen et al. [2005].

140. PAGE 302

PRINTED:

duponcheli Brullé, 1832: 260 (*Saperda*) E: AL BU MC GR

MUST BE:

duponcheli Brullé, 1832: 260 (*Saperda*) E: AL BU MC GR A: TR

NOTE:

The record for Asian Turkey see Özdikmen [2007, 2008e and 2011a].

141. PAGE 302-303

PRINTED:

repetekensis Semenov, 1935a: 279 **A:** TM

tekensis Semenov, 1897: 258 **A:** AF IN TM

vittipennis leuthneri Ganglbauer, 1886: 523 **A:** IS SY TR

akbesiana Pic, 1900j: 20

inhumeralis Pic, 1900c: 7 (*Obereina*)

samai Özdikmen & Turgut, 2008c: 572

vittipennis pallidior Pic, 19010: 67 (*Obereina*) **A:** TR

vittipennis pravei Plavilstshikov, 1926a: 8 [= 1926c: 339] **E:** AB AR GG **A:** IN TM TR

vittipennis vittipennis Reiche, 1877c: cxli **E:** AL BU GR **A:** LE TR

tokatensis Pic, 1933d: 11

MUST BE:

repetekensis Semenov, 1935a: 279 **A:** TM

samai Özdikmen & Turgut, 2008c: 572 **A:** TR

tekensis Semenov, 1897: 258 **A:** AF IN TM

vittipennis inhumeralis Pic, 1900c: 7 (*Obereina*) **A:** TR

vittipennis leuthneri Ganglbauer, 1886: 523 **A:** IS SY TR

akbesiana Pic, 1900j: 20

vittipennis pallidior Pic, 19010: 67 (*Obereina*) **A:** TR

tokatensis Pic, 1933d: 11

vittipennis pravei Plavilstshikov, 1926a: 8 [= 1926c: 339] **E:** AB AR GG **A:** IN TM TR

vittipennis vittipennis Reiche, 1877c: cxli **E:** AL BU GR **A:** LE TR

NOTE:

The necessary explanations are given in **1. PAGE 52**.

142. PAGE 303

PRINTED:

vittipennis vittipennis Reiche, 1877c: cxli **E:** AL BU GR **A:** LE TR

tokatensis Pic, 1933d: 11

subgenus *Cardoria* Mulsant, 1862: 436 type species *Saperda scutellata* Fabricius, 1792

MUST BE:

vittipennis vittipennis Reiche, 1877c: cxli **E:** AL BU GR **A:** LE TR

tokatensis Pic, 1933d: 11

volkovitshi Danilevsky, 2010: 24 **A:** TR

subgenus *Cardoria* Mulsant, 1862: 436 type species *Saperda scutellata* Fabricius, 1792

NOTE:

The record for Asian Turkey see Danilevsky [2010b].

143. PAGE 303-304

PRINTED:

subgenus *Helladia* Fairmaire, 1864a: 176 type species *Saperda flavescens* Brullé, 1832

alziari Sama, 1992b: 306 (*Phytoecia*) **A:** CY IS JO LE SY TR

...

millefolii Adams, 1817: 311 (*Saperda*) **E:** AB AR BU GG ST UK **A:** IN TR

azurea Steven, 1817: 190 (*Saperda*)

excelsa Stierlin, 1876: 479

orbicollis adelpha Ganglbauer, 1886: 522 **E:** AR **A:** CY SY TR

diversepubens Pic, 1952e: 691

orbicollis orbicollis Reiche & Saulcy, 1858: 15 **A:** JO LE

damascena Pic, 1899c: 211
edessensis Reitter, 1898e: 358
scapipicta Reitter, 1898e: 358
schmiedeknechti Pic, 1899c: 209
urfanensis Reitter, 1898e: 358

MUST BE:

subgenus *Helladia* Fairmaire, 1864a: 176 type species *Saperda flavescens* Brullé, 1832
adelpha Ganglbauer, 1886: 522 **E:** AR **A:** CY SY TR

damascena Pic, 1899c: 211
diversepubens Pic, 1952e: 691
edessensis Reitter, 1898e: 358
scapipicta Reitter, 1898e: 358
schmiedeknechti Pic, 1899c: 209
urfanensis Reitter, 1898e: 358

alziari Sama, 1992b: 306 (*Phytoecia*) **A:** CY IS JO LE SY TR

...

millefolii Adams, 1817: 311 (*Saperda*) **E:** AB AR BU GG ST UK **A:** IN TR

azurea Steven, 1817: 190 (*Saperda*)

excelsa Stierlin, 1876: 479

orbicollis orbicollis Reiche & Saulcy, 1858: 15 **A:** JO LE

NOTE:

Sama & Rapuzzi (2000) gave the specific epithet as *Helladia orbicollis* (Pic, 1899) wrongly. The author of this species is Reiche & Saulcy, 1858. Pic is the author of *Phytoecia (Helladia) schmiedeknechti* that Beitmeri (Lebanon) is the type locality. They also mentioned the species is endemic to Lebanon with question mark. *Phytoecia orbicollis* was described by Reiche & Saulcy (1858) from Nablus (=Naplouse) in Palestina. So the species can not be endemic to Lebanon. Nevertheless, *Phytoecia orbicollis* Reiche & Saulcy, 1858 should be distributed only in Palestina and Lebanon. It is replaced by *Phytoecia (Helladia) adelpha* Ganglbauer, 1886 from Syria and Turkey to Armenia. Therefore all the infrasubspecific taxa given under the species *Phytoecia (Helladia) orbicollis* by Breuning (1951 and 1966) should be forms of *Phytoecia (Helladia) adelpha* Ganglbauer, 1886. So, all old records from Turkey of *P. orbicollis* belong to *P. adelpha*.

See Özdikmen & Turgut [2010b].

144. PAGE 303

PRINTED:

fatima Ganglbauer, 1884: 570 **E:** AB

MUST BE:

fatima Ganglbauer, 1884: 570 **E:** AB **A:** TR

NOTE:

The record for Asian Turkey see Özdikmen & Turgut [2010b].

145. PAGE 303

PRINTED:

humeralis Waltl, 1838: 471 (*Saperda*) **E:** AB GR (Rodas) **A:** CY IN IQ IS LE SY TR

frontalis Chevrolat, 1882: 63

mersinensis Pic, 1900x: 140 (*Helladia*)

scapularis Chevrolat, 1882: 63

scapulata Mulsant, 1852: 54

imperialis dorud Sama, Rapuzzi & Rejzek, 2007: 166 (*Helladia*) **A:** IN

imperialis imperialis Sama & Rejzek, 2001: 239 **A:** IN

insignata Chevrolat, 1854: 485 **A:** IS JO SY

bethaniensis T. Pic, 1900b: 67

millefolii Adams, 1817: 311 (*Saperda*) **E:** AB AR BU GG ST UK **A:** IN TR

MUST BE:

humeralis humeralis Waltl, 1838: 471 (*Saperda*) **E:** AB GR (Rodas) **A:** CY IN IQ IS LE SY TR

frontalis Chevrolat, 1882: 63

mersinensis Pic, 1900x: 140 (*Helladia*)

scapularis Chevrolat, 1882: 63

scapulata Mulsant, 1852: 54

humeralis caneri Özdikmen & Turgut, 2010: 331 **A:** TR

humeralis insignata Chevrolat, 1854: 485 **A:** IS JO SY

bethaniensis T. Pic, 1900b: 67

imperialis dorud Sama, Rapuzzi & Rejzek, 2007: 166 (*Helladia*) **A:** IN

imperialis imperialis Sama & Rejzek, 2001: 239 **A:** IN

millefolii Adams, 1817: 311 (*Saperda*) **E:** AB AR BU GG ST UK **A:** IN TR

NOTE:

Phytoecia insignata was originally described by Chevrolat (1854) from Israel (Saida=Sidon). He separated it from *P. humeralis* and *P. scapulata* and stated this species approaches enough the *P. humeralis* and *P. scapulata*, but it is much smaller. Breuning (1951 and 1966) gave it as a morpha of *P. (H.) humeralis*. In recent times, it regarded as a separate species in such the original description by the authors (e.g., Sama & Rapuzzi, 2000; Rejzek et al., 2001; Sama et al., 2010). According to Sama et al. (2007), all specimens of *H. humeralis* from Iran differ from typical form and probably constitute a distinct taxon that distinguishable by some characters given in their work. They also mentioned that Iranian population resembles *H. insignata*. So according to our approach, probably this Iranian population should be represented another subspecies of *P. (H.) humeralis*.

See Özdikmen & Turgut [2010b].

146. PAGE 303**PRINTED:**

millefolii Adams, 1817: 311 (*Saperda*) **E:** AB AR BU GG ST UK **A:** IN TR

MUST BE:

millefolii Adams, 1817: 311 (*Saperda*) **E:** AB AR BU GG ST TR UK **A:** IN TR

NOTE:

The record for European Turkey see Özdikmen & Turgut [2010b].

147. PAGE 304**PRINTED:**

pretiosa Faldermann, 1837: 298 **E:** AB AR GG **A:** IN IQ SY TR

ninives Sama, 1994b: 33

nigroapicalis Breuning, 1944: 16

MUST BE:

pretiosa pretiosa Faldermann, 1837: 298 **E:** AB AR GG **A:** IN IQ SY TR

pretiosa nigroapicalis Breuning, 1944: 16 **A:** IQ

ninives Sama, 1994b: 33

NOTE:

I think that this species has two subspecies as the nominotypical subspecies and *Phytoecia (Helladia) pretiosa nigroapicalis* Breuning, 1944 occurs only in Iraq. The later was described by Breuning (1944) from Baghdad (Iraq) in the original combination *Phytoecia (Phytoecia) nigroapicalis* Breuning, 1944. According to Sama et al. (2007), *Phytoecia fatima* Ganglbauer, 1884 of which type locality is Iran, *Phytoecia (Phytoecia) nigroapicalis* Breuning, 1944 and *Helladia pretiosa ninives* Sama, 1994 of which type locality is Mosul (Iraq) are synonyms of *Phytoecia (Helladia) pretiosa* Faldermann, 1837. So, *Helladia pretiosa ninives* Sama, 1994 is a synonym of *Phytoecia (Helladia) pretiosa nigroapicalis* Breuning, 1944.

148. PAGE 304**PRINTED:**

pici Reitter, 1892a: 64 E: AB AR GG A: IN

MUST BE:

pici Reitter, 1892a: 64 E: AB AR GG A: IN TR

NOTE:

The record for Asian Turkey see Danilevsky & Miroshnikov [1985].

149. PAGE 306**PRINTED:**

bangi Pic, 1897i: 189 A: IN TR

bodemeyeri Reitter, 1913d: 665 A: IN TR

MUST BE:

bangi Pic, 1897i: 189 A: IN TR

bialookii Danilevsky, 2010: 22 A: TR

bodemeyeri Reitter, 1913d: 665 A: IN TR

NOTE:

The record for Asian Turkey see Danilevsky [2010b].

150. PAGE 306**PRINTED:**

cylindrica Linnaeus, 1758: 394 (*Cerambyx*) E: AB AR AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SP ST
SV SZ UK YU A: ES FE IN KZ TR WS XIN

MUST BE:

cylindrica Linnaeus, 1758: 394 (*Cerambyx*) E: AB AR AU BE BH BU BY CR CT CZ DE EN
FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SP ST
SV SZ TR UK YU A: ES FE IN KZ TR WS XIN

NOTE:

The record for Asian Turkey see Özdikmen [2008a,e and 2011a].

151. PAGE 307**PRINTED:**

icterica Schaller, 1783: 292 (*Cerambyx*) E: AU BH BU CR CZ FR GE HU IT MC MD PL PT
RO SK SL SP ST SZ TR UK YU A: KZ WS

MUST BE:

icterica Schaller, 1783: 292 (*Cerambyx*) E: AU BH BU CR CZ FR GE HU IT MC MD PL PT
RO SK SL SP ST SZ TR UK YU A: KZ TR WS

NOTE:

The record for Asian Turkey see Özdikmen [2008a,e and 2011a].

152. PAGE 307**PRINTED:**

kabateki Sama, 1997a: 104 A: SY

katarinae Holzschuh, 1974a: 99 A: TR

MUST BE:

kabateki Sama, 1997a: 104 A: SY

kartalensis Danilevsky, 2010: 21 A: TR

katarinae Holzschuh, 1974a: 99 A: TR

NOTE:

The record for Asian Turkey see Danilevsky [2010b].

153. PAGE 307

PRINTED:

nigricornis Fabricius, 1782: 499 (*Saperda*) E: AB AL AR AU BE BH BU BY CR CT CZ EN FI
FR GE GG HU IT LA LT LU MC MD NT PL RO SK SL SP ST SV SZ TR UK YU A: ES KZ
WS

MUST BE:

nigricornis Fabricius, 1782: 499 (*Saperda*) E: AB AL AR AU BE BH BU BY CR CT CZ EN FI
FR GE GG HU IT LA LT LU MC MD NT PL RO SK SL SP ST SV SZ TR UK YU A: ES KZ
TR WS

NOTE:

The record for Asian Turkey see Bodemeyer [1900], Özdikmen [2011a].

154. PAGE 308

PRINTED:

rungsi Antoine, 1953: 221 N: MO
sikkimensis Pic, 1907h: 152 A: KA NP SD

MUST BE:

rungsi Antoine, 1953: 221 N: MO
shokhini Kasatkin, 2010: 61 A: TR
sikkimensis Pic, 1907h: 152 A: KA NP SD

NOTE:

The record for Asian Turkey see Kasatkin [2010].

155. PAGE 308

PRINTED:

annulata annulata Hampe, 1852b: 315 (*Phytoecia*) E: AB A: IN TR
angorensis Pic, 1952a: 2
wawerkana Reitter, 1905b: 239

MUST BE:

annulata annulata Hampe, 1852b: 315 (*Phytoecia*) E: AB A: IN TR
annulata wawerkana Reitter, 1905b: 239 A: TR
angorensis Pic, 1952a: 2

NOTE:

Pilemia wawerkana was described by Reitter (1905) from Akbez (S Turkey: Hatay prov., not Syria). He separated this species from *P. annulata* (Hampe, 1852). Then following authors (e.g. Breuning, 1966) regarded it as a variety or morpha of *P. annulata* (Hampe, 1852). It was given by Rejzek & Hoskovec (1999) as a subspecies of *Phytoecia annulata* Hampe, 1852. So this species has 2 subspecies as *P. annulata annulata* Hampe, 1852 that occurs in Iran, Caucasus and NE Turkey and *P. annulata wawerkana* (Reitter, 1905) which occurs in S and SE Turkey. Breuning (1966) mentioned *P. annulata* v. *angorensis* Pic, 1952 that was described from Turkey (Ankara province) is a morpha of *P. annulata wawerkana* (Reitter, 1905).

See Özdikmen & Turgut [2010a], Özdikmen [2011a].

156. PAGE 309

PRINTED:

hirsutula moreana Breuning, 1943b: 102 (*Phytoecia*) E: GR

hladilorum Holzschuh, 2006a: 274
holtzi Pic, 1952a: 3
serriventris Holzschuh, 1984b: 169 E: BU

MUST BE:

hirsutula moreana Breuning, 1943b: 102 (*Phytoecia*) E: GR
hladilorum Holzschuh, 2006a: 274
holtzi Pic, 1952a: 3
samii Özdikmen & Turgut, 2010: 97 A: TR
serriventris Holzschuh, 1984b: 169 E: BU

NOTE:

See Özdikmen & Turgut [2010a].

157. PAGE 309

PRINTED:

hirsutula moreana Breuning, 1943b: 102 (*Phytoecia*) E: GR
hladilorum Holzschuh, 2006a: 274
holtzi Pic, 1952a: 3
serriventris Holzschuh, 1984b: 169 E: BU

MUST BE:

hirsutula moreana Breuning, 1943b: 102 (*Phytoecia*) E: GR
hladilorum Holzschuh, 2006a: 274
holtzi Pic, 1952a: 3
konyaensis Danilevsky, 2010: 20 A: TR
serriventris Holzschuh, 1984b: 169 E: BU

NOTE:

The record for Asian Turkey see Danilevsky [2010b].

158. PAGE 309

PRINTED:

tigrina Mulsant, 1851: 134 (*Phytoecia*) E: AR BU HU RO ST UK YU

MUST BE:

tigrina Mulsant, 1851: 134 (*Phytoecia*) E: AR BU HU RO ST UK YU A: TR

NOTE:

The records for Asian Turkey see Özdikmen & Turgut [2010a].

159. PAGE 309

PRINTED:

albolineata Hampe, 1852b: 314 (*Phytoecia*) E: AB AR GG A: IN

MUST BE:

albolineata Hampe, 1852b: 314 (*Phytoecia*) E: AB AR GG A: IN TR

NOTE:

The records for Asian Turkey see Sama [1982], Rejzek & Hoskovec [1999], Rejzek et al. [2001].

160. PAGE 310

PRINTED:

lusitanus Linnaeus, 1767: 1067 (*Cerambyx*) E: AB AL AR AU BH BU BY CR CT CZ DE EN
 FI FR GE GG GR HU IT LA LS LT MC MD NR NT PL RO SK SL SP ST SV SZ UK YU A:
 KZ NE WS

MUST BE:

lusitanus Linnaeus, 1767: 1067 (*Cerambyx*) E: AB AL AR AU BH BU BY CR CT CZ DE EN
FI FR GE GG GR HU IT LA LS LT MC MD NR NT PL RO SK SL SP ST SV SZ TR UK YU
A: KZ NE TR WS

NOTE:

The record for Turkey see Özdikmen [2008a].

161. PAGE 311**PRINTED:**

punctipennis Mulsant & Guillebeau, 1856: 103 E: AB AL AU BH BU BY CR CT CZ FR GE
GR HU IT MD PL RO SK SL SP SZ UK YU

MUST BE:

punctipennis Mulsant & Guillebeau, 1856: 103 E: AB AL AU BH BU BY CR CT CZ FR GE
GR HU IT MD PL RO SK SL SP SZ TR UK YU A: TR

NOTE:

The records for Turkey see Özdikmen [2008a and 2011a].

162. PAGE 312**PRINTED:**

eugeniae eugeniae Ganglbauer, 1891: 131 E: AL AU BH CR GR IT RO

MUST BE:

eugeniae eugeniae Ganglbauer, 1891: 131 E: AL AU BH CR GR IT RO A: TR

NOTE:

The record for Asian Turkey see Özdikmen et al. [2010].

163. PAGE 312**PRINTED:**

hispidulus Piller & Mitterpacher, 1783: 35 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CR
CT CZ FR GG GR HU IR IT LA LS LT LU MC MD NL NT PT RO SK SL SP ST SZ UK YU
N: MR A: TR

MUST BE:

hispidulus Piller & Mitterpacher, 1783: 35 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CR
CT CZ FR GG GR HU IR IT LA LS LT LU MC MD NL NT PT RO SK SL SP ST SZ TR UK
YU N: MR A: TR

NOTE:

The record for European Turkey see Özdikmen [2008a], Özdikmen et al. [2010].

164. PAGE 330**PRINTED:**

octopunctata Scopoli, 1772: 101 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CT CZ FR GE
GG GR HU IT MD PL RO SK SL SP ST SZ UK YU

MUST BE:

octopunctata Scopoli, 1772: 101 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CT CZ FR GE
GG GR HU IT MD PL RO SK SL SP ST SZ TR UK YU A: TR

NOTE:

The records for Turkey see Özdikmen [2007 and 2008a].

165. PAGE 330

PRINTED:

populnea Linnaeus, 1758: 394 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CT CZ DE EN FI FR GB GE GG GR HU IR IT LA LT LU MC MD NL NR NT PL PT RO SK SL SP ST SV SZ UK YU A: ANH ES FE FUJ GAN GUA HEB HEI HEN HUB IN JIA JIL KZ LIA MG NIN NMO SC SHA SHN SHX TR WS XIN **NAR**

MUST BE:

populnea Linnaeus, 1758: 394 (*Cerambyx*) E: AB AL AR AU BE BH BU BY CT CZ DE EN FI FR GB GE GG GR HU IR IT LA LT LU MC MD NL NR NT PL PT RO SK SL SP ST SV SZ TR UK YU A: ANH ES FE FUJ GAN GUA HEB HEI HEN HUB IN JIA JIL KZ LIA MG NIN NMO SC SHA SHN SHX TR WS XIN **NAR**

NOTE:

The record for European Turkey see Özdikmen [2008a].

166. PAGE 330

PRINTED:

quercus quercus Charpentier, 1825: 224 E: BH BU GR YU

MUST BE:

quercus quercus Charpentier, 1825: 224 E: BH BU GR TR YU

NOTE:

The record for European Turkey see Özdikmen [2008a].

167. PAGE 332

PRINTED:

gilvipes Faldermann, 1837: 290 (*Anaetia*) E: AB AR GG ST UK A: IN TM

MUST BE:

gilvipes Faldermann, 1837: 290 (*Anaetia*) E: AB AR GG ST UK A: IN TM TR

NOTE:

The record for European Turkey see Özdikmen [2007].

168. PAGE 333

PRINTED:

praeustus algiricus Chobaut, 1894b: cclxxvi N: AG
praeustus praeustus Linnaeus, 1758: 399 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CT CZ DE EN FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SL SP ST SV SZ TR UK YU A: ES KZ MG SY TR WS
anatolicus Özdikmen & Turgut, 2008e: 627
angorensis Pic, 1918d: 11
inapicalis Pic, 1891b: 37
mesmini Pic, 1928c: 6
muehlfeldi Mulsant, 1862: 348 (*Polyopsia*)
niger Kraatz, 1859: 57
pilosus Geoffroy, 1785: 78 (*Leptura*)
ustulatus Hagenbach, 1822: 11 (*Saperda*)
vicinus Pic, 1928c: 6

MUST BE:

praeustus algiricus Chobaut, 1894b: cclxxvi N: AG
praeustus anatolicus Özdikmen & Turgut, 2008e: 627 A: TR

praeustus praeustus Linnaeus, 1758: 399 (*Leptura*) E: AB AL AR AU BE BH BU BY CR CT CZ DE EN FI FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NR NT PL PT RO SK SL SL SP ST SV SZ TR UK YU A: ES KZ MG SY TR WS
angorensis Pic, 1918d: 11
inapicalis Pic, 1891b: 37
mesmini Pic, 1928c: 6
muehlfeldi Mulsant, 1862: 348 (*Polyopsia*)
niger Kraatz, 1859: 57
pilosus Geoffroy, 1785: 78 (*Leptura*)
ustulatus Hagenbach, 1822: 11 (*Saperda*)
vicinus Pic, 1928c: 6

NOTE:

The necessary explanations are given in **2. PAGE 53**.

LITERATURE CITED

- Bodemeyer, H. E. V.** 1900. Quer durch Klein Asien, in den Bulghar Dag; Eine Naturwissenschaftliche Studien-Reise, Coleopterologisches, 196 pp.
- Bodemeyer, H. E. V.** 1906. Beitrage zur Käferfauna von Klein Asien. Deutsche Entomologische Zeitschrift, 2: 417-437.
- Cebeci, H. & Özdikmen, H.** 2010. A synopsis on the genus *Rhamnusium* Latreille, 1829 with a new record (Coleoptera: Cerambycidae) for Anatolian fauna from a new host plant, *Liquidambar orientalis* Miller (Hamamelidaceae). Munis Entomology & Zoology 5 (1): 131-139.
- Cebeci, H., Özdikmen, H. & Turgut, S.** 2011. Callidiine Species in Turkey with zoogeographical remarks and some interesting and rare records (Coleoptera: Cerambycidae: Cerambycinae). Journal of Natural History, 45 (7-8): 475-483.
- Danilevsky, M. L.** 2010a. Additions and corrections to the new Catalogue of Palaearctic Cerambycidae (Coleoptera) edited by I. Löbl and A. Smetana, 2010. Russian Entomol. J., 19 (3): 215-239.
- Danilevsky, M.** 2010b. Four new *Phytoecia* (Coleoptera: Cerambycidae) from Turkey. Studies and Reports Taxonomical Series, 6 (1-2): 19-30.
- Danilevsky, M.** 2011. New subspecies of *Stenurella bifasciata* (Müller, 1776) (Coleoptera, Cerambycidae) from South West Turkey. Munis Entomology & Zoology, 6 (1): 1-5.
- Demelt, C. von** 1967. Nachtrag zur Kenntnis der Cerambyciden-Fauna Kleinasien, Entomologische Blätter, 63: 106-109.
- Kasatkin, D. G.** 2010. A new species of the genus *Phytoecia* Dejean 1835 (Coleoptera: Cerambycidae) from Eastern Turkey. Caucasian Entomological Bulletin, 6 (1): 61-62.
- Öymen, T.** 1987. The forest Cerambycidae of Turkey. İ. Ü. Forest Faculty, İstanbul, 146 pp.
- Özdikmen, H.** 2008e. The Longicorn Beetles of Turkey (Coleoptera: Cerambycidae) Part III – Aegean Region. Munis Entomology & Zoology 3 (1): 355-436.
- Özdikmen, H.** 2009. A short review on the genus *Paraclytus* Bates, 1884 (Coleoptera: Cerambycidae: Cerambycinae). Munis Entomology & Zoology 4 (2): 327-332.
- Özdikmen, H.** 2010a. Turkish Oxymirini Danilevsky in Althoff & Danilevsky, 1997 with zoogeographical remarks (Coleoptera: Cerambycidae: Lepturinae). Munis Entomology & Zoology 5 (1): 52-59.
- Özdikmen, H.** 2010b. The Turkish Dorcadiini with zoogeographical remarks (Coleoptera: Cerambycidae: Lamiinae). Munis Entomology & Zoology, 5 (2): 380-498.
- Özdikmen, H.** 2010c. Longicorn beetles fauna of European Turkey: A revision to the list of Özdikmen, 2008 (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 5, suppl.: 924-944.
- Özdikmen, H.** 2011a. The Longicorn Beetles of Turkey (Coleoptera: Cerambycidae) Part IV – Mediterranean Region. Munis Entomology & Zoology, 6 (1): 6-145.

- Özdikmen, H.** 2011b. Longhorned beetles of Bolu province in Turkey (Coleoptera: Cerambycidae). *Munis Entomology & Zoology*, 6 (1): 210-240.
- Özdikmen, H., Cebeci, H. & Turgut, S.** 2010. Turkish Pogonocherini with zoological remarks (Coleoptera: Cerambycidae). *Acta Zoologica Bulgarica*, 62 (2): 169-174.
- Özdikmen, H., Güven, M. & Gören, C.** 2010. Longhorned beetles fauna of Amanos Mountains, Southern Turkey (Coleoptera: Cerambycidae). *Munis Entomology & Zoology*, 5, suppl.: 1141-1167.
- Özdikmen, H., Özdemir, Y. & Turgut, S.** 2005. Longhorned Beetles Collection of the Nazife Tuatay Plant Protection Museum, Ankara, Turkey (Coleoptera, Cerambycidae). *Journal of Entomological Research Society*, 7 (2), 1-33 (2005).
- Özdikmen, H. & Tezcan, S.** 2011. A synopsis of Turkish *Xylotrechus* Chevrolat, 1860 with a new record, *Xylotrechus stebbingi* Gahan, 1906 (Coleoptera: Cerambycidae: Cerambycinae). *Munis Entomology & Zoology*, 6 (1): 276-281.
- Özdikmen, H. & Turgut, S.** 2006b. A zoogeographical review of Spondylidinae in Turkey (Coleoptera: Cerambycidae). *Munis Entomology & Zoology* 1 (2): 279-288.
- Özdikmen, H. & Turgut, S.** 2006c. The genus *Mesosa* Latreille, 1829 (Coleoptera, Cerambycidae) in Turkey with a new record. *Entomological News*, 117 (3): 309-312.
- Özdikmen, H. & Turgut, S.** 2009a. A review on the genera *Pseudovadonia* Lobanov et al., 1981 and *Vadonia* Mulsant, 1863 (Coleoptera: Cerambycidae: Lepturinae). *Munis Entomology & Zoology* 4 (1): 29-52.
- Özdikmen, H. & Turgut, S.** 2009b. On Turkish *Cerambyx* Linnaeus, 1758 with zoogeographical remarks (Coleoptera: Cerambycidae: Cerambycinae). *Munis Entomology & Zoology* 4 (2): 301-319.
- Özdikmen, H. & Turgut, S.** 2009c. A synopsis of Turkish *Clytus* Laicharting, 1784 and *Sphegoclytus* Sama, 2005 with zoogeographical remarks (Coleoptera: Cerambycidae: Cerambycinae). *Munis Entomology & Zoology* 4 (2): 353-370.
- Özdikmen, H. & Turgut, S.** 2009d. A short review on the genus *Plagionotus* Mulsant, 1842 (Coleoptera: Cerambycidae: Cerambycinae). *Munis Entomology & Zoology* 4 (2): 457-469.
- Özdikmen, H. & Turgut, S.** 2009e. A synopsis of Turkish *Chlorophorus* Chevrolat, 1863 with zoogeographical remarks (Coleoptera: Cerambycidae: Cerambycinae). *Munis Entomology & Zoology* 4 (2): 577-595.
- Özdikmen, H. & Turgut, S.** 2010a. An overview on the Palaearctic subgenus *Phytoecia* (*Pilemia*) Fairmaire, 1864 with a new species *Phytoecia* (*Pilemia*) *samii* sp. n. from Turkey (Coleoptera: Cerambycidae: Lamiinae). *Munis Entomology & Zoology*, 5 (1): 90-108.
- Özdikmen, H. & Turgut, S.** 2010b. An overview on the W-Palaearctic subgenus *Phytoecia* (*Helladia*) Fairmaire, 1864 with a new subspecies *Phytoecia* (*Helladia*) *humeralis caneri* ssp. n. from Turkey (Coleoptera: Cerambycidae: Lamiinae). *Munis Entomology & Zoology*, 5 (2): 317-343.
- Özdikmen, H. & Turgut, S.** 2010c. A synopsis of Turkish *Rhagium* F., 1775 with zoogeographical remarks (Coleoptera: Cerambycidae: Lepturinae). *Munis Entomology & Zoology*, 5, suppl.: 964-976.
- Özdikmen, H. & Turgut, S.** 2010d. Proposed conservation of the specific name *Rhamnusium bicolor* (Schränk, 1781) threatened by an older name with comments on subspecific status (Coleoptera: Cerambycidae: Lepturinae). *Munis Entomology & Zoology*, 5 (2): 812-818.
- Özdikmen, H., Turgut, S. & Güzel, S.** 2009. Longhorned beetles of Ankara region in Turkey (Coleoptera: Cerambycidae). *Munis Entomology & Zoology*, 4 (1): 59-102.
- Özdikmen, H., Yüksel, E. & Okutaner, A. Y.** 2011. Two rare species for Turkey of the genus *Vadonia* Mulsant, 1863 with their photos of habitus and male genitalia (Coleoptera: Cerambycidae: Lepturinae). *Munis Entomology & Zoology*, 6 (1): 504-507.
- Rapuzzi, P. & Sama, G.** 2009. Description of new Cerambycidae from Greece, Turkey, Northern Syria and China (Insecta: Coleoptera: Cerambycidae). *Quad. Studi Nat. Romagna*, 29: 181-188.

Rejzek, M. & Hoskovec, M. 1999. Cerambycidae of Nemrut Dağı National Park (Anatolia, South-East Turkey), Biocosme Mésogéen, Nice, 15: 257-272.

Rejzek, M., Sama, G. & Alziar, G. 2001. Host plants of several herb-feeding Cerambycidae mainly from East Mediterranean Region (Coleoptera: Cerambycidae), Biocosme Mésogéen, Nice, 17 : 263-294.

Sama, G., Dascalu, M. & Pesarini, C. 2010. Description of *Dorcadion gashtarovi* n.sp. (Coleoptera, Cerambycidae) from Romania and Bulgaria with review of the closely related species. North-Western Journal of Zoology, 6 (2): 286-293.

Simonetta, J. 1989. Contributo alla conoscenza dei Cerambicidi della Calabria (Coleoptera, Cerambycidae). Boll. Ass. Romana Entomol., 43 (1988): 49-53.

Švácha, P. & Danilevsky, M. L. 1989. Cerambycoid larvae of Europe and Soviet Union (Coleoptera, Cerambycoidea). Part III // Acta Universitatis Carolinae. Vol.32 [1988]. No.1–2. P.1–205.

Tauzin, P. 2000. Complement a l'inventaire des Coleopteres Cerambycidae de Turquie, L'entomologiste, 56: 151-153.

Tezcan, S. & Rejzek, M. 2002. Longhorn beetles (Coleoptera: Cerambycidae) recorded in cherry orchards in Western Turkey, Zoology in the Middle East, 27: 91-100.

Turgut, S. & Özdikmen, H. 2010. New data for Turkish longhorned beetles fauna from Southern Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 5, suppl.: 859-889.

Turgut, S., Özdikmen, H. & Cebeci, H. 2010. *Oxymirus cursor* and *Leptura aurulenta* (Coleoptera: Cerambycidae): First records for Turkey. Florida Entomologist, 93 (4): 516-518.

OAK GALLWASPS (HYMENOPTERA: CYNIPIDAE) FAUNA OF INNER-WESTERN ANATOLIAN

Yusuf Katılmış* and Suat Kiyak**

* Pamukkale University, Faculty of Arts and Sciences, Department of Biology, Kınıklı Campus, Denizli, TURKEY. E-mail: ykatilmis@pau.edu.tr

** Gazi University, Faculty of Arts and Sciences, Department of Biology, 06500 Teknikokullar, Ankara, TURKEY.

[**Katılmış, Y. & Kiyak, S.** 2011. Oak Gallwasps (Hymenoptera: Cynipidae) Fauna of Inner-western Anatolian. *Munis Entomology & Zoology*, 6 (2): 735-757]

ABSTRACT: The paper is recorded 58 species of 11 genera of tribe Cynipini and 1 species of 1 genus of tribe Synergini on 10 oak species in the Inner Western Anatolian (Afyon, Denizli, Kütahya and Uşak provinces) in 2007, 2008 and 2009. *Cynips disticha* Hartig, 1840, *Neuroterus obtectus* (Wachtl, 1880) and *Neuroterus saliens* (Kollar, 1857) are recorded from the Turkey for the first time. Distribution of each species in the research area and their hosts, and signed also new host records are given in the text.

KEY WORDS: Cynipidae, fauna, gallwasps, Inner-western Anatolian, new record, *Quercus*.

Studies about Cynipidae family were mostly carried out on oak galls and forest pests in Turkey (Bodenheimer, 1941; Acatay, 1943; Schimitschek, 1944; Alkan, 1952; Çanakçıoğlu, 1956; Karaca, 1956; Baş, 1973; Kiyak et al., 2008). Bodenheimer (1941) recorded 21 species of 5 genera, Acatay (1943) 24 species of 5 genera, Schimitschek (1944) 22 species of 5 genera, Alkan (1952) 32 species of 6 genera, Çanakçıoğlu (1956) 3 species of 1 genus, Karaca (1956) 21 species of 5 genera, Baş (1973) 34 species of 5 genera and Kiyak et al. (2008) 30 species of 7 genera. *Andricus askewi* and *Andricus megalucidus* were identified as new species from Turkey (Melika & Stone, 2001; Melika et al., 2004). Katılmış & Kiyak (2008) listed 81 gall inducing wasps (Hymenoptera: Cynipidae) with a new record from Turkey. Seven galls inducing wasps on oaks were recorded as new to Turkey from the same region (Katılmış & Kiyak, 2009a,b; Kiyak & Katılmış, 2010).

MATERIAL AND METHODS

This study was carried out in 2007, 2008 and 2009 in the Inner Western Anatolian (Afyon, Denizli, Kütahya and Uşak provinces). 10 oak species including *Quercus cerris*, *Quercus coccifera*, *Quercus frainetto*, *Quercus infectoria*, *Quercus ithaburensis*, *Quercus petraea*, *Quercus pubescens*, *Quercus trojana* and *Quercus vulcanica* were recorded in the study area (Akçiçek, 2003; Aytaç & Vural, 1991; Davis, 1982).

In the study area *Quercus* spp. were examined and the found galls were collected. The collected galls were put in jar bags which are one liter capacity and covered with tulle. We also recorded localities and collected time. Adult wasps were reared under laboratory conditions and the emerging of adult wasps was checked weekly. The specimens are deposited in the Zoology Museum of Gazi University. Galls and wasps identified according to the literature sources (Dalla-Torre & Kieffer 1910; Ionescu 1957; Nieves-Aldrey 2001; Melika & Stone, 2001; Melika et al. 2004).

RESULTS

The list of Oak gallwasps of Inner-Western Anatolian:

Andricus askewi Melika ve Stone, 2001

Materials: AFYON, Sinanpaşa (Sincanlı), Kırka village, 38°42'N, 30°13'E, 1204m, 15.08.2007, 3 galls, 27.08.2009, 2 galls; Emirdağ, Kurudere village, 38°54'N, 31°03'E, 1200m, 19.04.2008, 2 galls, 28.08.2009, 4 galls; Sandıklı, above Sorkun village (Akdağ Mountain), 38°24'N, 30°01'E, 1131m, 20.08.2008, 1 gall; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 18.09.2008, 2 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 16.08.2008, 4 galls, 19.09.2008, 4 galls; Sultandağı, above Çobanozü village, 38°28'N, 31°16'E, 1037m, 17.06.2009, 1 gall, 11.09.2009, 3 galls; DENİZLİ, Çivril, Çağlayan village, 38°21'N, 29°50'E, 918m, 12.09.2007, 4 galls; Çivril, above Cumalar village (Akdağ Mountain) 38°21'N, 29°56'E, 1302m, 20.08.2008, 2 galls; KÜTAHYA, between Afyon-Kütahya way to Kütahya 66.km, 39°19'N, 30°03'E, 1116m, 10.07.2007, 1 gall; Aslanapa, between Aslanapa-Kütahya way to Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 5 galls; Tavşanlı, between Tavşanlı-Domaniç, way to Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 2 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m 10.09.2007, 4 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 3 galls; Tavşanlı, between Tavşanlı-Emet, way to Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 2 galls; Altıntaş, between Altıntaş-Gediz way to Gediz 17.km next to Murat river, 38°58'N, 29°57'E, 1073m, 21.04.2008 3 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 04.05.2008, 6 galls; Söğüt village, 39°26'N, 30°10'E, 1075m, 04.05.2008, 2 galls; Kütahya, above Kozluca village (Türkmen Mountain), 39°26'N, 30°12'E, 1267m, 04.05.2008, 3 galls; Çavdarhisarı, Çerte village, 39°15'N, 29°28'E, 1165m, 05.05.2008, 1 gall; Tavşanlı, Çöğürtlen village 39°27'N, 29°19'E, 892m, 13.06.2008, 2 galls; Kütahya above Belkavak village 39°19'N, 30°11'E, 1069m, 17.08.2008, 4 galls; Kütahya Frig valley İnli village 39°29'N, 30°12'E, 1045m, 18.08.2008, 1 gall; Kütahya, between Kütahya-Çavdarhisarı way to Çavdarhisarı, 8.km 39°19'N, 29°59'E, 1009m, 16.09.2008, 28.02.2009, 1, 2 galls; Simav, Örenli village, 39°11'N, 28°53'E, 832m, 16.09.2008, 01.03.2009, 2 galls; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 2 gal; Türkmen Mountain below Hürünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 3 galls; Hisarcık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 1 gall. **Host:** *Quercus infectoria*

Andricus bulgaricus Vassileva-Sammalieva, 1977

Materials: KÜTAHYA, between Domaniç-Tahtaköprü way to Tahtaköprü 4.km, 39°50'N, 29°38'E, 1012m, 18.08.2007, 1 galls, 12.08.2008, 10 galls. **Host:** *Quercus pubescens*

Andricus caputmedusae (Hartig, 1843)

Materials: AFYON, Emirdağ, Çatallı village, 38°57'N, 31°07'E, 1078m, 23.04.2007, 4 galls, 10.08.2007, 4 galls; Emirdağ, Kurudere village, 38°54'N, 31°03'E, 1200m, 19.04.2008, 5 galls; Hocalar, Devlethan village; 38°31'N, 29°58'E, 1011m, 24.04.2007, 5 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 5 galls, 09.09.2007, 3 galls; İhsaniye, between İhsaniye-Döğer way to Döğer 2.km, 39°03'N, 30°24'E, 1107m, 19.06.2007, 4 galls; Sultandağı, Deresenek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 4 galls; Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 5 galls, 16.08.2008, 4 galls, 19.09.2008, 4 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1060m, 14.08.2007, 3 galls; Sandıklı, Yavaşlar Town, 38°31'N, 29°57'E, 1089m, 15.08.2007, 4 galls; Sandıklı, Karacaören village, 38°29'N, 30°17'E, 1212m, 15.08.2007, 4 galls; Sinanpaşa (Sincanlı), Kırka Town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 3 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 4 galls; İhsaniye, Döğer town surrounding Emre lake, 39°01'N, 31°00'E, 1067m, 03.05.2008, 5 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 07.05.2008, 5 galls; Emirdağı, Kemerkaya village, 38°54'N, 31°07'E, 1232m, 10.06.2008, 4 galls; Sultandağı, above Yakasenek village way to Çığirtgan stream, 38°31'N, 31°09'E, 1733m, 11.06.2008, 3 galls; above Yakasenek village way to Çığirtgan stream, 38°32'N, 31°09'E, 1542m, 11.06.2008; 2 galls, 19.09.2008, 4 galls, 19.05.2009, 2 galls; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°25'N, 30°02'E, 1023m, 20.08.2008, 3 galls; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°24'N, 30°01'E, 1131m, 20.08.2008, 4 galls; Bayat, between Bayat-Gözü way to Gözü 3.km, 38°59'N, 30°58'E, 1027m, 15.09.2008, 4 galls; Sultandağı, above Kırca Town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 2 galls, 11.09.2009, 3 galls; Sultandağı, above Çobanozü village, 38°28'N, 31°16'E, 1037m, 17.06.2009, 1 galls, 11.09.2009, 5 galls; DENİZLİ, Cankurtaran, (Honaz Mountain) 37°40'N, 29°13'E, 1207m, 26.06.2007, 4 galls, 25.08.2009, 4 galls; Buldan, between Buldan-Buldan lake way to lake 6.km, 38°02'N, 28°47'E, 1131m, 14.07.2007, 4 galls; above Buldan, 38°02'N, 28°48'E, 787m, 14.07.2007, 4 galls; Serinhisar, Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 4 galls; Serinhisar, Kefe upland, 37°37'N, 29°22'E, 1353m, 12.08.2007, 4 galls; Serinhisar, between Kocapınar village-Karaçay town, 37°40'N, 29°24'E, 1100m, 12.08.2007, 3 galls; above Babadağ, 37°48'N, 28°51'E, 745m, 13.08.2007, 5 galls, 09.09.2009, 3 galls; Babadağ, way to Akıyol upland, 37°47'N, 28°51'E, 1009m, 13.08.2007, 3 galls 08.09.2009, 2 galls; Babadağ, Yeniköy village 37°48'N, 28°52'E, 820m, 13.08.2007, 4 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 4 galls, 02.03.2009, 4 galls; Çivril, above Çağlayan village, (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 5 galls; Çivril, above Çağlayan village, (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 3 galls; Çivril, Çağlayan

village, 38°21'N, 29°50'E, 918m, 12.09.2007, 6 galls; Honaz above Aydınlar village (way to Karaçay village) 37°43'N, 29°23'E, 1049m, 18.09.2008, 5 galls; Serinhisar, Yatağan town 37°35'N, 29°23'E, 1046m, 18.09.2008, 5 galls; Serinhisar, Kocapınar village 37°39'N, 29°23'E, 1155m, 03.03.2009, 6 galls; Çal, Selcen village (way to Kabalar village), 38°06'N, 29°20'E, 954m, 29.04.2009, 2 galls; Serinhisar, Yatağan town way to Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 2 galls; Çameli, Kınıkyeri village way to Acıpayam 6.km, 37°13'N, 29°26'E, 1410m, 22.06.2009, 2 galls; KÜTAHYA, Söğüt village, surrounding Söğüt dam, 39°25'N, 30°11'E, 1135m, 19.06.2007, 4 galls; between Çavdarhisarı-Gediz, 39°04'N, 29°27'E, 1064m, 21.06.2007, 5 galls; Simav, Kuşu village, surrounding Kuşu dam, 38°59'N, 29°00'E, 1008m, 22.06.2007, 4 galls; Kütahya-Çavdarhisarı junction, way to Çavdarhisarı 3.km, 39°21'N, 30°02'E, 958m, 11.07.2007, 5 galls, 06.09.2009, 3 galls; Emet, 39°20'N, 29°15'E, 954m, 11.07.2007, 3 galls; between Simav-Hisarçık, way to Hisarçık 10.km, 39°08'N, 29°02'E, 1135m, 12.07.2007, 4 galls; above Simav, 39°03'N, 28°59'E, 1042m, 12.07.2007, 5 galls; between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 818m, 12.07.2007, 4 galls, 17.08.2007, 4 galls, 11.09.2007, 3 galls; Simav, Örenli village, surrounding Örenli village, 39°11'N, 28°53'E, 832m, 17.08.2007, 4 galls, 16.09.2008, 5 galls, 01.03.2009, 4 galls, 2♀; between Hisarçık-Emet way to Emet 2.km, 39°17'N, 29°13'E, 742m, 18.08.2007, 5 galls; Emet, Yenice village, 39°18'N, 29°10'E, 1017m, 18.08.2007, 3 galls; Emet, Hürşidler village, 39°20'N, 29°19'E, 1111m, 18.08.2007, 5 galls; Tavşanlı, between Tavşanlı-Harmancık way to Harmancık 5.km, 39°35'N, 29°24'E, 873m, 18.08.2007, 4 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 19.08.2007, 4 galls, 12.08.2008, 4 galls; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 2 galls; between Altıntaş-Gediz way to Gediz 13.km Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 4 galls; between Altıntaş-Gediz way to Gediz 17.km next to Murat river, 38°58'N, 29°57'E, 1073m, 21.04.2008, 5 galls; Aslanapa, between Aslanapa-Kütahya way to Kütahya 1.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 4 galls; between Tavşanlı-Domaniç way to Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 4 galls; Tavşanlı, Tunçbilek town, 39°39'N, 29°29'E, 815m 10.09.2007, 4 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m 10.09.2007, 5 galls; Tavşanlı, Karaköy village, 39°30'N, 29°24'E, 867m 11.09.2007, 4 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 4 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 4 galls; between Hisarçık-Simav 5.km, 39°13'N, 29°12'E, 916m, 11.09.2007, 5 gal; between Simav-Uşak 20.km, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 4 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 04.05.2008 4 galls; Söğüt village 39°26'N, 30°10'E, 1075m, 04.05.2008 2 galls; Kütahya Frigian valley Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 5 galls; Kütahya, Döğer town (Afyon)- way to Kütahya, 26.km, 39°19'N, 30°11'E, 1047m, 12.06.2008, 4 galls; Kütahya, Frigian vadisi, Çayca village, 39°26'N, 30°08'E, 1021m, 12.06.2008, 4 galls; Tavşanlı, Çöğürtlen village 39°27'N, 29°19'E, 892m, 13.06.2008, 2 galls; Altıntaş, Yayla village 38°57'N, 30°06'E, 1128m, 01.07.2008, 4 galls; Kütahya Döğer town (Afyon)- way to Türkmen Mountain 10.km 39°15'N, 30°17'E, 1180m, 17.08.2008, 4 galls; Kütahya Türkmen Mountain, between Yumaklı village-Kozluca village 1.km 39°25'N, 30°16'E, 1288m, 18.08.2008, 4 galls, 28.04.2009, 3 galls; Kütahya, Türkmen Mountain, Kozluca village, 39°26'N, 30°12'E, 1225m, 18.08.2008, 4 galls; Kütahya Frigian valley İnli village 39°29'N, 30°12'E, 1045m, 18.08.2008, 4 gal; Altıntaş, Saraycık village, 39°00'N, 29°57'E, 1053m, 18.08.2008, 4 galls; Simav, Gümüşsu town 39°07'N, 28°51'E, 798m, 19.08.2008, 4 galls; Kütahya Türkmen Mountain, above Söğüt upland 39°23'N, 30°18'E, 1400m, 16.09.2008, 3 galls; Kütahya Türkmen Mountain, above Yumaklı village 39°26'N, 30°14'E, 1275m, 16.09.2008, 4 galls; between Kütahya-Çavdarhisarı 8.km 39°19'N, 29°59'E, 1009m, 16.09.2008, 3 galls; above Murat Boğazi village, 39°20'N, 30°12'E, 1100m, 27.04.2009, 4 galls; Kütahya, Döğer (Afyon)- way to Türkmen Mountain, above Göçeri village, 39°14'N, 30°17'E, 1216m, 20.05.2009, 1 galls; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 1 galls; Simav, below Söğüt village, 39°06'N, 29°04'E, 991m, 21.05.2009, 2 galls; Simav, between Söğüt village-Gökçeler village, 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 1 gall; Türkmen Mountain., Hürünlü farm-Söğüt upland 3.km, 39°21'N, 30°13'E, 1168m, 18.06.2009, 2 galls; Tavşanlı, Ormanlı village, 39°29'N, 29°11'E, 521m, 19.06.2009, 2 galls; Tavşanlı, between Balıköy town-Taşdibi village 3.km 39°30'N, 29°04'E, 649m, 19.06.2009, 1 gall; Simav, Evciler village, 39°27'N, 29°00'E, 650m, 19.06.2009, 1 gall, Türkmen Mountain, below Hürünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 3 galls; Domaniç, Hayme Ana village, 39°46'N, 29°33'E, 835m, 17.07.2009, 3 galls; Tavşanlı, Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 1 gall; UŞAK, Eşme, Güllü village, 38°22'N, 28°58'E, 793m, 23.05.2007, 5 galls; between Eşme-Uşak 16.km, 38°36'N, 29°01'E, 650m, 22.06.2007, 4 galls; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 4 galls; Eşme, Ahmetler village, surrounding dam, 38°24'N, 29°05'E, 806m, 16.08.2007, 4 galls; Eşme, Kolonkaya village 38°28'N, 29°01'E, 782m, 16.08.2007, 4 galls; Uşak, Emirfaki village, 38°46'N, 29°12'E, 614m, 17.08.2007, 4 galls; Sivashi, Yenice village, 38°33'N, 29°37'E, 792m, 11.09.2007, 4 galls; Banaz Ahad village 38°38'N, 29°47'E, 1065m, 01.07.2008, 5 galls; between Uşak Sivashi-Uşak 5.km, 38°32'N, 29°39'E, 864m, 19.08.2008, 5 gal; Banaz, above Ulupınar village 38°37'N, 29°47'E, 1263m, 19.08.2008, 5 galls 17.09.2008, 4 galls; Uşak, Mesudiye village surrounding Mesudiye dam 38°43'N, 29°30'E, 925m, 17.09.2008 4 galls; Eşme, above Örencik village 38°37'N, 29°02'E, 652m, 17.09.2008, 4 galls; Eşme, above Bozlar village 38°29'N, 28°59'E, 873m, 17.09.2008, 4 galls. **Host:** *Quercus infectoria*, *Quercus pubescens*, *Quercus robur* and *Quercus vulcanica*

***Andricus cecconii* Kieffer, 1901**

Materials: AFYON, Emirdağ, Çatalalı village, 38°57'N, 31°07'E, 1078m, 23.04.2007, 3 galls; Yüreğil town Döneli district, 39°01'N, 31°07'E, 1006m, 23.04.2007; 2 galls, 03.05.2008, 3 galls; Bayat, between Gömü

town-Bayat 6.km 39°01'N, 31°00'E, 1006m, 18.06.2007, 2♀, 4 galls; DENİZLİ, Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 1 gall; Buldan, between Buldan-Güney 11.km, 38°05'N, 28°51'E, 597m, 14.07.2007; Tavas, Yorga village, Gökeçpinar district 37°19'N, 29°07'E, 1164m, 11.08.2007, 2 galls; Çivril, Işıklı Townı, 38°19'N, 29°51'E, 870m, 14.08.2007, 3 galls; Çivril between Işıklı town-Cumalar village 2.km 20.08.2008, 1 gall; KÜTAHYA, Şaphane, Şaphane junction, 39°00'N, 29°09'E, 876m, 22.06.2007, 1 gall; Gediz, between Gediz-Murat Mountain 12.km, 38°57'N, 29°32'E, 851m, 21.06.2007, 2 galls, 22.08.2009, 2 galls, UŞAK, Banaz, between, Banaz-Hocalar 20.km, 38°39'N, 29°48'E, 1005m, 23.05.2007, 1 gall; Ulubey, between Ulubey-Güney 5.km, 38°22'N, 29°11'E, 712m, 23.05.2007, 4 galls, 1♀; Ulubey, between Ulubey-Eşme 15.km, 38°26'N, 29°09'E, 841m, 23.05.2007, 2 galls; Uşak, Göğen dam, 38°43'N, 29°33'E, 948m, 13.07.2007, 6 galls; Karahallı, Kırkyaren village, 38°20'N, 29°25'E, 948m, 13.07.2007, 3 galls; Karahallı, 38°21'N, 29°36'E, 918m, 13.07.2007, 1 gall; Ulubey, İnay village, 38°25'N, 29°12'E, 878m, 16.08.2007, 3 galls; Uşak Mesudiye village surrounding Mesudiye dam 38°43'N, 29°30'E, 925m, 17.09.2008, 5 galls; Karahallı, Kırkyaren village, 38°20'N, 29°26'E, 859m, 21.05.2009, 19 galls, 4♀; Uşak, Gediz junction, way to Gediz 1.km, 38°40'N, 29°14'E, 681m, 20.06.2009, 12 galls. **Host:** *Quercus ithaburensis*

Andricus conglomeratus (Giraud, 1859)

Materials: KÜTAHYA, Simav, between Simav-Demirci village 2.km, 39°05'N, 28°57'E, 818m, 21.04.2008, 7 galls, 06.05.2008, 8 galls, 17.09.2008, 4 galls, 01.03.2009, 10 galls, 28.04.2009, 11 galls, 6♀. **Host:** *Quercus frainetto*.

Andricus coriarius (Hartig, 1843)

Materials: AFYON, Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 5 galls; Sultandağı, Yakasenek village, 38°32'N, 31°10'E, 1234m, 27.06.2007, 3 galls, 08.05.2008, 2 galls; Sultandağı, Deresek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 3 galls; Sultandağı, above Yakasenek village, 38°32'N, 31°10'E, 1282m, 19.04.2008, 4 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 4 galls 11.06.2008, 4 galls, 16.08.2008, 6 galls, 04.03.2009, 7 galls; Bayat, between Bayat-Afyon 5.km Köroğlu district, 38°55'N, 30°54'E, 1258m, 18.06.2007, 1 galls; İhsaniye, Döğertown surrounding Emre lake, 39°01'N, 31°00'E, 1067m, 03.05.2008, 1 galls; Sandıklı, Otluç village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 07.05.2008, 5 galls, 18.09.2008, 4 galls; Sultandağı, Yakasenek village way to Çıgırtan stream, 38°32'N, 31°09'E, 1542m, 11.06.2008, 3 galls; Sandıklı, Sorkun village, (Akdağ Mountain) 38°25'N, 30°02'E, 1023m, 20.08.2008, 3 galls; DENİZLİ, Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 2 galls; Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 14.07.2007, 1 gall; Çivril, Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 18.09.2008, 5 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 4 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 3 galls; Çivril Gabar village, 38°23'N, 29°43'E, 983m, 13.06.2008, 2 galls; Tavas, Kızılcahöyük town, way to Çakıroluk 1.km, 37°38'N, 29°01'E, 1060m, 21.06.2009, 1 galls; KÜTAHYA, Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 3 galls; Altıntaş, Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 4 galls; Tavşanlı, Kuruçay village, surrounding Kuruçay dam, 39°28'N, 29°30'E, 902m, 20.06.2007, 2 galls; Gediz, Murat Mountain, next to Murat Dağı stream, 38°58'N, 29°34'E, 878m, 21.06.2007, 2 galls, 22.08.2009, 3 galls; Kütahya, between Afyon-Kütahya 66.km, 39°19'N, 30°03'E, 1116m, 10.07.2007, 2 galls; Emet, 39°20'N, 29°15'E, 954m, 11.07.2007, 4 galls; above Simav, 39°03'N, 28°59'E, 1042m, 12.07.2007, 3 galls; Pazarlar, surrounding Pazarlar dam, 38°59'N, 29°05'E, 949m, 12.07.2007, 4 galls, 07.09.2009, 5 galls; Emet, Hurşidler village, 39°20'N, 29°19'E, 1111m, 18.08.2007, 2 galls; Tavşanlı, Karaköy village, 39°30'N, 29°24'E, 867m 11.09.2007, 3 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 3 galls; Hisarcık, between Hisarcık-Simav 5.km, 39°13'N, 29°12'E, 916m, 11.09.2007, 5 galls; Kütahya, Söğüt village, 39°26'N, 30°10'E, 1075m, 04.05.2008, 4 galls; Kütahya, Frigian valley Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008, 2 galls; Tavşanlı, Akçaçay village, surrounding Kayaboğazı dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 5 galls; Altıntaş, Yayla village 38°57'N, 30°06'E, 1128m, 01.07.2008, 4 galls; Kütahya, between Kütahya-Çavdarhisarı 8.km, 39°19'N, 29°59'E, 1009m, 28.02.2009, 5 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 01.03.2009, 5 galls, 1♀; Türkmen Mountain, between Hürünlü farm-Söğüt upland 3.km, 39°21'N, 30°13'E, 1168m, 18.06.2009, 1 gall; Simav, Evciler village, 39°27'N, 29°00'E, 650m, 19.06.2009, 3 galls; Türkmen Mountain, below Hürünlü farm 39°20'N, 30°11'E, 1043m, 16.07.2009, 3 galls; Tavşanlı, above Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 3 galls; UŞAK, Eşme, Yeşilkavak village, 38°18'N, 28°57'E, 753m, 22.06.2007, 2 galls; Eşme, between Eşme-Uşak 16.km, 38°36'N, 29°01'E, 650m, 22.06.2007, 3 galls; Eşme, Yeleğen village, 38°18'N, 28°55'E, 821m, 22.06.2007, 2 galls, 24.09.2009, 3 galls; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 3 galls, 24.09.2009, 1 gall; Eşme, Kolonkaya village 38°28'N, 29°01'E, 782m, 16.08.2007, 3 galls; Banaz Ahad village 38°38'N, 29°47'E, 1065m, 01.07.2008, 4 galls; Eşme above Bozlar village 38°29'N, 28°59'E, 873m, 17.09.2008, 3 galls; Banaz, above Ahad village, 38°38'N, 29°49'E, 1025m, 17.09.2008, 4 galls. **Host:** *Quercus infectoria*, *Quercus pubescens* and *Quercus vulcanica*.

Andricus coronatus (Giraud, 1859)

Materials: AFYON, Emirdağ, Çatallı village, 38°57'N, 31°07'E, 1078m, 23.04.2007, 3 galls, 10.08.2007, 2 galls; Emirdağ, Kurrudere village, 38°54'N, 31°03'E, 1200m, 19.04.2008, 2 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 3 galls; İhsaniye, between İhsaniye-Döğertown 2.km, 39°03'N, 30°24'E, 1107m, 19.06.2007, 1 galls; Yüreğil town Döneli district, 39°01'N, 31°07'E, 1006m,

09.09.2007, 2 galls; Bayat, between Bayat-Afyon 5.km Koroğlu district, 38°55'N, 30°54'E, 1258m, 18.06.2007, 1 gall; Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 4 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 5 galls; Emirdağı, Kemer kaya town, 38°54'N, 31°07'E, 1232m, 10.06.2008, 1 galls; Sultandağı Yakasenek village way to Çiğirtan stream, 38°32'N, 31°09'E, 1542m, 19.09.2008, 2 galls; DENİZLİ, Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 14.07.2007, 2 galls; Babadağ, Yeniköy village, 37°48'N, 28°52'E, 820m, 13.08.2007, 1 gall, 08.09.2009, 2 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 3 galls; Çivril Gabar village, 38°23'N, 29°43'E, 983m, 13.06.2008, 4 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1408m, 20.08.2008, 3 galls; Çameli, between Kınıkyeri village-Acıpayam 8.km, 37°13'N, 29°26'E, 1303m, 22.06.2009, 1 galls; KÜTAHYA, Emet, 39°20'N, 29°15'E, 954m, 11.07.2007, 1 gall; Pazarlar, surrounding Pazarlar dam, 38°59'N, 29°05'E, 949m, 12.07.2007, 2 galls, 07.09.2009, 3 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 19.08.2007, 4 galls; Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 3 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 1 gall; Altıntaş, between Altıntaş-Gediz 13.km Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008; 2 galls, Altıntaş, between Altıntaş-Gediz 17.km next to Murat stream, 38°58'N, 29°57'E, 1073m, 21.04.2008, 1 galls; Simav, Örenli village, surrounding, 39°11'N, 28°53'E, 832m, 21.04.2008, 3 galls, 01.03.2009, 5 galls, 1♀; Kütahya, Söğüt village, 39°26'N, 30°10'E, 1075m, 04.05.2008, 2 galls; Kütahya Frigian valley Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008, 3 galls; Tavşanlı, Akçağay village, above Kayaboğazı dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 2 galls; Kütahya, between Döğertown (Afyon)-Kütahya, 26.km, 39°19'N, 30°11'E, 1047m, 12.06.2008, 3 galls; Kütahya Frigian valley İnli village, 39°29'N, 30°12'E, 1045m, 18.08.2008, 1 gall; Kütahya, Türkmen Mountain Yumaklı village 39°26'N, 30°14'E, 1275m, 16.09.2008, 3 galls; Kütahya, between Kütahya-Çavdarhisarı 8.km 39°19'N, 29°59'E, 1009m, 16.09.2008, 2 galls, 28.02.2009, 3 galls, 1♀; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 2 galls; Hisarcık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 2 galls; UŞAK, Banaz Ahad village 38°38'N, 29°47'E, 1065m, 01.07.2008, 2 galls; Uşak, Mesudiye village surrounding Mesudiye dam, 38°43'N, 29°30'E, 925m, 17.09.2008, 1 gall. **Host:** *Quercus pubescens*

***Andricus corruptrix* (Schlechtendal, 1870)**

Materials: AFYON, Sultandağı, above way to Sultandağı fire tower, 38°31'N, 31°12'E, 1170m, 09.07.2007, 1 gall; KÜTAHYA, Hisarcık, above Hisarcık way to Simav 39°13'N, 29°12'E, 920m, 22.05.2007, 1 gall; Simav, Örenli village, surrounding, 39°11'N, 28°53'E, 832m, 17.08.2007, 1 gall; 21.04.2008, 1 gall. **Host:** *Quercus pubescens* and *Quercus robur*

***Andricus curtisii* (Müller, 1870)**

Materials: AFYON, Emirdağ, Çatalı village, 38°57'N, 31°07'E, 1078m, 23.04.2007, 5 galls; Emirdağ, Kurudere village, 38°54'N, 31°03'E, 1200m, 19.04.2008, 5 galls; Hocalar, Devlethan village; 38°31'N, 29°58'E, 1011m, 24.04.2007, 5 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 4 galls; Emirdağ, Başkonak village, Topçular district, 38°55'N, 31°06'E, 1207m, 10.08.2007, 3 galls; Sandıklı, above Otluk village, (Akdağ Mountain), 38°26'N, 29°57'E, 1060m, 14.08.2007, 4 galls; Sandıklı, Yavaşlar Town, 38°31'N, 29°57'E, 1089m, 15.08.2007, 6 galls; Bayat, between Bayat-Afyon 5.km Koroğlu district, 38°55'N, 30°54'E, 1258m, 18.06.2007, 4 galls; Sandıklı, above Otluk village, (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 12.09.2007, 5 galls, 07.05.2008, 5 galls, 18.09.2008, 6 galls; Sandıklı, above Otluk village, (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 5 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 4 galls; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°24'N, 30°01'E, 1131m, 20.08.2008, 2 galls; Sultandağı, above Kırca Town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 1 gall, 11.09.2009, 3 galls; DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 5 galls, 18.09.2008, 5 galls; 02.03.2009, 8 galls, 2♀; Çivril, above Çağlayan village (Akdağ Mountain), 38°21'N, 29°50'E, 918m, 12.09.2007, 4 galls, 21.04.2008, 4 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 4 galls, 22.04.2008, 4 galls; Çardak Beylerli town, 37°41'N, 29°37'E, 921m, 22.04.2008, 3 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1408m, 20.08.2008, 5 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1302m, 20.08.2008, 5 galls; Beyağaç, Kırkmaden district way to Eşen lake, 37°13'N, 28°59'E, 940m, 18.09.2008, 3 galls; Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046m, 5 galls, 2♀; Çameli, between Kınıkyeri village-Acıpayam 8.km, 37°13'N, 29°26'E, 1303m, 22.06.2009, 1 gall; KÜTAHYA, Domaniç between Domaniç -Tavşanlı, 5.km, 39°46'N, 29°34'E, 861m, 20.06.2007, 5 galls; Emet, 39°20'N, 29°15'E, 954m, 11.07.2007, 4 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 19.08.2007, 3 galls; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 6 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 6 galls; Kütahya, Gelinkaya village, 39°19'N, 29°59'E, 971m, 10.09.2007, 3 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m 10.09.2007, 4 galls; Kütahya, between Döğertown (Afyon)-Kütahya 26.km, 39°19'N, 30°11'E, 1047m, 12.06.2008, 5 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 04.05.2008, 3 galls; Altıntaş Saraycık village, 39°00'N, 29°57'E, 1053m, 18.08.2008, 5 galls; Kütahya, between Kütahya-Çavdarhisarı 8.km 39°19'N, 29°59'E, 1009m, 16.09.2008, 4 galls 28.02.2009, 8 galls, 3♀; UŞAK, Eşme, Yeşilkavak village surrounding dam, 38°18'N, 28°57'E, 753m, 22.06.2007, 3 galls; Eşme, between Eşme-Uşak 16.km, 38°36'N, 29°01'E, 650m, 22.06.2007, 5 galls; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 4 galls; Ulubey, between Ulubey-Karahallı 8.km, 38°21'N, 29°19'E, 543m, 13.07.2007, 3 galls; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007; Uşak, Emirfakı village, 38°46'N, 29°12'E, 614m, 17.08.2007, 6

galls; Banaz Ahad village, 38°38'N, 29°47'E, 1065m, 01.07.2008, 4 galls; Banaz, above Ulupınar village 38°37'N, 29°47'E, 1263m, 19.08.2008, 3 galls, 17.09.2008, 6 galls; Eşme above Örencik village, 38°37'N, 29°02'E, 652m, 17.09.2008, 5 galls; Eşme, above Bozlar village, 38°29'N, 28°59'E, 873m, 17.09.2008, 4 galls; Eşme, between Eşme-Ulubey 3.km, 38°25'N, 29°01'E, 781m, 17.09.2008, 5 galls. **Host:** *Quercus infectoria*

***Andricus curvator* (Hartig, 1840)**

Materials: AFYON, Emirdağ, Çatalı village 38°57'N, 31°07'E, 1074m, 19.05.2007, 4 galls; Sultandağı, Yakasenek village, 38°32'N, 31°10'E, 1234m, 27.06.2007, 8 galls; Sultandağı, above Sultandağı way to fire tower, 38°31'N, 31°12'E, 1170m, 09.07.2007, 2 galls; Emirdağ, Yüreğil town Döneli Mah, 39°01'N, 31°07'E, 1006m, 27.04.2008, 8 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 08.05.2008, 7 galls; Sandıklı, Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 18.09.2008, 2 galls; Sultandağı, above Kirca town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 10 galls, 1♀, 2♂; Sultandağı, above Çobanozü village, 38°28'N, 31°16'E, 1037m, 17.06.2009, 1 galls, 11.09.2009, 4 galls; DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°21'N, 29°50'E, 918m, 12.09.2007, 2 galls, 22.04.2008, 10 galls; Çardak, Beylerli town, 37°41'N, 29°37'E, 921m, 22.04.2008, 8 galls, 1♀, 1♂; Denizli, surrounding Şaklıgöl, 37°46'N, 29°21'E, 372m, 07.05.2008, 10 galls; Beyağaç, Kırkmaden district, way to Eşen lake, 37°13'N, 28°59'E, 940m, 18.09.2008, 2 galls; Çal, above Selen village way to Kabalar village, 38°06'N, 29°20'E, 954m, 29.04.2009, 4 galls; Serinhisar, Yatağan town way to Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 4 galls; Honaz, below Karaçay town, 37°41'N, 29°24'E, 1041m, 22.05.2009, 6 galls, 2♀; Honaz, Kızılyer town, 37°45'N, 29°22'E, 804m, 22.05.2009, 2 galls; Tavas, Kızılcaölük town, way to Çakıroluk 1.km, 37°38'N, 29°01'E, 1060m, 21.06.2009, 2 galls; KÜTAHYA Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 21.05.2007, 9 galls; Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 21.06.2007, 4 gal, 06.05.2008, 11 galls, 2♀; Simav, Örenli village, surrounding, 39°11'N, 28°53'E, 832m, 21.04.2008, 3 gall, 06.05.2008, 6 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 04.05.2008, 15 galls, 3♀, 1♂; Tavşanlı, surrounding Güzel yurt dam, 39°29'N, 29°34'E, 850m, 05.05.2008, 6 galls; Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 12 galls, 2♀, 1♂; Kütahya, Yumaklı village-Kozluca village 1.km (Türkmen Mountain), 39°25'N, 30°16'E, 1288m, 18.08.2008, 2 galls; Kütahya, Kozluca village, (Türkmen Mountain), 39°26'N, 30°12'E, 1225m, 18.08.2008, 1 gall; 2 galls; Simav, Söğüt village-Gökçeler village, 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 1 gall; Kütahya, Hürünlü farm-Söğüt upland 3.km, (Türkmen Mountain), 39°21'N, 30°13'E, 1168m, 18.06.2009, 1 galls; Tavşanlı, below Yeniköy village, 39°29'N, 29°17'E, 631m, 19.06.2009, 2 galls; Tavşanlı, Ormanlı village, 39°29'N, 29°11'E, 521m, 19.06.2009, 1 galls, UŞAK, Banaz, above Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 3 galls. **Host:** *Quercus pubescens*, *Quercus infectoria* and *Quercus vulcanica*

***Andricus cydoniae* (Giraud, 1859)**

Materials: AFYON, Sultandağı, above Kirca town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 3 galls; KÜTAHYA, Simav, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 835m, 22.05.2007; 3 galls; Kütahya, Kütahya-Frigian valley route 32.km 39°33'N, 30°09'E, 960m, 11.07.2007, 3 galls, 19.08.2007, 2 galls; UŞAK, Banaz, between Banaz-Hocalar 20.km 38°39'N, 29°48'E, 1005m, 23.05.2007, 4 galls; Ulubey, between Ulubey-Güney 5.km, 38°22'N, 29°11'E, 712m, 23.05.2007, 2 galls; Ulubey, between Ulubey-Eşme 15.km 38°26'N, 29°09'E, 841m, 23.05.2007, 4 galls; Uşak, between Uşak-Simav 20.km 39°00'N, 29°09'E, 890m, 22.05.2007, 3 gal; Sivashı, Pınarbaşı village, 38°27'N, 29°41'E, 948m, 13.07.2007, 2 galls; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 1 gall; Banaz, Kızılcaşöğüt village, 38°40'N, 29°39'E, 956m, 11.09.2007, 1 gall; Sivashı, between Sivashı-Uşak 5.km, 38°32'N, 29°39'E, 864m, 19.08.2008, 2 galls. **Host:** *Quercus cerris* and *Quercus ithaburensis*.

***Andricus foecundatrix* (Hartig, 1840)**

Materials: AFYON, Sultandağı, above Yakasenek town way to Çığirtgan stream, 38°32'N, 31°09'E, 1542m, 11.06.2008, 2 galls; KÜTAHYA, Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 21.05.2007, 2 galls. **Host:** *Quercus infectoria* and *Quercus vulcanica*

***Andricus galeatus* (Giraud, 1859)**

Materials: KÜTAHYA, Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 1 gall. **Host:** *Quercus infectoria*.

***Andricus gallaearnaeformis* (Fonscolombe, 1832)**

Materials: AFYON, Emirdağ, Çatalı village 38°57'N, 31°07'E, 1074m, 19.05.2007, 3 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 07.05.2008, 2 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 08.05.2008, 2 galls; KÜTAHYA, between Doğuş town (Afyon)-Kütahya 15.km, 39°14'N, 30°17'E, 1211m, 19.06.2007, 4 galls; Kütahya, Söğüt village, surrounding Söğüt dam, 39°25'N, 30°11'E, 1135m, 19.06.2007, 1 gall; Kütahya, Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 1 gall; Domaniç, between Domaniç-Tahtaköprü 4.km Tahtaköprü forest, 39°50'N, 29°38'E, 1012m, 20.06.2007, 4 galls; UŞAK, Ulubey, between Ulubey-Eşme 15.km, 38°26'N, 29°09'E, 841m, 23.05.2007, 2 galls. **Host:** *Quercus pubescens* and *Quercus petraea*

***Andricus grossularia* Giraud, 1859**

Materials: AFYON, Emirdağ, Çatalı village, 38°57'N, 31°07'E, 1074m, 19.05.2007, 3 galls, 8♀; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 11398m, 18.06.2007, 4 galls, 1♂; Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 4 galls; Sultandağı, Deresenek village, 38°32'N,

31°09'E, 1192m, 13.09.2007, 5 galls; Sultandağı, above Yakasenek town, 38°32'N, 31°10'E, 1234m, 13.09.2007, 4 galls; Sultandağı, Dereçine village, 38°28'N, 31°14'E, 1148m, 08.05.2008, 3 galls, 11.06.2008, 2 galls, 19.08.2008, 4 galls, 04.03.2009, 7 galls; Sultandağı, Çobanozü village, 38°28'N, 31°16'E, 1037m, 17.06.2009, 65 galls, 1♀; DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°21'N, 29°50'E, 918m, 12.09.2007, 4 galls, 02.03.2009, 6 galls; Honaz, above Aydınlı village, 37°43'N, 29°23'E, 1033m, 03.03.2009, 6 galls, 6♀; Serinhisar, between Yatağan town-Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 1 galls; Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 18.07.2009, 1 galls; KÜTAHYA, Gediz, Murat Mountain, 38°58'N, 29°35'E, 1026m, 21.06.2007, 4 galls; Tavşanlı, Kuruçay village, surrounding dam, 39°28'N, 29°30'E, 902m, 20.06.2007, 1 galls, 23.08.2009, 4 galls; Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 12.07.2007, 4 galls, 17.08.2007, 3 galls, 11.09.2007, 6 galls; Tavşanlı, Opanözü village, 39°28'N, 29°19'E, 795m, 18.08.2007, 3 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m 10.09.2007, 2 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 6 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 6 galls; Altıntaş, Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 3 galls; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 2 galls; above Domaniç, Tahtaköprü forest, 39°50'N, 29°38'E, 966m, 12.06.2008, 1 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 3 galls, 01.03.2009, 6 galls, 3♀, 28.04.2009, 21♀, 21.05.2009, 36 galls, 11♀; above Murat Boğazı village, 39°20'N, 30°12'E, 1100m, 27.04.2009, 4 galls; UŞAK, Ulubey, between Ulubey-Güney 5.km, 38°22'N, 29°11'E, 712m, 23.05.2007, 2 galls; Banaz, Ahad village, surrounding dam, 38°38'N, 29°49'E, 1025m, 17.09.2008, 3 galls. **Host:** *Quercus cerris*, *Quercus infectoria* and *Quercus pubescens*

***Andricus infectorius* (Hartig, 1843)**

Materials: AFYON, Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1138m, 18.06.2007, 2 galls; Sultandağı, above Yakasenek town, 38°32'N, 31°10'E, 1234m, 27.06.2007, 6 galls, 1♀, 19.09.2009, 4 galls, 1♀; Sultandağı, above Sultandağı way to fire tower, 38°31'N, 31°12'E, 1170m, 09.07.2007, 3 galls; Sultandağı, above Deresenek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 4 galls, 13.09.2007, 5 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 3 galls, 11.06.2008, 1 galls, 16.08.2008, 2 galls, 19.09.2008, 5 galls, 04.03.2009, 6 galls; Afyon, between Sandıklı-Afyon 35.km, 38°40'N, 30°19'E, 1320m, 15.08.2007, 2 galls; Sinanpaşa (Sincanlı), Kirka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 2 galls, 27.08.2009, 6 galls; Emirdağı, Kemer kaya village, 38°54'N, 31°07'E, 1232m, 10.06.2008, 4 galls, 1♀, Sandıklı; above Sorkun village, (Akdağ Mountain), 38°25'N, 30°02'E, 1023m, 20.08.2008, 2 galls; Sultandağı, above Yakasenek village way to Çığırtaş stream, 38°32'N, 31°09'E, 1542m, 19.09.2009, 5 galls; Sultandağı, Kirca town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 7 galls; DENİZLİ, Serinhisar, Yatağan town way to Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 1 galls; Serinhisar, between Kocapınar village-Karaçay town, 37°40'N, 29°24'E, 1100m, 12.08.2007, 2 galls; Babadağ, Akyol upland, 37°47'N, 28°51'E, 1009m, 13.08.2007, 2 galls, 08.09.2009, 3 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°21'N, 29°50'E, 918m, 12.09.2007, 4 galls, 18.09.2008, 5 galls, 02.03.2009, 6 galls, 1♀; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1302m, 20.08.2008, 2 galls; Çivril, between Işıklı town-Cumalar village 2.km 20.08.2008, 3 galls; Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046m, 4 galls; Serinhisar, Kocapınar village 37°39'N, 29°23'E, 1155m, 03.03.2009, 7 galls; Tavas, Kızılcaabolük town, way to Çakıroluk 1.km, 37°38'N, 29°01'E, 1060m, 21.06.2009, 1 galls; KÜTAHYA, Küthaya, Söğüt village, surrounding dam, 39°25'N, 30°11'E, 1135m, 19.06.2007, 1 galls; Tavşanlı, Kuruçay village, surrounding dam, 39°28'N, 29°30'E, 902m, 20.06.2007, 3 galls, 23.08.2009, 4 galls; between Çavdarhisarı-Gediz, 39°04'N, 29°27'E, 1064m, 21.06.2007, 2 galls; Şaphane, Şaphane junction, 39°00'N, 29°09'E, 876m, 22.06.2007, 1 galls, 07.09.2009, 4 galls; Küthaya, between Afyon-Küthaya 66.km, 39°19'N, 30°03'E, 1116m, 10.07.2007, 2 galls; Emet, 39°20'N, 29°15'E, 954m, 11.07.2007, 2 galls; above Simav, 39°03'N, 28°59'E, 1042m, 12.07.2007, 2 galls; Tavşanlı, Köprücekk village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 3 galls; Küthaya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 19.08.2007, 2 galls, Domaniç, Orman içi (Heyelanlı Bölge) 39°50'N, 29°38'E, 966m, 10.09.2007, 4 galls; Pazarlar, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 5 galls; Altıntaş, Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 2 galls; Küthaya, Söğüt village, 39°26'N, 30°10'E, 1075m, 04.05.2008, 4 galls; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 4 galls; Küthaya, between Döğertown (Afyon)-Küthaya, 26.km, 39°19'N, 30°11'E, 1047m, 12.06.2008, 1 galls; Küthaya Frigian valley İnli village 39°27'N, 30°11'E, 1097m, 12.06.2008, 3 galls; Tavşanlı, Çöğürtlen village, 39°27'N, 29°19'E, 892m, 13.06.2008, 2 galls; Küthaya, between Döğertown (Afyon)-Türkmen Mountain 10.km, 39°15'N, 30°17'E, 1180m, 17.08.2008, 1 galls; Küthaya Frigian valley İnli village 39°29'N, 30°12'E, 1045m, 18.08.2008, 2 galls; Altıntaş, Saraycık village, 39°00'N, 29°57'E, 1053m, 18.08.2008, 3 galls; Simav, Gümtüşsu town, 39°07'N, 28°51'E, 798m, 19.08.2008, 4 galls; Küthaya, Türkmen Mountain above Söğüt upland 39°23'N, 30°18'E, 1400m, 16.09.2008, 6 galls; Küthaya, Türkmen Mountain, above Yumaklı village, 39°26'N, 30°14'E, 1275m, 16.09.2008, 3 galls; Küthaya, between Küthaya-Çavdarhisarı 8.km, 39°19'N, 29°59'E, 1009m, 16.09.2008, 4 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 8 galls, 1♀, 01.03.2009, 6 galls; Simav, above Söğüt village, 39°06'N, 29°04'E, 991m, 21.05.2009, 4 galls; Simav, Söğüt village-Gökçeler village, 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 2 galls; Tavşanlı, between Balıkköy town-Taşdıbi village 3.km 39°30'N, 29°04'E, 649m, 19.06.2009, 2 galls; Küthaya Türkmen Mountain, below Hürünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 2 galls; Domaniç, Hayme Ana village, 39°46'N, 29°33'E, 835m, 17.07.2009, 1 galls; Tavşanlı, above Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 1 galls; UŞAK, Eşme, Kolonkaya village 38°28'N, 29°01'E, 782m, 16.08.2007, 2 galls; Banaz, above Ulupınar

village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 2 galls; Uşak, Mesudiye village surrounding Mesudiye dam 38°43'N, 29°30'E, 925m, 17.09.2008, 5 galls, 1♀; Eşme, above Örencik village, 38°37'N, 29°02'E, 652m, 17.09.2008, 6 galls; Banaz, Ulupinar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 17.09.2008, 5 galls.

Host: *Quercus infectoria* and *Quercus pubescens*

***Andricus inflator* Hartig, 1840**

Materials: AFYON, Emirdağ, Çatallı village, 38°57'N, 31°07'E, 1078m, 23.04.2007, 3 galls, 10.08.2007, 4 galls; Emirdağ, Yüreğil town Döneli district, 39°01'N, 31°07'E, 1006m, 23.04.2007, 4 galls; Sultandağı, Yakasenev village 38°32'N, 31°10'E, 1234m, 08.05.2008, 3 galls; DENİZLİ, Çameli, between Kınıkyeri village-Acıpayam 6.km, 37°13'N, 29°26'E, 1410m, 22.06.2009, 5 galls; KÜTAHYA, Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 2 galls; Gelinkaya village, 39°19'N, 29°59'E, 971m, 10.09.2007, 2 galls; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 1 galls; Domaniç Berçin village, 39°46'N, 29°34'E, 861m, 21.05.2007, 7 galls, 2♀, 1♂; Domaniç, between Domaniç-Tahtaköprü 4.km, 39°50'N, 29°38'E, 1012m, 18.08.2007, 5 galls, 17.07.2009, 3 galls; Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 21.06.2007, 4 galls, 12.07.2007, 2 galls, 21.04.2008, 4 galls, 1♂; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 21.04.2008, 15 galls, 6♀, 3♂, 06.05.2008, 13 galls, 1♂, 28.04.2009, 6 galls, 21.05.2009, 14 galls; Emet giriş, 39°20'N, 29°15'E, 954m, 11.07.2007, 2 galls; UŞAK, Emirfakı village, 38°44'N, 29°12'E, 628m, 06.05.2008, 4 galls, 21.05.2009, 4 galls. **Host:** *Quercus cerris*

***Andricus kollari* (Hartig, 1843)**

Materials: KÜTAHYA, Tavşanlı, Köprücek village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 3 galls; Pazarlar, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 1 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 04.05.2008, 1 galls; Kütahya Frigian valley İnli village, 39°29'N, 30°12'E, 1045m, 18.08.2008, 2 galls; UŞAK, Eşme, Yeşilkavak village surrounding dam, 38°18'N, 28°57'E, 753m, 22.06.2007, 1 gal; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 2 galls. **Host:** *Quercus pubescens*

***Andricus lignicolus* (Hartig, 1840)**

Materials: AFYON, Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1138m, 18.06.2007, 5 galls; Sultandağı, above Yakasenev town, 38°32'N, 31°10'E, 1234m, 27.06.2007, 2 galls, 09.07.2007, 2 galls, 19.04.2008, 7 galls; Sultandağı, above Sultandağı way to fire tower, 38°31'N, 31°12'E, 1170m, 09.07.2007, 3 galls; Sultandağı, above Deresenev village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 2 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 5 galls, 11.06.2008, 1 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 07.05.2008, 6 galls, 01.07.2008, 4 galls; Sultandağı, above Kirca town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 2 galls; Emirdağ, Kemerkaya town, above Yapraklı district, 38°51'N, 31°10'E, 1435m, 17.06.2009, 1 galls; DENİZLİ, Serinhisar, Kefe upland, 37°37'N, 29°22'E, 1353m, 12.08.2007, 2 galls; Babadağ, 37°48'N, 28°51'E, 745m, 13.08.2007, 5 galls, 08.09.2009, 3 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 2 galls; Honaz, Karaçay village 37°42'N, 29°23'E, 981m, 03.03.2009, 11 galls; Honaz, below Karaçay town, 37°41'N, 29°24'E, 1041m, 22.05.2009, 1 galls; Çameli, between Kınıkyeri village-Acıpayam 6.km, 37°13'N, 29°26'E, 1410m, 22.06.2009, 2 galls; Çameli, between Kınıkyeri village-Acıpayam 8.km, 37°13'N, 29°26'E, 1303m, 22.06.2009, 12 galls; KÜTAHYA, Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 8 galls; Kütahya, Afyon-Kütahya 66.km, 39°19'N, 30°03'E, 1116m, 10.07.2007, 3 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 11.07.2007, 3 galls, 04.05.2008, 7 galls; Kütahya, between Kütahya-Frig valley 32.km 39°33'N, 30°09'E, 960m, 11.07.2007, 2 galls; Kütahya, surrounding Pullar dam, 39°20'N, 29°49'E, 1213m, 11.07.2007, 3 galls, 07.09.2009; Simav, between Simav-Hisarçık 10.km, 39°08'N, 29°02'E, 1135m, 22.05.2007, 10 galls; Simav, between, Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 920m, 22.05.2007, 4 galls, 01.03.2009, 5 galls; Simav, Kuşu village, surrounding dam, 38°59'N, 29°00'E, 1008m, 22.06.2007, 6 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 21.04.2008, 10 galls, 06.05.2008, 8 galls, 28.04.2009, 6 galls; Tavşanlı, Kuruçay village, surrounding dam, 39°28'N, 29°30'E, 902m, 20.06.2007, 2 galls, 23.08.2009, 3 galls; Tavşanlı, Tunchilek town, 39°39'N, 29°29'E, 815m 10.09.2007; Domaniç, between Domaniç-Tahtaköprü Tahtaköprü forest 4.km, 39°50'N, 29°38'E, 1012m, 20.06.2007, 5 galls; 17.07.2009, 5 galls; Gediz, Murat Mountain, next to Murat stream, 38°58'N, 29°34'E, 878m, 21.06.2007, 5 galls; Gediz, between Gediz-Murat Mountain, 12.km, 38°57'N, 29°32'E, 851m, 21.06.2007, 4 galls; Pazarlar, surrounding Pazarlar dam, 39°59'N, 29°05'E, 949m, 12.07.2007, 2 galls, 07.09.2009, 3 galls; Domaniç, between Domaniç-Tahtaköprü Tahtaköprü forest 2.km, 39°50'N, 29°38'E, 966m, 05.05.2008, 3 galls; Çavdarhisarı, Çerte village, surrounding dam, 39°15'N, 29°28'E, 1165m, 05.05.2008, 5 galls; Kütahya Frig vadisi İnli village, 39°27'N, 30°11'E, 1097m, 12.06.2008, 2 galls; Kütahya Türkmen Mountain above Söğüt upland, 39°23'N, 30°18'E, 1400m, 16.09.2008, 6 galls; Kütahya, Türkmen Mountain Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 16.09.2008, 3 galls, 28.04.2009, 4 galls; Simav, Örenli village, surrounding, 39°11'N, 28°53'E, 832m, 16.09.2008, 6 galls; Kütahya, Türkmen Mountain above Kozluca village, 39°26'N, 30°12'E, 1267m, 04.05.2008, 4 galls; Kütahya Frigian valley Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008, 5 galls; Tavşanlı, Akçay village, surrounding Kayaboğazi dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 3 galls; Kütahya, above Murat Boğazi village, 39°20'N, 30°12'E, 1100m, 27.04.2009, 16 galls; Türkmen Mountain Söğüt upland 39°23'N, 30°19'E, 1378m, 27.04.2009, 3 galls; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 5 galls; Türkmen Mountain, between Hürünlü farm-Söğüt upland 3.km, 39°21'N, 30°13'E, 1168m, 18.06.2009, 4 galls; Tavşanlı, Dereli village, 39°29'N, 29°14'E, 603m, 19.06.2009, 4 galls; Tavşanlı, above Günlüce village, 39°25'N, 29°18'E, 1077m,

17.07.2009, 1 galls; UŞAK Banaz Ahad village, 38°18'N, 28°57'E, 939m, 23.06.2007, 4 galls; Eşme, Yeşilkavak village surrounding dam, 38°18'N, 28°57'E, 753m, 22.06.2007, 2 galls; Uşak, Emirfaki village, 38°44'N, 29°12'E, 628m, 06.05.2008, 11 galls; Karahallı, Çokaklı village, 38°21'N, 29°36'E, 912m, 02.03.2009, 4 galls. **Host:** *Quercus cerris*

***Andricus lucidus* (Hartig, 1843)**

Materials: AFYON, Emirdağ, Çatallı village 38°57'N, 31°07'E, 1074m, 19.05.2007, 3 galls; Hocalar, Devlethan village, 38°31'N, 29°58'E, 1011m, 24.04.2007, 5 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 11398m, 18.06.2007, 4 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1060m, 14.08.2007, 3 galls; (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 3 galls, 1♀, 1♂, 27.08.2009, 2 galls; Sultandağı, Yakasenek town, 38°32'N, 31°10'E, 1234m, 13.09.2007, 5 galls, 19.04.2008, 5 galls; Sultandağı above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 6 galls, 16.08.2008, 3 galls, 19.08.2008, 4 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 07.05.2008, 4 galls; Emirdağ, Kemer kaya village, 38°54'N, 31°07'E, 1232m, 10.06.2008, 2 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 04.03.2009, 5 galls, 1♀; DENİZLİ, Cankurtaran, Honaz Mountain, 37°39'N, 29°14'E, 1100m, 25.05.2007, 2 galls, 25.08.2009, 4 galls; Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 2 galls, 25.08.2009, 4 galls; Babadağ, Akyol upland, 37°47'N, 28°51'E, 1009m, 13.08.2007, 3 galls, 08.09.2009, 2 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 6 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 2 galls, 18.09.2008, 3 galls, 02.03.2009, 6 galls; Çivril, Gabar village, 38°23'N, 29°43'E, 983m, 13.06.2008, 3 galls; Honaz, Karaçay village, 37°42'N, 29°23'E, 981m, 03.03.2009, 7 galls; Çal, Selcen village (way to Kabalar village), 38°06'N, 29°20'E, 954m, 29.04.2009, 6 galls; Serinhisar, between Yatağan town-Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 1 galls; Tavas, Kızılcaölük town, way to Çakırluk district 1.km, 37°38'N, 29°01'E, 1060m, 21.06.2009, 1 gall; KÜTAHYA, Altıntaş, Genişler village, 38° 58'N, 30°06'E, 1064m, 24.04.2007, 1 galls, 10.09.2007, 4 galls; Altıntaş, Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 2 galls; Altıntaş, between Altıntaş-Gediz 17.km next to Murat stream, 38°58'N, 29°57'E, 1073m, 21.04.2008, 3 galls; Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 21.06.2007, 1 galls, 11.09.2007, 5 galls; Kütahya, between Afyon-Kütahya 53.km, 39°12'N, 30°07'E, 1172m, 10.07.2007, 2 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 11.07.2007, 3 galls, 19.08.2007, 3 galls; Kütahya, between Kütahya-Eskişehir 14.km, 39°30'N, 30°02'E, 935m, 11.07.2007, 2 galls, 06.09.2009, 2 galls; Simav, between Simav-Hisarçık 10.km, 39°08'N, 29°02'E, 1135m, 12.07.2007, 1 gall; above Simav, 39°03'N, 28°59'E, 1042m, 12.07.2007, 2 galls; Tavşanlı, Köprücek village, surrounding, 39°34'N, 29°20'E, 1027m, 18.08.2007, 5 galls; Kütahya, Gelin kaya village, 39°19'N, 29°59'E, 971m, 10.09.2007, 6 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 5 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 3 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 11.09.2007, 5 galls, 01.03.2009, 3 galls, 28.04.2009; Pazarcık, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 2 galls; Kütahya, Frigian valley, Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008, 3 galls; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 3 galls; Domanıç, between Domanıç-Tahtaköprü 2.km 39°50'N, 29°38'E, 966m, 12.06.2008, 2 galls; Altıntaş Yayla village, 38°57'N, 30°06'E, 1128m, 01.07.2008, 3 galls; Simav, Gümüşsu town, 39°07'N, 28°51'E, 798m, 19.08.2008, 2 galls; Kütahya, above Yumaklı village Türkmen Mountain, 39°26'N, 30°14'E, 1275m, 16.09.2008, 5 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 7 galls, 2♀; Simav, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 818m, 01.03.2009, 5 galls; Murat Boğazı village, 39°20'N, 30°12'E, 1100m, 27.04.2009, 4 galls; Simav, Söğüt village-Gökçeler village, 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 3 galls; UŞAK, Banaz, between Banaz-Hocalar 20km 38°39'N, 29°48'E, 1005m, 23.05.2007, 3 galls; Eşme, Yeşilkavak village surrounding dam, 38°18'N, 28°57'E, 753m, 22.06.2007, 2 galls; Eşme, between Eşme-Uşak 16.km, 38°36'N, 29°01'E, 650m, 22.06.2007, 1 gall; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 3 galls; Eşme above Bozlar village, 38°29'N, 28°59'E, 873m, 17.09.2008, 4 galls; Banaz Ahad village surrounding dam, 38°38'N, 29°49'E, 1025m, 17.09.2008, 3 galls. **Host:** *Quercus cerris*, *Quercus infectoria*, *Quercus ithaburensis* and *Quercus pubescens*

***Andricus malpighi* (Adler, 1881)**

Materials: AFYON, Hocalar, Devlethan village 38°31'N, 29°58'E, 1011m, 24.05.2007, 11 galls. **Host:** *Quercus infectoria*

***Andricus megalucidus* Melika, Stone, Sadeghi ve Pujade-Villar, 2004**

Materials: AFYON, Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 2 galls; Sultandağı, Deresenek village, 38°32'N, 31°09'E, 1192m, 13.09.2007, 4 galls; Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 5 galls, 16.08.2008, 4 galls, 19.09.2008, 6 galls, 04.03.2009, 6 galls; DENİZLİ, Çal, Selcen village, 38°06'N, 29°20'E, 940m, 14.07.2007, 3 galls; Serinhisar, Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 6 galls; Babadağ, Akyol uplandı, 37°47'N, 28°51'E, 1009m, 13.08.2007, 5 galls; Babadağ, Yeniköy village, 37°48'N, 28°52'E, 820m, 13.08.2007, 3 galls, 08.09.2009, 3 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 3 galls; Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046m, 7 galls, 14♀; Serinhisar, Kocapınar village 37°39'N, 29°23'E, 1155m, 03.03.2009, 4 galls; Honaz, Karaçay village, 37°42'N, 29°23'E, 981m, 03.03.2009, 4 galls; Honaz, above Aydınlar village, 37°43'N, 29°23'E, 1033m, 03.03.2009, 11 galls, 31♀; Çal, Selcen village, way to Kabalar village, 38°06'N, 29°20'E, 954m,

29.04.2009, 1 galls; Serinhisar, between Yatağan town-Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 1 galls; KÜTAHYA, Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 12.07.2007, 2 galls, 11.09.2007, 4 galls; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 2 galls; UŞAK, Banaz, Ahad village surrounding dam, 38°38'N, 29°49'E, 1025m, 17.09.2008, 4 galls. **Host:** *Quercus frainetto*, *Quercus infectoria* and *Quercus pubescens*

***Andricus mitratus* (Mayr, 1870)**

Materials: KÜTAHYA, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 818m, 21.04.2008, 10 galls, 06.05.2008, 3 galls, 17.09.2008, 15 galls, 01.03.2009, 4 galls. **Host:** *Quercus frainetto*

***Andricus multiplicatus* Giraud, 1859**

Materials: AFYON, Sultandağı, Yakasenek village, 38°32'N, 31°10'E, 1234m, 09.07.2007, 2 galls, 08.05.2008, 4 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 07.05.2008, 6 galls; Emirdağı, Kemer kaya village, 38°54'N, 31°07'E, 1232m, 10.06.2008, 4 galls, 9♀; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°25'N, 30°02'E, 1023m, 20.08.2008, 3 galls; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°24'N, 30°01'E, 1131m, 20.08.2008, 3 galls; Emirdağı, Kemer kaya town, above Yapraklı district, 38°51'N, 31°10'E, 1435m, 17.06.2009, 4 galls; Emirdağı, Kemer kaya town, below Yapraklı district, 38°54'N, 31°07'E, 1226m, 17.06.2009, 1 galls; DENİZLİ, Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1408m, 20.08.2008, 2 galls; Çameli, between Kınıkyeri village-Acıpayam 8.km, 37°13'N, 29°26'E, 1303m, 22.06.2009, 3 galls; KÜTAHYA, Simav, between Simav-Hisarçık 20.km, 39°10'N, 29°08'E, 1270m, 22.05.2007, 8 galls; Kütahya Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 4 galls; Kütahya, surrounding Pullar dam, 39°20'N, 29°49'E, 1213m, 11.07.2007, 3 galls, 07.09.2009, 3 galls; Pazarcılar, surrounding Pazarcılar dam, 38°59'N, 29°05'E, 949m, 11.07.2007, 4 galls, 07.09.2009, 3 galls; Tavşanlı, Köpriceci village surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 2 galls; Domaniç, between Domaniç-Tahtaköprü 4.km, 39°50'N, 29°38'E, 1012m, 18.08.2007, 3 galls; 17.07.2009, 5 galls; Domaniç, Berçin village, 39°46'N, 29°34'E, 864m, 10.09.2007, 10 galls, 12.06.2008, 6 galls; Domaniç, between Domaniç-Tahtaköprü 2.km, 39°50'N, 29°38'E, 966m, 10.09.2007, 3 galls, 12.06.2008, 10 galls; Kütahya, Frigian valley Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008, 2 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 04.05.2008, 3 galls, 12.06.2008, 3 galls; Tavşanlı, Akçaçay village, surrounding Kayaboğazi dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 8 galls, 4♀; Çavdarhisarı, Çerte village, surrounding dam, 39°15'N, 29°28'E, 1165m, 05.05.2008, 6 galls; Kütahya, Türkmen Mountain Ürünü Çiftliği-Söğüt upland, 39°21'N, 30°15'E, 1304m, 17.08.2008, 2 galls; Kütahya, Murat Boğazi village, 39°20'N, 30°12'E, 1100m, 27.04.2009, 1 gall; Simav, above Söğüt village, 39°08'N, 29°05'E, 1155m, 21.05.2009, 4 galls; Simav, Gökçeler village, 39°06'N, 29°02'E, 834m, 21.05.2009, 1 galls; Kütahya, Türkmen Mountain, Hürünlü farm-Söğüt upland 3.km, 39°21'N, 30°13'E, 1168m, 18.06.2009, 5 galls; Kütahya, Türkmen Mountain, between Söğüt upland-Yumaklı village 2.km, 39°24'N, 30°18'E, 1470m, 19.06.2009, 6 galls; Simav, Evciler village, 39°27'N, 29°00'E, 650m, 19.06.2009, 5 galls; Tavşanlı, Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 2 galls. **Host:** *Quercus cerris*

***Andricus quercusradicis* (Fabricius, 1798)**

Materials: DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 02.03.2009, 1 gall. **Host:** *Quercus cerris*

***Andricus quercustozae* (Bosc, 1792)**

Materials: AFYON, Hocalar, Devlethan village; 38°31'N, 29°58'E, 1011m, 24.04.2007, 3 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1060m, 14.08.2007, 3 galls; Sandıklı, between Sandıklı-Afyon 35.km, 38°40'N, 30°19'E, 1320m, 15.08.2007, 4 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 5 galls; Emirdağı, Kurudere village, 38°54'N, 31°03'E, 1200m, 19.04.2008, 2 galls, 28.08.2009, 2 galls; Sultandağı, above Yakasenek town, 38°32'N, 31°10'E, 1282m, 19.04.2008, 2 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 3 galls, 16.08.2008, 3 galls; Emirdağı, Kemer kaya village, 38°54'N, 31°07'E, 1232m, 10.06.2008, 1 galls; Sultandağı, above Yakasenek village way to Çığırtaş stream, 38°31'N, 31°09'E, 1733m, 11.06.2008, 4 galls; Sultandağı, above Yakasenek village way to Çığırtaş stream, 38°32'N, 31°09'E, 1542m, 11.06.2008, 2 galls, 19.09.2008, 8 galls, 19.05.2009, 1 gall; Sultandağı, above Kirca village, 38°30'N, 31°13'E, 1091m, 19.05.2009, 2 galls; DENİZLİ, Cankurtaran Honaz Mountain, 37°40'N, 29°13'E, 1207m, 26.06.2007, 2 galls, 25.08.2009, 4 galls; Beyağaç, between Beyağaç-Kartal lake 8.km 37°11'N, 28°51'E, 1070m, 25.06.2007, 2 galls; above Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 2 galls; Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 14.07.2007, 2 galls, 18.07.2009, 3 galls; Çal, Selcen village, 38°06'N, 29°20'E, 940m, 14.07.2007, 3 galls; Babadağ, 37°48'N, 28°51'E, 745m, 13.08.2007, 4 galls, 08.09.2009, 4 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 2 galls, 02.03.2009, 3 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 5 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 3 galls; Serinhisar, Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 4 galls, 1♀; Çivril Gabar village, 38°23'N, 29°43'E, 983m, 13.06.2008, 2 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1302m, 20.08.2008, 3 galls; Beyağaç, Kırkmaden district way to Eşen lake, 37°13'N, 28°59'E, 940m, 18.09.2008, 4 galls; Serinhisar, Yatağan town 37°35'N, 29°23'E, 1046m, 02.03.2009, 4 galls; Çal, Selcen village way to Kabalar village, 38°06'N, 29°20'E, 954m, 29.04.2009, 2 galls; Serinhisar, between Yatağan town-Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 3 galls; KÜTAHYA, Altıntaş, Genişler village, 38°58'N, 30°06'D, 1064m,

24.04.2007, 4 galls, 10.09.2007, 3 galls, 20.04.2008, 4 galls; Altıntaş, Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 2 galls; Altıntaş, between Altıntaş-Gediz 17 km next to Murat stream, 38°58'N, 29°57'E, 1073m, 21.04.2008, 2 galls; Simav, between Simav-Hisarçık 10 km, 39°08'N, 29°02'E, 1135m, 22.05.2007, 2 galls, 12.07.2007, 2 galls; Gediz, Murat Dağı, 38°58'K, 29°35'D, 1128m, 21.06.2007, 2 galls; Gediz, Murat Mountain, next to Murat stream, 38°58'N, 29°34'E, 878m, 21.06.2007, 1 gall; Simav, between Simav-Demirciköy, 2 km 39°05'N, 28°57'E, 818m, 21.06.2007, 2 galls, 11.09.2007, 5 galls; Simav, Kuşu village, surrounding Kuşu dam, 38°59'N, 29°00'E, 1008m, 22.06.2007, 2 galls; Şaphane, Şaphane junction, 39°00'N, 29°09'E, 876m, 22.06.2007, 2 galls, 07.09.2009, 3 galls; above Simav, 39°03'N, 28°59'E, 1042m, 12.07.2007, 2 galls; Pazarlar, surrounding Pazarlar dam, 38°59'N, 29°05'E, 949m, 12.07.2007, 3 galls; Simav, Örenli village surrounding lake, 39°11'N, 28°53'E, 832m, 17.08.2007, 3 galls, 16.09.2008, 4 galls, 01.03.2009, 6 galls; Hisarçık, between Hisarçık-Emet 2 km, 39°17'N, 29°13'E, 742m, 18.08.2007, 4 galls; Tavşanlı, Köprücek village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 2 galls; Aslanapa, between Aslanapa-Kütahya 5 km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 5 galls; Aslanapa, between Aslanapa-Kütahya 11 km Kireç village, 39°16'N, 29°55'E, 1100m, 10.09.2007, 4 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m 10.09.2007, 4 galls; Domaniç, between Domaniç-Tahtaköprü 2 km, 39°50'N, 29°38'E, 966m, 10.09.2007, 3 galls, 05.05.2008, 1 gall; Tavşanlı, Karaköy village, 39°30'N, 29°24'E, 867m 11.09.2007, 4 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 4 galls; Tavşanlı, between Tavşanlı-Emet 12 km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 5 galls; Hisarçık, between Hisarçık-Simav 5 km, 39°13'N, 29°12'E, 916m, 11.09.2007, 4 galls; Pazarlar, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 3 galls; Kütahya, Türkmen Mountain, above Yumaklı village, 39°25'N, 30°16'E, 1305m, 04.05.2008, 2 galls; Kütahya Frigian valley Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008, 2 galls; Tavşanlı, Akçağay village, surrounding Kayaboğazı dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 2 galls; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 2 galls; Altıntaş, Yayla village, 38°57'N, 30°06'E, 1128m, 01.07.2008, 2 galls; Kütahya Türkmen Mountain above Ürünli farm, 39°21'N, 30°15'E, 1304m, 17.08.2008, 4 galls; Altıntaş, Saraycık village, 39°00'N, 29°57'E, 1053m, 18.08.2008, 4 galls; Simav, Gümüşsu town, 39°07'N, 28°51'E, 798m, 19.08.2008, 3 galls; Kütahya, Türkmen Mountain, between Yumaklı village-Kozluca village 1 km 39°25'N, 30°16'E, 1288m, 16.09.2008, 5 galls, 29.04.2009, 4 galls; Kütahya, between Kütahya-Çavdarhisarı 8 km, 39°19'N, 29°59'E, 1009m, 16.09.2008, 3 galls, 28.02.2009, 6 galls; above Murat Boğazı village, 39°20'N, 30°12'E, 1100m, 27.04.2009, 2 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 20.05.2009, 3 galls; Tavşanlı, between Sekbanlı village girişi, 39°30'N, 29°22'E, 891m, 20.05.2009, 2 galls; Simav, below Söğüt village, 39°06'N, 29°04'E, 991m, 21.05.2009, 2 galls; Simav, between Söğüt village-Gökçeler village, 4 km, 39°06'N, 29°03'E, 898m, 21.05.2009, 2 galls; Simav, Gökçeler village surrounding dam, 39°06'N, 29°02'E, 834m, 21.05.2009, 2 galls; Simav, Evçiler village, 39°27'N, 29°00'E, 650m, 19.06.2009, 1 gall; Kütahya, Türkmen Mountain below Hürlünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 3 galls; Domaniç, Hayme Ana village, 39°46'N, 29°33'E, 835m, 17.07.2009, 1 gall; Tavşanlı, above Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 3 galls; Hisarçık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 4 galls; UŞAK, Emirfakı village, 38°46'N, 29°12'E, 614m, 17.08.2007, 2 galls; Eşme, Güllü village, 38°22'N, 28°58'E, 793m, 23.05.2007, 3 galls; Eşme, between Eşme-Uşak 16 km, 38°36'N, 29°01'E, 650m, 22.06.2007, 2 galls; Eşme, Kolonkaya village, 38°28'N, 29°01'E, 782m, 16.08.2007, 3 galls; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 3 galls; Sivash, Eldeniz village çıkışı, 38°33'N, 29°43'E, 1117m, 21.04.2008, 1 gall; Banaz Ahad village, 38°38'N, 29°47'E, 1065m, 01.07.2008, 3 galls; Banaz, Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 4 galls; Uşak, Mesudiye village, surrounding dam, 38°43'N, 29°30'E, 925m, 17.09.2008, 5 galls; Eşme, above Bozlar village, 38°29'N, 28°59'E, 873m, 17.09.2008, 4 galls; Banaz, above Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 3 galls, 17.09.2008, 5 galls. **Host:** *Quercus frainetto*, *Quercus infectoria*, *Quercus pubescens*, *Quercus robur* and *Quercus vulcanica*

***Andricus schroeckingeri* Wachtl, 1876**

Materials: AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 11.06.2008, 6 galls, 19.05.2009, 145 galls, 2♀. **Host:** *Quercus cerris*

***Andricus seckendorffi* (Wachtl, 1879)**

Materials: AFYON, Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 4 galls, 2♀; Bayat, between Bayat-Gözü 3 km, 38°59'N, 30°58'E, 1027m, 15.09.2008, 3 galls; DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 5 galls; KÜTAHYA, Simav, Örenli village surrounding lake, 39°11'N, 28°53'E, 832m, 17.08.2007, 5 galls, 11.09.2007, 4 galls, 16.09.2008, 5 galls; Tavşanlı, between Tavşanlı-Emet 12 km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 3 galls; Simav, between Simav-Demirciköy 2 km, 39°05'N, 28°57'E, 920m, 11.09.2007, 2 galls; UŞAK, Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 2 galls; Eşme, above Örencik village, 38°37'N, 29°02'E, 652m, 17.09.2008, 4 galls, 1♀; Banaz, Ahad village surrounding dam, 38°38'N, 29°49'E, 1025m, 17.09.2008, 3 galls. **Host:** *Quercus infectoria*, *Quercus pubescens* and *Quercus robur*

***Andricus solitarius* (Fonscolombe, 1832)**

Materials: KÜTAHYA, between Simav-Demirciköy 2 km, 39°05'N, 28°57'E, 818m, 12.07.2007, 2 galls, 17.08.2007, 3 galls, 11.09.2007, 2 galls, 06.05.2008, 2 galls, 13.06.2008, 2 galls, 29.04.2009, 3 galls. **Host:** *Quercus frainetto*

***Andricus stefanii* (Kieffer, 1897)**

Materials: AFYON, Sinanpaşa (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 2 galls; KÜTAHYA, Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 21.05.2007, 2 galls; Kütahya, Söğüt village, surrounding dam, 39°25'N, 30°11'E, 1135m, 19.06.2007, 3 galls; Tavşanlı, Kuruçay village, surrounding dam, 39°28'N, 29°30'E, 902m, 20.06.2007, 1 gall; Simav, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 818m, 21.06.2007, 2 galls; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 3 galls; Altıntaş, Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 3 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m 10.09.2007, 2 galls; Tavşanlı, Karaköy village, 39°30'N, 29°24'E, 867m 11.09.2007, 3 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 2 galls; Tavşanlı, Kütahya Frigian valley Sabuncupınar village, 39°30'N, 30°09'E, 984m, 04.05.2008, 1 gall; Kütahya, Türkmen Mountain between Yumaklı village-Kozluca village 2.km 39°25'N, 30°16'E, 1288m, 28.04.2009, 3 galls; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 3 galls; Simav, Söğüt village-Gökçeler village 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 3 galls; Tavşanlı, below Yeniköy village, 39°29'N, 29°17'E, 631m, 19.06.2009, 1 gall. **Host:** *Quercus frainetto*, *Quercus infectoria*, *Quercus pubescens* and *Quercus vulcanica*

***Andricus sternlichti* (Bellido, Pujade-Villar ve Melika, 2003)**

Materials: AFYON, Hocalar, Devlethan village, 38°31'N, 29°58'E, 1011m, 24.04.2007, 3 galls; Sandıklı, Yavaşlar town, 38°31'N, 29°57'E, 1089m, 15.08.2007, 2 galls; Sandıklı, above Otluk village, (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 5 galls; Sultandağı above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 3 galls, 16.08.2008, 2 galls, 19.09.2008, 5 galls, 04.03.2009, 2 ♀; DENİZLİ, Pamukkale University, above Sciences and Arts Faculty, 37°44'N, 29°06'E, 1025m, 27.06.2007, 5 galls; above Buldan, way to lake 2.km, 38°02'N, 28°48'E, 787m, 14.07.2007, 2 galls; Çal, Selcen village, 38°06'N, 29°20'E, 940m, 14.07.2007, 2 galls; Beyağaç, between Beyağaç-Kartal lake 5.km 37°11'N, 28°51'E, 1109m, 14.07.2007, 4 galls; Serinhisar, Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 4 galls; Babadağ, 37°48'N, 28°51'E, 745m, 13.08.2007, 4 galls, 1 ♀; Babadağ, Yeniköy village, 37°48'N, 28°52'E, 820m, 13.08.2007, 2 galls, 08.09.2009, 4 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 5 galls, 02.03.2009, 5 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°21'N, 29°50'E, 918m, 12.09.2007, 3 galls, 18.09.2008, 10 galls, 7 ♀; Serinhisar, Ayaz village, 37°34'N, 29°20'E, 1100m, 03.03.2009, 6 galls; Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046m, 03.03.2009, 1 gall; Çal, Selcen village (way to Kabalar), 38°06'N, 29°20'E, 954m, 29.04.2009, 3 galls; KÜTAHYA, Söğüt village, surrounding Söğüt dam, 39°25'N, 30°11'E, 1135m, 19.06.2007, 2 galls; Kütahya, between Afyon-Kütahya 66.km, 39°19'N, 30°03'E, 1116m, 10.07.2007, 3 galls; Kütahya, between Kütahya-Eskişehir, 14.km, 39°30'N, 30°02'E, 935m, 11.07.2007, 4 galls, 06.09.2009, 3 galls; Tavşanlı, Köprücek village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 2 galls; Altıntaş, between Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 3 galls; Altıntaş, Pınarcık village, 39°00'N, 29°58'E, 1058m, 21.04.2008, 2 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 4 galls; Domaniç, Berçin village, 39°46'N, 29°34'E, 864m, 10.09.2007, 3 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 2 galls; Kütahya, Türkmen Mountain, Kozluca village, 39°26'N, 30°12'E, 1225m, 18.08.2008, 3 galls; Simav, Gümüşsu town, 39°07'N, 28°51'E, 798m, 19.08.2008, 5 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 7 galls, 3 ♀; Hisarcık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 2 galls; UŞAK, Banaz, above Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 3 galls. **Host:** *Quercus infectoria* and *Quercus pubescens*

***Andricus theophrastea* Trotter, 1866**

Materials: AFYON, Sultandağı, above Sultandağı way to fire tower, 38°31'N, 31°12'E, 1170m, 09.07.2007, 3 galls; Sultandağı, above Deresenek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 2 galls; Sandıklı, above Otluk village, (Akdağ Mountain), 38°26'N, 29°57'E, 1060m, 14.08.2007, 4 galls, Bayat, between Bayat-Gömmü 3.km, 38°59'N, 30°58'E, 1027m, 15.09.2008, 2 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 19.09.2008, 3 galls; DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 2 galls, Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 2 galls, Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 18.07.2009, 1 galls; KÜTAHYA, Simav, Simav-Hisarcık 10.km 39°08'N, 29°02'E, 1135m, 12.07.2007, 5 galls; Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 12.07.2007, 3 galls, 17.08.2007, 3 galls, 17.09.2008, 5 galls; Emet, Hürşidler village, 39°20'N, 29°19'E, 1111m, 18.08.2007, 3 galls; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 2 galls; Aslanapa, between Aslanapa-Kütahya 11.km, Kireç village, 39°16'N, 29°55'E, 1100m, 10.09.2007, 5 galls; Tavşanlı, Tuncbilek town, 39°39'N, 29°29'E, 815m 10.09.2007, 6 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 3 galls; Kütahya, Türkmen Mountain above Yumaklı village, 39°25'N, 30°16'E, 1305m, 04.05.2008, 2 galls, 16.08.2008, 2 galls; Kütahya Frigian valley, İnli village, 39°29'N, 30°12'E, 1045m, 18.08.2008, 3 galls; Altıntaş, Saraycık village, 39°00'N, 29°57'E, 1053m, 18.08.2008, 2 galls; Simav, Gümüşsu town, 39°07'N, 28°51'E, 798m, 19.08.2008, 2 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 4 galls; Türkmen Mountain below Hürünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 6 galls; Domaniç, Hayme Ana village, 39°46'N, 29°33'E, 835m, 17.07.2009, 5 galls; Hisarcık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 1 gall; UŞAK, Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 3 galls; Eşme, Ahmetler village, surrounding dam, 38°24'N, 29°05'E, 806m, 16.08.2007, 2 galls; Eşme, Kolonkaya village 38°28'N,

29°01'E, 782m, 16.08.2007, 4 galls; Uşak, Emirfakı village, 38°46'N, 29°12'E, 614m, 17.08.2007, 5 galls; Sivashi, Yenice village, 38°33'N, 29°37'E, 792m, 11.09.2007, 4 galls; Eşme, above Örencik village, 38°37'N, 29°02'E, 652m, 17.09.2008, 5 galls. **Host:** *Quercus infectoria* and *Quercus pubescens*

***Andricus tomentosus* (Trotter, 1901)**

Materials: AFYON, İhsaniye, between İhsaniye-Döğler 2.km, 39°03'N, 30°24'E, 1107m, 19.06.2007, 2 galls; Sultandağı, Yakasenek village, 38°32'N, 31°10'E, 1234m, 27.06.2007, 1 galls, 13.09.2007, 5 galls; Sinanpaşa (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 3 galls; Emirdağ, Yüreğil town Döneli district, 39°01'N, 31°07'E, 1006m, 09.09.2007, 2 galls; Bayat, between Bayat-Afyon 5.km Koroğlu district, 38°55'N, 30°54'E, 1258m, 18.06.2007, 2 galls; Sultandağı, above Deresenek village, 38°32'N, 31°09'E, 1192m, 13.09.2007, 4 galls; Sandıklı, Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 07.05.2008, 2 galls; Bayat, between Bayat-Gözü 3.km, 38°59'N, 30°58'E, 1027m, 15.09.2008, 4 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 16.08.2008, 3 galls; DENİZLİ, Pamukkale University next to Faculty of Science and Arts, 37°44'N, 29°06'E, 1025m, 19.06.2007, 1 galls; Çal, Selcen village, 38°06'N, 29°20'E, 940m, 14.07.2007, 4 galls; Çivril, above Çağlayan village, 38°24'N, 29°50'E, 970m, 14.08.2007, 3 galls, 18.09.2008, 5 galls; Serinhisar, Yatağan town 37°35'N, 29°23'E, 1046m, 03.03.2009, 5 galls; Honaz, Aydıncılar village, 37°43'N, 29°23'E, 1033m, 03.03.2009, 4 galls; Çameli, between Kınık yeri village-Acıpayam 6.km, 37°13'N, 29°26'E, 1410m, 22.06.2009, 4 galls; KÜTAHYA, Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 1 galls, 10.09.2007, 4 galls; Simav, Simav-Demirciköy, 39°05'N, 28°57'E, 835m, 22.05.2007, 2 galls; Kütahya, Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 3 galls; Tavşanlı, Kuruçay village, surrounding, 39°28'N, 29°30'E, 902m, 20.06.2007, 2 galls; Şaphane, Şaphane junction, 39°00'N, 29°09'E, 876m, 22.06.2007, 2 galls, 07.09.2009, 4 galls; Kütahya, between Afyon-Kütahya 66.km, 39°19'N, 30°03'E, 1116m, 10.07.2007, 2 galls; Simav, Simav-Hisarçık 10.km 39°08'N, 29°02'E, 1135m, 12.07.2007, 2 galls; Hisarçık, between Hisarçık-Emet 2.km, 39°17'N, 29°13'E, 742m, 18.08.2007, 3 galls; Tavşanlı, between Tavşanlı-Harmançık 5.km, 39°35'N, 29°24'E, 873m, 18.08.2007, 4 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 5 galls; Aslanapa, between Aslanapa-Kütahya 11.km, Kireç village, 39°16'N, 29°55'E, 1100m, 10.09.2007, 3 galls; Tavşanlı, Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 6 galls; Tavşanlı, Karaköy village, 39°30'N, 29°24'E, 867m 11.09.2007, 4 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 2 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 11.09.2007, 5 galls, 01.03.2009, 6 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 04.05.2008, 2 galls; Kütahya, Türkmen Mountain above Yumaklı village, 39°25'N, 30°16'E, 1305m, 04.05.2008, 2 galls; Tavşanlı, surrounding Güzeylurt dam, 39°29'N, 29°34'E, 850m, 05.05.2008, 2 galls; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 1 galls; Kütahya, between Döğler town (Afyon)- Kütahya 26.km, 39°19'N, 30°11'E, 1047m, 12.06.2008, 2 galls; Altıntaş, Yayla village, 38°57'N, 30°06'E, 1128m, 01.07.2008, 1 galls; Kütahya, between Döğler town (Afyon)-Türkmen Mountain 10.km, 39°15'N, 30°17'E, 1180m, 17.08.2008, 4 galls; Kütahya Frigian valley İnli village 39°29'N, 30°12'E, 1045m, 18.08.2008, 3 galls; Simav Gümüşsu town, 39°07'N, 28°51'E, 798m, 19.08.2008, 3 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 3 galls; Kütahya, between Döğler town (Afyon)-Türkmen Mountain, above Göçeri village, 39°14'N, 30°17'E, 1216m, 20.05.2009, 3 galls; Kütahya, Akçamescit village, 39°19'N, 30°10'E, 1082m, 20.05.2009, 3 galls; Simav, below Söğüt village, 39°06'N, 29°04'E, 991m, 21.05.2009, 2 galls; Simav, between Söğüt village-Gökçeler village, 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 2 galls; Türkmen Mountain, below Hürünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 3 galls; Domaniç, Hayme village, 39°46'N, 29°33'E, 835m, 17.07.2009, 1 gall; Hisarçık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 1 gall; UŞAK, Eşme, Yeşilkavak village surrounding dam, 38°18'N, 28°57'E, 753m, 22.06.2007, 2 galls; Uşak, between Uşak-Simav, 22.km 38°36'N, 29°01'E, 650m, 22.06.2007, 1 galls; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 2 galls; Ulubey, Ulubey-Karahallı 8.km, 38°21'N, 29°19'E, 543m, 13.07.2007, 2 galls; Eşme Örencik village, 38°37'N, 29°02'E, 652m, 17.09.2008, 5 galls; Eşme, above Bozlar village, 38°29'N, 28°59'E, 873m, 17.09.2008, 4 galls. **Host:** *Quercus frainetto*, *Quercus infectoria*, *Quercus pubescens* and *Quercus robur*

***Andricus trunciculus* (Giraud, 1859)**

Materials: KÜTAHYA, between Kütahya-Eskişehir, 14.km, 39°30'N, 30°02'E, 935m, 11.07.2007, 8 galls, 06.09.2009, 3 galls; Şaphane, Sofulu village, 38°58'N, 29°11'E, 817m, 17.08.2007, 6 galls, 07.09.2009, 7 galls; Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 17.08.2007, 2 galls, 11.09.2007, 2 galls; Tavşanlı, Köprücek village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 4 galls; Tavşanlı, Tunçbilek town, 39°39'N, 29°29'E, 815m 10.09.2007, 3 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m 10.09.2007, 6 galls; Domaniç, Berçin village, 39°46'N, 29°34'E, 864m, 10.09.2007, 2 galls; Tavşanlı, Karaköy village, 39°30'N, 29°24'E, 867m 11.09.2007, 5 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 3 galls; Pazarlarcı, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 2 galls; Kütahya, between Söğüt village, 39°26'N, 30°10'E, 1075m, 04.05.2008, 2 galls; Kütahya Frigian valley İnli village 39°29'N, 30°12'E, 1045m, 18.08.2008, 4 galls; Kütahya Türkmen Mountain between Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 16.09.2008, 5 galls; Kütahya, Türkmen Mountain Yumaklı village, 39°26'N, 30°14'E, 1275m, 16.09.2008, 5 galls; Simav, Örenli village, surrounding, 39°11'N, 28°53'E, 832m, 01.03.2009, 2 galls; Tavşanlı, between Bahküy town-Taşdibi village 3.km, 39°30'N, 29°04'E, 649m, 19.06.2009, 2 galls; Tavşanlı, above Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 4 galls; Hisarçık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 4 galls. **Host:** *Quercus infectoria* and *Quercus pubescens*

***Aphelonyx cerricola* (Giraud, 1859)**

Materials: AFYON, Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 09.09.2007, 8 galls; Emirdağ, Kemer kaya town, above Yapraklı district, 38°51'N, 31°10'E, 1435m, 17.06.2009, 2 galls; Emirdağ, Kemer kaya town, below Yapraklı district, 38°54'N, 31°07'E, 1226m, 17.06.2009, 4 galls; Sultandağı, above Çobanozü village, 38°28'N, 31°16'E, 1037m, 17.06.2009, 2 galls, 11.09.2009, 6 galls; DENİZLİ, Çivril, Gülpınar village, 38°25'N, 29°43'E, 973m, 13.07.2007, 3 galls; above Bekeilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 4 galls; KÜTAHYA, Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 5 galls; Kütahya, Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 5 galls; Domaniç, between Domaniç-Tahtaköprü 4.km Tahtaköprü forest, 39°50'N, 29°38'E, 1012m, 20.06.2007, 3 galls; Gediz, Murat Mountain, next to Murat stream, 38°58'N, 29°34'E, 878m, 21.06.2007, 2 galls; Kütahya, Kütahya-Çavdarhisarı junction, way to Çavdarhisarı 3.km, 39°21'N, 30°02'E, 958m, 11.07.2007, 3 galls; Hisarcık, between Hisarcık-Emet 2.km, 39°17'N, 29°13'E, 742m, 18.08.2007, 7 galls; Tavşanlı, Köpricek village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 4 galls; Kütahya, between Kütahya-Frigian valley 32.km, 39°33'N, 30°09'E, 960m, 19.08.2007, 5 galls; Kütahya, Türkmen Mountain, Söğüt upland, 39°23'N, 30°19'E, 1378m, 27.04.2009, 4 galls; Simav, between Söğüt village-Gökçeler village, 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 4 galls; Kütahya, Türkmen Mountain, between Söğüt upland-Yumaklı village 2.km, 39°24'N, 30°18'E, 1470m, 19.06.2009, 2 galls; UŞAK, Karahallı, between Karahallı-Sivashi 12.km, 38°21'N, 29°36'E, 920m, 22.06.2007, 2 galls; Uşak, surrounding Göğen dam, 38°43'N, 29°33'E, 948m, 13.07.2007, 2 galls; Karahallı, Kırkyaren village, 38°20'N, 29°25'E, 948m, 13.07.2007, 4 galls; Sivashi, Pınarbaşı village, 38°27'N, 29°41'E, 948m, 13.07.2007, 3 galls; Karahallı, 38°21'N, 29°36'E, 918m, 13.07.2007, 3 galls; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 5 galls; Eşme, Kolonkaya village, 38°28'N, 29°01'E, 782m, 16.08.2007, 10 galls; Karahallı, Kırkyaren village, 38°20'N, 29°26'E, 859m, 21.05.2009, 4 galls; Sivashi, Ağaçbeyli town, 38°26'N, 29°40'E, 941m, 21.05.2009, 4 galls. **Host:** *Quercus cerris*, *Quercus ithaburensis* and *Quercus trojana*

***Biorhiza pallida* (Oliver, 1791)**

Materials: AFYON, Emirdağ, Yüreğil town Döneli district, 39°01'N, 31°07'E, 1006m, 23.04.2007, 3 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 5 galls; Sultandağı, above Yakasenek village, 38°32'N, 31°10'E, 1282m, 19.04.2008, 10 galls; above Dereçine village, 38°28'N, 31°14'E, 1148m, 20.04.2008, 6 galls, 08.05.2008, 8 galls, 5 ♀; Emirdağ, Kemer kaya village, 38°54'N, 31°07'E, 1232m, 10.06.2008, 3 galls; Sultandağı, above Yakasenek town, way to Çığirtgan stream, 38°31'N, 31°09'E, 1733m, 11.06.2008, 8 galls, 11 ♀, 1 ♂; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 18.09.2008, 2 galls; Sultandağı, above Yakasenek town, way to Çığirtgan stream 2.km, 38°32'N, 31°10'E, 1313m, 19.05.2009, 2 galls, 1 ♀; DENİZLİ, Beyağaç, between Beyağaç-Kartal lake 5.km, 37°11'N, 28°51'E, 1109m, 14.07.2007, 1 gall; Çivril, above Çağlayan village (Akdağ Mountain), 38°21'N, 29°50'E, 918m, 12.09.2007, 2 galls, 22.04.2008, 5 galls; Çardak, Beylerli town, 37°41'N, 29°37'E, 921m, 22.04.2008, 3 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1302m, 20.08.2008, 2 galls; Beyağaç, Kırkmaden district, way to Eşen lake, 37°13'N, 28°59'E, 940m, 18.09.2008, 1 galls; Serinhisar, Kocapınar village, 37°39'N, 29°23'E, 1155m, 03.03.2009, 2 galls; Serinhisar, Yatağan town-Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 2 galls, 1 ♀, 1 ♂; Honaz, below Karacağ town, 37°41'N, 29°24'E, 1041m, 22.05.2009, 1 gall, 4 ♀; Çameli, between Kınıkyeri village-Acıpayam 6.km, 37°13'N, 29°26'E, 1410m, 22.06.2009, 1 gall; Çameli, between Kınıkyeri village-Acıpayam 8.km, 37°13'N, 29°26'E, 1303m, 22.06.2009, 4 galls; KÜTAHYA, between Kütahya-Eskişehir 14.km, 39°30'N, 30°02'E, 935m, 11.07.2007, 2 galls, 06.09.2009, 5 galls; Simav, between Simav-Hisarcık 10.km 39°08'N, 29°02'E, 1135m, 12.07.2007, 3 galls; Simav, Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 835m, 22.05.2007, 5 galls, 12.07.2007; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 21.04.2008, 7 galls, 06.05.2008; Domaniç, between Domaniç-Tahtaköprü 4.km Tahtaköprü forest, 39°50'N, 29°38'E, 1012m, 20.06.2007, 6 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 2 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 04.05.2008, 5 galls; Tavşanlı surrounding Güzelyurt dam, 39°29'N, 29°34'E, 850m, 05.05.2008, 6 galls, 5 ♀; Tavşanlı, Akçağay village, surrounding Kayaboğazi dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 4 galls, 8 ♀; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 28.04.2009, 7 galls, 6 ♀, 3 ♂; Kütahya, between Döğer (Afyon)-Türkmen Mountain, above Göçeri village, 39°14'N, 30°17'E, 1216m, 20.05.2009, 7 galls; Simav, Gökçeler village surrounding dam, 39°06'N, 29°02'E, 834m, 21.05.2009, 4 galls, 8 ♀, 32 ♂; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 1 gall, 1 ♀; UŞAK, Eşme, Yeleşen village, 38°18'N, 28°55'E, 821m, 22.06.2007, 4 galls, 24.09.2009, 5 galls; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 5 galls, 24.09.2009, 3 galls; Sivashi, between Sivashi-Uşak 5.km, 38°32'N, 29°39'E, 864m, 19.08.2008, 2 galls; Banaz, above Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 2 galls; Uşak, Mesudiye village, surrounding Mesudiye dam, 38°43'N, 29°30'E, 925m, 17.09.2008, 3 galls. **Host:** *Quercus infectoria*, *Quercus petraea* and *Quercus pubescens*

***Callirhytis glandium* (Giraud, 1859)**

Materials: AFYON, Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 12.09.2007, 1 galls, 1 ♀. **Host:** *Quercus cerris*

***Callirhytis rufescens* (Mayr, 1882)**

Materials: KÜTAHYA, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 818m, 21.04.2008, 2 ♀, 1 ♂. **Host:** *Quercus frainetto*

***Chilaspis nitida* (Giraud, 1882)**

Materials: AFYON, Emirdağ, Çatalı village, 38°57'N, 31°07'E, 1074m, 19.05.2007, 13 galls, 4♀, 5♂, 07.05.2008, 11 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 08.05.2008, 8 galls; Sandıklı, above Sorkun village (Akdağ Mountain) 2.km, 38°24'N, 30°01'E, 1131m, 20.08.2008, 5 galls; Sultandağı, above Yakasenek town way to Çiğirtgan stream 2.km, 38°32'N, 31°10'E, 1313m, 19.05.2009, 184 gal, 4♀; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 19.05.2009, 108 galls, 42♀, 35♂; Sultandağı, above Kırca town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 6 galls, 11.09.2009, 2 galls; DENİZLİ, Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 30 galls; Honaz, below Karaçay town, 37°41'N, 29°24'E, 1041m, 22.05.2009, 42 galls; Serinhisar, between Yatağan town-Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 9 galls, 3♂; KÜTAHYA, Kütahya, Gelinkaya village, 39°19'N, 29°59'E, 971m, 10.09.2007, 3 galls; Kütahya, Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 4 galls; Aslanapa, between Aslanapa-Kütahya 2.km, 39°15'N, 29°53'E, 1143m, 20.05.2007, 2 galls; Domaniç, between Domaniç-Tavşanlı, 5.km, 39°46'N, 29°34'E, 861m, 21.05.2007, 11 galls, 1♀; Tavşanlı, Kuruçay village, Kuruçay surrounding, 39°28'N, 29°30'E, 902m, 20.06.2007, 2 galls; Çavdarhisarı, between Çavdarhisarı-Gediz, 8.km, 39°04'N, 29°27'E, 1064m, 21.06.2007, 3 galls; Gediz, Murat Mountain, 38°58'N, 29°35'E, 1128m, 21.06.2007, 4 galls; Gediz, Murat Mountain, 38°58'N, 29°35'E, 1026m, 21.06.2007, 6 galls; Simav, between Simav-Demirciköy 2km, 39°05'N, 28°57'E, 818m, 21.06.2007, 7 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 21.04.2008, 17 galls, 06.05.2008, 17 galls, 10♀, 4♂, 21.05.2009, 99 galls, 41♀, 13♂; Emet, Yenice town, 39°18'N, 29°10'E, 1017m, 18.08.2007, 8 galls; Domaniç, Berçin village, 39°46'N, 29°34'E, 864m, 21.05.2007, 30 galls, 05.05.2008, 12 galls; Domaniç, between Domaniç-Tahtaköprü 2.km, 39°50'N, 29°38'E, 966m, 05.05.2008, 6 galls; Tavşanlı, surrounding Güzeyurt dam, 39°29'N, 29°34'E, 850m, 05.05.2008, 18 galls, 11♀, 2♂; Tavşanlı, Akçaçay village, surrounding Kayabogazi dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 4 galls; Kütahya, Frigian valley, Çayca village, 39°26'N, 30°08'E, 1021m, 12.06.2008, 7 galls, 1♀; Kütahya, between Döğer (Afyon)-Türkmen Mountain, above Göçeri village, 39°14'N, 30°17'E, 1216m, 20.05.2009, 83 galls, 46♀, 26♂; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 32 galls, 16♀, 9♂; Simav, Gökçeler village surrounding dam, 39°06'N, 29°02'E, 834m, 21.05.2009, 190 galls, 87♀, 45♂; Kütahya, Türkmen Mountain, Hürünlü farm-Söğüt upland 3.km, 39°21'N, 30°13'E, 1168m, 18.06.2009, 81 galls; UŞAK, Ulubey, between Ulubey-Güney 5.km, 38°22'N, 29°11'E, 712m, 23.05.2007, 48 galls, 3♀, 8♂, 14 galls; Sivashi, Pınarbaşı village, 38°27'N, 29°41'E, 948m, 13.07.2007, 8 galls, 08.09.2009, 7 galls; Banaz, Ahad village, 38°38'N, 29°47'E, 1065m, 01.07.2008, 15 galls; Sivashi, between Cinoğlu village-Özbeyle village 2.km 38°34'N, 29°45'E, 1263m, 19.08.2008, 14 galls. **Host:** *Quercus cerris*

***Cynips agama* Hartig, 1840**

Materials: AFYON, Sultandağı, above Yakasenek town, 38°32'N, 31°10'E, 1234m, 27.06.2007, 3 galls; Sultandağı, above Deresenek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 2 galls; Sandıklı, between Sandıklı-Afyon 35.km, 38°40'N, 30°19'E, 1320m, 15.08.2007, 4 galls; Bayat, between Bayat-Gözü 3.km 38°59'N, 30°58'E, 1027m, 15.09.2008, 8 galls; DENİZLİ, Serinhisar, Kocapınar village-Karaçay town, 37°40'N, 29°24'E, 1100m, 12.08.2007, 2 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 18.09.2008, 3 galls; Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 18.07.2009, 7 galls; KÜTAHYA, Tavşanlı, Kuruçay village, surrounding, 39°28'N, 29°30'E, 902m, 20.06.2007, 4 galls; Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 17.08.2007, 3 galls, 11.09.2007, 6 galls, 17.09.2008, 4 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 4 galls; Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 2 galls; Domaniç, Berçin village, 39°46'N, 29°34'E, 864m, 10.09.2007, 4 galls; Altıntaş, Yayla village, 38°57'N, 30°06'E, 1128m, 01.07.2008, 3 galls; Tavşanlı, Balıkköy town-Taşdibi village 3.km 39°30'N, 29°04'E, 649m, 19.06.2009, 1 gall; Tavşanlı, above Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 4 galls; Hisarcık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 1 gall. **Host:** *Quercus pubescens*

***Cynips cornifex* Hartig, 1843**

Materials: AFYON, Hocalar, Devlethan village, 38°31'N, 29°58'E, 1011m, 24.05.2007, 7 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 16.08.2008, 15 galls; DENİZLİ, Beyağaç, between Beyağaç-Kartal lake 8.km 37°11'N, 28°51'E, 1070m, 25.06.2007, 23 galls; Serinhisar, Yatağan town way to Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 11 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 18.09.2008, 6 galls; Honaz, above Aydınlar village (way to Karaçay village), 37°43'N, 29°23'E, 1049m, 18.09.2008, 32 galls; Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046m, 03.03.2009, 19 galls; Honaz, Karaçay village, 37°42'N, 29°23'E, 981m, 03.03.2009, 17 galls; Honaz, above Kızılyer town, 37°45'N, 29°22'E, 804m, 22.05.2009, 34 galls; KÜTAHYA, Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 6 galls; Tavşanlı, below Yeniköy village, 39°29'N, 29°17'E, 631m, 19.06.2009, 24 galls; Tavşanlı, below Dereli village, 39°29'N, 29°14'E, 603m, 19.06.2009, 36 galls. **Host:** *Quercus infectoria* and *Quercus pubescens*

***Cynips disticha* Hartig, 1840**

Materials: AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 19.09.2008, 3 galls. **Host:** *Quercus pubescens*

***Cynips divisa* Hartig, 1840**

Materials: AFYON, Hocalar, Devlethan village, 38°31'N, 29°58'E, 1011m, 24.05.2007 12 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 3 galls; Sultandağı, above Yakasenek

town, 38°32'N, 31°10'E, 1234m, 09.07.2007, 13 galls; Sultandağı, above way to Sultandağı fire tower, 38°31'N, 31°12'E, 1170m, 09.07.2007, 3 galls; Sultandağı, above Dereçine town, 38°28'N, 31°14'E, 1148m, 20.04.2008, 8 galls, 16.08.2008, 4 galls, 19.09.2008, 6 galls, 04.03.2009, 9 galls; Emirdağ, Çatallı village, 38°57'N, 31°07'E, 1078m, 10.08.2007, 15 galls; Emirdağ, Kurudere village, 38°54'N, 31°03'E, 1200m, 19.04.2008, 7 galls, 28.08.2009, 2 galls; Sultandağı, above Deresenek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 18 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 8 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1060m, 14.08.2007, 18 galls; Sandıklı, Yavaşlar town, 38°31'N, 29°57'E, 1089m, 15.08.2007, 2 galls; Sinanpaşa (Sincanlı), Kurka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 11 galls; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°25'N, 30°02'E, 1023m, 20.08.2008, 14 galls; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°24'N, 30°01'E, 1131m, 20.08.2008, 18 galls; Bayat between Bayat-Gözü 3.km 38°59'N, 30°58'E, 1027m, 15.09.2008, 6 galls; Bayat, Sağırılı village 38°54'N, 30°52'E, 1333m, 15.09.2008, 7 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 18.09.2008, 6 galls; DENİZLİ, Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 14.07.2007, 3 galls, 18.07.2009, 2 galls; Çal, Selcen village, 38°06'N, 29°20'E, 940m, 14.07.2007, 4 galls; Serinhisar, Yatağan town way to Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 18 galls; Serinhisar, between Kocapınar village-Karaçay town, 37°40'N, 29°24'E, 1100m, 12.08.2007, 4 galls; Babadağ, 37°48'N, 28°51'E, 745m, 13.08.2007, 13 galls; Babadağ, Akyol upland, 37°47'N, 28°51'E, 1009m, 13.08.2007, 5 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 7 galls, 18.09.2008, 8 galls, 02.03.2009, 22 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 11 galls; Çal, between Kabalar village-Selcen town, 38°06'N, 29°20'E, 920m, 02.07.2008, 8 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1302m, 20.08.2008, 2 galls; Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046m, 13 galls; Serinhisar, between Kocapınar village-Karaçay town, 37°40'N, 29°24'E, 1070m, 03.03.2009, 6 galls; Honaz, Karaçay village, 37°42'N, 29°23'E, 981m, 03.03.2009, 12 galls; Tavas, above Kızılcaölük town, way to Çakıroluk, 1.km, 37°38'N, 29°01'E, 1060m, 21.06.2009, 8 galls; 26.08.2009, 3 galls; KÜTAHYA, Simav, between Simav-Demirciköy, 39°05'N, 28°57'E, 818m, 21.06.2007, 8 galls, 17.08.2007, 13 galls, 11.09.2007, 21 galls; Şaphane, Şaphane junction, 39°00'N, 29°09'E, 876m, 22.06.2007, 12 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 11.07.2007, 3 galls, 12.08.2008, 8 galls; Kütahya, between Kütahya-Eskişehir 14.km, 39°30'N, 30°02'E, 935m, 11.07.2007, 6 galls; Emet, 39°20'N, 29°15'E, 954m, 11.07.2007, 6 galls; Simav, Simav-Hisarlık 10.km 39°08'N, 29°02'E, 1135m, 12.07.2007, 4 galls; Tavşanlı, Köprücek village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 7 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 18 galls; Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 14 galls; Tavşanlı, Tunçbilek town, 39°39'N, 29°29'E, 815m 10.09.2007, 10 galls; Tavşanlı, Muhacir village, 39°40'N, 29°30'E, 704m, 10.09.2007, 12 galls; Domaniç, Berçin village, 39°46'N, 29°34'E, 864m, 10.09.2007, 11 galls; Tavşanlı, Karaköy village, 39°30'N, 29°24'E, 867m 11.09.2007, 14 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 10 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 12 galls; Pazarcık, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 3 galls; Altıntaş, between Altıntaş-Gediz 17.km next to Murat stream, 38°58'N, 29°57'E, 1073m, 21.04.2008, 2 galls; Altıntaş Yayla village, 38°57'N, 30°06'E, 1128m, 01.07.2008, 3 galls; Kütahya, between Döğer (Afyon)-Türkmen Mountain 10.km, 39°15'N, 30°17'E, 1180m, 17.08.2008, 6 galls; Kütahya, between Belkavak village-Türkmen Mountain 3.km, 39°19'N, 30°11'E, 1069m, 17.08.2008, 4 galls; Kütahya, Türkmen Mountain, above Ürünli Çiftliği, 39°21'N, 30°15'E, 1304m, 17.08.2008, 8 galls; Kütahya Türkmen Mountain, Kozluca village, 39°26'N, 30°12'E, 1225m, 18.08.2008, 5 galls; Kütahya Frigian valley İnli village, 39°29'N, 30°12'E, 1045m, 18.08.2008, 3 galls; Altıntaş, Saraycık village, 39°00'N, 29°57'E, 1053m, 18.08.2008, 4 galls; Simav, Gümüşsu town, 39°07'N, 28°51'E, 798m, 19.08.2008, 6 galls; Kütahya, Türkmen Mountain, above Söğüt upland, 39°23'N, 30°18'E, 1400m, 16.09.2008, 14 galls; Kütahya, Türkmen Mountain, Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 16.09.2008, 8 galls; Kütahya, Türkmen Mountain, above Yumaklı village, 39°26'N, 30°14'E, 1275m, 16.09.2008, 17 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 7 galls, 01.03.2009, 23 galls; Tavşanlı, below Yeniköy, 39°29'N, 29°17'E, 631m, 19.06.2009, 10 galls; Tavşanlı, Ormanlı village, 39°29'N, 29°11'E, 521m, 19.06.2009, 5 galls; Tavşanlı, between Balıkköy town-Taşdibi village 3.km, 39°30'N, 29°04'E, 649m, 19.06.2009, 4 galls; Simav, Evciler village, 39°27'N, 29°00'E, 650m, 19.06.2009, 3 galls; Türkmen Mountain, Söğüt upland, below Hürünlü çiftliği, 39°20'N, 30°11'E, 1043m, 16.07.2009, 1 gall; Domaniç, Hayme Ana village, 39°46'N, 29°33'E, 835m, 17.07.2009, 9 galls; Tavşanlı, above Günlüce village, 39°25'N, 29°18'E, 1077m, 17.07.2009, 8 galls; Hisarlık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 16 galls; UŞAK, Eşme, Yeşilkavak village, surrounding dam, 38°18'N, 28°57'E, 753m, 22.06.2007; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 2 galls; Banaz, between Banaz-Hocalar 20.km, Yazıtepe village, 38°39'N, 29°48'E, 1005m, 7 galls; Eşme, Ahmetler village, surrounding dam, 38°24'N, 29°05'E, 806m, 16.08.2007, 4 galls; Eşme, Kolonkaya village, 38°28'N, 29°01'E, 782m, 16.08.2007, 8 galls; Eşme, Güney village, 38°23'N, 28°51'E, 859m, 16.08.2007, 5 galls; Banaz Ahad village, 38°38'N, 29°47'E, 1065m, 01.07.2008, 3 galls; Sivashi, Sivashi-Uşak, 5.km 38°32'N, 29°39'E, 864m, 19.08.2008, 4 galls; Banaz, above Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 8 galls; 17.09.2008, 13 galls; Uşak, Mesudiye village surrounding dam, 38°43'N, 29°30'E, 925m, 17.09.2008, 12 galls; Eşme Örencik village surrounding lake, 38°37'N, 29°02'E,

652m, 17.09.2008, 11 galls; Eşme, between Eşme-Ulubey 3.km, 38°25'N, 29°01'E, 781m, 17.09.2008, 8 galls. **Host:** *Quercus infectoria* and *Quercus pubescens*

***Cynips quercus* (Fourcroy, 1785)**

Materials: AFYON, Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1138m, 18.06.2007; 2 galls; Sandıklı, between Sandıklı-Afyon 35.km, 38°40'N, 30°19'E, 1320m, 15.08.2007, 4 galls; Sultandağı, above Yakasenek town, 38°32'N, 31°10'E, 1282m, 19.04.2008, 2 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 16.08.2008, 3 galls, 19.09.2008, 8 galls; Sandıklı, above Sorkun village (Akdağ Mountain) 38°25'N, 30°02'E, 1023m, 20.08.2008, 5 galls; DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°21'N, 29°50'E, 918m, 12.09.2007, 12 galls, 18.09.2008, 9 galls; Çal, between Kabalar town-Selcen village, 38°06'N, 29°20'E, 920m, 02.07.2008, 3 galls; Buldan, between Buldan-Buldan lake 6km., 38°02'N, 28°47'E, 1131m, 18.07.2009, 2 galls; KÜTAHYA, Simav, between Simav-Demirciköy 2.km, 39°06'N, 28°55'E, 825m, 17.08.2007, 6 galls; Emet girişi, 39°20'N, 29°15'E, 954m, 11.07.2007, 3 galls; Simav, between Simav-Hisarlık 10.km 39°08'N, 29°02'E, 1135m, 12.07.2007, 4 galls; Tavşanlı, Opanözü village, 39°28'N, 29°19'E, 795m, 18.08.2007, 6 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 7 galls; Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 8 galls; Emet, Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 11 galls; Kütahya, between Döğeri (Afyon)-Türkmen Mountain 10.km, 39°15'N, 30°17'E, 1180m, 17.08.2008, 2 galls; Kütahya, Türkmen Mountain, above Ürünü farm, way to Söğüt upland, 39°21'N, 30°15'E, 1304m, 17.08.2008, 7 galls; Kütahya Frigian valley İnlü village, 39°29'N, 30°12'E, 1045m, 18.08.2008, 6 galls; Kütahya, Türkmen Mountain, Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 16.09.2008, 11 galls; Kütahya, Türkmen Mountain, Yumaklı village, 39°26'N, 30°14'E, 1275m, 16.09.2008, 7 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 16.09.2008, 4 galls; Kütahya, Türkmen Mountain, below Hürünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 2 galls; Domaniç, Hayme Ana village, 39°46'N, 29°33'E, 835m, 17.07.2009, 2 galls; Hisarlık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 2 galls; UŞAK, Eşme, Yeleğen village, 38°18'N, 28°55'E, 821m, 22.06.2007, 2 galls, 24.09.2009, 3 galls; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 3 galls, 24.09.2009, 4 galls; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 5 galls; Eşme, Ahmetler village surrounding dam, 38°24'N, 29°05'E, 806m, 16.08.2007, 6 galls; Eşme, Güney village, 38°23'N, 28°51'E, 859m, 16.08.2007, 4 galls; Banaz, Ahad village, 38°38'N, 29°47'E, 1065m, 01.07.2008, 3 galls; Sivashı, between Sivashı-Uşak 5.km, 38°32'N, 29°39'E, 864m, 19.08.2008, 6 galls; Banaz Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 6 galls; Uşak, Mesudiye village surrounding dam, 38°43'N, 29°30'E, 925m, 17.09.2008, 11 galls. **Host:** *Quercus infectoria* and *Quercus pubescens*

***Cynips quercusfolii* (Linnaeus, 1758)**

Materials: AFYON, Sultandağı, above Yakasenek village, 38°32'N, 31°10'E, 1234m, 27.06.2007, 2 galls; Sultandağı, above Sultandağı way to fire tower, 38°31'N, 31°12'E, 1170m, 09.07.2007, 3 galls; Emirdağ, Çatalı village, 38°57'N, 31°07'E, 1078m, 10.08.2007, 7 galls; Sultandağı, above Deresenek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 3 galls; Sandıklı, above Çağlayan village (Akdağ Mountain), 38°26'N, 29°57'D, 1060m, 14.08.2007, 2 galls; Sinanpaşa (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 4 galls; Sultandağı, above Yakasenek village way to Çığırtaş stream, 38°32'N, 31°09'E, 1542m, 11.06.2008, 11 galls, 19.09.2008, 18 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 04.03.2009, 8 galls; DENİZLİ, Buldan, between Buldan-Buldan lake, 38°02'N, 28°47'E, 1131m, 14.07.2007, 3 galls, 18.07.2009, 10 galls; Serinhisar, Yatağan town way to Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 4 galls; Babadağ, Akyol upland, 37°47'N, 28°51'E, 1009m, 13.08.2007, 6 galls; Çivril, Çağlayan village, 38°24'N, 29°50'E, 970m, 14.08.2007, 5 galls, 02.03.2009, 2 galls; KÜTAHYA, between Kütahya-Eskişehir, 14.km, 39°30'N, 30°02'E, 935m, 11.07.2007, 3 galls; Emet, 39°20'N, 29°15'E, 954m, 11.07.2007, 6 galls; Simav, Simav-Hisarlık 10.km 39°08'N, 29°02'E, 1135m, 12.07.2007, 2 galls; Pazarlar, surrounding Pazarlar dam, 39°59'N, 29°05'E, 949m, 12.07.2007, 5 galls, 07.09.2009, 3 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 19.08.2007, 8 galls; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 6 galls; Kütahya, Gelinkaya village, 39°19'N, 29°59'E, 971m, 10.09.2007, 7 galls, Tavşanlı, between Tavşanlı-Domaniç 2.km, 39°34'N, 29°27'E, 837m 10.09.2007, 7 galls; Domaniç, Berçin village, 39°46'N, 29°34'E, 864m, 10.09.2007, 15 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 14 galls; Pazarlar, Karamanca village, 39°00'N, 29°09'E, 890m, 22.05.2007, 2 galls; Kütahya, Türkmen Mountain between Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 18.08.2008, 6 galls, 16.09.2008, 21 galls, 29.04.2009, 9 galls; Domaniç, Hayme Ana village, 39°46'N, 29°33'E, 835m, 17.07.2009, 24 galls; Hisarlık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 4 galls. **Host:** *Quercus infectoria*, *Quercus pubescens* and *Quercus vulcanica*

***Dryocosmus cerriphilus* Giraud, 1859**

Materials: AFYON, Sultandağı, above Yakasenek village way to Çığırtaş stream 2.km, 38°32'N, 31°10'E, 1313m, 19.05.2009, 135 galls, 71♀, 49♂; KÜTAHYA, Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 21.04.2008, 3 galls, 2♀; Tavşanlı, Akçaçay village, surrounding Kayaboğazi dam, 39°25'N, 29°36'E, 928m, 05.05.2008, 1 galls. **Host:** *Quercus cerris*

***Neuroterus albipes* (Schenck, 1863)**

Materials: AFYON, Emirdağ, Çatalı village, 38°57'N, 31°07'E, 1074m, 19.05.2007, 21 galls; Emirdağ, Kurudere village, 38°54'N, 31°03'E, 1200m, 19.04.2008, 11 galls, 28.08.2009, 6 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 4 galls; Sultandağı, above Yakasenek town, 38°32'N,

31°10'E, 1234m, 27.06.2007, 30 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 28 galls; Sultandağı, Deresenek village, 38°32'N, 31°09'E, 1192m, 13.09.2007, 25 galls; Bayat, between Bayat-Gözü 3.km, 38°59'N, 30°58'E, 1027m, 15.09.2008, 14 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 18.09.2008, 34 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 04.03.2009, 7 galls; DENİZLİ, Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°50'E, 970m, 14.08.2007, 14 galls, 18.09.2008, 55 galls, 02.03.2009, 6 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°53'E, 1207m, 12.09.2007, 35 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1408m, 20.08.2008, 14 galls; Beyağaç, Kırkmaden district way to Eşen lake, 37°13'N, 28°59'E, 940m, 18.09.2008, 38 galls, 1 ♀; Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046m, 03.03.2009, 9 galls; Honaz, above Kızılyer town, 37°45'N, 29°22'E, 804m, 22.05.2009, 3 galls; KÜTAHYA, Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 18 galls, 10.09.2007, 43 galls; Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1094m, 10.09.2007, 28 galls; Aslanapa, between Aslanapa-Kütahya 11.km, Kireç village, 39°16'N, 29°55'E, 1100m, 10.09.2007, 26 galls; Kütahya, Gelinkaya village, 39°19'N, 29°59'E, 971m, 10.09.2007, 17 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 11.09.2007, 41 galls; Kütahya Türkmen Mountain, Söğüt upland, 39°21'N, 30°15'E, 1304m, 17.08.2008, 17 galls; Kütahya, between Kütahya-Çavdarhisarı 8.km, 39°19'N, 29°59'E, 1009m, 16.09.2008, 32 galls; UŞAK, Ulubey, between Ulubey-Güney 5.km, 38°22'N, 29°11'E, 712m, 23.05.2007, 6 galls; Simav, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 920m, 11.09.2007, 26 galls; Eşme, above Bozlar village, 38°29'N, 28°59'E, 873m, 17.09.2008, 21 galls; Banaz, above Ulupınar village, 38°37'N, 29°47'E, 1263m, 19.08.2008, 13 galls, 17.09.2008, 39 galls. **Host:** *Quercus infectoria*, *Quercus pubescens*, *Quercus robur* and *Quercus vulcanica*

***Neuroterus anthracinus* (Curtis, 1838)**

Materials: KÜTAHYA, Türkmen Mountain, between Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 18.08.2008, 4 galls. **Host:** *Quercus vulcanica*

***Neuroterus lanuginosus* Giraud, 1859**

Materials: AFYON, Sultandağı, above Yakasenek village, 38°32'N, 31°10'E, 1234m, 13.09.2007, 13 galls; Emirdağ, Başkonak village, Topçular district, 38°55'N, 31°06'E, 1207m, 10.08.2007, 18 galls; Sinanpaşa (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 17 galls; Sandıklı, above Otluk village (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 12.09.2007, 36 galls, 01.07.2008; Sandıklı, above Otluk village (Akdağ Mountain), 38°24'N, 29°55'E, 1215m, 12.09.2007, 28 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 16.08.2008, 30 galls; Bayat, Sağrılı village, 38°54'N, 30°52'E, 1333m, 15.09.2008, 43 galls; DENİZLİ, Çivril, Gülpınar village, 38°25'N, 29°43'E, 973m, 13.07.2007, 35 galls; above Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 13 galls; Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 14.07.2007, 8 galls; above Buldan, 38°02'N, 28°48'E, 787m, 14.07.2007, 17 galls; Çal, Selcen village, 38°06'N, 29°20'E, 940m, 14.07.2007, 11 galls; Tavas, Yorga village, Gökçepınar district, 37°19'N, 29°07'E, 1164m, 11.08.2007, 8 galls; above Babadağ, 37°48'N, 28°51'E, 745m, 13.08.2007, 27 galls; Çivril, Işıklı town, 38°19'N, 29°51'E, 870m, 14.08.2007, 57 galls; Çivril, above Çağlayan village (Akdağ Mountain), 38°24'N, 29°54'E, 1077m, 14.08.2007, 33 galls; Çivril, above Cumalar village (Akdağ Mountain), 38°21'N, 29°56'E, 1408m, 20.08.2008, 21 galls; Çivril between Işıklı town-Cumalar village 2.km, 20.08.2008, 48 galls; KÜTAHYA, Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 17.08.2007, 8 galls; Emet, Yenice town, 39°18'N, 29°10'E, 1017m, 18.08.2007, 17 galls; Tavşanlı, between Tavşanlı-Harmançık 5.km, 39°35'N, 29°24'E, 873m, 18.08.2007, 21 galls; Kütahya, between Gelinkaya village, 39°19'N, 29°59'E, 971m, 10.09.2007, 14 galls; Emet, between Günlüce village, 39°27'N, 29°19'E, 981m, 11.09.2007, 14 galls; UŞAK, Sivashi, Pınarbaşı village, 38°27'N, 29°41'E, 948m, 13.07.2007, 16 galls, 08.09.2009, 14 galls; Karahallı, 38°21'N, 29°36'E, 918m, 13.07.2007, 21 galls; Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991m, 15.08.2007, 31 galls; Uşak, between Uşak-Ulubey 15.km, 38°31'N, 29°20'E, 878m, 16.08.2007, 11 galls; Eşme, Kolonkaya village, 38°28'N, 29°01'E, 782m, 16.08.2007, 14 galls; Eşme, Güney village, 38°23'N, 28°51'E, 859m, 16.08.2007, 17 galls; Uşak, between Uşak-Gediz 15.km, 38°42'N, 29°12'E, 657m, 17.08.2007, 24 galls; Uşak, Emirfakı village, 38°44'N, 29°12'E, 628m, 11.09.2007, 12 galls; Uşak, between Sivashi-Uşak 5.km, 38°32'N, 29°39'E, 864m, 19.08.2008, 8 galls; Sivashi, between Sivashi-Eldeniz village 2.km, 38°31'N, 29°42'E, 1009m, 19.08.2008, 7 galls, 08.09.2009, 3 galls; Uşak, Uşak-Izmir-Eşme junction, way to Eşme 1.km, 38°38'N, 29°03'E, 553m, 17.09.2008, 37 galls; Eşme, between Eşme-Ulubey 3.km, 38°25'N, 29°01'E, 781m, 17.09.2008, 26 galls; Ulubey, between Ulubey-Karahallı 10.km, 38°21'N, 29°21'E, 689m, 17.09.2008, 36 galls; Karahallı, Çökaklı village, 38°21'N, 29°36'E, 912m, 17.09.2008, 37 galls, 02.03.2009, 14 galls, 2 ♀. **Host:** *Quercus cerris* and *Quercus ithaburensis*

***Neuroterus minutulus* Giraud, 1859**

Materials: AFYON, Sandıklı, above Otluk villageü (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 01.07.2008, 138 galls; Bayat, between Bayat-Gözü 3.km, 38°59'N, 30°58'E, 1027m, 15.09.2008, 13 galls; Bayat, Sağrılı village, 38°54'N, 30°52'E, 1333m, 15.09.2008, 27 galls; UŞAK, Emirfakı village, 38°44'N, 29°12'E, 628m, 13.06.2008, 45 galls; Karahallı, Çökaklı village, 38°21'N, 29°36'E, 912m, 02.03.2009, 148 galls; Karahallı, Beki village, 38°19'N, 29°26'E, 869m, 20.06.2009, 63 galls; Karahallı, Karbasan town, 38°17'N, 29°33'E, 901m, 20.06.2009, 32 galls. **Host:** *Quercus cerris* and *Quercus ithaburensis*

***Neuroterus numismalis* (Fourcroy, 1785)**

Materials: AFYON, Emirdağ, Çatallı village, 38°57'N, 31°07'E, 1074m, 19.05.2007, 5 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 3 galls; 15.09.2008, 32 galls; Bayat, between Gömü-Bayat 6.km, 39°01'N, 31°00'E, 1006m, 18.06.2007, 5 galls; Emirdağ, Kemer kaya village, 38°54'N, 31°07'E, 1232m, 10.06.2008, 7 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 11.06.2008, 5 galls; Sultandağı, above Yakasenek town way to Çiğirtan stream, 38°32'N, 31°09'E, 1542m, 19.09.2008, 37 galls; DENİZLİ, Çameli, between Kınıkyeri village-Acıpayam 6.km, 37°13'N, 29°26'E, 1410m, 22.06.2009, 11 galls; Çameli, between Kınıkyeri village-Acıpayam 8.km, 37°13'N, 29°26'E, 1303m, 22.06.2009, 25 galls; Buldan, between Buldan-Buldan lake 6.km, 38°02'N, 28°47'E, 1131m, 18.07.2009, 47 galls; KÜTAHYA, Domanic, between Domanic-Tavşanlı, 39°46'N, 29°34'E, 861m, 21.05.2007, 8 galls, 1♀; Kütahya, Yoncalı village, 39°28'N, 29°49'E, 1125m, 19.06.2007, 16 galls, Domanic, between Domanic-Tahtaköprü 4.km, Tahtaköprü forest, 39°50'N, 29°38'E, 1012m, 20.06.2007, 7 galls, 12.06.2008, 11 galls; Domanic, between Domanic-Tahtaköprü 2.km, Tahtaköprü forest, 39°50'N, 29°38'E, 966m, 10.09.2007, 78 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 11.09.2007, 96 galls, 28.04.2009, 18 galls; Kütahya, between Döğertown (Afyon)-Kütahya 26.km, 39°19'N, 30°11'E, 1047m, 12.06.2008, 4 galls; Domanic, Berçin village, 39°46'N, 29°34'E, 864m, 12.06.2008, 14 galls; Kütahya, Türkmen Mountain, Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 16.09.2008, 38 galls, 29.04.2009, 38 galls, 14♀; UŞAK, Banaz, between Banaz-Hocalar 20.km, 38°39'N, 29°48'E, 1005m, 21.05.2007, 7 galls; Eşme, Yeşilkavak village, 38°17'N, 28°57'E, 814m, 22.06.2007, 18 galls; Uşak, Emirfakı village, 38°44'N, 29°12'E, 628m, 13.06.2008, 23 galls, 21.05.2009, 21 galls. **Host:** *Quercus cerris*, *Quercus ithaburensis*, *Quercus petraea*, *Quercus robur* and *Quercus trojana*

Neuroterus obtectus (Wachtl, 1880)

Materials: AFYON, Sultandağı, above Deresenek village, 38°32'N, 31°09'E, 1192m, 10.08.2007, 1 gall; DENİZLİ, above Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 1 gall; KÜTAHYA, Tavşanlı, between Tavşanlı-Domanic 20.km, 39°43'N, 29°31'E, 706m, 21.05.2007, 1 gall; Tavşanlı, Opanözü village, 39°28'N, 29°19'E, 795m, 18.08.2007, 1 gall; Tavşanlı, Köprücek village, surrounding dam, 39°34'N, 29°20'E, 1027m, 18.08.2007, 1 gall. **Host:** *Quercus cerris*

Neuroterus quercusbaccarum (Linnaeus, 1758)

Materials: AFYON, Emirdağ, Çatallı village, 38°57'N, 31°07'E, 1074m, 19.05.2007, 8 galls; Emirdağ, Yüreğil town, Döneli district, 39°01'N, 31°07'E, 1006m, 27.04.2008, 3 galls; Bayat, Emirin village, 39°02'N, 31°02'E, 988m, 03.05.2008, 4 galls; Bayat, Sağırılı village, 38°54'N, 30°52'E, 1333m, 15.09.2008, 23 galls; DENİZLİ, Çal, Selcen village way to Kabalar village, 38°06'N, 29°20'E, 954m, 29.04.2009, 3 galls; Honaz, Karaçay town, 37°41'N, 29°24'E, 1041m, 22.05.2009, 5 galls; KÜTAHYA, Tavşanlı, between Tavşanlı-Domanic 2.km, 39°34'N, 29°27'E, 837m 21.05.2007, 8 galls, 3♀, Simav, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 835m 22.05.2007, 12 galls 17.08.2007, 19 galls; above Simav, 39°05'N, 28°57'E, 819m, 06.05.2008, 6 galls, 2♀; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 18 galls; Kütahya, Türkmen Mountain, between Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 16.09.2008, 19 galls; Tavşanlı, Sekbanlı village, 39°30'N, 29°22'E, 891m, 20.05.2009, 1 gall; Simav, between Söğüt village-Gökçeler village 4.km, 39°06'N, 29°03'E, 898m, 21.05.2009, 4 galls; Simav, Gökçeler village surrounding dam, 39°06'N, 29°02'E, 834m, 21.05.2009, 3 galls. **Host:** *Quercus frainetto*, *Quercus infectoria*, *Quercus pubescens* and *Quercus vulcanica*

Neuroterus saliens (Kollar, 1857)

Materials: AFYON, Emirdağ, Çatallı village, 38°57'N, 31°07'E, 1078m, 23.04.2007, 11 galls, 1♀, 1♂; Emirdağ, Yüreğil town above Döneli district, 39°01'N, 31°00'E, 1067m, 03.05.2008, 3 galls, 1♂; Sandıklı, above Sorkun village, (Akdağ Mountain), 38°25'N, 30°02'E, 1023m, 20.08.2008, 38 galls; Çivril, between Işıklı town-Cumalar village 2.km, 20.08.2008, 63 galls; Sultandağı, above Kirca town, 38°30'N, 31°13'E, 1091m, 19.05.2009, 13 galls, 9♀, 9♂; DENİZLİ, Çal, Selcen village way to Kabalar village, 38°06'N, 29°20'E, 954m, 29.04.2009, 1 galls, 1♀; KÜTAHYA, Aslanapa, between Aslanapa-Kütahya 5.km, 39°15'N, 29°53'E, 1143m, 10.09.2007, 14 galls; Kütahya, Kütahya-Frigian valley 32.km, 39°33'N, 30°09'E, 960m, 11.07.2007, 2 galls; Gediz, Yenikent town, 38°48'N, 29°14'E, 617m, 13.06.2008, 4 galls; UŞAK, Uşak, Emirfakı village, 38°44'N, 29°12'E, 628m, 06.05.2008, 8 galls, 2♀; Sivasi, between Sivasi-Uşak 5.km, 38°32'N, 29°39'E, 864m, 19.08.2008, 2 galls; Uşak, Uşak-İzmir-Eşme junction, way to Eşme 1.km, 38°38'N, 29°03'E, 553m, 17.09.2008, 18 galls; Eşme, between Eşme-Ulubey 3.km, 38°25'N, 29°01'E, 781m, 17.09.2008, 24 galls; Karahallı, Çoraklı village, 38°21'N, 29°36'E, 912m, 17.09.2008, 126 galls. **Host:** *Quercus cerris* and *Quercus ithaburensis*

Neuroterus tricolor (Hartig, 1841)

Materials: AFYON, Emirdağ, Yüreğil town Döneli district, 39°01'N, 31°07'E, 1006m, 09.09.2007, 12 galls; KÜTAHYA, Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 6 galls; Tavşanlı, between Tavşanlı-Domanic 2.km, 39°34'N, 29°27'E, 837m, 10.09.2007, 23 galls. **Host:** *Quercus infectoria*

Plagiotrochus quercusilicis (Fabricius, 1789)

Materials: AFYON, Dinar, Yapağılı village, 38°08'N, 30°05'E, 875m, 12.09.2007, 3 galls; Dinar, Tekin village, 38°00'N, 30°06'E, 1002m, 22.04.2008, 14 galls; Başmakçı, between Başmakçı-Gemiş town 6.km, 37°50'N, 29°57'E, 851m, 22.04.2008, 13 galls; Dinar, above Eldere village, surrounding Karakuyu lake, 38°04'N, 30°16'E, 1020m, 08.05.2008, 3 galls, 20.08.2008, 5 galls, 30.04.2009, 11 galls; DENİZLİ,

Cankurtaran town Honaz Mountain, 37°40'N, 29°13'E, 1207m, 26.06.2007, 7 galls; Honaz Mountain Natural Park 37°39'N, 29°14'E, 1207m, 25.05.2007, 13 galls; 22.04.2008, 4 galls; 25.08.2009, 4 galls; Çivril, Beydilli village, surrounding Işıklı lake, 38°16'N, 29°55'E, 827m, 25.04.2007, 16 galls; 24.05.2007, 9 galls; 29.04.2009, 17 galls; Çivril, Gökgöl village, 38°12'N, 30°02'E, 1118m, 22.04.2008, 6 galls; 20.08.2008, 2 galls; Çardak, Beylerli town, 37°41'N, 29°37'E, 921m, 24.06.2007, 3 galls; 22.04.2008, 11 galls; Çardak, Çaltı village, 37°43'N, 29°41'E, 858m, 24.06.2007, 6 galls; Beyağaç, between Beyağaç-Kartal 8.km, 37°11'N, 28°51'E, 1070m, 25.06.2007, 3 galls; above Bekilli, 38°12'N, 29°24'E, 813m, 13.07.2007, 2 galls; Çal, Belevi town, 37°54'N, 29°23'E, 954m, 14.07.2007, 2 galls; Tavas, between Tavas-Nikfer 7.km, 37°27'N, 29°04'E, 987m, 11.08.2007, 1 gall; Tavas, Yorga village, Gökçepinar district, 37°19'N, 29°07'E, 1164m, 11.08.2007, 6 galls; Babadağ, 37°48'N, 28°51'E, 745m, 13.08.2007, 4 galls; Babadağ, Kelci village, 37°49'N, 28°54'E, 687m, 13.08.2007, 2 galls; Çivril, Işıklı village, 38°12'N, 30°02'E, 836m, 12.09.2007, 1 galls; Çivril, Işıklı town, 38°19'N, 29°52'E, 870m, 07.05.2008, 5 galls; Denizli, surrounding Saklıgöl lake, 37°46'N, 29°21'E, 372m, 07.05.2008, 12 galls; Denizli, Aşağıdağdere village, 37°48'N, 29°24'E, 634m, 07.05.2008, 5 galls; Güney, above Adıgüzeli dam, 38°09'N, 29°12'E, 477m, 02.07.2008, 2 galls; Honaz, above Kızılyer town, 37°46'N, 29°20'E, 582m, 18.09.2008, 1 galls; Denizli, Beyağaç, surrounding Eşen lake, 37°12'N, 29°00'E, 1017m, 18.09.2008, 2 galls; Çivril, Gökgöl village (way to Dinar), surrounding Işıklı lake, 38°11'N, 30°03'E, 830m, 29.04.2009, 8 galls; Çardak, between Beylerli town-Çaltı village, surrounding Beylerli lake, 37°43'N, 29°41'E, 853m, 30.04.2009, 4 galls; Çardak, Gemiş town-Başmakçı (Afyon), surrounding Acıgöl lake, 37°47'N, 29°53'E, 849m, 30.04.2009, 14 galls; 25♀, 6♂, 18.07.2009, 4 gal; Çardak, Akpınar village, surrounding Acıgöl lake, 37°49'N, 29°55'E, 826m, 30.04.2009, 4 galls; 18.07.2009, 3 galls; Serinhisar, between Yatağan town-Kefe upland 2.km, 37°36'N, 29°23'E, 1199m, 22.05.2009, 6 galls; 5♀, Tavas, Kızılcaölük town, way to Çakıroluk district 6.km, 37°40'N, 29°00'E, 1405m, 21.06.2009, 6 galls; 26.08.2009, 6 galls; Tavas, Kızılcaölük town, way to Çakıroluk district 1.km, 37°38'N, 29°01'E, 1060m, 21.06.2009, 2 galls; 26.08.2009, 1 galls; Çameli, above Kızılyayla town, 36°58'N, 29°12'E, 844m, 22.06.2009, 3 galls; Çameli, Cevizli village, 37°00'N, 29°18'E, 1249m, 22.06.2009, 5 galls; UŞAK, Ulubey, between Ulubey-Güney 2.km, 38°23'N, 29°13'E, 431m, 23.05.2007, 6 galls; Ulubey, between Ulubey-Eşme 15.km, 38°26'N, 29°09'E, 841m, 23.05.2007, 5 galls; Ulubey, between Ulubey-Karahallı 5.km, 38°22'N, 29°18'E, 543m, 13.07.2007, 1 galls; Ulubey, between Ulubey-Karahallı 10.km, 38°22'N, 29°19'E, 560m, 22.06.2007, 3 galls; Eşme, between Eşme-Güney 2.km, 38°23'N, 28°56'E, 821m, 16.08.2007, 2 galls; Sivahı, Yenice village, 38°33'N, 29°37'E, 792m, 11.09.2007, 3 galls, 08.09.2009, 5 galls; Ulubey, between Ulubey-Karahallı 4.km, 17.09.2008, 1 gall; Ulubey, Ulubey canyon, 38°24'N, 29°18'E, 563m, 20.06.2009, 5 galls; Eşme, Kayapınarı village, 38°17'N, 29°03'E, 630m, 17.07.2009, 5 galls. **Host:** *Quercus coccifera*

***Pseudoneuroterus macropterus* (Hartig, 1843)**

Materials: AFYON, Emirdağ, Çatalı village, 38°57'N, 31°07'E, 1078m, 10.08.2007, 1 galls; Emirdağ, Başkonak village, Topçular district, 38°55'N, 31°06'E, 1207m, 10.08.2007, 1 galls; DENİZLİ, Buldan, between Buldan-Güney 11.km, 38°05'N, 28°51'E, 597m, 14.07.2007, 1 galls; KÜTAHYA, between Doğuş town (Afyon)-Kütahya 15.km, 39°14'N, 30°17'E, 1211m, 19.06.2007, 2 galls; Kütahya, Söğüt village, surrounding dam, 39°25'N, 30°11'E, 1135m, 19.06.2007, 1 galls; Çavdarhisarı, Çerte village, surrounding dam, 39°15'N, 29°28'E, 1165m, 05.05.2008, 1 galls; Domaniç, Domaniç-Tahtaköprü 2. km Tahtaköprü forest, 39°50'N, 29°38'E, 966m, 12.06.2008, 1 gall; Simav, Örenli village, surrounding dam, 39°11'N, 28°53'E, 832m, 16.09.2008, 2 galls. **Host:** *Quercus cerris* and *Quercus ithaburensis*

***Trigonaspis synaspis* (Hartig, 1841)**

Materials: AFYON, Sinanpaşa (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204m, 15.08.2007, 21 galls; 27.08.2009, 13 galls; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, 16.08.2008, 28 galls; Sandıklı, above Sorkun village (Akdağ Mountain), 38°25'N, 30°02'E, 1023m, 20.08.2008, 48 galls; DENİZLİ, Serinhisar, Yatağan town way to Kefe upland, 37°36'N, 29°23'E, 1301m, 12.08.2007, 94 galls; 1♀; Serinhisar, between Kocapınar village-Karaçay town, 37°40'N, 29°24'E, 1100m, 12.08.2007, 18 galls; KÜTAHYA, Tavşanlı, Köprücek village, surrounding lake, 39°34'N, 29°20'E, 1027m, 18.08.2007, 74 galls; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064m, 24.04.2007, 8 galls; Tavşanlı, between Tavşanlı-Emet 12.km, 39°22'N, 29°20'E, 1128m, 11.09.2007, 76 galls; Kütahya, Belkavak village, 39°19'N, 30°11'E, 1069m, 17.08.2008, 28 galls; Kütahya, Türkmen Mountain, above Ürünli farm, 39°21'N, 30°15'E, 1304m, 17.08.2008, 121 galls; Kütahya, Türkmen Mountain, between Yumaklı village-Kozluca village 1.km, 39°25'N, 30°16'E, 1288m, 18.08.2008, 26 galls; 29.04.2009, 26 galls; Kütahya Türkmen Mountain, above Kozluca village, 39°26'N, 30°12'E, 1225m, 18.08.2008, 39 galls; 16.09.2008, 43 galls; Kütahya, Frigian valley İnli village, 39°29'N, 30°12'E, 1045m, 18.08.2008, 18 galls; Kütahya, Türkmen Mountain, below Hürünlü farm, 39°20'N, 30°11'E, 1043m, 16.07.2009, 9 galls; Hisarcık, Dereli village, 39°09'N, 29°17'E, 877m, 17.07.2009, 4 galls. **Host:** *Quercus infectoria* and *Quercus pubescens*

***Synophorus politus* (Hartig, 1843)**

Materials: AFYON, Sandıklı, above Otluk (Akdağ Mountain), 38°26'N, 29°57'E, 1060m, 14.08.2007, 2 galls; Sandıklı, between Sandıklı-Afyon 35.km, 38°40'N, 30°19'E, 1320m, 15.08.2007, 4 galls; Emirdağ, Yüreğil town Döneli district, 39°01'N, 31°07'E, 1066m, 09.09.2007, 6 galls; 27.04.2008, 8 galls; 03.05.2008, 2 galls; Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, 18.06.2007, 4 galls; 09.09.2007, 4 galls; 15.09.2008, 5 galls; Sandıklı, above Otluk (Akdağ Mountain), 38°26'N, 29°57'E, 1105m, 12.09.2007, 2 galls; 07.05.2008, 3 galls; Bayat, Emirin village, 39°02'N, 31°02'E, 988m, 03.05.2008, 7 galls; DENİZLİ, Çivril, Gülpınar village, 38°25'N, 29°43'E, 973m, 13.07.2007, 10 galls;

above Buldan, 38°02'N, 28°48'E, 787m, 14.07.2007, 2 galls; Çivril, Işıklı town, 38°19'N, 29°51'E, 870m, 14.08.2007, 6 galls; 07.05.2008, 5 galls; Çivril, Gabar village, 38°23'N, 29°43'E, 983m, 13.06.2008, 4 galls; Çivril, between Işıklı town-Cumalar village 2.km, 20.08.2008, 2 galls; KÜTAHYA, Simav, between Simav-Hisarçık 10.km, 39°08'N, 29°02'E, 1135m, 22.05.2007, 4 galls; Simav, between Simav-Demirciköy 2.km, 39°05'N, 28°57'E, 835m, 22.05.2007, 2 galls, 21.06.2007, 4 galls, 11.09.2007, 3 galls; 17.09.2008, 4 galls; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832m, 17.08.2007, 2 galls, 06.05.2008, 5 galls; Tavşanlı, Köprücek village, surrounding lake, 39°34'N, 29°20'E, 1027m, 18.08.2007, 3 galls; Kütahya, Frigian valley, above Fındık village, 39°33'N, 30°12'E, 960m, 19.08.2007, 6 galls; Gediz, Yenikent town, 38°48'N, 29°14'E, 617m, 13.06.2008, 8 galls; UŞAK, Ulubey, Ulubey-Güney 5.km, 38°22'N, 29°11'E, 712m, 23.05.2007, 4 galls; Banaz, between Banaz-Hocalar 20.km, 38°39'N, 29°48'E, 1005m, 23.06.2007, 4 galls; Banaz, Ahad village, 38°18'N, 28°57'E, 939m, 23.06.2007, 6 galls; Ulubey, between Ulubey-Eşme 15.km, 38°26'N, 29°09'E, 841m, 23.05.2007, 7 galls; Uşak, surrounding Göğen dam, 38°43'N, 29°33'E, 948m, 13.07.2007, 12 galls 17.09.2008, 14 galls; Karahallı, Kırkyaren village, 38°20'N, 29°25'E, 948m, 13.07.2007, 8 galls; Sivash, Pınarbaşı village, 38°27'N, 29°41'E, 948m, 13.07.2007, 11 galls, 08.09.2009, 8 galls; Karahallı, 38°21'N, 29°36'E, 918m, 13.07.2007, 6 galls; Banaz, Kuşdemir village 38°44'N, 29°43'E, 991m, 15.08.2007, 4 galls; Uşak, between Uşak-Ulubey 15.km, 38°31'N, 29°20'E, 878m, 16.08.2007, 3 galls; Eşme, Ahmetler village, surrounding lake, 38°24'N, 29°05'E, 806m, 16.08.2007, 4 galls; Eşme, Güney village, 38°23'N, 28°51'E, 859m, 16.08.2007, 3 galls; Uşak, between Uşak-Gediz 15.km, 38°42'N, 29°12'E, 657m, 17.08.2007, 2 galls; Sivash, between Sivash-Uşak 5.km, 38°32'N, 29°37'E, 790m, 11.09.2007, 4 galls; Banaz, Güllüçam village, 38°41'N, 29°45'E, 956m, 06.05.2008, 9 galls; Uşak, between Sivash-Uşak 5.km, 38°32'N, 29°39'E, 864m, 19.08.2008, 11 galls; Sivash, between Sivash-Eldeniz 2.km, 38°31'N, 29°42'E, 1009m, 19.08.2008, 2 galls; Uşak-İzmir-Eşme junction, way to Eşme 1.km 38°38'N, 29°03'E, 553m, 17.09.2008, 10 galls; Eşme, between Eşme-Ulubey 3.km, 38°25'N, 29°01'E, 781m, 17.09.2008, 2 galls; Karahallı, Çoraklı village, 38°21'N, 29°36'E, 912m, 17.09.2008, 6 galls; 02.03.2009, 6 galls; Karahallı, Kırkyaren village, 38°20'N, 29°26'E, 859m, 21.05.2009, 3 galls; Sivash, Ağaçbeyli town, 38°26'N, 29°40'E, 941m, 21.05.2009, 2 galls, 08.09.2009, 4 galls; Uşak, Uşak-Gediz junction, way to Gediz 1.km, 38°40'N, 29°14'E, 681m, 20.06.2009, 11 galls; Karahallı, Beki village, 38°19'N, 29°26'E, 869m, 20.06.2009, 2 galls; Karahallı, Karbasan town, 38°17'N, 29°33'E, 901m, 20.06.2009, 3 galls. **Host:** *Quercus cerris* and *Quercus ithaburensis*

DISCUSSION

In the Oaks gallwasps of the Inner-western Anatolian 58 species belonging to 11 genera from Cynipini tribe and from Synergini tribe 1 species belonging to 1 genera were recorded. *Cynips disticha*, *Neuroterus obtectus* and *Neuroterus saliens* are recorded from the Turkey for the first time. From the same region, seven gall inducing wasps on oaks were recorded as new record for Turkey (Katılmış & Kiyak, 2009a,b; Kiyak & Katılmış, 2010). Katılmış & Kiyak (2008) listed 73 gall inducing wasps on oaks in checklist of Turkey. In this study and the other studies (Katılmış & Kiyak, 2009a,b; Kiyak & Katılmış, 2010) was totally recorded 10 oak gallwasps species as new record and now the number of known oak gallwasp species increase to 83 species.

Andricus askeui, *Andricus bulgaricus*, *Andricus cecconii*, *Andricus corruptrix*, *Andricus cydoniae*, *Andricus galeatae*, *Andricus gallaearnaeformis*, *Andricus inflator*, *Andricus malpighi*, *Andricus megalucidus*, *Andricus multiplicatus*, *Andricus mitratus*, *Andricus quercusradicis*, *Andricus schrockingeri*, *Andricus solitarius*, *Andricus theophrastea*, *Andricus truncicolus*, *Callirhytis glandium*, *Callirhytis rufescens*, *Chilaspis nitida*, *Cynips agama*, *Cynips cornifex*, *Cynips divisa*, *Dryocosmus cerriphilus*, *Neuroterus albipes*, *Neuroterus anthracinus*, *Neuroterus minutulus*, *Neuroterus quercusbaccarum*, *Neuroterus tricolor* and *Trigonaspis synaspis* are recorded for the first time from study area.

In this study we examined 10 oak species in the study area and gave their galls on table 1. Some oak species are new host records for oak gallwasps and this species was signed (*) on the table 1.

This study and the other studies (Katılmış and Kiyak, 2009a,b; Kiyak and Katılmış, 2010) carried out in the Inner-western Anatolian contributed Cynipidae fauna of Turkey with 10 new records. We hope that number of species of Turkey cynipid fauna will increase following local faunistic studies in the future.

ACKNOWLEDGEMENTS

We thank to Dr. Graham STONE and Dr. Mustafa AVCI for helping to assure the literature. Thanks also to Dr. Hayri DUMAN and Dr. Zeki AYTAÇ for helping

the identification of the plant species. We thanks also to Gazi University Scientific Research Project Unit (Project No: BAP-05/2007-40) for financial support of this work.

LITERATURE CITED

- Acatay, A.** 1943. İstanbul ve çevresi ve bilhassa Belgrad ormanındaki zararlı orman böcekleri, mücadeleleri ve işletme üzerine tesirleri, Yüksek Ziraat Enstitüsü çalışmaları, Ankara No: 142: 107-120.
- Akçiçek, E.** 2003. Flora of Kumalar Mountain (Afyon). Turk. J. Bot., 27: 383-420.
- Alkan, B.** 1952. Türkiye'nin Zoosesid (Zoocecid) leri (kökeni hayvansal bitki urları) üzerinde çalışmalar II, A. Ü. Ziraat Fakültesi 1952 yıllığı, Ankara 17: 259-279.
- Aytaç, Z. & Vural, M.** 1991. Maymun ve Beşparmak Dağlarının florası-I, J. Biol. Fac. Sci. Gazi Univ., 1: 187-230.
- Baş, R.** 1970. Türkiye'de Orman ağaçlarında zarar yapan zar kanatlılar (Hymenoptera) üzerine araştırmalar, Doktora tezi, İstanbul Üniversitesi Orman Fakültesi, İstanbul, 100-150.
- Bodenheimer, F. S.** 1941. Türkiye'de ziraat ve ağaçlara zararlı olan böcekler ve bunlarla savaş hakkında bir etüt, Bayur matbaası, Ankara 300-308.
- Çanakçıoğlu, H.** 1956. Bursa ormanlarında entomolojik araştırmalar, İstanbul Üniversitesi Yayınları, No: 690: 28-30.
- Dalla-Tore, K. W. & Kieffer, J. J.** 1910. Cynipidae, Verlag von R. Friedlander und Sohn, Berlin. 891 pp.
- Davis, P. H.** 1982. Flora of Turkey, Part: 7, Edinburg University Press, 947 pp.
- Ionescu, M. A.** 1957. Fauna Repub. Popul. Romine Insecta Cynipidae, Editura Academiei Republicii Populare Romine. Bucarest. 239 pp.
- Karaca, İ.** 1956. Orta Anadolu orman ve meyve ağaçlarında görülen menşei nebati ve hayvani önemli urların amili ve morfolojileri hakkında araştırmalar. Ankara Üniversitesi Ziraat Fakültesi Yayınları No: 84: 75-120.
- Katılmış, Y. & Kıyak, S.** 2008. Checklist of Cynipidae of Turkey, with a New Genus Record. Journal of Natural History, 42 (31-32): 2161-2167.
- Katılmış, Y. & Kıyak, S.** 2009a. The oak gallwasp *Aphelonyx persica*: a new record from Turkey, with some new host records. Phytoparasitica, 37: 95-97.
- Katılmış, Y. & Kıyak, S.** 2009b. Oak gallwasp Genus *Andricus* (Hymenoptera, Cynipidae) – new records from Turkey. Zoology in the Middle East, 48: 108-110.
- Kıyak, S., Kılıç, T. & Katılmış, Y.** 2008. A Contribution to the Knowledge of the Cynipini (Cynipidae: Hymenoptera) Fauna of Turkey. Munis Entomology and Zoology, 3(1): 523-535.
- Kıyak, S. & Katılmış, Y.** 2010. Oak gallwasp *Dryocosmus mayri* (Hymenoptera, Cynipidae)- new record from Turkey. Journal of the Entomological Research Society, 12 (1): 67-70.
- Melika, G. & Stone G. N.** 2001. A new species of cynipid gall wasp from Turkey (Hymenoptera: Cynipidae). Folia Entomologica Hungarica, 62: 127-131.
- Melika, G., Stone, G. N., Sadeghi, S. E. & Pujade-Villar, J.** 2004. New species of cynipid gallwasps from Iran and Turkey (Hymenoptera: Cynipidae: Cynipini). Acta Zoologica Academiae Scientiarum Hungaricae, 50(2): 139-151.
- Nieves-Aldrey, J. L.** 2001. Fauna Iberica Hymenoptera Cynipidae, Museo Nacional de Ciencias Naturales Consejo Superior de Investigaciones Científicas. Madrid. 636 pp.
- Schimitschek, E.** 1944. Forstinsekten der Türkei und ihre Umwelt, Volk und Reich Verlag, Prag, Amsterdam, Berlin, Wien, 271-308.

Table 1. Oak gallwasps species and their hosts (* new host record) in the research area.

Species names	<i>Q. cerris</i>	<i>Q. coccifera</i>	<i>Q. frainetto</i>	<i>Q. infectoria</i>	<i>Q. ithaburensis</i>	<i>Q. petraea</i>	<i>Q. pubescens</i>	<i>Q. robur</i>	<i>Q. trojana</i>	<i>Q. vulcanica</i>
<i>Andricus askewi</i>				+						
<i>Andricus bulgaricus</i>							+			
<i>Andricus caputmedusae</i>				+			+	+		+
<i>Andricus ceconii</i>					+					
<i>Andricus conglomeratus</i>			+							
<i>Andricus cortarius</i>				+			+			+
<i>Andricus coronatus</i>							+			
<i>Andricus corruptrix</i>								+		
<i>Andricus curtisii</i>				+						
<i>Andricus curvator</i>				+			+			+
<i>Andricus cydoniae</i>	+				+					
<i>Andricus foecundatrix</i>				+						+
<i>Andricus galeatus</i>				+						
<i>Andricus gallaearnaeformis</i>						+	+			
<i>Andricus grossularia</i>	+			+			+			
<i>Andricus infectorius</i>				+			+			
<i>Andricus inflator</i>	+									
<i>Andricus kollari</i>							+			
<i>Andricus lignicolus</i>	+									
<i>Andricus lucidus</i>	+			+	+		+			
<i>Andricus malpighi</i>				+						
<i>Andricus megalucidus</i>			+	+			+			
<i>Andricus mitratus</i>			+							
<i>Andricus multiplicatus</i>	+									
<i>Andricus quercusradicis</i>	+									
<i>Andricus quercustozae</i>			+	+			+	+		+
<i>Andricus schroeckingeri</i>	+									
<i>Andricus seckendorffi</i>				+			+	+		
<i>Andricus solitarius</i>			+							
<i>Andricus stefanii</i>			+	+			+			+
<i>Andricus sternlichti</i>				+			+			
<i>Andricus theophrastea</i>				+			+			
<i>Andricus tomentosus</i>			+	+			+	+		
<i>Andricus truncicolus</i>				+			+			
<i>Aphelonyx cerricola</i>	+				+				+	
<i>Biorhiza pallida</i>				+		+	+			
<i>Callirhytis glandium</i>	+									
<i>Callirhytis rufescens</i>			+							
<i>Chilaspis nitida</i>	+									
<i>Cynips agama</i>							+			
<i>Cynips cornifex</i>				+			+			
<i>Cynips disticha</i>							+			
<i>Cynips divisa</i>				+			+			
<i>Cynips quercus</i>				+			+			
<i>Cynips quercusfolii</i>				+			+			+
<i>Dryocosmus cerriphilus</i>	+									
<i>Neuroterus albipes</i>				+			+	+		+
<i>Neuroterus anthracinus</i>										+
<i>Neuroterus lanuginosus</i>	+				+					
<i>Neuroterus minutulus</i>	+				+					
<i>Neuroterus numismalis</i>	+				+	+		+	+	
<i>Neuroterus obtectus</i>	+									
<i>Neuroterus quercusbaccarum</i>			+	+			+			+
<i>Neuroterus saliens</i>	+				+					
<i>Neuroterus tricolor</i>				+						
<i>Plagiotrochus quercusilicis</i>		+								
<i>Pseudoneuroterus macropterus</i>	+				+					
<i>Trigonaspis synaspis</i>				+			+			
<i>Synophrus politus</i>	+				+					

NEW DATA FOR ARGENTINIAN ASSASSIN BUGS FAUNA (HEMIPTERA: REDUVIIDAE: HARPACTORINAE)

Maria del Carmen Coscarón* and Abdiel Martin-Park**

* Museo de La Plata, Div. Entomología, Paseo del Bosque, 1900 La Plata, ARGENTINA. E-mail: mcoscaron@fcnym.unlp.edu.ar

** Universidad Autónoma de Yucatán – Campus Ciencias Biológicas y Agropecuarias – Fac. de Medicina Veterinaria y Zootecnia A.P. 4-116 Col. Itzimná, 97100. Mérida, Yucatán, MEXICO. E-mail: apark27@fmvz.uady.mx

[Coscarón, M. del C. & Martin-Park, A. 2011. New data for Argentinian assassin bugs fauna (Hemiptera: Reduviidae: Harpactorinae). Munis Entomology & Zoology, 6 (2): 758-763]

ABSTRACT: New Harpactorinae findings as localities and provinces are given from Argentina. *Harpactor distinguendus* is mentioned for the first time for this country. This work includes a result of studied material of Reduviidae that belongs to the Museo de La Plata (Argentina).

KEY WORDS: Argentina, Reduviidae, Hemiptera, Distribution.

Reduviidae or “assassin bugs” comprise one of the five largest families of Heteroptera (Froeschner, 1985). According to Henry (2009) 981 genera and more than 6878 species are known, with most occurring in the tropics. Its members comprise a large and diverse group of predatory insects, although some, like Triatominae have hematophagous feeding habits (Lent & Wygodzinsky, 1979). The subfamily Harpactorinae is the largest and most poorly studied subfamily of the Reduviidae (Chai & Tomokuni, 2003). More than 300 genera and 2000 species are known (Putshkov & Putshkov, 1985; Maldonado, 1990) and have representatives in all biogeographical areas.

Argentina is a link between two large geographic regions (Morrone, 1996), and this contributes to biodiversity of arthropods. Likewise, Argentina has an “austral” biota with affinity to the fauna of the south of Chile, Australia (including Tasmania), New Zealand, and New Guinea; and a “tropical” fauna (30° S) with affinity with the rest of South America, Mesoamerica, and the tropics of the Old World (Olivo & Coscarón, 2009).

The entomological collections from the Museo de La Plata (Argentina) comprise an important reservoir of information for systematic studies like taxonomic revisions, cladistic analysis and contributions of geographic distribution.

The purpose of this study is to enlarge the known distribution of Argentinian Harpactorinae with bioconservation purposes.

We studied 163 specimens of Reduviidae Harpactorinae that belongs to Entomological collection of the Museo de La Plata and provide new records for provinces and localities from Argentina.

RESULTS

SUBFAMILY HARPACTORINAE TRIBE APIOMERINI

Apiomerus flavipennis (Herrich-Schaeffer, 1848)

Material examined: **Chaco prov.:** Campo del Cielo, S 27 38 W 61 42, I.1934, A. da. Costa Lima det., 1 specimen; **Jujuy prov.:** Ledesma, S 23 49 W 64 47, 17.X.1930, A. da. Costa

Lima det., 1 specimen; **Misiones prov.:** El Dorado, S 31 27 W 64 15, III.1936, 4 specimens; Loreto, S 27 19 W 55 31, X.1931, A. da. Costa Lima det., 1 specimen.
Argentinian Records: Chaco; Corrientes: San Miguel (12 Km NE) Trujillo; Jujuy; Misiones
Remarks: These are new records of this species from Argentina.

***Apiomerus hempeli* (Costa Lima, Campos Seabra & Hathaway, 1951)**

Material examined: **Misiones prov.:** Pindapoy, S 27 35 W 55 49, III.1936, A. da. Costa Lima det., 1 specimen.
Argentinian Records: Entre Ríos: Villa Elisa.
Remarks: These are new records of this species from Argentina.

***Apiomerus lanipes* (Fabricius, 1803)**

Material examined: **Misiones prov.:** Loreto, S 27 19 W 55 31, 1 specimen.
Argentinian Records: from Misiones to Mendoza, and Northern provinces. Córdoba: Caimán, Carlos Paz, San Javier; Corrientes: Department Capital, Department Esquina, Department Saladas, Department San Roque; Entre Ríos: Department Concordia; Mendoza: City; Misiones: Department Caingúas, Department Eldorado; San Luis: Carolina.
Remarks: These are new records of this species from Argentina.

***Apiomerus nigricollis* (Stål, 1860)**

Material examined: **Entre Ríos prov.:** Paraná, S 31 44 W 80 30, 1 specimen.
Argentinian Records: Argentina: Misiones: Puerto Iguazú.
Remarks: These are new records of this species from Argentina.

TRIBE HARPACTORINI

***Atrachelus cinereus cinereus* (Fabricius, 1798)**

Material examined: **Buenos Aires prov.:** Ciudad, 15.III.1912, 8 specimens; José C. Paz, 1940, 4 specimens; Miramar, 04.III.1939, P. Wygodzinsky det., 1 specimen; Oriente, S 38 44 W 60 36, 28.II.1957, 1 specimen; Isla Martín García, 01.10.1921, 1 specimen; **Catamarca prov.:** Andalgalá, S 27 36 W 66 18, 08.III.1962, 1 specimen; Pomán, S 28 23 W 66 13, 08.III.1962, 3 specimens; Portezuelo, S 28 28 W 65 37, 05.III.1962, 1 specimen; **Chaco prov.:** Charata, S 27 13 W 61 11, X.1924, 1 specimen; Puerto Tirol, 10.IV.1936, 1 specimen; Resistencia, S 27 27 W 58 59, 22.V.1939, 1 specimen; Bajo Grande, S 31 37 W 64 13, 12.XII.1939, 15.XII.1939, 19.XII.1939, 8 specimens; **Córdoba prov.:** Cabana, S 31 13 W 64 22, 10.II.1942, 1 specimen; Oncativo, S 31 54 W 63 40, 17.I.1939, 2 specimens; San Francisco, S 31 25 W 62 05, 21.I.1940, 1 specimen; Tanti, S 31 19 W 64 35, 1 specimen; Unquillo, S 31 14 W 64 19, 17.III.1942, 1 specimen; Villa Rumpal, S 32 10 W 64 58, 18.II.1943 1 specimen; **Corrientes prov.:** San Roque, S 28 34 W 58 42, II.1920, 1 specimen; Solari, S 28 34 W 58 42, 17.XII.1942, 1 specimen; **Jujuy prov.:** Pampa Blanca, S 24 31 W 65 04, 13.III.1939; 2 specimens; **Misiones prov.:** El Dorado, S 31 27 W 64 15, 05.XI.1944, 8 specimens; Iguazú, S 25 37 W 54 20, XI.1944, 1 specimen; **San Luis prov.:** Nogolí, S 32 55 W 66 20, 21.II.1940; 1 specimen; **Santiago del Estero prov.:** Quimilí, S 27 38 W 62 24, 09.XII.1939, 1 specimen; Girardet, S 27 37 W 62 10, 09.XII.1939, 1 specimen; **La Pampa prov.:** Anzoátegui S 38 58 W 63 51, 26.II.1941, 1 specimen.
Argentinian Records: Buenos Aires: Bella Vista; José C. Paz, Luján, Tigre, Cerro Cura Malal; Catamarca: Andalgalá, Cerro Negro, Colpe; Chaco: Resistencia; Córdoba: Dean Funes, Quilino, Carlos Paz, Río San José, Carlos Paz, Río San José; Corrientes: Colonia C. Pellegrini; Misiones: Department Caingúas, Department Concepción de la Sierra, Department Eldorado, Department Guaraní, Department Oberá, Loreto; Corrientes: Department Bella Vista, Department Concepción, Department Lavalle, Department San Cosme, Department San Luis del Palmar, Department Santo Tomé, Entre Ríos: Department Concordia; Salta: Güemes, Rosario de la Frontera; San Juan: Calingasta; Santa Fé: Five Lillies, Fontana, Reconquista; Santiago del Estero: La Aurora.
Remarks: These are new records of this species from Argentina.

***Atrachelus ignobilis* (Stål, 1859)**

Material examined: **Formosa prov.:** Puente Iriburo, 05.XI.1940, Elkins, 1 specimen.
Argentinian Records: Argentina.
Remarks: These are new records of this species from Argentina.

***Cosmoclopius nigroannulatus* (Stål, 1860)**

Material examined: **Corrientes prov.:** San Roque, S 28 34 W 58 42, II.1920, 2 specimens; **Chaco prov.:** Puente de la Plaza, 07.XII.1939, 1 specimen; Picada Guaycurú, S 26 06 W 59 54, 1 specimen; **Jujuy prov.:** Yola, 12.III.1939, 2 specimens; **Santiago del Estero prov.:** Río Salado, S 26 22 W 63 42, 1 specimen.

Argentinian Records: Buenos Aires: Cerro Cura Malal; Chaco: Charata, Picada Guaycurú, Presidente de La Plaza, Resistencia; Catamarca: Pomán; Corrientes: Department Bella Vista, Department Berón de Astrada, Department Capital, Department Curuzú Cuatiá, Department Empedrado, Department Esquina, Department General Paz, Department Goya, Department Itatí, Department Lavalle, Department San Cosme, Department San Luis del Palmar, Department San Martín, Department San Miguel, Department San Roque, Department Santo Tomé, Department Sauce; Misiones: Department Alem, Department Belgrano, Department Cainguás, Department Capital, Department Eldorado, Department Montecarlo, Department Oberá, Department San Javier, Department 25 de Mayo; Colonia C. Pellegrini, Manantiales, Puerto Azcurra, Reserva Iberá, San Roque; Misiones: A. del Medio, Aristóbulo del Valle, Iguazú, L.N. Alem, Loreto, Pindaití Siruk, L.N. Alem; Córdoba Mar Chiquita, Tanti; Corrientes: Colonia C. Pellegrini; Entre Ríos; La Pampa; La Rioja Mendoza; Misiones; Formosa: Pirané; Chaco: Charata, Picada Guaycurú, Presidente de la Plaza, Resistencia; Catamarca: Pomán; Córdoba: Mar Chiquita; Tanti; Corrientes: Colonia C. Pellegrini, Manantiales, Puerto Azcurra, Reserva Iberá, San Roque; Entre Ríos: Concordia; Formosa: Pirané; La Pampa; La Rioja; Misiones: A. del Medio, Aristóbulo del Valle, Iguazú, L. N. Alem, Loreto; Mendoza Pindaití Siruk, Stefañuk, Taranco; Neuquén; Salta: Vaqueros, Cafayate; San Juan; San Luis: Quines; Santa Fé; Santiago del Estero: Río Salado; San Luis: Quines; Tucumán.

Remarks: These are new records of this species from Argentina.

***Cosmoclopius poecilus* (Herrich-Schaeffer, 1848)**

Material examined: **Buenos Aires prov.:** 1 specimen; **Catamarca prov.:** I.1941, 1 specimen; **Córdoba prov.:** Serrezuela, S 30 38 W 65 23, 18.II.1939, P. Wygodzinsky det., 1 specimen; **Formosa prov.:** Isla de Oro, XII.1937, P. Wygodzinsky det., 1 specimen; **Misiones prov.:** Cerro Azul, S 27 38 W 55 29, 1997, 1 specimen; Pindapoy, S 27 35 W 55 49, II.1936, P. Wygodzinsky, det., 1 specimen; **Salta prov.:** XI.1929, 1 specimen; **Tucumán prov.:** VII.1939, 1 specimen.

Argentinian Records: Buenos Aires: Córdoba: Capilla del Monte, Río San José Capilla del Monte, Río San José; Corrientes: Department Bella Vista, Department Berón de Astrada, Department Capital, Department Empedrado, Department Esquina, Department General Paz, Department Goya, Department Ituzaingó, Department Lavalle, Department Mburucuyá, Department San Cosme, Department San Luis del Palmar, Department San Miguel, Department San Roque. Entre Ríos; Formosa: Palosanto Misiones: Department Alem, Department Cainguás, Department Candelaria, Department Montecarlo, Department San Javier, Department 25 de Mayo; A. del Medio, L. N. Alem, Loreto, Stefañuk; Santa Fé.

Remarks: These are new records of this species from Argentina.

***Graptocleptes bicolor* (Burmeister, 1838)**

Material examined: **Córdoba prov.:** San Francisco, S 23 37 W 61 39, 21.I.1940, 3 specimens; **Corrientes prov.:** San Roque, S 28 34 W 58 42, II.1920, 2 specimens; **Entre Ríos prov.:** Concordia, S 31 23 W 58 01, II.1936, 3 specimens; **Jujuy prov.:** 1 specimen; **Misiones prov.:** Santa María, 1 specimen; **Santa Fe prov.:** 1 specimen; **Santiago del Estero prov.:** 1 specimen; **Tucumán prov.:** 06.XII.1928, 1 specimen.

Argentinian Records: Chaco; Corrientes: Department Empedrado; Entre Ríos: Department Concordia.

Remarks: These are new records of this species from Argentina.

***Harpactor angulosus* (Lepelletier & Serville, 1825)**

Material examined: **Misiones prov.:** Iguazú, S 25 37 W 54 20, VI.1942, 1 specimen; Loreto, S 27 19 W 55 31, P. Wygodzinsky det., 1 specimen; **Salta prov.:** Río Cañas, VI.1933, 2 specimens.

Argentinian Records: Argentina: Misiones: Corpus.

Remarks: These are new records of this species from Argentina.

***Harpactor distinguendus* (Stål, 1859)**

Material examined: **Misiones prov.:** 1 specimen.

Remarks: These are the first records of this species from Argentina.

***Harpactor tuberculosus* (Stål, 1872)**

Material examined: **Catamarca prov.:** Icaño, S 28 54 W 65 19, P. Wygodzinsky det., 1 specimen; **Córdoba prov.:** Cabana, S 31 13 W 64 22, 08.II.1937, P. Wygodzinsky det., 2 specimens; **Formosa prov.:** San Francisco, S 23 37 W 61 39, 12.XI.1942, P. Wygodzinsky det., 1 specimen; **Misiones prov.:** El Soberbio, S 27 17 W 54 12, X.1947, 1 specimen; Loreto, S 27 19 W 55 31, P. Wygodzinsky det., 2 specimens; Pindapoy, S 27 35 W 55 49, II.1936, 1 specimen; Santa María, X.1956, 1 specimen; **Santiago del Estero prov.:** 1 specimen.

Argentinian Records: Salta.

Remarks: These are new records of this species from Argentina.

***Heza binotata* (Lepelletier & Serville, 1825)**

Material examined: **Corrientes prov.:** Pellegrini, S 27 27 W 58 50, 09.V.2002, M. Melo det., 4 specimens.

Argentinian Records: Argentina.

Remarks: These are new records of this species from Argentina.

***Repipta flavicans* (Amyot & Serville, 1843)**

Material examined: **Corrientes prov.:** San Roque, S 28 34 W 58 42, 4 specimens; **Entre Ríos prov.:** Concordia, S 31 23 W 58 01, II.1936, 1 specimen; **Formosa prov.:** Misión Lashi, 12.XI.1942, 2 specimens; **Jujuy prov.:** Ledesma, S 23 49 W 64 47, 28.I.1958, 1 specimen; **Misiones prov.:** Iguazú, S 25 37 W 54 20, XI.1944, 5 specimens.

Argentinian Records: Chaco; Corrientes: Colonia C. Pellegrini, Department San Martín; Entre Ríos; Formosa; Jujuy; Misiones: Department Alem, Department Belgrano, Department Cainguás, Department Eldorado, Department 25 de Mayo; Santa Fé, Salta; Tucumán.

Remarks: These are new records of this species from Argentina.

***Ricolla quadrispinosa* (Linnaeus, 1767)**

Material examined: **Corrientes prov.:** 1 specimen; **Misiones prov.:** Caragatay, S 26 37 W 54 46, 13.XII.1957, 27.I.1960, M. Melo det., 5 specimens; Loreto, S 27 19 W 55 31, III.1936, IV.1936, IV.1939, 11.XI.1941, P. Wygodzinsky det., 8 specimens; Pindapoy, S 27 35 W 55 49, 10.I.1959, M. Melo det., 2 specimens; **Tucumán prov.:** P. Wygodzinsky det., 1 specimen.

Argentinian Records: Entre Ríos, Paraná; Misiones: Santa Rita; Department Belgrano, Department El Dorado, Department Iguazú, Department San Ignacio.

Remarks: These are new records of this species from Argentina.

***Sindala granuligera* (Stål, 1860)**

Material examined: **Chaco prov.:** Resistencia, S 27 27 W 58 59, XII.1935, 1 specimen; **Entre Ríos prov.:** 1 specimen; **Formosa prov.:** Clorinda, S 25 17 W 57 43, IV.1940, 1 specimen.

Argentinian Records: Corrientes: Colonia C. Pellegrini.

Remarks: These are new records of this species from Argentina.

***Zelus armillatus* (Lepelletier & Serville, 1825)**

Material examined: **Corrientes prov.:** Santa María, 28.X.2003, M. Melo det., 1 specimen; **Misiones prov.:** El Dorado, S 31 27 W 64 15, IV.1935, 1 specimen.

Argentinian Records: Corrientes: Department Santo Tomé; Misiones: Department Cainguás. Victoria; Salta: Orán, Aguas Blancas.

Remarks: These are new records of this species from Argentina.

***Zelus illotus* (Berg, 1879)**

Material examined: **Corrientes prov.:** San Roque, S 28 34 W 58 42, XI.1920, 1 specimen; **Entre Ríos prov.:** Concordia, S 31 23 W 58 01, 19.XII.1941, 1 specimen; **Formosa prov.:** Clorinda, S 25 17 W 57 43, IV.1940, 1 specimen; Isla Oca, III.1936, 1 specimen; **Misiones**

prov.: El Dorado, S 31 27 W 64 15, V.1936, 1 specimen; Iguazú, S 25 37 W 54 20, XI.1944, 1 specimen; Loreto, S 27 19 W 55 31, III.1936, 1 specimen; Montecarlo, S 26 34 W 54 45, 20.07.1982, 1 specimen; **Salta prov.:** Ortiz, S 24 47 W 65 26, IX.1939, 1 specimen; **Tucumán prov.:** Villa Monti, S 26 28 W 64 58, XI.1961, 1 specimen.

Argentinian Records: Corrientes: Colonia C. Pellegrini; Misiones.

Remarks: These are new records of this species from Argentina.

***Zelus leucogrammus* (Perty, 1834)**

Material examined: **Jujuy prov.:** 30.I.1946, 1 specimen; **Misiones prov.:** Iguazú, S 25 37 W 54 20, P. Wygodzinsky det., 1 specimen; **Tucumán prov.:** Aragón, S 27 10 W 64 47, 06.VI.1913, 1 specimen.

Argentinian Records: Catamarca: El Rodeo; Chaco; Corrientes Caa-catí, Department Monte Caseros, Department Santo Tomé, Colonia C. Pellegrini; Entre Ríos Paraná; Formosa; Salta: Abra Santa Laura, Valle Viejo; Santa Fé; Santiago del Estero; Misiones El Dorado; Salta: Abra Santa Laura, Valle Viejo; Santa Fé; Tucumán.

Remarks: These are new records of this species from Argentina.

ACKNOWLEDGEMENTS

This work was supported by the Consejo Nacional de Ciencia y Tecnología (CONACYT - Mexico) and the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET - Argentina).

LITERATURE CITED

- Amyot, C. J. B. & Serville, J. G. A.** 1843. Histoire naturelles des insectes. Hémiptères. In : « Suites à Buffon ». Fain et Thunot, Paris, lxxvi + 681 pp., 12 pls.
- Berg, C.** 1878-1880. Hemiptera Argentina: Ensayo de una monografía de los Hemipteros Heteropteros y Homopteros de la República Argentina. Anales de la Sociedad Científica Argentina, 1879, 86-92.
- Burmesteir, H. C. C.** 1838. Some account of the genus *Myocoris*, of the Reduviini. Transaction of the Royal Entomological of London, 2: 102-107.
- Chai, W. & Tomokuni, M.** 2003. *Camptibia obscura*, gen. and sp. n. (Heteroptera: Reduviidae: Harpactorinae) from China. European Journal of Entomology, 100: 181-185.
- Costa Lima, A. da., Campos Seabra, C. A. & Hathaway, C. R.** 1951. Estudo dos *Apiomerus*. Memorias do Instituto Oswaldo Cruz, 49: 273-442.
- Fabricius, J. C.** 1798. Supplementum Entomologiae systematicae. Proft et Storch, Hafniae, i-ii+572 pp. [Classis XII. Rhyngota pp. 511-546].
- Fabricius, J. C.** 1803. Systema Rhyngotorum Secundum Ordines, Genera, Species, Adjectis Synonymis, Locis, Observationibus, descriptionibus. Reichard, Brunsvigae, i-x+335 pp.
- Froeschner, R. C.** 1985. Synopsis of the Heteroptera or true bugs of the Galapagos Islands. Smithsonian Contributions to Zoology, 407: 1-84.
- Henry, T. J.** 2009. Biodiversity of Heteroptera. In: Footitt, R. & Adler, P. (eds.) Insect Biodiversity: Science and Society Wiley-Blackwell. 223-263.
- Herrich-Schaeffer, G. A. W.** 1836-1853. Die Wanzenartigen Insekten. Volumes 3-9. C. H. Zeh'schen, Nurnberg. [1848, 8, 1-130].
- Lent, H. & Wygodzinsky, P.** 1979. Revision of the Triatominae (Hemiptera, Reduviidae), and there significance as vectors of Chagas' disease. Bulletin of the American Museum of Natural History, 163: 125-520.
- Lepeletier, A. L. M. & Serville, J. G. A.** 1825-1828. [Articles on Hemiptera] In: G. A. Olivier (ed.) Encyclopédie méthodique. volume 10, 833 pages (1825: 1-344).

Linnaeus, C. 1767. Hemiptera. *In*: Systemae naturae per regne tria naturae secundum classes, ordines, genera, species cum caracteristibus, differentiis, synonymis, locis. Editio duodecim, reformata. Stockholm: L. Salvii. 1: 687-743.

Maldonado, C. J. 1990. Systematic catalogue of the Reduviidae of the World (Insecta: Heteroptera). Caribbean Journal of Science. Special Edition. 694 pp.

Morrone, J. J. 1996. The biogeographical Andean subregion: A proposal exemplified by Arthropod taxa (Arachnida, Crustacea, and Hexapoda), Neotropica, 42: 103-114.

Olivo, V. I. & Coscarón, M. C. 2009. Additional records of Heteroptera (Hemiptera) from Argentina. Zootaxa, 2311: 38-48.

Perty, M. 1830-1834. Delectus animalium articulorum, quae in itinere per Brasiliam annis MDCCCXVII-MDCCCXX, jussu et auspiciis Maximiliani Josephi I. Bavariae regis augustissimi peracto, collegerunt Dr. J. B. de Spix et Dr. C. F. Ph. de Martius. Impensis editoris, Monachii, i-iii+44+222 pp., 40 plates.

Putshkov, V. G. & Putshkov, P. V. 1985. A catalogue of assassin-bugs genera of the world (Heteroptera, Reduviidae). VINITI, Moskva, 138 pp.

Stål, C. 1858. Bidrag till Rio Janeiro-Traktens Hemiptera-fauna. Svenska VetenskAkad Handlingar, 2: 1-84.

Stål, C. 1859. Till kännedomen om Reduvini. Öfversigt af Kongliga Svenska Vetenskaps-Akademiens Förhandlingar, 16: 175-205, 363-386.

Stål, C. 1860. Bidrag till Rio Janeiro-Traktens Hemipter-fauna. Part I. Svenska Vetenskaps-Akademiens Handlingar, 2: 1-84 [Stål himself used 1860 when referring to this paper].

Stål, C. 1861. Miscellanea Hemipterologica. Stettiner Entomologische Zeitung, 22: 129-153.

Stål, C. 1870-1876. Enumeratio Hemipterorum: Bidrag till en företeckning öfver alla Hittills kända Hemiptera, jemte systematiska meddelanden. Parts I-V. Kongliga Svenska Vetenskaps-Akademiens Handlingar, 1872, Part 2, 10: 1-159.

CONTRIBUTION TO THE KNOWLEDGE OF FLAT BUGS FROM THE TEMPERATE SOUTH AMERICA (HEMIPTERA: HETEROPTERA)

**Eugenia Fernanda Contreras*, Lilia Estela Neder*
and María del Carmen Coscarón****

* Universidad Nacional de Jujuy. Instituto de Biología de la Altura, Universidad Nacional de Jujuy. Av Bolivia 1661. 4600. S. S. de Jujuy. ARGENTINA. E-mail: eugecon@yahoo.com.ar and leneder@inbial.unju.edu.ar

** Museo de La Plata, Div. Entomología, Paseo del Bosque, 1900 La Plata, ARGENTINA. E-mail: mcoscaron@fcnym.unlp.edu.ar

[Contreras, E. F., Neder, L. E. & Coscarón, M. del C. 2011. Contribution to the knowledge of flat bugs from the temperate South America (Hemiptera: Heteroptera). Munis Entomology & Zoology, 6 (2): 764-768]

ABSTRACT: New Aradidae findings as localities and provinces are given from Argentina. *Mezira regularis* Champion is mentioned for the first time for this country. This work includes a result of studied material of Aradidae that belongs to the Museo de La Plata and Fundación Miguel Lillo (Argentina).

KEY WORDS: Argentina, Aradidae, Hemiptera, Distribution.

Argentina is a link between two large geographic regions (Morrone, 1996), and this contributes to the biodiversity of arthropods. Likewise, Argentina has an “austral” biota with affinity to the fauna of the south of Chile, Australia (including Tasmania), New Zealand, and New Guinea; and a “tropical” fauna (30° S) with affinity with the rest of South America, Mesoamerica, and the tropics of the Old World (Olivo & Coscarón, 2009).

Aradidae are commonly known as flat bugs. Most of the species are subcortical and mycetophagous. Their flattened form and sombre of colours are well adapted for a life on or under the bark of dead trees and the coiled setae are a remarkable adaptation for sucking the juices. The Aradidae constitute a well-difened family of the Aradoidea (Gylensväd, 1964). And contain 8 subfamilies: Aneurinae, Aradinae, Calisiinae, Carventinae, Chinamyersiinae, Isoderminae, Mezirinae and Prosymptestinae. According to Henry (2009), 233 genera and more than 1931 species are known in all the biogeographical regions of the world.

The entomological collections from the Museo de La Plata and Fundación Miguel Lillo (Argentina) comprises an important reservoir of information for systematic studies like taxonomic revisions, cladistic analysis and contributions of geographic distribution.

Bioconservation is the purpose of this study. New distributional records enlarge the known distribution of its species for the Austral Biota.

We studied 497 specimens deposited at the Museo de La Plata (MLP) and Fundación Miguel Lillo (FML) (Argentina). Usinger and Matsuda (1959) provide a systematic account of the family and Kormilev & Froeschner (1987) a catalog (bibliography cited there was used).

RESULTS

SUBFAMILY ANEURINAE

Iralunelus subdipterus (Burmeister, 1835)

Material examined: Chaco prov.: Vilela, 27° 30' 51,81" S-58° 56' 13,88", 20-IX-36, Museo Argentino de Ciencias Naturales, 1 specimen (MLP). Jujuy prov.: La Mendieta, 24°

18°50,80'S-64° 58'01,00'W, 27-XII-39, Museo Argentino de Ciencias Naturales, 1 specimen (MLP). **Santiago del Estero prov.:** Lago Mayo, 27° 31' 28,68''S-64° 52' 10,93'' W, III-57, Golbach col., 2 specimens (FML). **Tucumán prov.:** 1-X-68, Weyrauch col., 7 specimens (FML); San Miguel de Tucumán, 26° 48' 30,08 S-65° 13' 03,40'' W 7-XII-44, Golbach col, Museo Argentino de Ciencias Naturales, 1 specimen (FML).

Argentinian Records: Buenos Aires; Chaco: La Escondida, Vilela; Córdoba: Calamuchita; Formosa: Puerto Tirol; Jujuy: La Mendieta; Misiones: Puerto 17 de Octubre, Concepción, Santa María; Salta: El Piquete; Santiago del Estero. El Sauce. Córdoba: V.G. Belgrano.

Remarks: These are new records of this species from Argentina.

SUBFAMILY ARADINAE

***Aradus angustellus* (Blanchard, 1852)**

Material examined: **Chubut prov.:** Piedra Parada, 43° 39' 22,17''S-69° 17' 08,85''W, 28-III-45, Castellanos col., Museo Argentino de Ciencias Naturales, 3 specimens (FML).

Río Negro prov.: Lago Mascarol, 41° 10' 59,78''S-71° 24' 20,22''W, 6-III-41, Velaro col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); El Bolson, 41° 57' 51,88''S-71° 30' 58,34''W, 12-II-49, Monrós col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); El Tronador, 41° 06' 14,70''S-71° 21' 46,68''W, II-46, Velaro, col., Museo Argentino de Ciencias Naturales, 1 ejemplar (FML). **Santa Cruz prov.:** Lago Argentino, 50° 20' 03,13''S-72° 16' 16,16''W, 22-I-53, Willink col., Museo Argentino de Ciencias Naturales, 1 specimen (FML), Lago Posadas, 47° 30' 42,30''S- 71° 46' 37,01''W, Dibon col., 2 specimens (MLP).

Argentinian Records: Buenos Aires; Chaco; Córdoba; Chubut: Piedra Parada; Río Negro: Bariloche, Lago Mascarol, El Tronador; Santa Cruz: Lago Posadas; Patagonia Austral.

Remarks: These are new records of this species from Argentina.

***Aradus mexicanus* (Usinger, 1936)**

Material examined: **Tucumán prov.:** Horco Molle, 26° 56' 06,77''S-65° 17' 44,50''W, 22-XI-64, Haedo-Rossi cols., 3 specimens (FML).

Argentinian Records: Misiones: Puerto Londero.

Remarks: These are new records of this species from Argentina.

***Aradus penningtoni* (Drake, 1942)**

Material examined: **Buenos Aires prov.:** La Plata, 34° 55' 02,75''S-57° 56' 59,61''W, 30-X-44, Museo Argentino de Ciencias Naturales, 1 specimen (MLP). **Chaco prov.:** Resistencia, 27° 27' 05,58''S- 58° 59' 10,44'' W, 21-XII-39, Benítez col, 4 specimens (MLP); Campos del Cielo, 27° 20' 52,18''S- 61° 41' 52,33''W, 1954, Museo Argentino de Ciencias Naturales, 2 specimens (MLP), XII-48, Benítez- Golbach cols., Museo Argentino de Ciencias Naturales, 24 specimens (FML). **Corrientes prov.:** 15-III-39, Denier col., Museo Argentino de Ciencias Naturales, 1 specimen (MLP). **Formosa prov.:** 08-I-39, Denier col., Misión Laishi, 26° 13' 48,70''S-58° 38' 06,30''W, 18-XII-48, Golbach col., Museo Argentino de Ciencias Naturales, 2 specimens (FML); Mojón de Fierro, 26° 02' 58,01''S-58° 03' 00,47''W, 12-XII-48, Golbach col., Museo Argentino de Ciencias Naturales, 1 specimen (FML). **Misiones prov.:** Iguazú, 26° 55' 13,21''S-54° 27' 03,31''W, 24-II-45, Hayward- Willink-Golbach cols., Museo Argentino de Ciencias Naturales, 10 specimens (FML); 13-III-45, Hayward-Willink-Golbach cols., 7 specimens, (FML); XII-45, Hayward-Willink-Golbach cols., 1 specimen; 10-XI-73, Willink- Tomsic cols., 4 specimens (FML); 1957, Biraben col., Museo Argentino de Ciencias Naturales, 1 specimen (MLP); Pte Bemberg, 23° 57' 02''S-54° 37' 10''W, 23-III-45, Hayward- Willink-Golbach cols., Museo Argentino de Ciencias Naturales, 3 specimens (FML); Pindapoy, 27° 35' 41,63''S-55° 49' 21,40''W, 27-VI-37, Drake col., Museo Argentino de Ciencias Naturales, 1 specimen (MLP); **Santa Fé prov.:** Drake col., Museo Argentino de Ciencias Naturales, 5 specimens (FML); Villa Guillermina, 28° 14' 36,59''S- 59° 27' 10,30''W, 18-II-46, Hayward-Willink cols., Museo Argentino de Ciencias Naturales, 95 specimens (FML); **Santiago del Estero prov.:** 1935, Fernandez col., Museo Argentino de Ciencias Naturales, 3 specimens (MLP); **Tucumán prov.:** 19-XI-46, Golbach col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); I-56, Golbach col., 2 specimens (FML); Horco Molle, 26° 56' 44, 18''S-65° 17' 28,57''W, 22-XI-64, Rossi col., 3 specimens (FML).

Argentinian Records: Buenos Aires: Capital; Devoto, La Plata; Chaco: Charata, Colonia Benítez, Fontana, Puerto La Plata, Reconquista, Resistencia; Córdoba: Córdoba; Corrientes:

San Cosme; Formosa: Clorinda, Isla de Oro, Misión Laishi, Zona Laguna La Oca; Jujuy: Ledesma, Marta; La Rioja: Department Belgrano, Iliar; Misiones: Iguazú, Puerto Bemberg, Pindapoy; Santa Fé: Santiago del Estero: Campos del Cielo, Río Salado; Río Negro: Río Colorado.

Remarks: These are new records of this species from Argentina.

SUBFAMILY ISODERMINAE

Isodermus gayi (Spinola, 1852)

Material examined: **Río Negro prov.:** El Tronador, 41° 06' 14,70'' S-71° 21' 46,68'' W, II-46, Velaro col., Museo Argentino de Ciencias Naturales, 1 specimen (FML). **Santa Cruz prov.:** Lago Argentino, 50° 20' 03,13'' S-72° 16' 16,16'' W, 25-II-53, Willink col., Museo Argentino de Ciencias Naturales, 48 specimens (FML); Río Las Vueltas, 49° 23' 43,42'' S-72° 45' 06,33'' W, I-44, Lenko col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); Ventisquero, Moreno, Parque Nacional los Glaciares, 46° 26' 00,16'' S-67° 31' 41,37'' W, 29-I-77, Stange col., 28 specimens (FML). **Tierra del Fuego prov.:** Parque Nacional de Tierra del Fuego, 54° 39' 57,10'' S-68° 30' 10,05'' W, 22-I-77, Stange col., 20 specimens (FML); 1975, Stål col., P. Wygodzinsky det., Museo Argentino de Ciencias Naturales, 1 specimen (MLP).

Argentinian Records: Neuquén: San Martín de los Andes; Río Negro: El Tronador; Tierra del Fuego: Puerto Arenas, Ushuaia. Patagonia.

Remarks: These are new records of this species from Argentina.

SUBFAMILY MEZIRINAE

Aphleboderris pilosa (Stål, 1869)

Material examined: **Jujuy prov.:** 30-I-46, Biraben, col., 5 specimens (MLP). **Tucumán prov.:** 1933, N. Kormilev det., 18 specimens (MLP); Tafi del Valle, 26° 50' 43,98'' S-65° 42' 01,05'' W, 28-XI-51, Golbach col., N. Kormilev det., Museo Argentino de Ciencias Naturales, 2 specimens (FML).

Argentinian Records: Jujuy: Santa María; Misiones; Tucumán: Siambón.

Remarks: These are new records of this species from Argentina.

Mezira americana (Spinola, 1852)

Material examined: **La Rioja prov.:** 29° 24' 52,66'' S-66° 51' 18,09'' W, II-42, Monros col., Museo Argentino de Ciencias Naturales, 2 specimens (FML). **Neuquén prov.:** 1902, Bruch, col., Museo Argentino de Ciencias Naturales, 3 specimens (MLP); Lago Quillen, 39° 25' 05,17'' S-71° 19' 17,31'' W, Monrós col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); Hua-Hum, 40° 06' 56, 58'' S- 71° 39' 39,70'' W, 22-I-49, 27 specimens (FML), 16-II-46; Museo Argentino de Ciencias Naturales, 2 specimens (FML); 6-XII-46, Hayward col.; 27-I-49, Monros, col., 1 specimen (FML); II-51, Shayovskoy col., 4 specimens (FML). **Río Negro prov.:** Nahuel Huapi, Isla Victoria, 40° 07' 22,18'' S- 71° 21' 36,94'' W, Museo Argentino de Ciencias Naturales, 5 specimens (MLP).

Argentinian Records: Argentina: Córdoba: El Sauce; La Rioja; Neuquén: Correntoso, Hua-Hum, Lago Nonthuel, Lago Queñi, San Martín de los Andes; Río Negro: Isla Victoria, Llao-Llao, Nahuel Huapi, San Carlos de Bariloche.

Remarks: These are new records of this species from Argentina.

Mezira granuliger (Stål, 1860)

Material examined: **Buenos Aires prov.:** Lujan, 34° 33' 43,40'' S-59° 05' 29,87'' W, Museo Argentino de Ciencias Naturales, 2 specimens (MLP). **Entre Ríos prov.:** Paraná, 31° 44' 28,22'' S-60° 30' 41,57'' W, 7-III-49, Monros col., Museo Argentino de Ciencias Naturales 1 specimen (FML). **Misiones prov.:** Iguazú, 25° 40' 13,93'' S-54° 26' 21,79'' W, 1944, Biraben col., Museo Argentino de Ciencias Naturales, 2 specimens (MLP). **Santa Fé prov.:** Rosario, 32° 57' 02,43'' S-60° 39' 59,61'' W, 1954, Museo Argentino de Ciencias Naturales, 4 specimens (MLP). **Tucumán prov.:** 1949, Golbach col., Museo Argentino de Ciencias Naturales, 3 specimens (FML); Horco Molle, 26° 56' 06,77'' S-65° 17' 44,50'' W, 1-IX-73, Stange col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); Tacanas, 27° 07' 59,87'' S-64° 49' 00,05'' W, II-47, Golbach col., 1 specimen (FML); Amaicha del Valle, 26° 35' 10,66'' S-65° 55' 05,53'' W, XII-47, Golbach col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); Burruyacú, 26° 29' 57,77'' S-64° 44' 30,92'' W, 1-II-42, Golbach col., 1 specimen (FML).

Argentinian Records: Buenos Aires: Escobar, Las Conchas, Luján, Punta Chica, San Isidro, Tigre; Isla de Coble; Paraná de las Palmas; Misiones: Iguazú; Salta: San Lorenzo; Santa Fé Rosario; Tucumán: Amaicha del Valle, Buruyacu, Tacanas, Tafi del Valle.

Remarks: These are new records of this species from Argentina.

***Mezira nigripennis* (Usinger, 1936)**

Material examined: **Jujuy prov.:** La Mendieta, 24° 18' 50,80" S-64° 58' 01,00" W,), 27-XII-39, 3 specimens (MLP). **Salta prov.:** Alemania, 25° 36' 01,23" S-65° 37' 57,64" W, 9-II-48, Willink- Monros col., Museo Argentino de Ciencias Naturales, 2 specimens (FML). **Tucumán prov.:** Horco Molle, 26° 56' 06,77" S-65° 17' 44,50" W, 1-IX-73, Stange col., 3 specimens (FML); San Pedro de Colalao, 26° 13' 59,77" S-65° 29' 00,30" W, II-53, Teran col., 1 specimen (FML).

Argentinian Records: Chaco: Pte. Perón; Jujuy: La Mendieta; Misiones: Salta: Alemania, Las Cañas, Pocitos, Santa María, Urundel.

Remarks: These are new records of this species from Argentina.

***Mezira regularis* (Champion, 1898)**

Material examined: **Tucumán prov.:** Horco Molle, 26° 56' 06, 77" S-65° 17' 44, 50" W, 1- IX-73, Stange, col. 16 specimens (FML).

Remarks: These are new records of this species from Argentina.

***Mezira saltensis* (Kormilev, 1953)**

Material examined: **Tucumán prov.:** Horco Molle, 26° 56' 06, 77" S-65° 17' 44,50" W, III-65, Haedo-Rossi, cols., 3 specimens (FML).

Argentinian Records: Salta: Anta.

Remarks: These are new records of this species from Argentina.

***Neuroctenus centralis* (Berg, 1879)**

Material examined: **Catamarca prov.:** 1899, Ventura col., Museo Argentino de Ciencias Naturales, 5 specimens (MLP); El Suncho, 29° 11' 52,36" S- 65° 22' 05,01" W, 18-II-57, Golbach col., 19 specimens (FML); El Alto, 28° 17' 58, 90" S- 65° 22' 00,10" W, 24-XII-58, 2 specimens (FML). **Cordoba prov.:** 01-IV-20, Bruch col., Museo Argentino de Ciencias Naturales, 3 specimens (MLP). **Corrientes prov.:** 1940, Biraben col., Museo Argentino de Ciencias Naturales, 3 specimens (MLP). **Jujuy prov.:** Cerro Peroties, 27-I-48, Monros col., Museo Argentino de Ciencias Naturales, 1 specimen (FML); 30-I-46, Biraben col., 2 specimens (MLP). **La Rioja prov.:** Anillaco, 28° 48' 00,00" S-65° 56' 58,84" W, 27-II-39, Biraben-Scott cols., Museo Argentino de Ciencias Naturales, 8 specimens (MLP). **Misiones prov.:** XI-51, Willink, col., 1 specimen (FML); Loreto, 27° 18' 56,95" S-55° 32' 01,70" W, Museo Argentino de Ciencias Naturales, 5 specimens (MLP). **Salta prov.:** Cafayate, 26° 04' 14,30" S- 65° 58' 43, 51" W, VII-54, Hayward col., 15 specimens (FML). **Santa Fé prov.:** Rosario, 27-XII-39, Biraben-Bezzi cols., (MLP). **Tucumán prov.:** I-56, Golbach col., 3 specimens (FML); Tafi del Valle, 26° 50' 43,98" S-65° 42' 01,05" W, I-50, Golbach col., 4 specimens (FML); 23-X-47, Golbach col., 4 specimens, II-47, Golbach col., 4 specimens; I-50, Monros col., 4 specimens (FML); III-59, Wygodzinsky col., 3 specimens (FML); 28-XI-51, Golbach col., 1 specimen (FML); Burruyacu, 26° 29' 57,77" S-64° 44' 30,92" W, 8-II-61, Golbach col., 5 specimens (FML); San Javier, 26° 46' 59, 43" S- 65° 23' 01,24" W, XI-50, Golbach col., 1 specimen (FML); Siambón, 26° 41' 57,21" S- 65° 27' 01,24" W, 26-XII-49, Monros col., 7 specimens (FML); Río La Caldera, 26° 49' 55,90" S-65° 12' 00,84" W, 12-II-29, 6 specimens (FML); 1933, Museo Argentino de Ciencias Naturales, 5 specimens (MLP).

Argentinian Records: Buenos Aires; Catamarca. Chaco. Córdoba: Alta Gracia, Calamuchita, El Sauce, Punilla, Tanti, V.G. Belgrano; Corrientes: Manantiales; Jujuy: Zapla; La Rioja: Anillaco; Salta: Rosario de la Frontera; Santa Fé: Colonia Mascías, Garay, Guadalupe; Tucumán: San José, Siambón, Tafi del Valle.

Remarks: These are new records of this species from Argentina.

***Notapictinus sanmigueli* (Kormilev, 1960)**

Material examined: **Tucumán prov.:** 5-I-68, 1 specimen, Weyrauch col.

Argentinian Records: Argentina.

Remarks: These are new records of this species from Argentina.

ACKNOWLEDGEMENTS

This work was supported by the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET - Argentina).

LITERATURE CITED

- Berg, C.** 1878-1880. Hemiptera Argentina: Ensayo de una monografía de los Hemipteros Heteropteros y Homopteros de la República Argentina. Anales de la Sociedad Científica Argentina, 1879, 41-47, C. G. Proft, Hafniae.
- Bergroth, E.** 1892. Aradidae novae. Revue d'Entomologie, 2, 259-261.
- Blanchard, M. E.** 1852. Orden VII: Hemipteros. In: Gay, C. (Ed); Historia Física y Política de Chile. Zoología. Mauk & Renou, París, 7, 113-320.
- Burmeister, H. C. C.** 1835-1839. Handbuch der Entomologie. Volume 2, 1835 1, i-xii + 1-400; 1839 2, 757-1050 (second half). T. Enslin, Berlin.
- Champion, G. C.** 1898. Fam. Aradidae. In Biología Centrali-Americana. Insecta. Rhynchota. 2: 93 and 99.
- Drake, C. J.** 1942. Two new American species of the genus *Aradus* Fabr. (Hemiptera). Revista de Entomología, Rio de Janeiro, 13, 151-154.
- Fabricius, J. C.** 1794. Entomologia systematica emendata et aucta secundum classes, ordines, genera, species adjectis synonymis, locis, observationibus, descriptionibus. Vol. 4: i-v.
- Gyllensväd, N.** 1964. A key to Swedish Aradidae (Hem. Het.) with figures of the male genitalia. Opusc. Entomol., 29:110-116.
- Henry, T. J.** 2009. Biodiversity of Heteroptera.. In: Footitt, R. & Adler, P. (eds.). Insect Biodiversity: Science and Society. Wiley-Blackwell. 223-263.
- Kormilev, N. A.** 1953. Aradidae (Hemiptera) Argentinae II. Acta Zoologica Lilloana. 230-231 pp.
- Kormilev, N. A.** 1959. Notas sobre Aradidae Neotropicales, V; (Hemiptera). Sobre el género *Pictinus* Stål, 1973. Revista de la Sociedad Uruguaya de Entomología, 3: 21-33.
- Kormilev, N. A. & Froeschner, R. C.** 1987. Flat Bugs of the World, a Synonymic List. 246 p.
- Morrone, J. J.** 1996. The Biogeographical Andean subregion: A proposal exemplified by Arthropod taxa (Arachnida, Crustacea, and Hexapoda), Neotropica, 42: 103-114.
- Olivo, V. I. & Coscarón, M. C.** 2009. Additional records of Heteroptera (Hemiptera) from Argentina. Zootaxa, 2311: 38-48.
- Spinola, M.** 1852. [Insects]. In: Gay, C., Historia física y política de Chile, Zoología. 7, pp. 1-471.
- Stål, C.** 1860. Bidrag till Rio Janeiro-Traktens Hemipter-fauna. Part I. Svenska Vetenskaps-Akademiens Handlingar, 2, 1-84 [Stål himself used 1860 when referring to this paper].
- Stål, C.** 1869. Hemiptera fabriciana. Fabricianska Hemipterarter, Efter de i Köpenhaamen, Och Kiel förvarade Typexemplaren grandskade och beskrifne. 2. Kungliga Svenska Vetenskaps-Akademiens Handlingar, 8, 1-130.
- Usinger, R. L.** 1936. Studies in the American Aradidae with Descriptions of New Species. Annals of the Entomological Society of America, 29, 490-516.
- Usinger, R. L.** 1940. A New Species of *Aradus* from Brazil (Hemiptera, Aradidae). Revista de Entomología, Rio de Janeiro, 11, 639-642.
- Usinger, R. L. & Matsuda, R.** 1959. Classification of the Aradidae. 410 pages. London. British Museum.

NEW NAMES FOR SOME PREOCCUPIED SPECIFIC EPITHETS IN THE FAMILIES CERAPHRONIDAE, DIAPRIIDAE AND PLATYGASTRIDAE (HYMENOPTERA: PARASITICA)

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE.
Email: ozdikmen@gazi.edu.tr

[Özdikmen, H. 2011. New names for some preoccupied specific epithets in the families Ceraphronidae, Diapriidae and Platygastriidae (Hymenoptera: Parasitica). Munis Entomology & Zoology, 6 (2): 769-778]

ABSTRACT. According to the International Code of Zoological Nomenclature (ICZN, 1999), *Aphanogmus reticulatus* Parr, 1960 (Ceraphronoidea: Ceraphronidae); *Spilomicrus brevicornis* (Kieffer, 1910); *Spilomicrus kiefferi* (Ogloblin, 1966); *Spilomicrus maculipennis* Kieffer, 1907; *Spilomicrus superbus* Masner, 1991; *Trichopria affinis* Dodd, 1915; *Trichopria montana* Sharma, 1979 and *Trichopria spinosa* Rajmohana & Narendran, 2006 (Diaprioidea: Diapriidae); *Calliscelio niger* (Fullaway, 1939); *Gryon elegans* Kononova, 2001; *Gryon elongatum* Mineo, 1991; *Gryon longipenne* Masner, 1983; *Gryon oculatum* Kozlov & Kononova, 2004; *Idris bicolor* Kononova, 1995; *Macroteleia nitida* Muesebeck, 1977; *Opisthacantha nigriceps* Dodd, 1913; *Telenomus antennalis* (Kononova, 1973); *Telenomus brevis* (Ryu, 1989); *Telenomus decoratus* Kononova, 2009; *Telenomus impressus* Kononova, 1986; *Telenomus minimus* Kozlov, 1967; *Telenomus striatus* Kononova, 1973; *Trimorus brevipennis* (Kieffer, 1908); *Trimorus coxalis* (Ashmead, 1893); *Trimorus coxalis* (Ashmead, 1893); *Trimorus longispina* Mukerjee, 1981; *Trimorus pedestris* (Dahl, 1912); *Trimorus tananarivensis* (Risbec, 1956); *Trimorus varicornis* (Dodd, 1914) and *Trimorus varicornis* (Thomson, 1859) (Platyastroidea: Platygastriidae) are not correct because the specific epithets are illegitimate. Accordingly, the following replacement names are proposed for the preoccupied specific names respectively: *Aphanogmus parrii* nom. nov. (Ceraphronoidea: Ceraphronidae); *Spilomicrus oskayi* nom. nov.; *Spilomicrus argentinus* nom. nov.; *Spilomicrus javaensis* nom. nov.; *Spilomicrus masneri* nom. nov.; *Trichopria australiaensis* nom. nov.; *Trichopria sharmai* nom. nov. and *Trichopria indiana* nom. nov. (Diaprioidea: Diapriidae); *Calliscelio samoensis* nom. nov.; *Gryon kononovai* nom. nov.; *Gryon mineoi* nom. nov.; *Gryon masneri* nom. nov.; *Gryon kozlovi* nom. nov.; *Idris kononovai* nom. nov.; *Macroteleia muesebecki* nom. nov.; *Opisthacantha derya* nom. nov.; *Telenomus ukrainicus* nom. nov.; *Telenomus ryui* nom. nov.; *Telenomus kononovai* nom. nov.; *Telenomus russianicus* nom. nov.; *Telenomus moldovanus* nom. nov.; *Telenomus eustriatus* nom. nov.; *Trimorus hispanicus* nom. nov.; *Trimorus nihali* nom. nov.; *Trimorus nearcticus* nom. nov.; *Trimorus mukerjeei* nom. nov.; *Trimorus dahli* nom. nov.; *Trimorus madagascariensis* nom. nov.; *Trimorus doddi* nom. nov. and *Trimorus thomsoni* nom. nov. (Platyastroidea: Platygastriidae).

KEY WORDS. Nomenclatural change, homonymy, replacement name, Hymenoptera, Ceraphronidae, Diapriidae, Platygastriidae.

HYMENOPTERA PARASITICA

CERAPHRONOIDEA CERAPHRONIDAE

Genus APHANOGMUS

Aphanogmus parrii nom. nov.

Junior secondary homonym: *Aphanogmus reticulatus* Parr, 1960: 122 from Britain.

Senior homonym: *Aphanogmus reticulatus* (Fouts, 1934) from Southern Italy.
Original combination: *Calliceras reticulata* Fouts, 1934: 101.

Replacement name: *Aphanogmus parrii* **nom. nov.**

pro *Aphanogmus reticulatus* Parr, 1960 **syn. nov.**

Etymology: The species name is dedicated to W. J. Parr who is the author of the preexisting species *A. reticulatus*.

DIAPRIOIDEA

DIAPRIIDAE

Genus *SPILOMICRUS*

Spilomicrus oskayi **nom. nov.**

Junior secondary homonym: *Spilomicrus brevicornis* (Kieffer, 1910) from Peru.
Original combination: *Hoplopria brevicornis* Kieffer, 1910: 40, 47.

Senior homonym: *Spilomicrus brevicornis* (Ashmead, 1893) from Colorado.
Original combination: *Basalys brevicornis* Ashmead, 1893: 443, 446.

Replacement name: *Spilomicrus oskayi* **nom. nov.**

pro *Spilomicrus brevicornis* (Kieffer, 1910) **syn. nov.**

Etymology: The species name is dedicated to Mustafa Oskay (Turkey).

Spilomicrus argentinicus **nom. nov.**

Junior secondary homonym: *Spilomicrus kiefferi* (Ogloblin, 1966) from Argentina.
Original combination: *Hoplopria kiefferi* Ogloblin, 1966: 71, 77.

Senior homonym: *Spilomicrus kiefferi* (Crawford, 1910) from Philippine Islands.
Original combination: *Cologlyptus kiefferi* Crawford, 1910: 124.

Replacement name: *Spilomicrus argentinicus* **nom. nov.**

pro *Spilomicrus kiefferi* (Ogloblin, 1966) **syn. nov.**

Etymology: From the type country Argentina.

Spilomicrus javaensis **nom. nov.**

Junior secondary homonym: *Spilomicrus maculipennis* Kieffer, 1907: 260 from Java.

Senior homonym: *Spilomicrus maculipennis* (Cameron, 1888) from Panama.
Original combination: *Paramesius maculipennis* Cameron, 1888: 438.

Replacement name: *Spilomicrus javaensis* **nom. nov.**

pro *Spilomicrus maculipennis* Kieffer, 1907 **syn. nov.**

Etymology: From the type locality Java.

Spilomicrus masneri **nom. nov.**

Junior secondary homonym: *Spilomicrus superbus* Masner, 1991: 117, 151 from Mexico.

Senior homonym: *Spilomicrus superbus* (Ogloblin, 1966) from Argentina.
Original combination: *Holopria superbus* Ogloblin, 1966: 74, 77, 78.

Replacement name: *Spilomicrus masneri* **nom. nov.**

pro *Spilomicrus superbus* Masner, 1991 **syn. nov.**

Etymology: The species name is dedicated to L. Masner who is the author of the preexisting species *S. superbus*.

Genus *TRICHOPRIA****Trichopria australiaensis* nom. nov.**

Junior secondary homonym: *Trichopria affinis* Dodd, 1915: 435, 437 from Australia.

Senior homonym: *Trichopria affinis* (Ashmaed, 1893) from Columbia.

Original combination: *Phaenopria affinis* Ashmaed, 1893: 437, 440.

Replacement name: *Trichopria australiaensis* **nom. nov.**

pro *Trichopria affinis* Dodd, 1915 **syn. nov.**

Etymology: From the type country Australia.

***Trichopria sharmai* nom. nov.**

Junior secondary homonym: *Trichopria montana* Sharma, 1979: 63, 73 from India.

Senior homonym: *Trichopria montana* (Ashmaed, 1893) from California.

Original combination: *Phaenopria montana* Ashmaed, 1893: 438, 440.

Replacement name: *Trichopria sharmai* **nom. nov.**

pro *Trichopria montana* Sharma, 1979 **syn. nov.**

Etymology: The species name is dedicated to S. K. Sharma who is the author of the preexisting species *T. montana*.

***Trichopria indiana* nom. nov.**

Junior primary homonym: *Trichopria spinosa* Rajmohana & Narendran, 2006: 77, 94 from Kerala, India.

Senior homonym: *Trichopria (Trichopria) spinosa* Kieffer, 1911: 991 from Ösel Island.

Replacement name: *Trichopria indiana* **nom. nov.**

pro *Trichopria spinosa* Rajmohana & Narendran, 2006 **syn. nov.**

Etymology: From the type country India.

PLATYGASTROIDEA
PLATYGASTRIDAE

Genus *CALLISCELIO****Calliscelio samoensis* nom. nov.**

Junior secondary homonym: *Calliscelio niger* (Fullaway, 1939) from Samoan Islands.

Original combination: *Caloteleia nigra* Fullaway, 1939: 211.

Senior homonym: *Calliscelio niger* (Dodd, 1913) from Australia.

Original combination: *Ceratoteleia nigra* Dodd, 1913: 175.

Replacement name: *Calliscelio samoensis* **nom. nov.**

pro *Calliscelio niger* (Fullaway, 1939) **syn. nov.**

Etymology: From the type locality Samoan Islands.

Genus *GRYON****Gryon kononovai* nom. nov.**

Junior secondary homonym: *Gryon elegans* Kononova, 2001: 1478 from Ukraine.

Senior homonym: *Gryon elegans* (Dodd, 1914) from Australia.

Original combination: *Plastogryon elegans* Dodd, 1914: 94.

Replacement name: *Gryon kononovai* **nom. nov.**

pro *Gryon elegans* Kononova, 2001 **syn. nov.**

Etymology: The species name is dedicated to S. V. Kononova who is the author of the preexisting species *G. elegans*.

***Gryon mineoi* nom. nov.**

Junior secondary homonym: *Gryon elongatum* Mineo, 1991: 22 from Zimbabwe.

Senior homonym: *Gryon elongatum* (Risbec, 1950) from Senegal.

Original combination: *Hadronotus antestiae* var. *elongatus* Risbec, 1950: 597.

Replacement name: *Gryon mineoi* **nom. nov.**

pro *Gryon elongatum* Mineo, 1991 **syn. nov.**

Etymology: The species name is dedicated to G. Mineo who is the author of the preexisting species *G. elongatum*.

***Gryon masneri* nom. nov.**

Junior secondary homonym: *Gryon longipenne* Masner, 1983: 134, 156 from Missouri, California, Georgia, Maryland, New York, Texas (S Nearctic region).

Senior homonym: *Gryon longipenne* (Dodd, 1913) from S Queensland.

Original combination: *Platyteleia longipennis* Dodd, 1913: 335.

Replacement name: *Gryon masneri* **nom. nov.**

pro *Gryon longipenne* Masner, 1983 **syn. nov.**

Etymology: The species name is dedicated to L. Masner who is the author of the preexisting species *G. longipenne*.

***Gryon kozlovi* nom. nov.**

Junior primary homonym: *Gryon oculatum* Kozlov & Kononova, 2004: 205 from Russia.

Senior homonym: *Gryon oculatum* Mineo, 1983: 548, 551 from Somali.

Replacement name: *Gryon kozlovi* **nom. nov.**

pro *Gryon oculatum* Kozlov & Kononova, 2004 **syn. nov.**

Etymology: The species name is dedicated to M. A. Kozlov who is the first author of the preexisting species *G. oculatum*.

Genus IDRIS

***Idris kononovai* nom. nov.**

Junior secondary homonym: *Idris bicolor* Kononova, 1995: 90 from Russia.

Senior homonym: *Idris bicolor* (Ashmead, 1893) from N America.

Original combination: *Acoloides bicolor* Ashmead, 1893: 170, 172.

Replacement name: *Idris kononovai* **nom. nov.**

pro *Idris bicolor* Kononova, 1995 **syn. nov.**

Etymology: The species name is dedicated to S. V. Kononova who is the author of the preexisting species *I. bicolor*.

Genus *MACROTELEIA****Macroteleia muesebecki* nom. nov.**

Junior primary homonym: *Macroteleia nitida* Muesebeck, 1977: 31 from Colombia.

Senior homonym: *Macroteleia nitida* Kieffer, 1908 from Trieste.

Original combination: *Macroteleia bicolora* var. *nitida* Kieffer, 1908: 176.

Replacement name: *Macroteleia muesebecki* **nom. nov.**

pro *Macroteleia nitida* Muesebeck, 1977 **syn. nov.**

Etymology: The species name is dedicated to C. F. W. Muesebeck who is the author of the preexisting species *M. nitida*.

Genus *OPISTHACANTHA****Opisthacantha derya* nom. nov.**

Junior secondary homonym: *Opisthacantha nigriceps* Dodd, 1913: 147 from Australia.

Senior homonym: *Opisthacantha nigriceps* (Kieffer, 1904) from Brasil.

Original combination: *Lapitha nigriceps* Kieffer, 1904: 537.

Replacement name: *Opisthacantha derya* **nom. nov.**

pro *Opisthacantha nigriceps* Dodd, 1913 **syn. nov.**

Etymology: The species name is dedicated to Derya Özbek Aslan (Turkey).

Genus *TELENOMUS****Telenomus ukrainicus* nom. nov.**

Junior secondary homonym: *Telenomus antennalis* (Kononova, 1973) from Ukraine.

Original combination: *Platytenomus antennalis* Kononova, 1973: 441, 442.

Senior homonym: *Telenomus antennalis* Fouts, 1934: 104 from Italy.

Replacement name: *Telenomus ukrainicus* **nom. nov.**

pro *Telenomus antennalis* (Kononova, 1973) **syn. nov.**

Etymology: From the type country Ukraine.

***Telenomus ryui* nom. nov.**

Junior secondary homonym: *Telenomus brevis* (Ryu, 1989) from Japan.

Original combination: *Platytenomus brevis* Ryu, 1989: 57, 59.

Senior homonym: *Telenomus brevis* (Thomson, 1860) from Sweden.

Original combination: *Phanurus brevis* Thomson, 1860: 173.

Replacement name: *Telenomus ryui* **nom. nov.**

pro *Telenomus brevis* (Ryu, 1989) **syn. nov.**

Etymology: The species name is dedicated to J. Ryu who is the author of the preexisting species *T. ryui*.

***Telenomus kononovai* nom. nov.**

Junior primary homonym: *Telenomus decoratus* Kononova, 2009: 524 from Bulgaria.

Senior homonym: *Telenomus decoratus* Kononova, 2000: 35, 37 from Ukraine.

Replacement name: *Telenomus kononovai* **nom. nov.**

pro *Telenomus decoratus* Kononova, 2009 **syn. nov.**

Etymology: The species name is dedicated to S. V. Kononova who is the author of the preexisting species *T. decoratus*.

***Telenomus russianicus* nom. nov.**

Junior primary homonym: *Telenomus impressus* Kononova, 1986: 60 from Russia.

Senior homonym: *Telenomus impressus* Ashmead, 1894: 203, 204, 205 from St. Vincent Island.

Replacement name: *Telenomus russianicus* **nom. nov.**

pro *Telenomus impressus* Kononova, 1986 **syn. nov.**

Etymology: From the type country Russia.

***Telenomus moldovianus* nom. nov.**

Junior primary homonym: *Telenomus minimus* Kozlov, 1967: 369 from Moldova.

Senior homonym: *Telenomus minimus* Ashmead, 1893: 144, 152 from N America.

Replacement name: *Telenomus moldovianus* **nom. nov.**

pro *Telenomus minimus* Kozlov, 1967 **syn. nov.**

Etymology: From the type country Moldova.

***Telenomus eustriatus* nom. nov.**

Junior primary homonym: *Telenomus striatus* Kononova, 1973: 45 from Ukraine.

Senior homonym: *Telenomus striatus* Risbec, 1950: 558, 564 from M'bambey, Africa.

Replacement name: *Telenomus eustriatus* **nom. nov.**

pro *Telenomus striatus* Kononova, 1973 **syn. nov.**

Etymology: From the name of species.

Genus *TRIMORUS*

***Trimorus hispanicus* nom. nov.**

Junior secondary homonym: *Trimorus brevipennis* (Kieffer, 1908) from Spain.

Original combination: *Penthacantha brevipennis* Kieffer, 1908: 240, 245.

Senior homonym: *Trimorus brevipennis* (Kieffer, 1908) from Italy.

Original combination: *Hoplogryon brevipennis* Kieffer, 1908: 206, 223.

Replacement name: *Trimorus hispanicus* **nom. nov.**

pro *Trimorus brevipennis* (Kieffer, 1908) **syn. nov.**

Etymology: From the type country Spain.

***Trimorus nihali* nom. nov. and *Trimorus nearcticus* nom. nov.**

Junior secondary homonym: *Trimorus coxalis* (Ashmead, 1893) from N America.

Original combination: *Teleas coxalis* Ashmead, 1893: 199.

Junior primary homonym: *Trimorus coxalis* (Ashmead, 1893) from N America.

Original combination: *Prosacantha coxalis* Ashmead, 1893: 186.

Senior homonym: *Trimorus coxalis* (Thomson, 1859) from Sweden.

Original combination: *Prosacantha coxalis* Thomson, 1859: 427.

Replacement names: *Trimorus nihali* **nom. nov.**
pro *Trimorus coxalis* (Ashmead, 1893) **syn. nov.**
Teleas coxalis Ashmead, 1893

Etymology: The species name is dedicated to Nihal Mercan (Turkey).

Replacement names: *Trimorus nearcticus* **nom. nov.**
pro *Trimorus coxalis* (Ashmead, 1893) **syn. nov.**
Prosacantha coxalis Ashmead, 1893

Etymology: From the type locality.

***Trimorus mukerjeei* nom. nov.**

Junior secondary homonym: *Trimorus longispina* Mukerjee, 1981: 17, 26 from India.

Senior homonym: *Trimorus longispina* (Kieffer, 1913) from Philippine.

Original combination: *Hoplogryon longispina* Kieffer, 1913: 429.

Replacement name: *Trimorus mukerjeei* **nom. nov.**
pro *Trimorus longispina* Mukerjee, 1981 **syn. nov.**

Etymology: The name is dedicated to M. K. Mukerjee who is the author of the preexisting species *T. longispina*.

***Trimorus dahl* nom. nov.**

Junior secondary homonym: *Trimorus pedestris* (Dahl, 1912) from N America.

Original combination: *Hoplogryon pedestris* Dahl, 1912: 550.

Senior homonym: *Trimorus pedestris* (Kieffer, 1908) from Bitche, Europe.

Original combination: *Paragryon pedestris* Kieffer, 1908: 199.

Replacement name: *Trimorus dahl* **nom. nov.**
pro *Trimorus pedestris* (Dahl, 1912) **syn. nov.**

Etymology: The name is dedicated to F. Dahl who is the author of the preexisting species *T. pedestris*.

***Trimorus madagascariensis* nom. nov.**

Junior secondary homonym: *Trimorus tananarivensis* (Risbec, 1956) from Madagascar.

Original combination: *Hoplogryon tananarivensis* Risbec, 1956: 369.

Senior homonym: *Trimorus tananarivensis* Risbec, 1950: 580 from Madagascar.

Replacement name: *Trimorus madagascariensis* **nom. nov.**
pro *Trimorus tananarivensis* (Risbec, 1956) **syn. nov.**

Etymology: From the type locality Madagascar.

***Trimorus doddi* nom. nov. and *Trimorus thomsoni* nom. nov.**

Junior secondary homonym: *Trimorus varicornis* (Dodd, 1914) from Australia.

Original combination: *Hoplogryon varicornis* Dodd, 1914: 75, 78.

Junior secondary homonym: *Trimorus varicornis* (Thomson, 1859) from Sweden.

Original combination: *Prosacantha varicornis* Thomson, 1859: 429.

Senior homonym: *Trimorus varicornis* (Walker, 1836) from France.

Original combination: *Teleas varicornis* Walker, 1836: 357.

Replacement name: *Trimorus doddi* **nom. nov.** for *Trimorus varicornis* (Dodd, 1914)
pro *Trimorus varicornis* (Dodd, 1914) **syn. nov.**

Etymology: The name is dedicated to A. P. Dodd who is the author of the preexisting species *T. varicornis*.

Replacement name: *Trimorus thomsoni* **nom. nov.** for *Trimorus varicornis* (Thomson, 1859)

pro *Trimorus varicornis* (Thomson, 1859) **syn. nov.**

Etymology: The name is dedicated to C. G. Thomson who is the author of the preexisting species *T. varicornis*.

LITERATURE CITED

Ashmead, W. H. 1893. A monograph of the North American Proctotrypidae. Bulletin of the United States National Museum, 45: 1-472.

Ashmead, W. H. 1894. Report on the parasitic Cynipidae, part of the Braconidae, the Ichneumonidae, the Proctotrypidae, and part of the Chalcidinae. Part III. Zoological Journal of the Linnean Society of London, 25: 188-254.

Ashmead, W. H. 1896. Report on the parasitic Hymenoptera of the island of Grenada, comprising the families Cynipidae, Ichneumonidae, Braconidae, and Proctotrypidae. Proceedings of the Zoological Society of London, 1895: 742-812.

Cameron, A. E. 1888. Insecta. Hymenoptera (Families Tenthredinidae - Chrysididae). Vol. I. Biologia Centrali-Americana, 433-466.

Crawford, J. C. 1910. New Hymenoptera from the Philippine Islands. Proceedings of the U.S. National Museum, 38: 119-133.

Dahl, F. 1912. Tierwelt. Beitr. Naturdenkmalpfl., 3: 339-638.

Dodd, A. P. 1913. Australian Hymenoptera Proctotrypoidea. No. 1. Transactions of the Royal Society of South Australia, 37: 130-181.

Dodd, A. P. 1913. Some south Queensland Proctotrypoidea. Memoirs of the Queensland Museum, 2: 335-339.

Dodd, A. P. 1914. Further new genera and species of Australian Proctotrypoidea. Proceedings of the Royal Society of Queensland, 26: 91-140.

Dodd, A. P. 1914. Australian Hymenoptera Proctotrypoidea. No. 2. Transactions of the Royal Society of South Australia, 38: 58-131.

Dodd, A. P. 1915. Australian Hymenoptera Proctotrypoidea. No. 3. Transactions and Proceedings of the Royal Society of South Australia, 39: 384-454.

Fouts, R. M. 1934. Report on a small collection of parasitic Hymenoptera from Italian Somaliland. Memorie della Societa Entomologica Italiana, 13: 98-109.

Fullaway, D. T. 1939. New species of proctotrupid wasps from the Bishop Museum collection of Samoan and Fijian insects. Proceedings of the Hawaiian Entomological Society, 14: 209-221.

Kieffer, J. J. 1904. Beschreibung neuer Proctotrypiden und Evaniiden. Arkiv för Zoologi, 1: 525-562.

Kieffer, J. J. 1907. Beschreibung neuer im Naturhistorischen Museum zu Hamburg aufbewahrter Proctotrypiden und Evaniidae. Berliner Entomologische Zeitschrift, 51: 258-278.

Kieffer, J. J. 1908. Revision des Scelionidae (Hymenopteres). Annales de la Société Scientifique de Bruxelles. Memoires, (32): 111-250.

Kieffer, J. J. 1910. Beschreibung neuer suedamerikanischer im Zoologischen Museum zu Berlin aufbewahrter Diapriiden. Entomologische Rundschau, 27: 39-56.

- Kieffer, J. J.** 1911. Species des Hyménoptères d'Europe et d'Algérie. Vol. 10. Pages 913-1015. Librairie Scientifique A. Hermann & Fils, Paris. pp.
- Kieffer, J. J.** 1913. Serphides des Îles Philippines. *Insecta*, 3: 253-462.
- Kieffer.** 1914. Nouveaux diapiiides de Manila. *Insecta*, 4: 190-198.
- Kononova, S. V.** 1973. [Contribution to studies of the telenomine fauna (Hymenoptera, Scelionidae) of the Ukraine.] *Vestnik Zoologii*, 1973 (5): 42-47.
- Kononova, S. V.** 1973. [Egg parasites of the genera *Aporophlebus* Kozlov, 1970 and *Platytelenomus* Dodd, 1914 (Hymenoptera, Scelionidae) in the fauna of the Ukraine.] *Entomologicheskoye Obozreniye*, 52: 658-664.
- Kononova, S. V.** 1986. [New species of telenomine parasitoids (Hymenoptera, Scelionidae, Telenominae) from the Far East of the USSR.] Pages 55-63 *In*: Ler, Belokobyl'skii & Storozheva. [Hymenoptera of eastern Siberia and the Far East, collected works.] Far-East Science Center, Biological-Soil Institute AN SSSR, Vladivostok. 152 pp.
- Kononova, S. V.** 1995. [Fam. Scelionidae.] Pages 57-121 *In*: Lehr. [Key to insects of Russian Far East in six volume. vol. 4. Neuropteroidea, Mecoptera, Hymenoptera. Part 2. Hymenoptera. Dal'nauka, Vladivostok. 600 pp.
- Kononova, S. V.** 2000. [New Palearctic genus and species of Scelionidae (Hymenoptera).] *Vestnik Zoologii*, 34 (1-2): 31-40.
- Kononova, S. V.** 2009. [New Palearctic species of Telenominae of the subgenus *Telenomus* (Hymenoptera, Scelionidae, Telenominae) having metadorsum with parapsidal wrinkles.] *Zoologicheskii Zhurnal*, 88: 522-529.
- Kononova, S. V. & Petrov, P.** 2001. [A review of the genera *Gryon* and *Exon* (Hymenoptera, Scelionidae) from the Palearctic. 1. New species of the genus *Gryon*. *Zoologicheskii Zhurnal*, 80: 1468-1480.
- Kozlov, M. A.** 1967. [Palearctic species of egg parasites of the genus *Telenomus* Haliday (Hymenoptera, Scelionidae, Telenominae).] *Entomologicheskoye Obozreniye*, 46: 361-378.
- Kozlov, M. A. & Kononova, S. V.** 1978. [Species of the genus *Telenomus* Haliday, 1833 (Hymenoptera, Scelionidae) with shortened wings.] *Vestnik Zoologii*, 1978 (3): 80-81.
- Kozlov, M. A. & Kononova, S. V.** 2004. [New species of egg-parasites of the genus *Gryon* Haliday (Hymenoptera: Scelionidae) of the Palearctic fauna.] *Trudy Russkogo Entomologicheskogo Obshchestva*, 75: 194-208.
- Masner, L.** 1983. A revision of *Gryon* Haliday in North America (Hymenoptera: Proctotrupoidea: Scelionidae). *The Canadian Entomologist*, 115: 123-174.
- Masner, L.** 1991. Revision of *Spilomicrus* Westwood in America north of Mexico (Hymenoptera: Proctotrupoidea, Diapriidae). *The Canadian Entomologist*, 123: 107-177.
- Mineo, G.** 1983. Studies on the Scelionidae (Hym. Proctotrupoidea) XX. Revision of the genus *Gryon* Haliday (Ethiopian region): the insulare and oculatum-groups. *Redia*, 66: 527-552.
- Mineo, G.** 1991. Description of new species of *Gryon* Haliday (Hym., Scelionidae). *Frustula Entomologica*, 14 (27): 1-42.
- Muesebeck, C. F. W.** 1977. The parasitic wasps of the genus *Macroteleia* Westwood of the New World (Hymenoptera, Proctotrupoidea, Scelionidae). U.S. Department of Agriculture Technical Bulletin, 1565: 1-57.
- Mukerjee, M. K.** 1981. On a collection of Scelionidae and Platygastriidae (Hymenoptera: Proctotrupoidea) from India. *Rec. Zool. Surv. India Misc. Publ. Occ. Pap. No. 2*, . 78 pp.
- Mukerjee, M. K.** 1994. Descriptions of some new and records of some known Proctotrupoidea (Hymenoptera) from Garhwal Himalayas, India. *Records of the Zoological Survey of India Occasional Papers*, 163: 1-73.

Ogloblin, A. 1966. Especies nuevas o poco conocidas del genero *Hoplopria* Ashmead (Hymenoptera, Diapriidae). *Revista Sociedad Entomologica Argentina*, 28: 71-78.

Parr, W. J. 1960. Three new species of *Aphanogmus* (Hymenoptera: Ceraphrontidae) from Britain, with a re-description of *A. fumipennis* Thoms., 1858, a species new to Britain. *Transactions of the Society for British Entomology*, 14: 115-130.

Rajmohana, K. 2006. Studies on Proctotrupeoidea and Platygastroidea (Hymenoptera: Insecta) of Kerala. *Memoirs of the Zoological Survey of India*, 21 (1): 1-153.

Risbec, J. 1950. Contribution a l'étude des Proctotrupidae (Serphiidae). (II) Pages 511-639 *In*: Risbec. *Travaux du Laboratoire d'Entomologie du Secteur Soudanais de Recherches Agronomiques. Gouvernement Général de l'Afrique Occidentale Française*, Paris. 639 pp.

Risbec, J. 1956. Scelioninae de Madagascar (Telenomini, Teleasini, Baeini). *Bulletin de la Société Zoologique de France*, 80: 364-374.

Ryu, J. & Hirashima, Y. 1989. Taxonomic studies on the genera *Aporophlebus*, *Eumicrosoma*, and *Platytenomus* of Japan and Korea (Hymenoptera, Scelionidae, Telenominae). *Esakia*, 28: 49-62.

Sharma, S. K. 1979. Studies on Indian Diapriidae (Proctotrupeoidea: Hymenoptera). *Memoirs of the School of Entomology, St. John's College*, 7: 1-88.

Thomson, C. G. 1859. Sveriges Proctotruper. Tribus VII. Scelionini. Öfversigt af Kongliga Ventenskaps-Akadamiens Förhandlingar, 15: 417-431.

Thomson, C. G. 1860. Sveriges Proctotruper. Tribus IX. Telenomini. Tribus X. Dryinini. Öfversigt af Kongliga Ventenskaps-Akadamiens Förhandlingar, 17: 169-181.

Walker, F. 1836. On the species of Teleas, &c. *Entomological Magazine*, 3: 341-370.

**CHECK-LIST OF THE FAMILY CIMBICIDAE OF TURKEY
AND SOME BIOLOGICAL OBSERVATIONS
(HYMENOPTERA: SYMPHYTA)**

Önder Çalmaşur*

Atatürk University, Faculty of Agriculture, Department of Plant Protection, 25240, Erzurum, TURKEY. E-mails: calmasur@atauni.edu.tr and ondercali@hotmail.com

[Çalmaşur, Ö. 2011. Check-list of the family Cimbicidae of Turkey and some biological observations (Hymenoptera: Symphyta). Munis Entomology & Zoology, 6 (2): 779-784]

ABSTRACT: A total of 17 species in six genera of the sawfly family Cimbicidae were found in Turkey. The material was collected in various provinces, mainly in the eastern part of the country, during 1987-2009. The paper gave an updated list of species together with distribution records from own observations and literature. Five species are reported as new to Turkey, namely *Cimbex femoratus* (Linné, 1758), *Corynis crassicornis* (Rossi, 1790), *Corynis orientalis* (Konow, 1898), *Corynis similis* (Mocsáry, 1880) and *Trichiosoma latreillii* Leach, 1817. New localities are added for previously known species.

KEY WORDS: Cimbicidae, Symphyta, sawfly, fauna, new records, Turkey.

The suborder Symphyta includes those Hymenoptera, which are structurally primitive, most families and superfamilies are relatively small taxa containing, world-wide, about 8755 species (Taeger & Blank, 2008). Symphytans may be recognized by the absence of a marked constriction between the first and second abdominal segments, and by the possession of at least one closed anal cell in the forewing. The larvae have well-developed head capsule and most have thoracic legs; the majority of free-feeding larvae are caterpillar-like with abdominal prolegs. With the exception of the Orussidae the larvae are phytophagous (Gauld & Bolton, 1988; Goulet & Huber, 1993).

The Tenthredinoidea is the largest superfamily of Symphyta, contains 8 families and, 7230 species in these families and, 196 species in the family of Cimbicidae (Taeger & Blank, 2008). The Cimbicidae are a small family of large-bodied, often hairy sawflies. The family is distinctive in having antennae with a prominent apical club or knob and 6 to 7-segmented. Some members of Cimbicidae are among the largest Hymenoptera. One of them, *Cimbex americana* Leach, is a spectacular insect as it is the largest sawfly (adult about 3 cm long, larva 5 cm long) that attracts attention when found (Goulet & Huber, 1993).

Larva polypodous, with eight pairs of abdominal prolegs; antenna 2-segmented. The Larva is the size of the little finger, it coils itself into a tight spiral and drops when disturbed. Larvae are solitary herbivores and eat leaves of honeysuckle (*Lonicera*), willow (*Salix*), elm (*Ulmus*), snowberry (*Symphoricarpus*), and sometimes other plants as Rosaceae. The larva of most species feed on woody angiosperm (Gauld & Bolton, 1988; Goulet & Huber, 1993; Anon., 2009). Adult buzzes when picked up; when touched, the spines on its powerful legs generally cause pain that is intense enough to cause it to be dropped. The males of many species have enlarged hind legs and mandibles which they use in fights with rival males for the possession of females (Gauld & Bolton, 1988; Goulet & Huber, 1993).

With the exception of a few scattered studies on a few incurious species (Birkardeşler, 1961; Tuatay, 1963; Acatay, 1969; Özeren, 1970; Baş, 1973; Altınayar, 1976) sawfly fauna of Turkey has not been studied previously. Faunal and systematic studies were carried out by Benson (1968) and Wolf (1968);

Benson published a comprehensive paper on sawflies of Turkey and described many new species and subspecies. Özbek (1986) detected *Fenusa pusilla* Lep. (Tenthredinidae) as a new pest on *Betula verrucosa* Ehr.. Recently, Güçlü & Özbek (1999) recognized *Messa hortulana* (Klug) as a new poplar pest and more recently Çalmaşur & Özbek (2004a,b) made contributions on the Tenthredinidae fauna of Turkey. The same authors recognized two sawfly species, *Heterarthrus ochropoda* (Klug) and *Nematus salicis* (Linnaeus) as new records and new pests on poplar and willow respectively (Çalmaşur & Özbek, 2004c, 2006a). Additionally, Özbek & Çalmaşur (2005) listed several sawflies species as pest of *Rosa* spp. in Turkey and finally they prepared a checklist for the family Argidae occurring in Turkey (Çalmaşur & Özbek, 2006b). There is no any special study on Cimbicidae in Turkey up to now.

Present paper is aimed to update my present-day knowledge on the Turkish species of Cimbicidae.

MATERIAL AND METHODS

In the present study more than 78 specimens have been collected by sweeping plants, with an insect net, mostly by the authors, mainly in eastern Turkey during 1987-2009. Few specimens have been reared from larvae in cages in the laboratory. The species have already been recorded, but no representatives found in this study were also added. Specimens were examined with stereoscopic microscope for diagnosis. Identification of the species was made according to Zhelochovtsev (1988) and by comparing the specimens with aforesaid museum collections. Undetermined specimens were identified by D.R. Smith. Within the genera the species are listed alphabetically. The genera and species are listed in the alphabetic order according Taeger & Blank (2008). I also use the distributional records from this publication and Zhelochovtsev (1988). All records are arranged in the following way "province, town, collecting locality, geographic name, and altitude if known, date of collecting, and number of individuals". The name of the province from which a particular species is recorded for the first time is given in the bold type. The material mentioned in this study is deposited in the Entomology Museum Erzurum, Turkey (EMET).

RESULTS

List of the species as follows:

***Abia aenea* (Klug, 1820)**

Distribution: Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Latvia, Luxembourg, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008), Turkey: Trabzon (Benson, 1968).

Host Plant: *Lonicera*, *Symphoricarpos* (Zhelochovtsev, 1988; Liston, 1995).

***Abia sericea* (Linné, 1767)**

Distribution: Austria, Belgium, Bosnia and Herzegovina, Bulgaria, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Macedonia, Netherlands, Poland, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine (Liston, 1995; Taeger & Blank, 2008), Turkey: Istanbul, Mersin, Samsun (Benson, 1968; Chevin & Chenon, 1982).

Material examined: **Ardahan:** Posof, Aşık Zülali, 2200 m, 25.VII.2005, 1 specimen. **Bayburt:** Kopdağı, 2100 m, 25.VI.2004, 1 specimen. **Bilecik:** 600 m, 15.VII.1995, 1 specimen. **Erzurum:** İlca, Eğerti, 1900 m, 28.VI.1997, 1 specimen; Oltu, Tutmaç-Başaklı, 2000 m, 01.VII.2000, 1 specimen; Pasinler, Çalıyazı, 2400 m, 10.VII.1997, 1 specimen; Tortum, Çataldere, 1950-2500 m, 12.VII.2001, 1 specimen; Uzundere, Dikyar, 1750 m, 10.VII.1994, 1 specimen.

Host Plants: *Succisa pratensis*, *Knautia arvensis*, *Fragaria* (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 1998). *Dipsacus* (Savina & Liston, 2009).

***Cimbex femoratus* (Linné, 1758)**

Distribution: Austria, Belgium, Bulgaria, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Japan, Korea (North + South Korea), Latvia, Luxembourg, Macedonia, Netherlands, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008).

Material Examined: Erzurum: University Fields, 1850 m, 03.III.2000, 4 specimens, 07.V. 2001, 5 specimens, 25.V.2000, 12 specimens, 07.VI.2003, 1 specimen, 14.VI.2004, 1 specimen.

Host Plant: *Betula pendula*, *B. pubescens* (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 1998).

New for the Turkish fauna.

Biological observations: The Birch sawfly (*Cimbex femoratus* L.) is a new pest for Turkey on *Betula pendula* Ehr. in Erzurum during May - July. The eggs are laid in the leaves of the birch tree. The larvae resembles a caterpillar, has eleven pairs of extremities, is slow-moving and light green in colour with a dark dorsal stripe and dark spots round the spiracles. The larvae rest on the underneath of birch leaves during the day at the shape of spiral, feeding on birch leaves at night. When threatened they spray haemolymph to a distance of 15-20 cm. I observed only one generation a year in the ecological conditions of Erzurum. Most of the material was obtained from overwintered larvae in the laboratory.

***Corynis caucasica* (Mocsáry, 1886)**

Distribution: Bulgaria, Iran, Turkey, Yugoslavia (Serbia and Montenegro) (Liston, 1995; Taeger & Blank, 2008), Turkey: Amasya, Edirne, Trabzon (Benson, 1968).

Host Plant: Unknown.

***Corynis crassicornis* (Rossi, 1790)**

Distribution: Albania, Austria, Belgium, Bosnia and Herzegovina, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Macedonia, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Switzerland, Ukraine, Yugoslavia (Serbia and Montenegro) (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008).

Material Examined: Artvin: Şavşat, Karagöl, 1750 m, 08.VII.1998, 1 specimen. **Erzurum:** Palandöken, 2400 m, 01.VI.1996, 1 specimen; Uzundere, Yedigöller, 1100 m, 17.V.1998, 1 specimen.

Host Plant: *Sedum acre*, *S. album* (Zhelochovtsev, 1988; Taeger & Blank, 1998).

New for the Turkish fauna as well as Asian Continent.

***Corynis frontina* (Konow, 1905)**

Distribution: Greece, Turkey (Taeger & Blank, 2008), Turkey: Amasya, Ankara, Artvin, Balıkesir, Gümüşhane, Mersin, Samsun (Benson, 1968; Chevin & Chenon, 1982).

Host Plant: Unknown.

***Corynis italica* (Lepeletier, 1823)**

Distribution: Croatia, France, Greece, Italy, Spain, Switzerland, Turkey, Ukraine, Yugoslavia (Serbia and Montenegro) (Liston, 1995; Taeger & Blank, 2008), Turkey: Amasya, Bursa, Isparta (Benson, 1968; Chevin & Chenon, 1982).

Host Plant: Adults visit flowers of *Geranium molle* (Liston, 1995).

***Corynis krueperi* (Stein, 1876)**

Distribution: Greece, Libya, Macedonia, Turkey (Liston, 1995; Taeger & Blank, 2008), Turkey: Amasya, Bursa (Benson, 1968).

Host Plant: Unknown.

***Corynis lateralis* (Brullé, 1832)**

Distribution: Bulgaria, France, Greece, Kazakhstan, Macedonia, Romania, Russia, Spain, Turkey, Ukraine (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008), Turkey: Amasya, Ankara, Artvin (Benson, 1968).

Material Examined: **Artvin:** Genye Dağı, 1850 m, 28.VII.2004, 1 specimen. **Erzurum:** Ilıca, Atlıkonak, 2400 m, 29.VI.2001, 1 specimen; İspir, Fısırk Kalesi, 2300 m, 12.VII.2001, 1 specimen; Köprüköy, Örentaş, 2100 m, 12.VI.2001, 2 specimens; Oltu, Tutmaç-Başaklı, 1900 m, 01.VII.2000, 1 specimen; Pasinler, Çalıyazı, 2400 m, 10.VII.1997, 1 specimen; Pazaryolu, Karataş, 2200 m, 05.VII.2000, 1 specimen; Tortum, 1550 m, 10.VI.1987, 2 specimens. **Gümüşhane:** Vauk Geçidi, 1850 m, 21.VI.2001, 1 specimen.

Host Plant: Unknown.

***Corynis mutabilis* (Tischbein, 1852)**

Distribution: Bulgaria, Greece, Turkey, Ukraine (Taeger & Blank, 2008), Turkey: Amasya, Antalya, Çankırı, Erzurum, Konya, Mersin, Trabzon (Benson, 1968; Wolf, 1968).

Material Examined: **Erzincan:** Avclar, 1350 m, 25.V.2005, 1 specimen. **Erzurum:** Ilıca, Atlıkonak, 2100 m, 21.VI.2004, 1 specimen; Horasan, Yukarı Bademli, 1950 m, 24.VI.1999, 1 specimen.

Host Plant: Unknown.

***Corynis orientalis* (Konow, 1898)**

Distribution: Iraq, Israel, Lebanon, Syria (Benson, 1968).

Material Examined: **Diyarbakır:** Silvan, 17.IV.1995, 1 specimen.

Host Plant: Unknown.

New for the Turkish fauna.

***Corynis obscura* (Fabricius, 1775)**

Distribution: Albania, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Macedonia, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008), Turkey: Bolu, Erzurum, Trabzon (Benson, 1968; Wolf, 1968).

Material Examined: **Ardahan:** Posof, Aşık Zılal, 2200 m, 25.VII.2005, 2 specimens. **Artvin:** Genye Dağı, 1600 m, 10.VI.2005, 1 specimen; Şavşat, 1500 m, 10.VI.2005, 1 specimen. **Erzurum:** Oltu, Başaklı, 1850 m, 14.VII. 2004, 1 specimen, 09.VIII.2000, 1 specimen, 22.VIII.2001, 1 specimen; Çamlıbel, 1600 m, 26.VII.2000, 5 specimens, Tutmaç-Başaklı, 1700-2000 m, 31.VII.2001, 2 specimens; Tortum, Uzun kavak, 1800 m, 12.VII.2001, 1 specimen; University Campus, 1850 m, 21.VIII.1996, 1 specimen. **Gümüşhane:** Vauk Geçidi, 1850 m, 21.VI.2001, 1 specimen, 24.VI.2001, 1 specimen. **Rize:** İkizdere, Çamlık, 1600 m, 29.VII.2000, 1 specimen.

Host Plant: *Geranium silvaticum*, *G. sanguineum* (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 1998).

***Corynis reticulata* Benson, 1954**

Distribution: Israel, Turkey (Taeger & Blank, 2008), Turkey: Niğde (Benson, 1968).

Material Examined: **Kars:** Aras Vadisi, Akkurt, 1600 m, 18.V.2002, 1 specimen.

Malatya: Arapgir, 1250 m, 16.V.2002, 3 specimens.

Host Plant: Unknown

Remark: Kars is the north-easternmost distribution of *C. reticulata*.

***Corynis similis* (Mocsáry, 1880)**

Distribution: Crete, Cyprus, Greece, Israel, Jordan, Lebanon, Syria (Liston, 1995; Taeger & Blank, 2008).

Material Examined: **Hatay:** Bademli, 6 km W Hassa, 850 m, 13.V.2002, 2 specimens.

Host Plant: *Papaver* sp. (Liston, 1995).

New for the Turkish fauna.

***Palaeocimbex quadrimaculata* (Müller, 1766)**

Distribution: Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Israel, Italy, Macedonia, Netherlands, Portugal, Romania, Slovakia, Spain, Turkey, Ukraine (Benson, 1968; Liston, 1995; Taeger & Blank, 2008), Turkey: İzmir (Wolf, 1968).

Host Plant: *Prunus spinosa*, *Pyrus*, *Crataegus* (Liston, 1995).

***Pseudoclavellaria amerinae* (Linné, 1758)**

Distribution: Austria, Bulgaria, China, Corea, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Macedonia, Netherlands, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine, Yugoslavia (Serbia and Montenegro) (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008), Turkey: Gümüşhane (Benson, 1968).

Material Examined: Erzurum: Tortum, Aşağı Meydanlar, 1750 m, 21.V.1995, 1 specimen. **Kars:** Sarıkamış, Karakurt, 1550 m, 02.V.2000, 1 specimen, 26.V.2000, 1 specimen.

Host Plant: *Salix fragilis*, *S. caprea*, *Populus* (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 1998).

***Trichiosoma latreillii* Leach, 1817**

Distribution: Austria, Belgium, China, Czech Republic, Great Britain, Hungary, Mongolia, Netherlands, Russia, Slovakia, Ukraine (Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008).

Material Examined: Bayburt: Kopdağı, 2000 m, 25.VI.2004, 2 specimen.

Host Plant: *Betula*, *Salix* (Zhelochovtsev, 1988; Liston, 1995).

New for the Turkish fauna.

DISCUSSION

With this study, the list of Cimbicidae (Symphyta, Hymenoptera) is increased to a total of 23 species in six genera in Turkey. Of these, *Cimbex femoratus*, *Corynis crassicornis*, *Corynis orientalis*, *Corynis similis* and *Trichiosoma latreillii* are new for Turkish fauna (Benson, 1968; Wolf, 1968; Chevin & Chenon 1982; Zhelochovtsev, 1988; Liston, 1995; Taeger & Blank, 2008). There is no detailed faunal study on this group except for above researchers, current data in this paper is contributed determining Turkish fauna. Distribution data and host plant ranges are reviewed for Cimbicidae in Turkey. Brief biological data regarding *Cimbex femoratus* is newly produced from Turkey and it is also an important pest on *Betula pendula* in Erzurum.

ACKNOWLEDGEMENTS

I express my cordial thanks to David R. SMITH (USA) for identification of materials. I also would like to thanks following persons who kindly helped in the collection of the material: Hikmet Özbek, Erol YILDIRIM, İrfan ASLAN, Rüstem HAYAT, Göksel TOZLU, Saliha ÇORUH, and Coşkun GÜÇLÜ.

LITERATURE CITED

- Acatay, A.** 1969. Gül ve Gülyağı. Özaydın Matbaası, İstanbul, 63 (Turkish).
- Altınayar, G.** 1976. Cereal stem sawflies in Turkey. Report - CENTO Scientific Programme. Wheat pests, 39-48.
- Anonymous.** 2009. <http://www.answers.com/topic/cimbicidae-1>.
- Baş, R.** 1973. Türkiye'de orman ağaçlarında zarar yapan zar kanatlılar (Hymenoptera) üzerinde araştırmalar. Orman Bakanlığı, Orman Genel Müdürlüğü, Yayın, No:570, Seri No: 23, 169 (Turkish).
- Benson, R. B.** 1968. Hymenoptera from Turkey, Symphyta. Bulletin of the British Museum (N.H.) Entomology, 22 (4): 4-207.
- Birkardeşler, H.** 1961. *Sterictophora furcata* Vill. (Erik Yaprak Arısı). Koruma, sayı 11-12. Model Matbaası-İstanbul, 10-12.
- Chevin, H. & Chenon, R. D. de** 1982. Contribution a la faune des Hymenopteres Symphytes de Turkie. Bulletin de la Societe Entomologique de France, 87: 44-47.

Çalmaşur, Ö. & Özbek, H. 2004a. A Contribution to the knowledge of the fauna of Tenthredinidae (Symphyta, Hymenoptera) of Turkey part I: The subfamily Tenthredininae. Turkish Journal of Zoology, 28: 37-54.

Çalmaşur, Ö. & Özbek, H. 2004b. A Contribution to the knowledge of Tenthredinidae (Symphyta, Hymenoptera) fauna of Turkey part II: subfamilies Blennocampinae, Dolerinae, Nematinae and Selandrinae. Turkish Journal of Zoology, 28:55-71.

Çalmaşur, Ö. & Özbek, H. 2004c. *Heterarthrus ochropoda* (Klug) (Hymenoptera: Tenthredinidae), a new record and a new pest of *Populus* spp. (Salicaceae) in Turkey. Proceedings of The Entomological Society of Washington, 106 (3): 717-721.

Çalmaşur, Ö. & Özbek, H. 2006a. A willow sawfly, *Nematus salicis* (Linnaeus) (Hymenoptera: Tenthredinidae), A new record and new pest of *Salix* spp. in Turkey. Proceedings of The Entomological Society of Washington, 108 (1): 139-144.

Çalmaşur, Ö. & Özbek, H. 2006b. Check-list of the Argidae fauna (Hymenoptera: Symphyta) of Turkey. Zoology in The Middle East, 39: 89-96.

Gauld, I. & Bolton, B. 1988. The Hymenoptera. Oxford University Press, Oxford, 332.

Goulet, H. & Huber J. T. 1993. Hymenoptera of The World: An identification guide to families. Canada Communication Group Publishing Ottawa, Canada KIA 0S9, 669.

Güçlü, Ş. & Özbek, H. 1999. *Messa hortulana* (Klug) (Hymenoptera: Tenthredinidae), a new record and a new poplar pest for Turkey. Acta Entomologica Bulgarica, 1999: 72-75.

Liston, A. D. 1995. Compendium of European Sawflies. Chalastos Forestry, Daibersdorf 6, Gottfrieding. Germany, 190.

Özbek, H. 1986. Erzurum'da Türkiye için yeni bir huş (*Betula verrucosa* Ehr) zararlısı, *Fenusa pusilla* Lep. (Tenthredinidae: Hymenoptera). Türkiye Bitki Koruma Dergisi, 10(2): 115-123.

Özbek, H. & Çalmaşur, Ö. 2005. A review of insects and mites associated with Roses (*Rosa* spp.). Acta Horticulturae, (ISHS) 690:167-174.

Özeren, H. 1970. Ankara Bölgesinde bazı meyve ve orman ağaçları ile süs bitkilerine zarar veren Hymenoptera türleri, yayılışı ve taksonomileri üzerinde ön araştırmalar. Ankara Üniversitesi Ziraat. Fakültesi Yay. 396, B.A.Inc.:246, 73.

Savina, H. & Liston, A. D. 2009. European *Abia* species feeding on Dipsacaceae, with description of the larva of *A. fulgens* Zaddach, 1863 (Hymenoptera, Symphyta, Cimbicidae). Bulletin de la Société Entomologique de France, Paris 114 (3): 265-276.

Taeger, A. & Blank, S. M. 1998. Pflanzenwespen Deutschlands (Hymenoptera, Symphyta). Goecke und Evers, 364.

Taeger, A. & Blank, S. M. 2008. ECatSym Electronic World Catalog of Symphyta (Insecta, Hymenoptera). Program version 3.9 data version 34 (05.09.2008). Digital Entomological Information, Müncheberg. http://www.zalf.de/homezalf/institute/dei/php_e/ecatsym/ecatsym.php.

Tuatay, N. 1963. Isparta ve Burdur bölgesi yağ güllerinin başlıca zararlıları, kısa biyolojileri ve savaş metodları üzerinde araştırmalar. Tarım Bakanlığı, Ankara Zirai Mücadele Enstitüsü Müdürlüğü, Sayı 39, 78.

Wolf, F. 1968. Hymenopteres Symphytes de Turquie. Bulletin des Recherches Agronomiques de Gembloux 3 (3): 562-565.

Zhelochovtsev, A. N. 1988. Symphyta, pp. 377-387. In Medvedjev, G.S., ed. Oprendielat Nasekomykh Evropeiskoi Chasti SSSR. III. Perepondhatokrylye 6. Oprenditel'i po faune SSSR 158. Nauka Leningrad. (1994, English translation, 27, Order Hymenoptera, Suborder Symphyta (Chalastogastra). In Medvedjev, G.S., ed. Keys to the Insects of the European Part of the USSR. Amerind Publishing Co., Pvt. Ltd., New Delhi. 432.

INVESTIGATION OF *EMBLICA OFFICINALIS* DIET ON LONGEVITY, BEHAVIOR AND FITNESS CHARACTERS IN A *DROSOPHILID*: *PHORTICELLA STRIATA*

B. R. Guru Prasad* M. C. Mokshith and Pathak Pankaj

* Lecturer Department of Biology, Kannada Bharthi College, Khusal Nagar, Madikeri, INDIA. E-mail: gurup2006@yahoo.co.in

[Guru Prasad, B. R., Mokshith, M. C. Pankaj, P. 2011. Investigation of *Embllica officinalis* diet on Longevity, behavior and fitness characters in a *Drosophilid*: *Phorticella striata*. Munis Entomology & Zoology, 6 (2): 785-795]

ABSTRACT: *Drosophilid* is one of the model organisms to test Ayurvedic medicines. The objective of our study was to explore the potential of *Embllica officinalis* drug on longevity, sexual behavior and reproductive fitness of *Drosophila melanogaster* using adult feeding method. Increase in the lifespan, fecundity, fertility, ovarioles number and developmental time was observed in both parents and F₁ generation, but not in the F₂ generation in experimental culture (control+ *Embllica officinalis*). According to the DMRT and ANOVA there is a significant difference between two cultures. It was also noticed that *Embllica officinalis* influence some fitness characters in *Drosophila* along with sexual behavior.

KEY WORDS: Ayurveda, *Drosophilid*, *Embllica officinalis*.

Ayurveda-literally "Science of Life"-is based on the twin principles of wholeness and balance. As a holistic healing tradition, Ayurveda recommends treating the "whole" person-body, mind, senses, emotions and spirit-instead of following the "one-cause-one-cure" principle and focusing on the symptoms of the moment. The promise is that if the roots are nourished and watered, the plant will flourish. Diet, sleep, lifestyle, daily and seasonal routines and internal cleansing are just as, or more, important than herbs and potions in order to maintain good health. Ayurveda is equally about maintaining or preserving good health as it is about treating disorders - "*Swaasthasya Rakshanam*" is one of the goals of Ayurveda (Charaka Samhita Sutrasthana, 2000a).

The branch of *rasayana* or rejuvenation is one of the eight specialized branches of Ayurveda that primarily deals with the maintenance of health (Sushruta Samhita Sutrasthana, 1972a). *Rasayana* is defined as any herb, food, or activity which confers youthfulness and cures diseases. If taken in a proper way the *rasayana* prevents early aging and keeps person young and active both physically and mentally (Charaka Samhita Chikitsasthana, 2000b). The literal meaning of *rasayana* is "augmentation of *rasa*", the vital fluid produced by the digestion of food. *Rasa* provides nutrition, enhances the immunity, and sustains life. *Rasayana* is the method of treatment through which the *rasa* is maintained in the body. The purpose of *rasayana* is to give strength, immunity, *ojus*, vitality, will power and determination, and to strengthen the sense faculties, so that you are not exposed to sickness and disease as long as you live.

According to Sushruta Samhita Sutrasthana (1972b) Sexuality and reproduction is so vital in Ayurveda that an entire discipline, known as Vajikarana, is dedicated to enhancing fertility and the rejuvenation of sexual and reproductive energy. Vajikarana therapy improves the function of the reproductive organs and vitalizes reproductive tissues, increasing semen count and strengthening their motility and making eggs more viable for conception. This not only enhances the quality and longevity of individual life, but also the health and vitality of offspring. While some Vajikarana herbs work as

aphrodisiacs, they also engender reproductive strength in order to increase the health of our offspring, or what Vajikarana calls subahupraja – children who are physically and mentally vital and have the fundamental qualities needed for a conscious life Charaka Samhita Chikitsasthana (2000c). *Embllica officinalis* is such herb used as rasayana in treatment of diseases. However effect of this drug on normal life activities has not been significantly validated. Therefore the present study was carried out with an *objective* to explore the potential of *Embllica officinalis* drug, on fitness of *Drosophila bipectinata* using adult feeding method. We have *Drosophila melanogaster* as the test system which proved to be an excellent organism to test the effect of many drugs and other chemicals.

The fruit fly *Drosophila* is one of the most intensively studied in medicine and serves as a model system for investigations of many developmental and cellular processes common to higher eukaryotes, including man. This fly is being used for genetic studies since almost a century. Studies on *Drosophila* have enabled biologists to make significant contributions to the fields as diverse as basic genetics, population biology, evolutionary biology, behavioral biology and molecular biology. It has a short life cycle, easy and inexpensive in culturing and they could be kept in large numbers. Library of several *Drosophila* species with mutant and transgenic stock is available at different laboratories in the world. Presence of giant polytene chromosome and less number of the chromosomes are added advantages of the flies for genetic studies. Its genome has also been sequenced recently (Adams et al., 2000). Vertebrates have about four homologous for every gene found in *Drosophila*. The species shares large numbers of homologous genes with mammals, 13,601 with humans. These have been analyzed to identify sequences related to those causing human diseases (Reiter et al. 2001). The evolutionary conservation of gene function between humans and *Drosophila* make it an ideal model system for the study of the molecular mechanisms of human disease. Moreover identification of specific genes that regulate life span in *D. melanogaster* has been achieved by two processes: I. mutational analysis (Ford and Tower, 2006) in which manipulation of pathway function or gene has demonstrated life span extension. II. Quantitative trait locus analysis (QTL) (Tatar and Yin, 2001) in which genetic elements affecting natural variations in longevity have been mapped to specific positions along the chromosomes (Paaby & Schmidt, 2008, 2009). In *Drosophila* and many other insects body size is positively correlated with mating success, longevity, fecundity and other fitness characters and best phenotypic heritable characters (Santos et al., 1992). All these findings demonstrated the advantage of size in mating success and fitness. Various workers demonstrated the fitness studies in *Drosophila* such as fecundity, fertility (Long et al., 1980) and longevity (Cordts & Partridge, 1996, Partridge Tower, 2008).

Survey of the literature shows (Annalise & Paul, 2009) on decrease gene activity such as *chico*, *dlip genes*, *dS6K*, *dTOR*, *DTS-3*, *EcR*, *Indy*, *InR*, *meth*, *ovo*, *Puc* extends the lifespan in *D.melanogaster*. Simultaneously there are such as genes *Cat* *CCTl* *dFOXO*, *DPOSH*, *dTSc1*, *dTSc2*, *EF-1a*, *fwd*, *G6PD*, *magu*, *Mel-41*, *Pcmt*, *PTEN* which increase gene activity leads to lifespan extends. Moreover with these genes (*Catsup*, *Ddc*, *Dox-A2*, *Lim 3*, *stc*) allelic variation is also varies longevity of fruit flies. These facts has proved *Drosophila* one of the most excellent eukaryote for exploring the genetic determination of life span, genetics of degeneration and aging process, reproductive capacity. With these results there is an insight into what to seek in man. For instant the human *Xist* gene and the analogous *Drosophila Sxl* gene both control sex determination, and may both be involved in regulating longevity. This shows that any investigation *Embllica*

officinalis on the aging process on *Drosophila* will be fruitful research. In order to validate *Emblica officinalis* concepts more precisely, we proposed using *D. melanogaster* as a model. Till here there are very less literature is available for evaluation of some Ayurvedic medicine on *Drosophila* on life span *Emblica officinalis* fruit is one of the Ayurvedic drug used in *Rasayana Chikitsa*. But there is no literature on non *Drosophilids* such as *Phorticella striata*. Ayurveda lexicon states that the fruit of *Emblica officinalis* is the best medicine to increase longevity. The biological effect of this drug has not been tested in recent times, but only is being prescribed to human beings. Furthermore, assessing its effect in human beings has practical and ethical problems. Therefore to be revalidated the concept of *Rasayana Chikitsa* and in particular to be assesses the effect of *Emblica officinalis*. The present study has been carried out using *Phorticella striata* which belongs to *Drosophilids group* and non *Drosophila* as the test system. We authors therefore formulated a *rasayana* from *Emblica officinalis* organic herb and with traditional principles; this is carefully altered to reflect intrinsic differences between mammals and insects. Here, we tried to investigate the impact of the *Emblica officinalis* on fitness parameters such as number of fertility, fecundity, ovarioles and developmental time in *Phorticella straita* flies in next generation along with behavior and its fitness characters.

MATERIALS AND METHODS

Preparation of cultures

To study the impact of *Emblica officinalis* on some quantitative sexual behavior and fitness parameters *Phorticella straita* (Mysore strain), flies were caught from Chamundi hill from the nature. The pure culture of these flies was maintained under standard food medium (Guruprasad et al., 2010). The effect of *Emblica officinalis* was studied by adult feeding method. For this purpose the stocks of the flies were built up for five to six generation from isofemale line. The virgin females and bachelor males emerged from the normal media were isolated under ether anesthesia within 3 hours of eclosion. They were transferred to 8×2.5 cm glass culture vials containing equal quantities of normal food media used for *Drosophila* culture (wheat cream agar medium this medium was prepared by boiling 1000ml of distilled water along with 100g of jagery (sugar). When jagery dissolved in it, 100g of wheat powder (soji or rava) was added to the medium and then 10g of agar agar and 7.5ml of propionic acid (anti-fungal) were added gently). The medium was distributed to glass vials of 8×2.5 cm size. The mouth of the bottles/vials was kept closed with cotton. One day later one or two drops of yeast solution were added to the food media. This medium was used after 24 hours. At every step heat vials were used for preparing medium. This was to prevent outbreak of pests and diseases. Similarly sterilized cotton was used to plug the vials. This culture is used as control culture. For experimental culture 5 drops of *Emblica officinalis* was included to above wheat cream agar medium and virgin females and bachelor males were transferred into this media and aged for 4 days. There is no dietary restriction for the flies in both control and experimental culture.

Experimental Design

For longevity (life span) twenty five virgin females and bachelor males from both cultures were used to test the longevity. For this purpose each pairs were transferred to control culture and experimental culture. Daily these flies were

transferred to the fresh vials of both cultures until flies die from the day of eclosion. This is calculated in terms of number of days.

For analysis of sexual behavior patterns fifty virgin females and fifty bachelor males emerged from the normal media were isolated under ether anesthesia within 3 hours of eclosion and maintained them separately in both control and experimental culture for 4 days. Twenty five flies of both the sex were used to study some courtship activities (Spieth and Ringo, 1983, Hegde Krishnamurthy, 1979) such as mating latency, copulation duration. For observation of sexual behavior a virgin female and bachelor male were introduced into an Elens-Wattiaux mating chamber (5 cm x 5 cm circular glass chamber with a lid to facilitate easy observation). Because maximum mating occurs during morning hours, observation was made between 7 and 11 a.m. Mating latency (time between introduction of males and females into mating chamber and initiation of copulation of each pair), copulation duration (time between initiation and termination of copulation of each pair) were recorded. The terminologies are used as per the description of Hegde and Krishnamurthy, 1979). A minimum of 25 pairs involving each isofemale line were observed for both culture groups. Similarly mating latency and copulation duration was also observed in F₁ and F₂ generations (fed with normal food media) which were generated from the above 25 mated pairs which are considered as parents.

The reproductive fitness parameters such as fecundity, fertility, ovarioles number and developmental time were analyzed from mated parents and their two successive generations. For fecundity test mated males were transferred to vials containing normal food media and allowed to lay eggs for 24 hours. After 24 hours, the flies were individually transferred to fresh vial containing food media. The number of eggs laid (fecundity) during the following ten days was scored using stereomicroscope for both control and experimental groups. Twenty five replicates were maintained for each of the control and experiment studies. The fertility was measured by counting the number of the progeny produced by a single mated female. For testing fertility, each mated female was kept in an individual food vial for a period of one day and then transferred to a fresh food vial every day. Ten successive changes were made and the total number of flies that emerged from each vial was counted. Twenty five replicates were maintained for each of the experimental and control under study. Data were pooled and the mean number of flies per female was calculated. Counting of ovarioles number was done by selecting the twenty five virgin females separately and maintained in both control and experimental cultures and aged 4 days. These virgin females were dissected for left ovaries in saline and bundles of ovarioles were separated by fine needle and counted under a stereomicroscope. For analysis of developmental time, after emergence of the flies were counted every day from the first to last day of the eclosion. A minimum two pairs of virgin female and bachelor's male were selected from the all ten vials which are considered as F₁ generation. Similarly for F₂ generation flies were selected from the F₁ generation. These were mated separately maintained in the separate vial to calculate their fecundity, fertility, developmental time and ovarioles number too. All the culture was maintained under the laboratory condition at a temperature 24±2°C. One way analysis of variance (ANOVA) followed by Duncan's multiple range test (DMRT) was applied for all parameters using SPSS 10.5 software.

RESULTS

The data on the longevity (lifespan) is represented in Table 1 reflects longevity of *Drosophilids Phorticella straita* where the parent flies fed with experimental culture shows high lifespan with 72 minimum days and 83 maximum days than F_1 generation, F_2 generation and control one too.

The data on sexual behavior and fitness parameters of *Phorticella straita* of two different cultures has been reported in table 2. Sexual activities such as mating latency was highest in control culture than experimental culture (10.32 ± 0.72) and it is significant by one way ANOVA and DMRT (F value = 20.04; $P < 0.001$) between the two cultures this is also seen in their successive generations. Mean while copulation duration is highest in experimental culture (28.64 ± 1.15) compare to control culture this is also carried in the nest generation with highly significant according one way ANOVA and DMRT (F value= 30.45; $P < 0.001$) which is opposite to copulation duration.

The scrutiny of table 2 also shows fitness parameters such as fecundity, fertility, developmental time and ovarioles number was high in experimental culture compare to control and significant too between two cultures (fecundity= 131.1 ± 1.36 , fertility= 122.9 ± 1.32 , developmental time= 15.63 ± 0.15 , ovarioles number= 17.00 ± 0.73 , F value=24.85; 16.73; 6.57; 15.75; these mean values are more compare to their F_1 and F_2 generation. Table 2.represents mean values of fitness parameters, where F_1 progeny shows high compare to F_2 generation (fecundity= 128.1 ± 1.21 , fertility= 120.3 ± 1.47 ; developmental time 14.04 ± 0.13 ; ovarioles number= 15.00 ± 0.71). All these parameters are highly significant when compare between the cultures (table 2). The above fitness parameters and sexual behavior are depicted in figure 1 and figure 2, where flies reared in control media shows no such variation among the parameters, but there is variation in the mean values in the experimental culture between the parents, F_1 generation and F_2 generation.

DISCUSSION

For the above results the longevity is more in case of parents compare to their progenies in experimental cultured fed flies than control one this confirms there is influence of *Embllica officinalis* which is mixed in experimental culture. These results were similar to some workers Charaka SamhitaSutrasthana.2000a. Sexually reproducing animals are endowed with special features, first to produce fertile offspring and second to adapt to a particular environment. The reproduction is preceded by a series of courtship acts where in males and females show unique rituals to attract each other, mate and produce the offspring. The courtship and mating although are genetic, are also influenced by various factors. This may imply that these courtship activities are directed by the same set of genes and that these traits are related genetically. This agrees with the observations which show the genetic determination of certain components of sexual behavior in *Drosophila* (Spieth & Ringo, 1983; Spiess, 1970; Parsons, 1973). Though genetically determined there is every possibility for a change in sexual behavior because these activities are also influenced by changes in physical environment according to Crossley, 1974; Gutzke and Crews, 1998; Laudien et al., 1980; Sisodia and Singh 2002; West and Packer, 2002). In the present study an effort is made to study the effect of *Embllica officinalis* on quantitative sexual behavior and fitness parameters on *Phorticella striata*. From our studies, the mating latency was shorter in the flies reared in experimental culture than either

at high in control (Table 1). The differences in mating latency in two cultures were also statistically significant (by ANOVA and DMRT). Mating latency is measured as the time taken for the male oriented towards female until initiation of copulation duration by Markow, 1985. It is the period during which the pairs acclimatize in the mating chamber and then start the courtship activities. It actually indicates the vigor of male (Eastwood & Burnet, 1977). A male with high vigor reacts quickly in the presence of female while a male with less vigor reacts slowly (Markow, 1988). Obviously shorter mating latency indicates higher vigor of male. The shorter mating latency was noticed in experimental culture. This suggests that the males from experimental culture have higher vigor and therefore are quickly attracted by the females. The mating latency was also shorter in the flies from experimental culture compared control shown in figures 1 and 2. The Mating latency not only indicates vigor of males and but also receptivity of females. It is the time required for males and females to initiate copulation. Higher the vigor of males and receptivity of females, shorter is the mating latency. During this period, courtship acts are performed mostly by males, to increase the receptivity of females and to make her sexually excited (Spieth & Ringo, 1983). A male with high vigor has to perform the same courtship act more number of times to a non-receptive female than to a receptive female. If she is receptive, only a few courtship acts are performed leading to quick pairing. The short mating latency of experimental culture in the present studies therefore indicates that the males maintain high vigor and females maintain high receptivity at this culture while at those in control, they cannot maintain the vigor and receptivity. Mating latency of control culture of parents and their generations more or less equal (Table 2).

Courtship activity of the male or female culminates in copulation demonstrated by Spiess (1970). During copulation sperms from the male is transferred to the female reproductive tract and therefore the duration of copulation has a lot of significance in an animal's life. In the present studies, the copulation duration was longest at experimental culture than at control one. According to Guruprasad, et al. (2008) longer duration of copulation permits the transfer of more number of sperms by male to the female. Therefore extension of copulation duration enhances the fitness of the male. It can also enhance the fitness of the females because the sperms received by a female can fertilize more number of eggs. Therefore it is unlikely that the longer copulation duration could enhance the fitness. As the females have high receptivity and males have high vigor.

In *Drosophila*, The fecundity remains one of the less known quantitative traits along with fitness parameters such as fertility, developmental time and ovarioles number. Estimation of fecundity and fertility is important in routine testing of various chemicals. This gives an insight into the extent of effect on ovarioles and other physiological factors, which is expressed in the terms of egg and offspring production. Table 2 reveals the mean fecundity eggs / female in the adult feeding methods was more than control. According to ANOVA and DMRT have shown that increased fecundity in experimental were significant ($P < 0.001$). This indicates that the mode of administration is also important factor, which one should consider while assessing the effect of any chemical on any biological system. In contrast to this in control culture, the decrease in fecundity may be accounted for the fact that the flies are under the influence of *Emblia officinalis*, hence they might not have been able to lay eggs rather than producing less egg. This finding agrees with the observation of Gruwes et al. (1971) where they noticed oviposition rhythm in *Drosophila melanogaster* and Vogel (1972) has demonstrated that certain aziridine analogous have discernible effect on fecundity

in *Drosophila*. Table 1 also incorporates mean fertility per female in adult experimental diet with *Emblica officinalis* was seriously increase compare to control, and they were more fertile than control, ($P < 0.001$ by ANOVA and DMRT). Several workers have made studies on the effect of different chemicals on fertility in *Drosophila melanogaster* (Vasudeva and Krishnamurthy 1983). The present study of the author agrees with them that influence of the chemicals will alter the fertility in *Drosophila*.

Rate of development is another parameter, which is used to analyze the some chemicals clinically. In the present investigations the genetic constitution, amount of the food, temperature, and space were kept constant. Obviously the differences in the developmental must have been determined by the chemical used or not by the other factors. This type of effect on the developmental time by different chemicals in *Drosophila melanogaster* has been shown by Luning (1966).

The estimation of fitness is the first step in understanding the adaptive evolution of a population. Ovarioles number is an anatomical trait determined during pupation for which a polygenic basis is known in various species of the *D. melanogaster* complex. Interestingly, our results are contrary to this where experimental culture fed flies are having more ovarioles than control this shows there is influence of the *Emblica officinalis* rasayana mixed in experimental culture.

Figure 1 suggests that all the fitness parameters and sexual behavior of *Phorticella striata* reared in control media is similar in all parents and their generation too. According to Figure 2 fitness parameters and sexual behavior of *Phorticella striata* in experimental media have variation among F_1 generation and F_2 generation compare with their parents. The Flies which are fed in the experimental culture have long life span than control one (Table 1). Our results confirm the effect of *Emblica officinalis* on parents than their progenies and the impact of *Emblica officinalis* is carried to F_1 generation rather in F_2 generation in experimental culture. The author in this study observed variation in the developmental time in both cultures (Table 2) longest mean of developmental time was noticed in the experimental cultures.

CONCLUSION

The conclusion of our experiment suggests that rasayana of *Emblica officinalis* enhance the sexual activities. This obviously increases in longevity, fertility, fecundity, ovarioles number along with developmental time. The Influence of the above rasayana is found in the parents and F_1 generation and not in the F_2 generations. The impact of the rasayana is not carried in further generation after F_1 generation Lastly, author concludes there is also linear interrelationship between sexual activities and fitness parameters in experimental culture. "Adding Life to years is better than adding years to life". So, along with longevity other reproductive fitness characters of flies were undertaken for this study so as to explore the hidden principles of rasayana therapy which improves the quality of the life.

ACKNOWLEDGEMENTS

I would like to acknowledge the principal of Atreya Ayurvedic Medical College, Bangalore and Kannada Bharthi College Khusal Nagar for support in performing this experiment.

LITERATURE CITED

- Adams, M.D, Celniker, S. E, Holl, RA, Evans, C.A. Gocayne, J.D, Amanatides, P.G.** 2000. The Genome sequence of *Drosophila melanogaster*. Science, 287: 2185-95.
- Charaka Samhita Sutrasthana.** 2000a. Bhagvan Dash vol 1, 6th ed. Chowkambha series office, Varanasi, India; Chowkamba Orientalia: 25: 17.
- Charaka Samhita Chikitsasthana.** 2000b. Bhagvan Dash vol 3, 4th ed. Chowkambha series office, Varanasi, India; Chowkamba Orientalia. 30: 2.
- Charaka Samhita Chikitsasthana.** 2000c. Bhagvan Dash vol 3, 4th ed. Chowkambha series office, Varanasi, India; Chowkamba Orientalia. 1: 11.
- Cordts, R. & Partridge, L.** 1996. Courtship reduces longevity in male *Drosophila melanogaster*. Animal Behaviour, 52: 269-278.
- Crossley, S. A.** 1974. Changes in mating behavior produced by selection for the ecological between and vestigial mutants of *Drosophila melanogaster*. Evolution, 28: 631-647.
- Eastwood, L. & Burnet, B.** 1977. Courtship latency in male *D. malenogaster*. Behaviour genetica, 7: 359-372.
- Ford, D. & Tower J.** 2006. Genetic manipulation of lifespan in *Drosophila melanogaster*. In: Masaro EJ, Austad SN. eds. Hand book of the Biology of aging. Sixth edition. Burlington, MA: Elsevier Press 2006. 400-14.
- Guruprasad, B. R., Hegde, S. N., & Krishna, M. S.** 2008. Positive correlation between male size and remating success in few populations of *D.bipectinata*. Zoological studies, 47 (1): 75-83.
- Guruprasad, B. R., Hegde, S. N. & Krishna, M. S.** 2009. Seasonal and altitudinal variation of 20 species of Chamundi hill. Journal of insect science, Pp 1-12.
- Gutzke, W. H. & Crews, D.** 1998. Embryonic temperature determines adult sexuality in a reptile. Nature, 332 (1667): 832-834.
- Hegde, S. N. & Krishnamurthy, N. B.** 1979. Studies on mating behaviour in the *Drosophila bipectinata* complex. Australian journal of Zoology, 27: 421-431.
- Laudien, H., Fecher, W. & Schumann, W.** 1980. Temperature dependence of Courtship in male guppies, *Poecilia reticulata*. Peters. Z. Tierpsychol, 52 (1): 1-18.
- Long, C. E., Markow, T. A. & Yeager, P.** 1980. Relative male age, fertility, and competitive mating success in *Drosophila melanogaster*. Behaviour genetics, 10: 163.
- Luning, K. G.** 1966. *Drosophila* tests in Pharmacology. Nature, 209: 84-86.
- Markow, T. A.** 1985. A comparative investigation of the mating system of *Drosophila hydei*. Animal Behavior, 33: 775-781.
- Markow, T. A.** 1988. Reproductive behavior of *Drosophila melanogaster* and *Drosophila nigraspiracula* in the field and in the laboratory. T. Compative Pshycology, 102: 169-173.
- Paaby, A. B. & Schmidt, P. S.** 2008. Functional significance of allelic variation at *methuselah*, an aging gene in *Drosophila*. Plos One, 3: 1987.
- Paaby, A. B. & Schmidt, P. S.** 2009. Dissecting the genetics of longevity in *Drosophila melanogaster*. Fly, 3 (1): 29-38.
- Parsons, P. A.** 1973. Behavioral and Ecological genetics: A study in *Drosophila*. Oxford: Clarendon Press: pp1-55.
- Partridge, L. & Tower.** 2008. Yeast a Feast: The Fruit fly *Drosophila* as a model organism for research in aging. Molecular Biology of Aging. In: Garanto L, Partridge L, Wallace D, Editors Cold Spring Harbor: Cold spring Harbor laboratory press.

- Reiter, L. T., Potocki, L., Chein, S., Ghribkov, M. & Bier, E.** 2001. A systematic analysis of human disease-associated gene sequences in *Drosophila melanogaster*. *Genome Resonance*, 11: 1114-25.
- Santos, M. A., Ruiz, J. E., Quezada-Diaz, A., Barbadilla, A. & Fontdevila.** 1992. The evolutionary history of *Drosophila buzzatii*. XX. Positive phenotypic covariance between field adult fitness components and body size. *Journal Evolutionary biology*, 5: 403-422.
- Sisodia, S. & Singh, B. N.** 2002. Effect of the temperature on longevity and trade productivity in *Drosophila ananassae*; evidence for adaptive plasticity and trade off between longevity and productivity. *Genetika*, 114 (1): 95 -102.
- Spiess, E. B.** 1970. Mating propensity and its genetic basis in *Drosophila*. In essay in evolution and genetics in honour of the Dobzhansky (Eds.Hecht, M.T and Streere W.C) 315-379. Appleton-Century-Crafts, New York.
- Spieth, H. T & Ringo, J. M.** 1983. Mating behavior and sexual isolation in *Drosophila*. In the genetics and biology of *Drosophila* (Eds Ashburner, M. Carsony, H.L. and Thompson, Jr. J.N) Vol. 3c., pp 223-224. Academic Press, London.
- Spieth, H. T. & Ringo, J. M.** 1983. Mating behavior and sexual isolation in *Drosophila*. In the genetics and biology of *Drosophila* (Eds Ashburner, M. Carson, H.L. and Thompson, Jr. J.N) Vol. 3c., pp 223-224. Academic Press, London.
- Sushrutha Samhita Sutrasthana.** 1972a. Bhisgratna S.S. vol 1. Chowkambha series office, Varanasi, India; Chowkamba Orientalia.
- Sushrutha Samhita Sutrasthana.** 1972b. Bhisgratna S.S. vol 1. Chowkambha series office, Varanasi, India; Chowkamba Orientalia. 1: 9.
- Tatar, M. & Yin, C.** 2001. Slow aging during insect reproductive diapause: why butterflies, grasshoppers and flies are like worms. *Exp geronotol.* 36: 723-38.
- Vasudeva, V. & Krishnamurthy, N. B.** 1983. Effect of Dithane M-45 on the rate of development viability, morphology, and fecundity in *Drosophila melanogaster*. *J.Mys.University*, 29: 79-86.
- West, P. M. & Packer, C.** 2002. Sexual selection, temperature and the lion's mane. *Science*, 297: 1339-1343.

Table 1. The longevity of *Phorticella straita* cultured in control and experimental media.

	Culture	Parents (Min/Max)	F1 Generation (Min/Max)	F2 Generation (Min/Max)
Longevity	Control	40/56	43/53	42/54
	Experimental	72/83	69/74	56/65

Min-minimum days; Max-maximum days

Table 2. Sexual activities and fitness parameters of *Phorticella straita* (values are Means $\pm$ SE).

Parameters	Culture	Parents	F1 Generation	F2 Generation
Copulation duration	Control	19.76 $\pm$ 0.62	18.40 $\pm$ 0.42	20.41 $\pm$ 0.76
	Experimental	28.64 $\pm$ 1.15	26.42 $\pm$ 1.17	23.32 $\pm$ 2.16
	F= value	30.45**	27.15**	25.16**
Mating latency	Control	10.32 $\pm$ 0.72	10.14 $\pm$ 0.82	9.14 $\pm$ 0.42
	Experimental	7.20 $\pm$ 0.85	7.45 $\pm$ 1.06	9.02 $\pm$ 1.46
	F= value	20.04**	18.16**	15.23**
Fecundity	Control	118.3 $\pm$ 1.43 ^a	116.3 $\pm$ 1.22 ^a	115.3 $\pm$ 1.43 ^a
	Experimental	131.1 $\pm$ 1.36 ^b	128.1 $\pm$ 1.21 ^b	121.1 $\pm$ 1.19 ^b
	F= value	24.85**	23.65**	20.51**
Fertility	Control	106.3 $\pm$ 2.48 ^a	104.2 $\pm$ 3.34 ^a	102.8 $\pm$ 1.03 ^a
	Experimental	122.9 $\pm$ 1.32 ^b	120.3 $\pm$ 1.47 ^b	113.4 $\pm$ 1.35 ^a
	F= value	16.73**	15.43**	13.04**
Developmental time	Control	11.65 $\pm$ 0.09 ^b	11.43 $\pm$ 0.11 ^a	10.02 $\pm$ 0.09 ^a
	Experimental	15.63 $\pm$ 0.15 ^a	14.04 $\pm$ 0.13 ^a	11.03 $\pm$ 0.13 ^b
	F= value	6.57*	5.06*	6.46*
Ovarioles number	Control	14.00 $\pm$ 0.13 ^a	13.00 $\pm$ 0.12 ^a	13.00 $\pm$ 0.10 ^a
	Experimental	20.00 $\pm$ 0.73 ^b	16.00 $\pm$ 0.71 ^a	13.00 $\pm$ 0.62 ^c
	F= value	15.75**	13.04**	14.04**

Different alphabet as superscript in each column is significant according DMRT.

*P<0.01; **P<0.001;

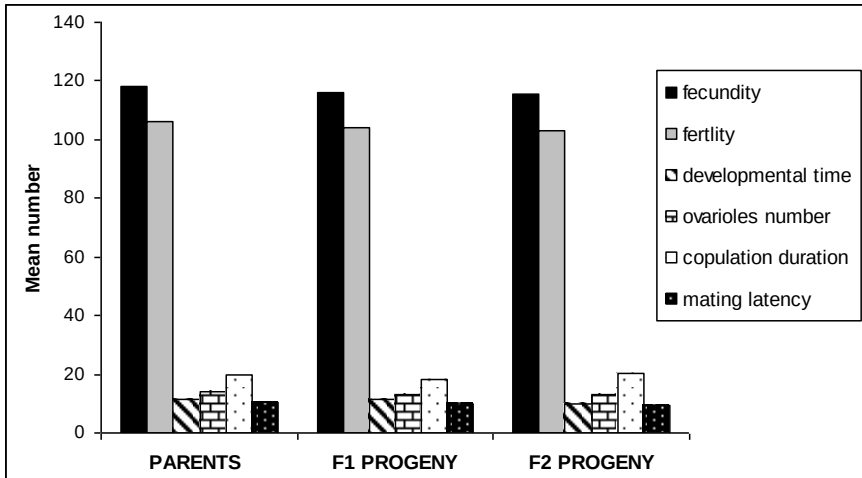


Figure 1. Fitness parameters and sexual behavior of *Phorticella straita* cultured in control media.

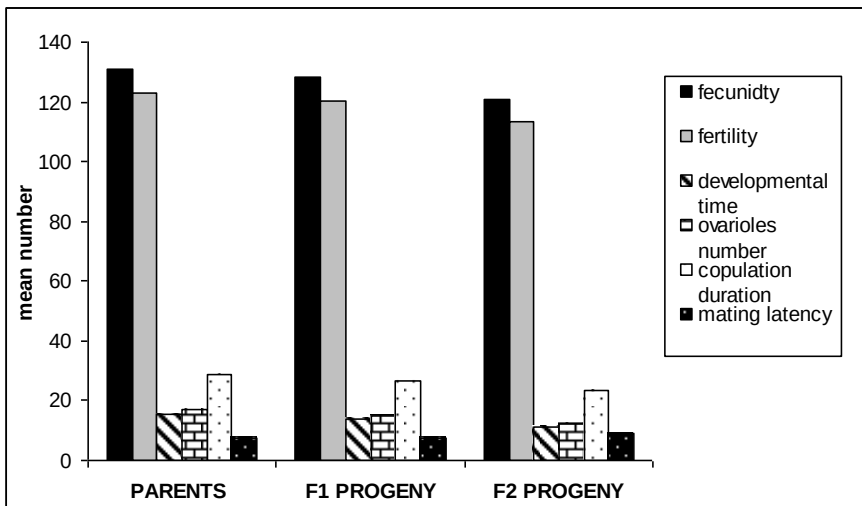


Figure 2. Fitness parameters and sexual behavior of *Phorticella straita* cultured in experimental media.

NEW NAMES FOR SOME PREOCCUPIED SPECIFIC EPITHETS IN CHALCOIDEA I: FAMILIES AGAONIDAE, APHELINIDAE, CHALCIDIDAE, ENCYRTIDAE, EULOPHIDAE (HYMENOPTERA: PARASITICA)

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE.
Email: ozdikmen@gazi.edu.tr

[Özdikmen, H. 2011. New names for some preoccupied specific epithets in Chalcidoidea I: Families Agaonidae, Aphelinidae, Chalcididae, Encyrtidae, Eulophidae (Hymenoptera: Parasitica). Munis Entomology & Zoology, 6 (2): 796-814]

ABSTRACT. According to the International Code of Zoological Nomenclature (ICZN, 1999), *Sycoscapter tibialis* Wiebes, 1981 (**Agaonidae: Sycoryctinae**); *Coccophagus saissetiae* (Annecke & Mynhardt, 1979); *Encarsia citricola* Myartseva & Evans, 2008; *Encarsia clavata* Myartseva & González, 2008: 103-105; *Encarsia verticina* Myartseva & González, 2008 and *Pteroptrix stenoptera* Huang, 1994 (**Aphelinidae: Coccophaginae**); *Brachymeria secundaria* Habu, 1960; *Brachymeria tibialis* Steffan, 1958; *Conura maculata* (Holmgren, 1868) and *Conura picta* (André, 1881) (**Chalcididae: Chalcidinae**); *Antrocephalus bicolor* (Masi, 1932) and *Hockeria fumipennis* (Cameron, 1907) (**Chalcididae: Haltichellinae**); *Aphycooides speciosus* Hoffer, 1965; *Cheiloneurus bifasciatus* (Trjapitzin, 1962); *Cheiloneurus hemipterus* (Timberlake, 1922); *Cheiloneurus phenacocci* Shi, 1994; *Copidosoma gelechiae* (Howard, 1898); *Encyrtus dubius* (Mercet, 1921); *Metaphycus acanthococci* Myartseva, 1987; *Metaphycus ericeri* Xu & Jiang, 1991; *Metaphycus flavus* (Shi, Si & Wang, 1994); *Metaphycus insularis* (Sharkov, 1988); *Metaphycus turkmenicus* Myartseva, 1987; *Syrphophagus nigricornis* (De Santis, 1964) and *Syrphophagus parvus* (Girault, 1923) (**Encyrtidae: Encyrtinae**); *Aprostocetus arsenjevi* (Kostjukov, 1990); *Aprostocetus bouceki* Khan, Agnihotri & Sushil, 2005; *Aprostocetus bouceki* (Khan & Shafee, 1988); *Aprostocetus hyalinipennis* (Girault, 1914); *Aprostocetus pallidipes* (Perkins, 1912); *Aprostocetus senegalensis* (Risbec, 1951: 96); *Leptomastix histrio* Mayr, 1876 and *Rhopus flavus* Xu, 2004 (**Encyrtidae: Tetracneminae**); *Chrysonotomyia reticulata* Hansson, 2004; *Closterocerus (Achyrocharis) longus* Hansson, 1994; *Closterocerus pulcher* (Girault, 1913); *Closterocerus trifasciatus* (Girault, 1913); *Closterocerus violaceus* (Askew, 1999); *Closterocerus (Achyrocharis) violaceus* Hansson, 1994; *Entedon leucopus* (Ashmead, 1888); *Entedon tibialis* Szélnyi, 1978 and *Pediobius ni* Khan, 1996 (**Eulophidae: Entedoninae**); *Aulogymnus indicus* Khan, Agnihotri & Sushil, 2005; *Cirrospilus nigrivariegatus* (Girault, 1917); *Cirrospilus pulcher* (Girault, 1913); *Di cladocerus japonicus* Yoshimoto, 1976; *Diglyphomorphomyia nigra* Narendran, 2005 and *Microlycus erdoesi* (Szélnyi, 1976) (**Eulophidae: Eulophinae**); *Aprostocetus auriflavus* (Girault, 1915); *Aprostocetus distinguendis* (Masi, 1917); *Aprostocetus elongatus* (Doutt, 1961); *Aprostocetus flavus* (Girault, 1913: 240); *Aprostocetus flavus* (Girault, 1913: 217, 220); *Aprostocetus longiventris* (Masi, 1917); *Aprostocetus purpureus* Girault, 1913; *Tetrastichus breviscapus* Kostjukov, 1995; *Tetrastichus breviscapus* Kostjukov, 1978; *Tetrastichus clavatus* Khan, Agnihotri & Sushil, 2005; *Tetrastichus clavatus* Yang, 1996; *Tetrastichus coeruleus* (Bingham, 1906); *Tetrastichus dignus* Kostjukov, 1995; *Tetrastichus lepidus* Masi, 1940; *Tetrastichus lopezi* Blanchard, 1936; *Tetrastichus magnus* Kostjukov, 1995; *Tetrastichus magnus* Risbec, 1958; *Tetrastichus niger* Kostjukov, 1995; *Tetrastichus nigriscapus* Kostjukov, 1995; *Tetrastichus orientalis* Khan, Agnihotri & Sushil, 2005; *Tetrastichus planipectus* Kostjukov, 1995; *Tetrastichus tibialis* Kostjukov, 1995 and *Tetrastichus thoracicus* Khan, Agnihotri & Sushil, 2005 (**Eulophidae: Tetrastichinae**) are not correct because the specific epithets are illegitimate. Accordingly, the following replacement names are proposed for the preoccupied specific names respectively: *Sycoscapter wiebesi* nom. nov. (**Agaonidae: Sycoryctinae**); *Coccophagus eusaissetiae* nom. nov. and *Encarsia neocitricola* nom. nov.; *Encarsia eumexicana* nom. nov.; *Encarsia*

verticinella nom. nov. and *Pteroptrix sinica* nom. nov. (**Aphelinidae: Coccophaginae**); *Brachymeria habui* nom. nov.; *Brachymeria steffani* nom. nov.; *Conura equadorica* nom. nov. and *Conura noyesi* nom. nov. (**Chalcididae: Chalcidinae**); *Antrocephalus masii* nom. nov. and *Hockeria cameroni* nom. nov. (**Chalcididae: Haltichellinae**); *Aphycoides czeikiacus* nom. nov.; *Cheiloneurus daghestanicus* nom. nov.; *Cheiloneurus hawaiiicus* nom. nov.; *Cheiloneurus sinensis* nom. nov.; *Copidosoma americana* nom. nov.; *Encyrtus merceti* nom. nov.; *Metaphycus myartsevai* nom. nov.; *Metaphycus xujiangi* nom. nov.; *Metaphycus sinensis* nom. nov.; *Metaphycus sharkovi* nom. nov.; *Metaphycus euturkmenicus* nom. nov.; *Syrphophagus noyesi* nom. nov. and *Syrphophagus australis* nom. nov. (**Encyrtidae: Encyrtinae**); *Aprostocetus primoricus* nom. nov.; *Aprostocetus indicus* nom. nov.; *Aprostocetus jaipurensis* Khan & Shafee, 1988; *Aprostocetus cengizi* nom. nov.; *Aprostocetus moluccasicus* nom. nov.; *Aprostocetus eusenegalensis* nom. nov.; *Leptomastix mayri* nom. nov. and *Rhopus sinicus* nom. nov. (**Encyrtidae: Tetracneminae**); *Chrysonotomyia costaricana* nom. nov.; *Closterocerus hanssoni* nom. nov.; *Closterocerus eupulcher* nom. nov.; *Closterocerus australis* nom. nov.; *Closterocerus askewi* nom. nov.; *Closterocerus americanus* nom. nov.; *Entedon nearcticus* nom. nov.; *Entedon neotibialis* nom. nov. and *Pediobius khani* nom. nov. (**Eulophidae: Entedoninae**); *Aulogygnus arifaokhani* nom. nov.; *Cirrospilus americanus* nom. nov.; *Cirrospilus noyesi* nom. nov.; *Di cladocerus yoshimotoi* nom. nov.; *Diglyphomorphomyia keralana* nom. nov. and *Microlycus hungarica* nom. nov. (**Eulophidae: Eulophinae**); *Aprostocetus giraulti* nom. nov.; *Aprostocetus seychellensis* nom. nov.; *Aprostocetus doutti* nom. nov.; *Aprostocetus euflavus* nom. nov.; *Aprostocetus neoflavus* nom. nov.; *Aprostocetus metei* nom. nov.; *Aprostocetus pseudopurpureus* nom. nov.; *Tetrastichus breviscapella* nom. nov.; *Tetrastichus ukrainensis* nom. nov.; *Tetrastichus uttaranchalicus* nom. nov.; *Tetrastichus yangi* nom. nov.; *Tetrastichus pehlivani* nom. nov.; *Tetrastichus dignella* nom. nov.; *Tetrastichus meridionalis* nom. nov.; *Tetrastichus argentinacus* nom. nov.; *Tetrastichus primoricus* nom. nov.; *Tetrastichus acaciae* nom. nov.; *Tetrastichus khabarovskensis* nom. nov.; *Tetrastichus euprimoricus* nom. nov.; *Tetrastichus hindicus* nom. nov.; *Tetrastichus euplanipectus* nom. nov.; *Tetrastichus kostjukovi* nom. nov. and *Tetrastichus neothoracicus* nom. nov. (**Eulophidae: Tetrastichinae**).

KEY WORDS. Nomenclatural change, homonymy, replacement name, Hymenoptera, Chalcidoidea.

HYMENOPTERA PARASITICA

CHALCOIDEA

AGAONIDAE

SYCORYCTINAE

Genus *SYCOSCAPTER*

Sycoscapter wiebesi nom. nov.

Junior secondary homonym: *Sycoscapter tibialis* Wiebes, 1981.
Distribution: Réunion.

Senior homonym: *Sycoscapter tibialis* (Mayr, 1906).
Original combination: *Sycoryctes tibialis* Mayr, 1906.
Distribution: Indonesia.

Replacement name: *Sycoscapter wiebesi* nom. nov.

pro *Sycoscapter tibialis* Wiebes, 1981 **syn. nov.**

Etymology: The name is dedicated to J. T. Wiebes who is the author of the preexisting species *S. tibialis*.

APHELINIDAE

COCCOPHAGINAE

Genus *COCCOPHAGUS**Coccophagus eusaissetiae* **nom. nov.**

Junior secondary homonym: *Coccophagus saissetiae* (Annecke & Mynhardt, 1979).

Original combination: *Prococcophagus saissetiae* Annecke & Mynhardt, 1979.

Distribution: Israel, Italy, South Africa, America (California).

Senior homonym: *Coccophagus saissetiae* Gahan, 1922.

Distribution: Cuba, Panama, Uruguay.

Replacement name: *Coccophagus eusaissetiae* **nom. nov.**

pro *Coccophagus saissetiae* (Annecke & Mynhardt, 1979) **syn. nov.**

Etymology: From the specific epithet.

Genus *ENCARSIA**Encarsia neocitricola* **nom. nov.**

Junior primary homonym: *Encarsia citricola* Myartseva & Evans, 2008.

Distribution: Mexico.

Senior homonym: *Encarsia citricola* Myartseva, 2007.

Distribution: Mexico.

Replacement name: *Encarsia neocitricola* **nom. nov.**

pro *Encarsia citricola* Myartseva & Evans, 2008 **syn. nov.**

Etymology: From the specific epithet.

Encarsia verticinella **nom. nov.**

Junior primary homonym: *Encarsia verticina* Myartseva & González, 2008.

Distribution: Mexico.

Senior homonym: *Encarsia verticina* Myartseva & González, 2008.

Distribution: Mexico.

Replacement name: *Encarsia verticinella* **nom. nov.**

pro *Encarsia verticina* Myartseva & González, 2008 **syn. nov.**

Etymology: From the specific epithet.

Genus *PTEROPTRIX**Pteroptrix sinica* **nom. nov.**

Junior secondary homonym: *Pteroptrix stenoptera* Huang, 1994.

Distribution: Fujian, China.

Senior homonym: *Archenomus stenopterus* Huang, 1992.

Original combination: *Pteroptrix stenoptera* (Huang, 1992).

Distribution: Fujian, China.

Replacement name: *Pteroptrix sinica* **nom. nov.**

pro *Encarsia clavata* Myartseva & González, 2008 **syn. nov.**

Etymology: From the type locality.

CHALCIDIDAE

CHALCIDINAE

Genus *BRACHYMERIA**Brachymeria habui* nom. nov.

Junior secondary homonym: *Brachymeria secundaria* Habu, 1960.

Distribution: India, China, Japan.

Senior homonym: *Brachymeria secundaria* (Ruschka, 1922).

Original combination: *Chalcis secundaria* Ruschka, 1922.

Distribution: Europe, Russia, Turkey, Central Asia, India, Japan.

Replacement name: *Brachymeria habui* **nom. nov.**

pro *Brachymeria secundaria* Habu, 1960 **syn. nov.**

Etymology: The name is dedicated to A. Habu who is the author of the preexisting species *B. secundaria*.

Brachymeria steffani nom. nov.

Junior secondary homonym: *Brachymeria tibialis* Steffan, 1958.

Distribution: Madagascar.

Senior homonym: *Brachymeria tibialis* (Walker, 1834).

Original combination: *Chalcis tibialis* Walker, 1834.

Distribution: Europe, Caucasus, Russia, Kazakhstan, Uzbekistan, Turkey, Cyprus, Syria, Israel, Lebanon, Iraq, Iran, North Africa, Pakistan, India, North America (America, Canada).

Replacement name: *Brachymeria steffani* **nom. nov.**

pro *Brachymeria tibialis* Steffan, 1958 **syn. nov.**

Etymology: The name is dedicated to J. R. Steffan who is the author of the preexisting species *B. tibialis*.

Genus *CONURA**Conura equadorica* nom. nov.

Junior primary homonym: *Conura maculata* (Holmgren, 1868).

Original combination: *Chalcis maculata* Holmgren, 1868.

Distribution: Ecuador.

Senior homonym: *Conura maculata* (Fabricius, 1787).

Original combination: *Chalcis maculata* Fabricius, 1787

Distribution: Argentina, Brasil, Colombia, Costa Rica, Ecuador, French Guiana, Paraguay, Mexico, America.

Replacement name: *Conura equadorica* **nom. nov.**

pro *Conura maculata* (Holmgren, 1868) **syn. nov.**

Etymology: From the type locality Ecuador.

Conura noyesi nom. nov.

Junior secondary homonym: *Conura picta* (André, 1881).

Original combination: *Smicra picta* André, 1881.

Distribution: Brasil, French Guiana.

Senior homonym: *Conura picta* (Fabricius, 1804).

Original combination: *Chalcis picta* Fabricius, 1804.

Distribution: Neotropical.

Replacement name: *Conura noyesi* **nom. nov.**

pro *Conura picta* (André, 1881) **syn. nov.**

Etymology: The name is dedicated to J. S. Noyes.

HALTICHELLINAE

Genus *ANTROCEPHALUS*

***Antrocephalus masii* nom. nov.**

Junior secondary homonym: *Antrocephalus bicolor* (Masi, 1932).

Original combination: *Sabatiella bicolor* Masi, 1932.

Distribution: India, Singapore, Sri Lanka, Taiwan.

Senior homonym: *Antrocephalus bicolor* (Ashmead, 1900).

Original combination: *Haltichella bicolor* Ashmead, 1900.

Distribution: Australia.

Replacement name: *Antrocephalus masii* **nom. nov.**

pro *Antrocephalus bicolor* (Masi, 1932) **syn. nov.**

Etymology: The name is dedicated to L. Masi who is the author of the preexisting species *A. angustipennis*.

Genus *HOCKERIA*

***Hockeria cameroni* nom. nov.**

Junior secondary homonym: *Hockeria fumipennis* (Cameron, 1907).

Original combination: *Stomatoceras fumipennis* Cameron, 1907.

Distribution: South Africa.

Senior homonym: *Hockeria fumipennis* (Walker, 1871).

Original combination: *Halticella fumipennis* Walker, 1871.

Distribution: Spain, France, Albania, Greece.

Replacement name: *Hockeria cameroni* **nom. nov.**

pro *Hockeria fumipennis* (Cameron, 1907) **syn. nov.**

Etymology: The name is dedicated to P. Cameron who is the author of the preexisting species *H. fumipennis*.

ENCYRTIDAE

ENCYRTINAE

Genus *APHYCOIDES*

***Aphycoides czeakiacus* nom. nov.**

Junior secondary homonym: *Aphycoides speciosus* Hoffer, 1965.

Distribution: Czechia.

Senior homonym: *Aphycoides speciosus* (Hoffer, 1968).

Original combination: *Plesiomicroterys speciosus* Hoffer, 1968.

Distribution: Czechia, Finland, Russia, Slovakia, Sweden.

Replacement name: *Aphycoides czeakiacus* **nom. nov.**

pro *Aphycoides speciosus* **syn. nov.**

Etymology: From the type locality Czechia.

Genus CHEILONEURUS***Cheiloneurus daghestanicus* nom. nov.**

Junior secondary homonym: *Cheiloneurus bifasciatus* (Trjapitzin, 1962).

Original combination: *Tobiasia bifasciata* Trjapitzin, 1962.

Distribution: Daghestan ASSR, Russia, Caucasus, Turkmenistan.

Senior homonym: *Cheiloneurus bifasciatus* (Timberlake, 1922).

Original combination: *Aulonops bifasciata* Timberlake, 1922.

Distribution: Hawaii.

Replacement name: *Cheiloneurus daghestanicus* **nom. nov.**

pro *Cheiloneurus bifasciatus* (Trjapitzin, 1962) **syn. nov.**

Etymology: From the type locality Daghestan ASSR, Russia.

***Cheiloneurus hawaiiicus* nom. nov.**

Junior secondary homonym: *Cheiloneurus hemipterus* (Timberlake, 1922).

Original combination: *Hypergonatopus hemipterus* Timberlake, 1922.

Distribution: Hawaii

Senior homonym: *Cheiloneurus hemipterus* (Girault, 1920).

Original combination: *Eusemionella hemiptera* Girault, 1920.

Distribution: Queensland, Australia.

Replacement name: *Cheiloneurus hawaiiicus* **nom. nov.**

pro *Cheiloneurus hemipterus* (Timberlake, 1922) **syn. nov.**

Etymology: From the type locality Hawaii.

***Cheiloneurus sinensis* nom. nov.**

Junior primary homonym: *Cheiloneurus phenacocci* Shi, 1994.

Distribution: China (Henan, Shianxi).

Senior homonym: *Cheiloneurus phenacocci* Trjapitzin, 1964.

Distribution: Primor'ye Kray, Russia and Japan.

Replacement name: *Cheiloneurus sinensis* **nom. nov.**

pro *Cheiloneurus phenacocci* Shi, 1994 **syn. nov.**

Etymology: From the type locality China.

Genus COPIDOSOMA***Copidosoma americana* nom. nov.**

Junior secondary homonym: *Copidosoma gelechia* (Howard, 1898).

Original combination: *Parapsilophrys gelechia* Howard, 1898.

Distribution: America.

Senior homonym: *Copidosoma gelechia* Howard, 1885.

Distribution: Canada, America, Peru.

Replacement name: ***Copidosoma americana* nom. nov.**

pro *Copidosoma gelechia* (Howard, 1898) **syn. nov.**

Etymology: From the type locality America.

Genus *ENCYRTUS****Encyrtus merceti* nom. nov.**

Junior secondary homonym: *Encyrtus dubius* (Mercet, 1921).

Original combination: *Eucomys dubius* Mercet, 1921.

Distribution: Canary Islands, Spain.

Senior homonym: *Encyrtus dubius* Fonscolombe, 1840.

Distribution: France.

Replacement name: *Encyrtus merceti* **nom. nov.**

pro *Encyrtus dubius* (Mercet, 1921) **syn. nov.**

Etymology: The name is dedicated to R. G. Mercet who is the author of the preexisting species *E. dubius*.

Genus *METAPHYCUS****Metaphycus myartsevai* nom. nov.**

Junior primary homonym: *Metaphycus acanthococci* Myartseva, 1987.

Distribution: Turkmenistan.

Senior homonym: *Metaphycus acanthococci* Myartseva, 1984.

Distribution: Turkmenistan.

Replacement name: *Metaphycus myartsevai* **nom. nov.**

pro *Metaphycus acanthococci* Myartseva, 1987 **syn. nov.**

Etymology: The name is dedicated to S. N. Myartseva who is the author of the preexisting species *M. acanthococci*.

***Metaphycus xujiangi* nom. nov.**

Junior primary homonym: *Metaphycus ericeri* Xu & Jiang, 1991.

Distribution: China (Hunan, Sichuan, Yunnan).

Senior homonym: *Metaphycus ericeri* Trjapitzin, 1967.

Distribution: China, Russia.

Replacement name: *Metaphycus xujiangi* **nom. nov.**

pro *Metaphycus ericeri* Xu & Jiang, 1991 **syn. nov.**

Etymology: The name is dedicated to Z. H. Xu and D. Jiang who are the authors of the preexisting species *M. ericeri*.

***Metaphycus sinensis* nom. nov.**

Junior primary homonym: *Metaphycus flavus* (Shi, Si & Wang, 1994).

Original combination: *Aenasioidea flava* Shi, Si & Wang, 1994.

Distribution: Shandong, China.

Senior homonym: *Metaphycus flavus* (Howard, 1881).

Original combination: *Aphycus flavus* Howard, 1881.

Distribution: Europe, North, Central and South America, Antilles, Australia, Caucasus, Middle East, Iran, Canary Islands, North Africa, India.

Replacement name: *Metaphycus sinensis* **nom. nov.**

pro *Metaphycus flavus* (Shi, Si & Wang, 1994) **syn. nov.**

Etymology: From the type locality China.

***Metaphycus sharkovi* nom. nov.**

Junior secondary homonym: *Metaphycus insularis* (Sharkov, 1988).
Original combination: *Aenasioidea insularis* Sharkov, 1988.
Distribution: Kamchatka blast, Russia.

Senior homonym: *Metaphycus insularis* Annecke & Mynhardt, 1981.
Distribution: Afrotropical, Mauritius.

Replacement name: *Metaphycus sharkovi* **nom. nov.**

pro *Metaphycus insularis* (Sharkov, 1988) **syn. nov.**

Etymology: The name is dedicated to A. V. Sharkov who is the author of the preexisting species *M. insularis*.

***Metaphycus euturkmenicus* nom. nov.**

Junior primary homonym: *Metaphycus turkmenicus* Myartseva, 1987.
Distribution: Turkmenistan.

Senior homonym: *Metaphycus turkmenicus* Myartseva, 1984.
Distribution: Turkmenistan.

Replacement name: *Metaphycus euturkmenicus* **nom. nov.**

pro *Metaphycus ericeri* Xu & Jiang, 1991 **syn. nov.**

Etymology: From the specific epithet.

Genus *SYRPHOPHAGUS****Syrphophagus noyesi* nom. nov.**

Junior secondary homonym: *Syrphophagus nigricornis* (De Santis, 1964).
Original combination: *Syrphidencyrtus nigricornis* De Santis, 1964.
Distribution: Argentina.

Senior homonym: *Syrphophagus nigricornis* (Girault, 1922).
Original combination: *Hexanusia nigricornis* Girault, 1922.
Distribution: Queensland, Australia.

Replacement name: *Syrphophagus noyesi* **nom. nov.**

pro *Syrphophagus nigricornis* (De Santis, 1964) **syn. nov.**

Etymology: The name is dedicated to J. S. Noyes.

***Syrphophagus australis* nom. nov.**

Junior secondary homonym: *Syrphophagus parvus* (Girault, 1923).
Original combination: *Cerchysiopsis parva* Girault, 1923.
Distribution: Queensland, Australia.

Senior homonym: *Syrphophagus parvus* (Mercet, 1921).
Original combination: *Microterys parvus* Mercet, 1921.
Distribution: Spain.

Replacement name: *Syrphophagus australis* **nom. nov.**

pro *Syrphophagus parvus* (Girault, 1923) **syn. nov.**

Etymology: From the type locality Australia.

TETRACNEMINAE**Genus *LEPTOMASTIX******Leptomastix mayri* nom. nov.**

Junior secondary homonym: *Leptomastix histrio* Mayr, 1876.

Distribution: Europe (Czechia, Germany, Hungary, Italy, Moldova, Slovakia, Spain, Montenegro), Mongolia, Pakistan, China, Hawaii.

Senior homonym: *Leptomastix histrio* (Förster, 1856).

Original combination: *Sterrhocoma histrio* Förster, 1856.

Distribution: Germany.

Replacement name: *Leptomastix mayri* **nom. nov.**

pro *Leptomastix histrio* Mayr, 1876 **syn. nov.**

Etymology: The name is dedicated to G. Mayr who is the author of the preexisting species *L. histrio*.

Genus *RHOPUS****Rhopus sinicus* nom. nov.**

Junior secondary homonym: *Rhopus flavus* Xu, 2004.

Distribution: Liaoning, China.

Senior homonym: *Rhopus flavus* (Mercet, 1921).

Original combination: *Pholidoceras flava* Mercet, 1921.

Distribution: Spain.

Replacement name: *Rhopus sinicus* **nom. nov.**

pro *Rhopus flavus* Xu, 2004 **syn. nov.**

Etymology: From the type locality China.

EULOPHIDAE**ENTEDONINAE****Genus *CHRYSONOTOMYIA******Chrysonotomyia costaricana* nom. nov.**

Junior primary homonym: *Chrysonotomyia reticulata* Hansson, 2004.

Distribution: Costa Rica.

Senior homonym: *Chrysonotomyia reticulata* Sheng & Zhan, 2000.

Distribution: China (Guangdong, Jiangxi).

Replacement name: *Chrysonotomyia costaricana* **nom. nov.**

pro *Chrysonotomyia reticulata* Hansson, 2004 **syn. nov.**

Etymology: From the type locality Costa Rica.

Genus *CLOSTEROCERUS****Closterocerus hanssoni* nom. nov.**

Junior secondary homonym: *Closterocerus (Achrysocharis) longus* Hansson, 1994.

Distribution: America.

Senior homonym: *Closterocerus longus* (Girault, 1915).

Original combination: *Achrysocharis longus* Girault, 1915.

Distribution: New South Wales, Australia.

Replacement name: *Closterocerus hanssoni* **nom. nov.**

pro *Closterocerus (Achrysocharis) longus* Hansson, 1994 **syn. nov.**

Etymology: The name is dedicated to C. Hansson who is the author of the preexisting species *C. longus*.

***Closterocerus eupulcher* nom. nov.**

Junior secondary homonym: *Closterocerus pulcher* (Girault, 1913).

Original combination: *Chrysocharella pulchra* Girault, 1913.

Distribution: Queensland, Australia.

Senior homonym: *Closterocerus pulcher* (Howard, 1897).

Original combination: *Entedon pulcher* Howard, 1897.

Distribution: Grenada.

Replacement name: *Closterocerus eupulcher* **nom. nov.**

pro *Closterocerus pulcher* (Girault, 1913) **syn. nov.**

Etymology: From the specific epithet.

***Closterocerus australis* nom. nov.**

Junior secondary homonym: *Closterocerus trifasciatus* (Girault, 1913).

Original combination: *Achrysocharis trifasciatus* Girault, 1913.

Distribution: Queensland, Australia.

Senior homonym: *Closterocerus trifasciatus* Westwood, 1833.

Distribution: Europe, Russia, Yemen, China, Japan, Canada, America.

Replacement name: *Closterocerus australis* **nom. nov.**

pro *Closterocerus trifasciatus* (Girault, 1913) **syn. nov.**

Etymology: From the type locality Australia.

***Closterocerus askewi* nom. nov. and *Closterocerus americanus* nom. nov.**

Junior secondary homonym: *Closterocerus violaceus* (Askew, 1999).

Original combination: *Neochrysocharis violacea* Askew, 1999.

Distribution: Canary Islands, Spain.

Junior secondary homonym: *Closterocerus (Achrysocharis) violaceus* Hansson, 1994.

Distribution: America.

Senior homonym: *Closterocerus violaceus* (Ferrière, 1936).

Original combination: *Teleopterus violaceus* Ferrière, 1936.

Distribution: Afrotropical.

Replacement name: *Closterocerus askewi* **nom. nov.**

pro *Closterocerus violaceus* (Askew, 1999) **syn. nov.**

Etymology: The name is dedicated to R. R. Askew who is the author of the preexisting species *C. violaceus*.

Replacement name: *Closterocerus americanus* **nom. nov.**

pro *Closterocerus (Achrysocharis) violaceus* Hansson, 1994 **syn. nov.**

Etymology: From the distribution area of the species.

Genus *ENTEDON****Entedon nearcticus* nom. nov.**

Junior secondary homonym: *Entedon leucopus* (Ashmead, 1888).

Original combination: *Pleurotropis leucopus* Ashmead, 1888.

Distribution: Canada, America.

Senior homonym: *Entedon leucopus* Dalman, 1820.

Distribution: Sweden.

Replacement name: *Entedon nearcticus* **nom. nov.**

pro *Entedon leucopus* (Ashmead, 1888) **syn. nov.**

Etymology: From the distribution area of the species.

***Entedon neotibialis* nom. nov.**

Junior secondary homonym: *Entedon tibialis* Szélenyi, 1978.

Distribution: Hungary, Netherlands.

Senior homonym: *Entedon tibialis* (Nees, 1834).

Original combination: *Eulophus tibialis* Nees, 1834.

Distribution: Europe.

Replacement name: *Entedon neotibialis* **nom. nov.**

pro *Entedon tibialis* Szélenyi, 1978 **syn. nov.**

Etymology: From the specific epithet.

Genus *PEDIOBIUS****Pediobius khani* nom. nov.**

Junior primary homonym: *Pediobius ni* Khan, 1996.

Distribution: Uttar Pradesh, India.

Senior homonym: *Pediobius ni* Peck, 1985.

Distribution: Costa Rica, Honduras, America (Arizona).

Replacement name: *Pediobius khani* **nom. nov.**

pro *Pediobius ni* Khan, 1996 **syn. nov.**

Etymology: The name is dedicated to M. A. Khan who is the author of the preexisting species *P. ni*.

EULOPHINAE**Genus *AULOGYMNUS******Aulogymnus arifaokhani* nom. nov.**

Junior secondary homonym: *Aulogymnus indicus* Khan, Agnihotri & Sushil, 2005.

Distribution: Uttaranchal, India.

Senior homonym: *Aulogymnus indicus* (Arifa & Khan, 1992).

Original combination: *Olynx indicus* Arifa & Khan, 1992.

Distribution: Uttar Pradesh, India.

Replacement name: *Aulogymnus arifaokhani* **nom. nov.**

pro *Aulogymnus indicus* Khan, Agnihotri & Sushil, 2005 **syn. nov.**

Etymology: The name is dedicated to N. Arifa and M. A. Khan who are the authors of the preexisting species *A. indicus*.

Genus CIRROSPILUS***Cirrospilus americanus* nom. nov.**

Junior secondary homonym: *Cirrospilus nigrivariegatus* (Girault, 1917).
Original combination: *Pseudiglyphomyia nigrivariegata* Girault, 1917.
Distribution: America.

Senior homonym: *Cirrospilus nigrivariegatus* (Girault, 1915).
Original combination: *Cirrospilopsis nigrivariegatus* Girault, 1915.
Distribution: Queensland, Australia.

Replacement name: *Cirrospilus americanus* **nom. nov.**
pro *Cirrospilus nigrivariegatus* (Girault, 1917) **syn. nov.**
Etymology: From the type locality America.

***Cirrospilus noyesi* nom. nov.**

Junior secondary homonym: *Cirrospilus pulcher* (Girault, 1913).
Original combination: *Gyrolasella pulchra* Girault, 1913.
Distribution: Queensland, Australia and Ul'yanovsk Oblast, Russia
Senior homonym: *Cirrospilus pulcher* Masi, 1911.
Distribution: Italy, Czechia, Hungary, Switzerland, Slovakia, Moldova, Morocco, New Zealand.

Replacement name: *Cirrospilus noyesi* **nom. nov.**
pro *Cirrospilus pulcher* (Girault, 1913) **syn. nov.**
Etymology: The name is dedicated to J. S. Noyes.

Genus DICLADOCERUS***Dicladocerus yoshimotoi* nom. nov.**

Junior secondary homonym: *Dicladocerus japonicus* Yoshimoto, 1976.
Distribution: Japan, America.

Senior homonym: *Dicladocerus japonicus* (Ashmead, 1904).
Original combination: *Eulophus japonicus* Ashmead, 1904.
Distribution: Japan, Russia, America.

Replacement name: *Dicladocerus yoshimotoi* **nom. nov.**
pro *Dicladocerus japonicus* Yoshimoto, 1976 **syn. nov.**
Etymology: The name is dedicated to C. M. Yoshimoto who is the author of the preexisting species *D. japonicus*.

Genus DIGLYPHOMORPHOMYIA***Diglyphomorphomyia keralana* nom. nov.**

Junior primary homonym: *Diglyphomorphomyia nigra* Narendran, 2005.
Distribution: Kerala, India.

Senior homonym: *Diglyphomorphomyia nigra* Zhu & Huang, 2003.
Distribution: China (Fujian, Hainan).

Replacement name: *Diglyphomorphomyia keralana* **nom. nov.**
pro *Diglyphomorphomyia nigra* Narendran, 2005 **syn. nov.**
Etymology: From the type locality Kerala, India.

Genus *MICROLYCUS****Microlycus hungarica* nom. nov.**

Junior secondary homonym: *Microlycus erdoesi* (Szelényi, 1976).

Original combination: *Neolachertus erdoesi* Szelényi, 1976.

Distribution: Hungary, Sweden.

Senior homonym: *Microlycus erdoesi* Boucek, 1959.

Distribution: Sweden, Austria, Bulgaria, Czechia, Hungary, Moldova, Slovakia, England, Turkey, Russia.

Replacement name: *Microlycus hungarica* **nom. nov.**

pro *Microlycus erdoesi* (Szelényi, 1976) **syn. nov.**

Etymology: From the type locality Hungary.

Genus *SYMPIESIS****Sympiesis turkmenica* nom. nov. and *Sympiesis myartsevai* nom. nov.**

Junior primary homonym: *Sympiesis elaeagni* Myartseva, 1999.

Distribution: Turkmenistan.

Junior primary homonym: *Sympiesis elaeagni* Myartseva, 1998.

Distribution: Turkmenistan.

Senior homonym: *Sympiesis elaeagni* Myartseva, 1997.

Distribution: Turkmenistan.

Replacement name: *Sympiesis turkmenica* **nom. nov.**

pro *Sympiesis elaeagni* Myartseva, 1999 **syn. nov.**

Etymology: From the type locality Turkmenistan.

Replacement name: *Sympiesis myartsevai* **nom. nov.**

pro *Sympiesis elaeagni* Myartseva, 1998 **syn. nov.**

Etymology: The name is dedicated to S. N. Myartseva who is the author of the preexisting species *S. elaeagni*.

TETRASTICHINAE**Genus *APROSTOCETUS******Aprostocetus primoricus* nom. nov.**

Junior secondary homonym: *Aprostocetus arsenjevi* (Kostjukov, 1990).

Distribution: Primor'ye Kray, Russia.

Senior homonym: *Aprostocetus arsenjevi* (Kostjukov, 1995).

Distribution: Kamchatka Oblast, Russia.

Replacement name: *Aprostocetus primoricus* **nom. nov.**

pro *Aprostocetus arsenjevi* (Kostjukov, 1990) **syn. nov.**

Etymology: From the type locality Primor'ye Kray, Russia.

***Aprostocetus giraulti* nom. nov.**

Junior secondary homonym: *Aprostocetus auriflavus* (Girault, 1915).

Original combination: *Tetrastichodes auriflavus* Girault, 1915.

Distribution: Queensland, Australia.

Senior homonym: *Aprostocetus auriflavus* (Girault, 1913).
Original combination: *Syntomosphyrella auriflava* Girault, 1913.
Distribution: Queensland, Australia.

Replacement name: *Aprostocetus giraulti* **nom. nov.**

pro *Aprostocetus auriflavus* (Girault, 1915) **syn. nov.**

Etymology: The name is dedicated to A. A. Girault who is the author of the preexisting species *A. auriflavus*.

***Aprostocetus indicus* nom. nov. and *Aprostocetus jaipurensis* Khan & Shafee, 1988**

Junior primary homonym: *Aprostocetus bouceki* Khan, Agnihotri & Sushil, 2005.
Distribution: Uttranchal, India.

Junior secondary homonym: *Aprostocetus bouceki* (Khan & Shafee, 1988).
Original combination: *Tetrastichus bouceki* Khan & Shafee, 1988.
Synonym: *Tetrastichus jaipurensis* Khan & Shafee, 1988.
Distribution: India (Maharashtra, Rajasthan).

Senior homonym: *Aprostocetus* (*Aprostocetus*) *bouceki* Graham, 1987.
Distribution: Spain.

Replacement name: *Aprostocetus indicus* **nom. nov.**

pro *Aprostocetus bouceki* Khan, Agnihotri & Sushil, 2005 **syn. nov.**

Etymology: From the type locality India.

Replacement name: *Aprostocetus jaipurensis* (Khan & Shafee, 1988)
pro *Aprostocetus bouceki* (Khan & Shafee, 1988) **syn. nov.**
Etymology: From the available synonym name of *A. bouceki*.

***Aprostocetus seychellensis* nom. nov.**

Junior secondary homonym: *Aprostocetus distinguendis* (Masi, 1917).
Original combination: *Tetrastichus distinguendus* Masi, 1917.
Distribution: Seychelles.

Senior homonym: *Aprostocetus distinguendus* (Perkins, 1912).
Original combination: *Ootetrastichus distinguendus* Perkins, 1912.
Distribution: Europe.

Replacement name: *Aprostocetus seychellensis* **nom. nov.**

pro *Aprostocetus distinguendis* (Masi, 1917) **syn. nov.**

Etymology: From the type locality.

***Aprostocetus doutti* nom. nov.**

Junior secondary homonym: *Aprostocetus elongatus* (Doutt, 1961).
Original combination: *Ootetrastichus elongatus* Doutt, 1961.
Distribution: Japan.

Senior homonym: *Aprostocetus elongatus* (Förster, 1841).
Original combination: *Eulophus elongatus* Förster, 1841.
Distribution: Europe.

Replacement name: *Aprostocetus doutti* **nom. nov.**

pro *Aprostocetus elongatus* (Doutt, 1961) **syn. nov.**

Etymology: The name is dedicated to R. L. Doutt who is the author of the preexisting species *A. elongatus*.

***Aprostocetus euflavus* nom. nov. and *Aprostocetus neoflavus* nom. nov.**

Junior secondary homonym: *Aprostocetus flavus* (Girault, 1913).
Original combination: *Aprostocerella flava* Girault, 1913: 240.
Distribution: Queensland, Australia.

Junior secondary homonym: *Aprostocetus flavus* (Girault, 1913).
Original combination: *Ootetrastichus flavus* Girault, 1913: 217, 222.
Distribution: Queensland, Australia.

Senior homonym: *Aprostocetus flavus* Girault, 1913: 212.
Distribution: Queensland, Australia.

Replacement name: *Aprostocetus euflavus* **nom. nov.**
pro *Aprostocetus flavus* (Girault, 1913) **syn. nov.**
Aprostocerella flava Girault, 1913: 240.
Etymology: From the specific epithet.

Replacement name: *Aprostocetus neoflavus* **nom. nov.**
pro *Aprostocetus flavus* (Girault, 1913) **syn. nov.**
Ootetrastichus flavus Girault, 1913: 217, 222.
Etymology: From the specific epithet.

***Aprostocetus cengizi* nom. nov.**

Junior secondary homonym: *Aprostocetus hyalinipennis* (Girault, 1914).
Original combination: *Syntomosphyrum hyalinipenne* Girault, 1914.
Distribution: Queensland, Australia.

Senior homonym: *Aprostocetus hyalinipennis* (Girault, 1911).
Original combination: *Tetrastichodes hyalinipennis* Girault, 1911.
Distribution: Paraguay.

Replacement name: *Aprostocetus cengizi* **nom. nov.**
pro *Aprostocetus hyalinipennis* (Girault, 1914) **syn. nov.**
Etymology: The name is dedicated to Gökhan Cengiz (Turkey).

***Aprostocetus metei* nom. nov.**

Junior secondary homonym: *Aprostocetus longiventris* (Masi, 1917).
Original combination: *Tetrastichus longiventris* Masi, 1917.
Distribution: Seychelles.

Senior homonym: *Aprostocetus longiventris* (Girault, 1913).
Original combination: *Ootetrastichella longiventris* Girault, 1913.
Distribution: Queensland, Australia.

Replacement name: *Aprostocetus metei* **nom. nov.**
pro *Aprostocetus longiventris* (Masi, 1917) **syn. nov.**
Etymology: The name is dedicated to Mete Murat Haliloğlu (Turkey).

***Aprostocetus moluccasicus* nom. nov.**

Junior secondary homonym: *Aprostocetus pallidipes* (Perkins, 1912).
Original combination: *Ootetrastichus pallidipes* Perkins, 1912.
Distribution: South Moluccas, Indonesia and Mauritius.

Senior homonym: *Aprostocetus pallidipes* (Ashmead, 1904).
Original combination: *Tetrastichodes pallidipes* Ashmead, 1904.

Distribution: Japan.

Replacement name: *Aprostocetus moluccasicus* **nom. nov.**

pro *Aprostocetus pallidipes* (Perkins, 1912) **syn. nov.**

Etymology: From the type locality Moluccas, Indonesia.

***Aprostocetus pseudopurpureus* nom. nov.**

Junior secondary homonym: *Aprostocetus purpureus* Girault, 1913.

Distribution: Queensland, Australia.

Senior homonym: *Aprostocetus purpureus* (Cameron, 1913).

Original combination: *Hadrothrix purpurea* Cameron, 1913.

Distribution: Australia, Bangladesh, India, Malaysia, Pakistan, China (Zhejiang).

Replacement name: *Aprostocetus pseudopurpureus* **nom. nov.**

pro *Aprostocetus purpureus* Girault, 1913 **syn. nov.**

Etymology: From the specific epithet.

***Aprostocetus eusenegalensis* nom. nov.**

Junior secondary homonym: *Aprostocetus senegalensis* (Risbec, 1951: 96).

Original combination: *Hyperteles senegalensis* Risbec, 1951: 96.

Distribution: Senegal.

Senior homonym: *Aprostocetus senegalensis* (Risbec, 1951: 89).

Original combination: *Tetrastichodes senegalensis* Risbec, 1951: 89.

Distribution: Senegal.

Replacement name: *Aprostocetus eusenegalensis* **nom. nov.**

pro *Aprostocetus purpureus* Girault, 1913 **syn. nov.**

Etymology: From the specific epithet.

Genus *TETRASTICHUS*

***Tetrastichus breviscapella* nom. nov. and *Tetrastichus ukrainensis* nom. nov.**

Junior primary homonym: *Tetrastichus breviscapus* Kostjukov, 1995.

Distribution: Primor'ye Kray, Russia.

Junior primary homonym: *Tetrastichus breviscapus* Kostjukov, 1978.

Distribution: Ukraine.

Senior homonym: *Tetrastichus breviscapus* Kostjukov, 1977.

Distribution: Ukraine.

Replacement name: *Tetrastichus breviscapella* **nom. nov.**

pro *Tetrastichus breviscapus* Kostjukov, 1995 **syn. nov.**

Etymology: From the specific epithet.

Replacement name: *Tetrastichus ukrainensis* **nom. nov.**

pro *Tetrastichus breviscapus* Kostjukov, 1978 **syn. nov.**

Etymology: From the type locality Ukraine.

***Tetrastichus uttaranchalicus* nom. nov. and *Tetrastichus yangi* nom. nov.**

Junior primary homonym: *Tetrastichus clavatus* Khan, Agnihotri & Sushil, 2005.

Synonym: *Tetrastichus clavus* Khan, Agnihotri & Sushil, 2005 [Alternative original spelling of *Tetrastichus clavatus* Kostjukov (page 177)]

Distribution: India.

Junior primary homonym: *Tetrastichus clavatus* Yang, 1996.

Distribution: Shaanxi, China.

Senior homonym: *Tetrastichus clavatus* Kostjukov, 1995.

Distribution: Primor'ye Kray, Russia.

Replacement name: *Tetrastichus uttaranchalicus* **nom. nov.**

pro *Tetrastichus clavatus* Khan, Agnihotri & Sushil, 2005 **syn. nov.**

Etymology: From the type locality Uttarakhand, India.

Replacement name: *Tetrastichus yangi* **nom. nov.**

pro *Tetrastichus clavatus* Yang, 1996 **syn. nov.**

Etymology: The name is dedicated to Z. Q. Yang who is the author of the preexisting species *T. clavatus*.

***Tetrastichus pehlivani* nom. nov.**

Junior secondary homonym: *Tetrastichus coeruleus* (Bingham, 1906).

Original combination: *Microterys coeruleus* Bingham, 1906.

Distribution: Queensland, Australia.

Senior homonym: *Tetrastichus coeruleus* (Nees, 1834).

Original combination: *Eulophus coeruleus* Nees, 1834.

Distribution: Europe, Canada, America.

Replacement name: *Tetrastichus pehlivani* **nom. nov.**

pro *Tetrastichus coeruleus* (Bingham, 1906) **syn. nov.**

Etymology: The name is dedicated to Prof. Dr. Sevil Pehlivan and Prof. Dr. Ferit Pehlivan (Turkey).

***Tetrastichus dignella* nom. nov.**

Junior primary homonym: *Tetrastichus dignus* Kostjukov, 1995.

Distribution: Primor'ye Kray, Russia.

Senior homonym: *Tetrastichus dignus* Kostjukov, 1995.

Distribution: Khabarovsk Kray, Russia.

Replacement name: *Tetrastichus dignella* **nom. nov.**

pro *Tetrastichus dignus* Kostjukov, 1995 **syn. nov.**

Etymology: From the specific epithet.

***Tetrastichus meridionalis* nom. nov.**

Junior primary homonym: *Tetrastichus lepidus* Masi, 1940.

Distribution: Somalia, Ivory Coast, Senegal, West Africa.

Senior homonym: *Tetrastichus lepidus* Walker, 1874.

Distribution: Amur Oblast, Russia.

Replacement name: *Tetrastichus meridionalis* **nom. nov.**

pro *Tetrastichus lepidus* Masi, 1940 **syn. nov.**

Etymology: From the distribution area of the species.

***Tetrastichus argentinacus* nom. nov.**

Junior primary homonym: *Tetrastichus lopezi* Blanchard, 1936.

Distribution: Argentina.

Senior homonym: *Tetrastichus lopezi* Cristobal, 1936.

Distribution: Argentina.

Replacement name: *Tetrastichus argentinacus* **nom. nov.**

pro *Tetrastichus lopezi* Blanchard, 1936 **syn. nov.**

Etymology: From the type locality Argentina.

***Tetrastichus primoricus* nom. nov. and *Tetrastichus acaciae* nom. nov.**

Junior primary homonym: *Tetrastichus* (*Tetrastichus*) *magnus* Kostjukov, 1995.

Distribution: Primor'ye Kray, Russia.

Junior primary homonym: *Tetrastichus magnus acaciae* Risbec, 1958.

Distribution: Madagascar.

Senior homonym: *Tetrastichus magnus* Risbec, 1951.

Distribution: Ivory Coast.

Replacement name: *Tetrastichus primoricus* **nom. nov.**

pro *Tetrastichus* (*Tetrastichus*) *magnus* Kostjukov, 1995 **syn. nov.**

Etymology: From the type locality Primor'ye Kray, Russia.

Replacement name: *Tetrastichus acaciae* **nom. nov.**

pro *Tetrastichus magnus acaciae* Risbec, 1958 **syn. nov.**

Etymology: From the name of Risbec.

***Tetrastichus khabarovskensis* nom. nov.**

Junior primary homonym: *Tetrastichus* (*Tetrastichus*) *niger* Kostjukov, 1995

Distribution: Khabarovsk Kray, Russia.

Senior homonym: *Tetrastichus niger* Ranaweera, 1950.

Distribution: India, Sri Lanka.

Replacement name: *Tetrastichus khabarovskensis* **nom. nov.**

pro *Tetrastichus* (*Tetrastichus*) *niger* Kostjukov, 1995 **syn. nov.**

Etymology: From the type locality Khabarovsk Kray, Russia.

***Tetrastichus euprimoricus* nom. nov.**

Junior secondary homonym: *Tetrastichus nigriscapus* Kostjukov, 1995.

Distribution: Primor'ye Kray, Russia.

Senior homonym: *Tetrastichus nigriscapus* (Howard, 1897).

Original combination: *Tetrastichodes nigriscapus* Howard, 1897.

Distribution: Grenada.

Replacement name: *Tetrastichus primoricus* **nom. nov.**

pro *Tetrastichus nigriscapus* Kostjukov, 1995 **syn. nov.**

Etymology: From the type locality Primor'ye Kray, Russia.

***Tetrastichus hindicus* nom. nov.**

Junior primary homonym: *Tetrastichus orientalis* Khan, Agnihotri & Sushil, 2005.

Distribution: India.

Senior homonym: *Tetrastichus* (*Musciformia*) *orientalis* Kostjukov, 1995.

Distribution: Russia.

Replacement name: *Tetrastichus hindicus* **nom. nov.**

pro *Tetrastichus orientalis* Khan, Agnihotri & Sushil, 2005 **syn. nov.**

Etymology: From the type locality India.

***Tetrastichus euplanipectus* nom. nov.**

Junior primary homonym: *Tetrastichus planipectus* Kostjukov, 1995.

Distribution: Primor'ye Kray, Russia.

Senior homonym: *Tetrastichus planipectus* Kostjukov, 1978.

Distribution: St. Petersburg, Russia.

Replacement name: *Tetrastichus euplanipectus* **nom. nov.**

pro *Tetrastichus planipectus* Kostjukov, 1995 **syn. nov.**

Etymology: From the specific epithet.

***Tetrastichus neothoracicus* nom. nov.**

Junior primary homonym: *Tetrastichus thoracicus* Khan, Agnihotri & Sushil, 2005.

Distribution: Uttaranchal, India.

Senior homonym: *Tetrastichus thoracicus* Yang, 1996.

Distribution: Heilongjiang, China.

Replacement name: *Tetrastichus neothoracicus* **nom. nov.**

pro *Tetrastichus thoracicus* Khan, Agnihotri & Sushil, 2005 **syn. nov.**

Etymology: From the specific epithet.

***Tetrastichus kostjukovi* nom. nov.**

Junior secondary homonym: *Tetrastichus tibialis* Kostjukov, 1995.

Distribution: Russia.

Senior homonym: *Tetrastichus tibialis* (Ashmead, 1894).

Original combination: *Tetrastichodes tibialis* Ashmead, 1894.

Distribution: Canada, America.

Replacement name: *Tetrastichus kostjukovi* **nom. nov.**

pro *Tetrastichus tibialis* Kostjukov, 1995 **syn. nov.**

Etymology: The name is dedicated to Kostjukovi who is the author of the preexisting species *T. tibialis*.

* The references will be give at the end of the next paper.

STUDIES ON THE LONG-TERM PRESERVATION METHOD OF MUGA COCOON (*ANTHERAEA ASSAMENSIS* HELFER) AT LOW TEMPERATURE

G. Rajkhowa*, Rajesh Kumar and R. K. Rajan

* Central Muga Eri Research and Training Institute, Central Silk Board, Ministry of Textiles, Govt. of India, Lahdoigarh 785700 Assam, INDIA. E-mail : girinrajkhwa@yahoo.co.in

[Rajkhowa, G., Kumar, R. & Rajan, R. K. 2011. Studies on the long-term preservation method of Muga Cocoon (*Antheraea assamensis* Helfer) at low temperature. Munis Entomology & Zoology, 6 (2): 815-818]

ABSTRACT: A study was made to develop a suitable long term seed cocoon preservation method for skipping unfavorable *Aherua* pre-seed crop of Muga silkworm by postponing moth emergence. Muga silkworm seed cocoons of 8 days old were subjected to the low temperatures at $7.5 \pm 1^\circ\text{C}$ and $10 \pm 1^\circ\text{C}$ in BOD incubator for long term preservation of 32 to 52 days following the double step preservation method. The results indicated that muga seed cocoons can effectively be preserved at $10 \pm 1^\circ\text{C}$ for 42 days without affecting the grainage parameters measured for seed production.

KEY WORDS: Muga silkworm, *Antheraea assamensis*, seed cocoons, preservation.

The Vanya Muga silkworm, *Antheraea assamensis* Helfer is multivoltine with 6 overlapping crops, namely, *Jethua* (Apr–May), *Aherua* (Jun–July), *Bhadia* (Aug–Sept.), *Katia* (Oct–Nov), *Jarua* (Dec–Jan) and *Chatua* (Feb–Mar). Among these 6 crops, *Jethua* and *Katia* are the only commercial crops, reared during favourable climatic conditions, while the remaining 4 crops, which are reared as pre-seed and seed crops, viz., *Aherua* & *Jarua* pre-seed crops and *Bhadia* & *Chatua* seed crops are hazardous due to adverse inclement climatic conditions as well as other biotic factors.

In Assam, temperature prevailing during summer crop seasons, especially in *Aherua* pre-seed and *Bhadia* seed crop, ranges from $24\text{--}36^\circ\text{C}$ coupled with high humidity of 85–95%. Because of these hazardous inclement climatic conditions as well as other biotic factors viz., diseases and insect predators, the pre-seed and seed crops are low productive (14–40% crop loss) and sometimes highly uncertain leading to uneconomic crops (Chkravorty et al., 2007). However, these pre-seed and seed crops are mandatory to maintain the linkage for production of commercial seed for *Katia* crops.

Particularly, during summer pre-seed crop (*Aherua*), muga silkworms are exposed to the extremes of temperature & relative humidity detrimental to congenial development, which results in poor crop harvest in terms of quality and quantity. The rate of multiplication of seeds from pre-seed crop cocoons is also affected due to lack of quality seed cocoons obtained from the adverse *Aherua* pre-seed crop, which results in high ratio of cocoon : dfl and low hatching. As such, the rearing *vis-à-vis* seed production from summer pre-seed crop (*Aherua*) is identified as a major constraint and critical aspect In Muga culture, which is considered as bottleneck in augmenting Muga production.

In view of the above mentioned circumstances, this study is undertaken to tackle or to overcome the constraints of *Aherua* (May–June) pre-seed crop linked with the *Katia* (October–November) commercial seed production of Muga silkworm. An attempt is being made in this study to develop a suitable long term seed cocoon preservation method for skipping unfavourable *Aherua* pre-seed crop rearing of Muga silkworm by postponing moth emergence.

MATERIAL AND METHODS

Muga silkworm seed cocoons of 8 days old from commercial *Jethua* (April-May) crop were preserved in two lots at 7.5° & 10°C for 20 days initially followed by intermediate temperature treatment of 12.5°C for two days to allow pupae to develop to the next stage. Subsequently, treated pupae were further subjected to second step refrigeration for 10-30 days in BOD incubator and released at 10 days interval, i.e., released after 32, 42 and 52 days of preservation.. During the time of consigning and releasing, the cocoons were passed through an intermediate temperature exposure of 15°C for 12 hrs. After releasing from BOD incubator, the seed cocoons were kept in Air Condition Room at temperature 27±1°C and relative humidity 75-85% for grainage operation. The grainage performance of the preserved lots of seed cocoons in respect of total pupal period, the time taken for emergence after release, percentage of moth emergence, percentage of coupling, number of invalid of moths, percentage of fecundity and hatching were studied.

RESULTS AND DISCUSSION

The recorded data of the present observations are tabulated in Table 1. **Pupal period** was prolonged up to a maximum of 68 days (at 7.5°C) followed by 62 days (at 10°C) in 52 days preservation as compared to 18 days in the control (Fig. 1). **Moth emergence** ranged from 96.70 to 100.00% recorded and there was not much significant difference among the treatments in respect of moth emergence (Fig. 2). However, the emergence of the moth was found crippled and invalid while preserved for longer duration of 52 days at 7.5°C and 10°C (Fig. 3). **Coupling percentage** was recorded maximum of 72% at 10°C preserved for 32 days followed by 63% preserved for 42 days. However, 58% followed by 45% coupling was observed at 7.5°C preserved for 32 and 42 days, respectively (Fig. 4, 5). The crippled and invalid moths were recorded more in number, while the seed cocoons were preserved beyond 42 days. **Fecundity** was recorded maximum of 200 at 10°C followed by 196 at 7.5°C in 32 days preservation as compared to 190 in the control (Fig. 6, 7, 8). **Hatching** was recorded maximum of 79.80 % in 32 days preservation followed by 68.60 % in 42 days preservation at 10°C as compared to 80 % in the control. However, 25 to 30% eggs were found depressed while preserved beyond 42 to 52 days both at 7.5°C and 10°C.

These results are found in contrast to the findings of earlier workers. Attempts made by earlier workers to preserve seed cocoons at 5°C beyond 30 days led to detrimental effects on economic characters in muga silkworm (Sengupta and Singh, 1974 and Bharali, 1982; Anonymous, 1999-2000).). It was also observed that tolerance of this temperature beyond 30 days was fully detrimental, but its tolerance beyond 120 days showed almost complete pupal mortality (Choudhury et al., 1987).

ACKNOWLEDGEMENT

The financial help provided by Central Silk Board (Ministry of Textiles, Govt. of India) is gratefully acknowledged.

LITERATURE CITED

Anonymous. 1999-2000. Annual Report. Central Muga Eri Research and Training Institute, Lahdoigarh, Assam. pp. 22-25.

Bharali, N. 1982. Preliminary records on rearing of *A. proylei* on *Lagerstroemia flowereginae* and refrigeration of *A. assamensis* and *A. proylei* cocoons. Proc. 15th Congress of the International Silk Association, London. pp. 37-40.

Chkravorty, R., Das, R., Neog, K., Das, K. & Sahu, M. 2007. A diagnostic manual for diseases and pest of muga silkworms and their host plants. Published by CMERTI, CSB, Lahdoigarh, Jorhat, Assam pp. 1-47.

Choudhury, C.C., Dubey, O.P., Choudhury, A. & Sengupta, K. 1987. Effect of refrigeration and preservation of muga seed cocoons *Antheraea assamensis* Ww. Sericologia, 27 (3): 547-552.

Sengupta, K. & Singh, K. 1974. Some studies on the effect of refrigeration of muga *A. assamensis* cocoons on moth emergence, egg laying and hatching of eggs. First International Seminar on non-mulberry silks, CTR&TI, Ranchi, pp. 174.

Table 1. Grainage performance of Muga seed cocoons preserved for longer duration (32, 42 and 52 days) at low temperatures (7.5°C and 10°C).

SL No.	Parameters	Preservation Duration (Days)						Control
		LOT-I (7.5°C)			LOT-II (10°C)			Normal Room condition
		32	42	52	32	42	52	
1	Pupal period (days)	48	58	68	44	53	62	18
2	Emergence after release (Days)	7	7	7	3	2	1	-
3	Emergence (%)	100	98.00	96.67	100	100	98.0	98.50
4	Coupling (%):	58	45	28	72	63	39	65.00
	a) Natural –	18	15	07	19	17	08	54.8
	b) Manual –	06	06	09	04	05	09	45.2
5	Invalid Moth	-	-	43	-	-	21	4
	a) Male –	-	-	35	-	-	6	3
	b) Female –	-	-		-	-		
6	Fecundity (No)	196	162	153	200	192	185	190
7	Hatching (%)	64.00	55.40	50.80	79.80	68.60	45.80	80.00



1



2



3



4



5



6



7



8

Figures 1-8, Muga silkworm, *Antheraea assamensis* Helfer. 1. Seed cocoons preserved in BOD incubator, 2. Seed cocoons kept in moth cages for emergence, 3. Crippled and invalid moths, 4. Naturally coupled moths 5. Coupled moth tied on *Kharika*, the egg laying device, 6. Female moth laid eggs on *Kharika*, 7. Healthy eggs, 8. Depressed eggs.

**PRELIMINARY REPORT ON A SURVEY OF THE
SAPROXYLIC BEETLE FAUNA LIVING ON OLD HOLLOW
OAKS (*QUERCUS* SPP.) AND OAK WOOD IN TURKEY
(COLEOPTERA: CERAMBYCIDAE)**

Gianfranco Sama*, Nicklas Jansson, Mustafa Avcı***,
Oğuzhan Sarıkaya***, Mustafa Coşkun****, Tamer Kayış****
and Hüseyin Özdikmen*******

* Via Raffaello Sanzio, 84, 47521 Cesena (FC), ITALY. E-mail: francosama@gmail.com

** IFM, Division of Ecology, Linköping University, Linköping, SWEDEN. E-mail: nicja@ifm.liu.se

*** Forest Faculty, Süleyman Demirel University, Isparta, TURKEY. E-mail: avci@orman.sdu.edu.tr

**** Department of Biology, Adiyaman University, Adiyaman, TURKEY. E-mail: mcoskun@adiyaman.edu.tr

***** Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara, TURKEY. E-mail: ozdikmen@gazi.edu.tr

[Sama, G., Jansson, N., Avcı, M., Sarıkaya, O., Coşkun, M., Kayış, T. & Özdikmen, H. 2011. Preliminary report on a survey of the saproxylic beetle fauna living on old hollow oaks (*Quercus* spp.) and oak wood in Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 6 (2): 819-831]

ABSTRACT: 45 species of Cerambycidae collected during a survey of the saproxylic beetle fauna ecologically associated with the hollows of old oak trees are listed. *Poecilium kasnaki* Sama n. sp. close to *P. wrzecionkoi* Rapuzzi & Sama, 2010 from Syria is described; *Necydalis hadullai* Szallies, 1994 is regarded as a synonym of *N. ulmi*; *Trichoferus pallidus* (Olivier, 1790) is mentioned for the first time from Turkey, several species are mentioned as first records for various Turkish provinces.

KEY WORDS: Saproxylic fauna, old oaks, Cerambycidae, Turkey, new species, new records.

Old oaks are exceptionally species-rich in Europe, but the habitat in most countries has declined substantially. Saproxylic insects associated with old trees and dead wood is one of the most endangered invertebrate groups in Europe, as their habitat has severely decreased (McLean & Speight, 1993). These insects are living in fungal fruit bodies, dead wood outside the tree (in branches, twigs or parts of the trunk) or inside the tree in hollows (Palm, 1959; Speight, 1989; Dajoz, 2000). Many species dependent on large, old and hollow trees have survived in small remnant woodlands of ancient trees, often in the agricultural landscape (Speight 1989; Warren & Key, 1989). In general the knowledge of the Turkish beetle fauna is poor in comparison to other European countries. In comparison to others there are some beetle families, with large amount of saproxylic species, with relatively good information of what species existing in Turkey. One of these is the longhorn beetles (Cerambycidae).

Large parts of Turkey are intensively grazed since many centuries and old trees are very rare. But in some areas in higher altitudes (>1000m) patches with old oaks can still be found. Most of the old broad leaved deciduous trees in Turkey are regularly pollarded. The forest authorities have quite recently started to reforest the landscape. In this process many of the last sites with old oaks are transformed to pine (*Pinus brutia*) or cedar (*Cedrus libani*) plantations. The beetle fauna associated with old oaks in Turkey is virtually unknown but very threatened.

The aim of this study is to describe the saproxylic beetle fauna living on old oaks (*Quercus* spp) and oak wood in Turkey. This article presents the longhorn beetles found in the study.

MATERIAL AND METHODS

The four studied sites are situated on the southern part of Turkey (Fig. 1), 100-150 km from the Mediterranean coast at an altitude of 1000-1500m. The studied trees were all old hollow oaks. The trees studied at the sites were *Quercus cerris*, *Q. infectoria*, *Q. trojana*, *Q. libanii*, *Q. pubescens*, *Q. vulcanica* and *Q. ithaburensis*.

At each site 20 trees were examined with two different trap types for sampling the beetle fauna. The window traps (w-trap) consisted of a 30x60 cm wide transparent plastic plate with a tray underneath (Jansson and Lundberg, 2000). They were placed near the trunk (<1 m), beside or in front of a cavity entrance (Fig. 2a). Their positions were 1.5-5 m from the ground, depending on where the cavity entrance was situated on the studied tree.

The pitfall traps (p-trap) were plastic cups with a top diameter of 6.5 cm. They were placed, in the wood mould in the bottom of the cavity, with the opening on level with the wood mould surface (Fig. 2b).

We used interception traps to survey the flight-active beetle fauna of the oak trees. Individual trees used for trapping were randomly selected from the pool of oaks investigated in habitat modelling.

RESULTS

During the present survey, we have found about 180 specimens of Cerambycidae belonging to 45 different species, among which 1 species new to the Science, 1 new to Turkey [*Trichoferus pallidus* (Olivier, 1790)], 3 [*Grammoptera abdominalis* (Stephens, 1831), *G. ustulata* (Schaller, 1783) and *Xylotrechus antilope antilope* (Schönherr, 1817)] new to southern Turkey (previously recorded from northern Turkey only); *Deroplia genei genei* (Aragona, 1830) is here recorded from Turkey for the second time; finally, several species are firstly recorded from Isparta (13 species), Burdur (10), Bingöl (1) and Mersin (3) provinces of Turkey.

Among the identified species, *Prinobius myardi* Mulsant, 1842, *Stictoleptura rufa* (Brullé, 1832), *Necydalis ulmi* (Chevrolat, 1838) and *Alocerus moesiacus* (Frivaldszky, 1837) are really associated with the hollows of old oaks where they oviposit and where their immature stages develop. A further species (*Rhamnusium juglandis* Fairmaire, 1866), which develops inside hollows of old trees and is known to occur in the studied area, cannot be collected.

On the other hand, some species collected during our survey are, in fact, unrelated to the hollows of old oaks, being ecologically associated with herbaceous plants (*Cortodera colchica colchica* Reitter, 1890) or to conifer trees [*Anastrangalia montana montana* (Mulsant & Rey, 1863)] (which develops in dead wood of *Pinus* spp.), *Delagrangeus angustissimus angustissimus* Pic, 1892 (*Juniperus* and *Cupressus*) and *Leiopus syriacus abieticola* Sama & Rapuzzi, 2010 (*Abies cilicica*). Larvae of *Pseudovadonia livida livida* (Fabricius, 1777) (and very likely those of *Alosterna anatolica* Adlbauer, 1992 and some *Cortodera* spp.) tunnel freely in the soil feeding externally between dead or dying roots and root stalks of grasses and among white micelium of fungi which, at least for *P. l. livida*, seems an indispensable component of his food (Burakovsky, 1979).

Turkey, Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park, 37°42'964"N 30°49'899" – hollow *Quercus*, leg. N. Jansson & M. Avcı

Prinobius myardi Mulsant, 1842 - 7.VI.2007 (1, trap 28); 19.VII.2007 (1, p-trap 17); 11.IX.2007 (1, p-trap 27).
Mesopronus besikanus (Fairmaire, 1855) - 19.VII.2007 (1, w-trap 28).
Cortodera colchica colchica Reitter, 1890 - 07.VI.2007 (1, w-trap 17/5).
Cortodera humeralis orientalis Adlbauer, 1988 - 17.V.2007 (3, w-trap 3), (1, w-trap 17).
Cortodera imrasanica Sama & Rapuzzi, 1999 - 17.V.2007 (2, w-trap 3), (1, w-trap 23), (1, w-trap 16). 07.VI.2007 (1, w-trap 1).
Grammoptera abdominalis (Stephens, 1831) - 17.V.2007 (1, w-trap 1). 07.VI.2007 (1, w-trap 1); 07.VI.2007 (2 w-trap 11).
Grammoptera ustulata (Schaller, 1783) - 07.VI.2007 (2, w-trap 1), (1, w-trap 12), (1, w-trap 5).
Stictoleptura rufa rufa (Brullé, 1832) ♀ - 27.VI.2007 (1, w trap 8).
Paracorymbia excisipes (Daniel & Daniel, 1891) - 07.VI.2006 (1, w-trap 19).
Paracorymbia fulva (DeGeer, 1775) - 27.VI.2007 (1, w-trap 11).
Pseudovadonia livida livida (Fabricius, 1777) - 27.VI.2007 (1, w-trap 21); 27.VI.2007 (2, w-trap 4); 27.VI.2007 (1, w-trap 19).
Stenurella bifasciata bifasciata (O. F. Müller, 1776) - 27.VI.2007 (1, w-trap 13); 7.VIII.2007 (1, w-trap 8); 19.VII.2007 (1, w-trap 19).
Necydalis ulmi (Chevrolat, 1838) - 27.VI.2007 (1, w-trap 24).
Cerambyx uelensii (Küster, 1845) - 19.VII.2007 (1, p-trap 24).
Alocerus moesiacus Frivaldszky, 1837 - 07.VIII.2007 (2, w-trap 17), (3, w-trap 13).
Trichoferus pallidus (Olivier, 1790) - 11.IX.2007 (1, w-trap 10).
Axinopalpis gracilis gracilis (Krynicky, 1832) - 27.VI.2007 (1, w-trap 1), (1, w-trap 5), (1, w-trap 12).
Callimus angulatus angulatus (Schränk, 1789) - 17.V.2007 (1, w-trap 4), (1, W-trap 28), (1, w-trap 29), (1, w-trap 4).
Phymatodes testaceus (Linnaeus, 1758) - 07.VI.2007 (1, w-trap 4), (1, w-trap 6), (1, w-trap 28); 17.VI.2007 (1, w-trap 16); 19.VII.2007 (1, w-trap 12).
Poecilium magnanii Sama & Rapuzzi, 1999 - 17.V.2007 (1, w-trap 3); 7.VI.2007 (1, w-trap 3).
Poecilium kasnaki Sama, n. sp. - 07.VI.2007 (3, w-trap 12), (1, w-trap 3), (1, w-trap 29), (1, w-trap 17/5); 17.V.2007 (1, w-trap 21), (2, w-trap 24), (2, w-trap ?); 27.VI.2007 (1 w-trap 1).
Xylotrechus antilope antilope (Schoenherr, 1817) - 07.VI.2007 (1, w-trap 4), (1, w-trap 7); 11.IX.2007 (1, w-trap 28).
Plagionotus arcuatus (Linnaeus, 1758) - 06.VI.2007 (1, w-trap 3); 11.IX.2007 (1, w-trap 13).
Chlorophorus nivipictus (Kraatz, 1879) - 06.VII.2007 (1, w-trap 1).
Deroplia genei genei (Aragona, 1830) - 17.05.2007 (1, w-trap ?).
Leiopus syriacus abieticola Sama & Rapuzzi, 2010 - 27.VI.2007 (1, w-trap 29); 19.VII.2007 (1, w-trap 1).

Turkey, Mersin: 30 km NW Gülnar: Köseçobanlı / Tasdüstü, old *Quercus* sp., 1480 m, 36°30'22,5" N 33°07'43,3"E - leg. N. Jansson & M. Coşkun

Prinobius myardi Mulsant, 1842 - 24.VI.2006 (2, p-trap 6), (1, p-trap 17).
Rhagium (Megarhagium) syriacum Pic, 1892 - 24.V.2006 (1, w-trap 1), (1, w-trap 6), (1, w-trap 16).
Anisorus heterocerus (Ganglbauer, 1882) - 24.5.2006 (1, w-trap 12).
Cortodera omophloides Holzschuh, 1975 - 24.VI.2006 (1, w-trap 16).
Alosterna anatolica Adlbauer, 1992 - 24.VI.2006 (1, w-trap 14).
Alocerus moesiacus Frivaldszky, 1837 - 24.V.2006 (1, w-trap 16); 26.VI.2006 (1, w-trap 16), (2, w-trap 18); 26.VII.2006 (2, w-trap 3).
Stromatium unicolor (Olivier, 1795) - 26.VIII.2006 (1, w-trap 20).
Cerambyx cerdo Linnaeus, 1758 - 24.VI.2006 (1, w-trap 3), (1, w-trap 20); 28.VIII.2006 (1, w-trap 1), (1, w-trap 3), (1, w-trap 12).
Stenhomalus (Obriopsis) bicolor (Kraatz, 1862) - 24.VI.2006 (1, w-trap 7).

Anatolobrium eggeri Adlbauer, 2004 - 26.VII.2006 (1, w-trap 16); 26.VIII.2006 (1, p-trap 16).

Phymatodes testaceus (Linnaeus, 1758) - 24.V.2006 (1, w-trap 9); 26.VII.2006 (1, w-trap 19).

Poecilium lividum (Rossi, 1794) - 24.V.2006 (1, w-trap 1).

Chlorophorus sartor (Müller, 1776) - 26.7.2006 (1, w-trap 8).

Chlorophorus nivipictus (Kraatz, 1879) - 26.VII.2006 (1, w-trap 10).

Turkey, Burdur: Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla, 36°57'40"N 29°27'53"E - hollow Quercus sp., leg. N. Jansson & Mustafa Avcı

Anisorus homocerus (K. Daniel, 1900) - 28.VI.2009 (1, w-trap 4).

Rhagium (Megarhagium) syriacum Pic, 1892 - (22.VI.2009 (1, w-trap 27).

Cortodera humeralis orientalis Adlbauer, 1988 - 28.VI.2009 (1, w-trap 16); 22.V.2009 (1, w-trap 17); 17.V.2009 (2 w-trap 17); 07.VI.2009 (1, w-trap 5).

Cortodera imrasanica Sama & Rapuzzi, 1999 - 22.V.2009 (3, w-trap 7).

Cortodera colchica colchica Reitter, 1890 - 28.VI.2009 (1, w-trap 5).

Stictoleptura rufa rufa (Brullé, 1832) - 25.VII.2009 (2, w-trap 17).

Anastrangalia montana montana (Mulsant & Rey, 1863) - 28.VI.2009 (1, w-trap 7).

Alosterna anatolica Adlbauer, 1992 - 22.V.2009 (3, w-trap 7); 1♀, w-trap 18).

Alocerus moesiacus Frivaldszky, 1837 - 30.VIII.2009 (1, w-trap 14), (1, w trap ?).

Cerambyx welensii (Küster, 1845) - 22.V.2009 (1, p-trap 21).

Axinopalpis gracilis gracilis (Krynicky, 1832) - 28.VIII.2009 (1, w-trap 12).

Calchaenesthes oblongomaculata (Guérin-Ménéville, 1844) - 28.VI.2009 (1, w-trap 5).

Callimus angulatus angulatus (Schränk, 1789) - 22.V.2009 (2♀♀, w-trap 7), (1♀, w-trap 1), (2♀♀ w-trap 18); 28.VI.2009 (4♀♀, w-trap 7).

Phymatodes testaceus (Linnaeus, 1758) - 28.VI.2009 (2, w-trap 7); (1 w-trap 8), (1 w-trap 13), (1 w-trap 23), (1, w-trap 9).

Poecilium kasnaki Sama, n. sp. - 22.V.2009 (1, w-trap 7).

Xylotrechus antilope antilope (Schönherr, 1817) - 28.VI.2009 (1, w-trap 27).

Turkey, Mersin, Devrent 30 km N. Erdemli, 1139 m, hollow oak, leg. N. Jansson & M. Coşkun

Cortodera omophloides Holzschuh, 1975 - 23.V.2005 (1, w-trap 15); 16.VII.2005 (25, 16 w-trap).

Paracorymbia excisipes (Daniel & Daniel, 1891) - 1.VI.2005 (1, w-trap 14).

Anoplodera rufipes lucidipes Sama, 1999 - 23.V.2005 (1♀, w-trap 13).

Stenomatus (Obrlopsis) bicolor (Kraatz, 1862) - 23.V.2005 (1, w-trap 13).

Poecilium lividum (Rossi, 1794) - 23.V.2005 (1, w-trap 17).

Clytus rhamni Germar, 1817 - 7.VII.2005 (1, w-trap, 19).

Chlorophorus varius varius (Müller, 1766) - 11.VIII.2005 (1, w-trap 18).

Turkey, Mersin, Kizilen, 50 km N. Erdemli, 1250 m, old oak, leg. N. Jansson & M. Coşkun

Cortodera omophloides Holzschuh, 1975 - 23.V.2005 (1, w-trap 1), (1, w-trap 4), (1, w-trap 18); 17.VI.2005 (2, w-trap 16), (1, w-trap 13), (1, w-trap 3), (1, w-trap 14).

Grammoptera merkli Frivaldszky, 1884 - 17.VI.2005 (1, p-trap, 6).

Alocerus moesiacus Frivaldszky, 1837 - 11.VIII.2005 (1, w-trap 4).

Cerambyx cerdo Linnaeus, 1758 - 11.VIII.2005 (1, w-trap 6).

Anatolobrium eggeri Adlbauer, 2004 - 11.VIII.2005 (1, w-trap 1), (1, w-trap 6).

Molorchus juglandis Sama, 1982 - 23.V.2005 (1, w-trap 4).

Delagrangeus angustissimus angustissimus Pic, 1892 - 23.V.2005 (1, w-trap 5).

SYSTEMATIC LIST

01 - *Prinobius myardi myardi* Mulsant, 1842 – Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Mersin:** 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus*, leg. N. Jansson & M. Coskun. 6 specimens: 24.VI.2006, 7.VI.2007, 19.VII.2007, 11.IX.2007. **Remark.** This is a new record for Isparta province. It has been recorded from Mersin province (Özdikmen & Turgut, 2009).

02 - *Mesoprionus besikanus* (Fairmaire, 1855) – Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 1 specimen: 19.VII.2007.

Remark. All specimens of prionine beetle intercepted during our survey were collected by pitfall traps inside the hollows of old oak trees. It is a new record for Isparta province (Özdikmen & Turgut, 2009).

03 - *Rhagium (Megarhagium) syriacum* Pic, 1892 – Mersin: 30 km NW Gülnar: Köseçobanlı / Taşdüştü, old *Quercus* sp., 1480 m, leg. M. Coskun & N. Jansson; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altınyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 4 specimens: 24.V.2006, 22.VI.2009.

Remark. This species was originally described from "Akbes, Syria" (currently in SE Turkey) and later described again under the name *R. phrygium* Daniel, 1906, from "Philomelium, Asiae minoris" (currently Akşehir); moreover it is known from Mersin and Bingöl provinces (Buğlan geçidi NW Muş) in Turkey and from Sinfah, east of Latakia, in NW Syria. Development on *Quercus*. It is a new record for both Burdur and Bingöl provinces.

04 - *Anisorus heterocerus* (Ganglbauer, 1882) – Mersin: 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus* sp., leg. N. Jansson & M. Coskun. 1 specimen: 24.V.2006.

05 - *Anisorus homocerus* (K. Daniel, 1900) - Burdur: Gölhisar 120 km W. Antalya, 7 km SW. Altınyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 1 specimen: 28.VI.2009.

Remark. This species was previously known only from Central Anatolian region of Turkey; this is a new record for Burdur province and for the Mediterranean region of Turkey.

06 - *Cortodera colchica colchica* Reitter, 1890 – Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altınyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 2 specimens: 07.VI.2007, 28.VI.2009.

Remark. Species widely distributed in Turkey; the present record is the first one for the Isparta province.

07 - *Cortodera humeralis orientalis* Adlbauer, 1988 - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altınyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 9 specimens: 17.V.2007, 07.VI.2007, 22.V.2009, 28.VI.2009.

Remark. This taxon was only known from Antalya and Osmaniye provinces of Turkey (Özdikmen, 2011); this is a new record for both Burdur and Isparta provinces.

08 - *Cortodera imrasanica* Sama & Rapuzzi, 1999 - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altınyayla - hollow *Quercus* sp., leg. N. Jansson & Mustafa Avci. 8 specimens: 17.V.2007, 07.VI.2007, 22.V.2009.

Remark. Endemic species from southern Turkey, previously known only from the type locality: Imrasan gecidi (Çakilli pass north of Antalya). The present records constitute the first ones for both Burdur and Isparta provinces. Host plants and bionomics of immature stages are unknown. Adults were collected by beating flowering oak trees.

09 - *Cortodera omophloides* Holzschuh, 1975 - Mersin: 30 km NW Gülnar: Köseçobanlı / Tasdüstü, old *Quercus* sp., 1480 m, leg. M. Coskun & N. Jansson; **Mersin:** Devrent 30 km N. Erdemli, 1139 m, hollow oak, leg. N. Jansson & M. Coskun. 35 specimens: 23.V.2005, 17.VI.2005, 16.VII.2005, 24.VI.2006.

Remark. Endemic species from southern Turkey, recorded from Antalya and Mersin provinces. Bionomics: Host plants and bionomics of immature stages like the preceding species. Adults are usually found on flowering oaks and other bushes.

10 - *Grammoptera merkli* Frivaldszky, 1884 - Mersin: Kizilen, 50 km N. Erdemli, 1250 m, old oak, leg. N. Jansson & M. Coskun. 1 specimen: 17.VI.2005.

Remark. Very likely endemic species to Turkey; a single record from north-eastern Greece (Berger, 2005), probably refers to a different, unpublished species.

11 - *Grammoptera abdominalis* (Stephens, 1831) (Fig. 4) - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 3 specimens: 17.V.2007, 07.VI.2007.

Remark. The present locality constitutes the first record in southern Turkey for this species previously recorded from northern provinces (Özdikmen, 2008).

12 - *Grammoptera ustulata* (Schaller, 1783) (Fig. 5) - Isparta, Egirdir: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park, hollow *Quercus*, leg. N. Jansson & M. Avci. 4 specimens: 07.VI.2007.

Remark. An uncommon species in Turkey, where it was previously known only from northern provinces (Özdikmen, 2008).

13 - *Anastrangalia montana montana* (Mulsant & Rey, 1863) - Burdur: Gölhisar 120 km W. Antalya, 7 km SW. Altınyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 1 specimen: 28.VI.2009).

Remark. Development in dead wood of *Pinus* spp., adults on flowers. This is the first record for Burdur province.

14 - *Stictoleptura rufa rufa* (Brullé, 1832) - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altınyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 3 specimens: 27.VI.2007, 25.VII.2009.

Remark. This uncommon species develops inside the hollows (caries) of living trees; all specimens collected during our surveys are females probably intercepted when flying for oviposition. This taxon is a new record for both Burdur and Isparta provinces.

15 - *Paracorymbia excisipes* (Daniel & Daniel, 1891) - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park, hollow *Quercus*, leg. N. Jansson & M. Avci; **Mersin:** Devrent 30 km N. Erdemli, 1139 m, hollow oak, leg. N. Jansson & M. Coskun. 3 specimens: 1.VI.2005, 7.VI.2006.

Remark. This species has been recorded by Adlbauer (1988) and Tauzin (2000) from Mersin province. It is a new record for Isparta province.

16 - *Paracorymbia fulva* (DeGeer, 1775) - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 1 specimen: 27.VI.2007.

17 - *Pseudovadonia livida livida* (Fabricius, 1777) - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 4 specimens: 27.VI.2007.

18 - *Stenurella bifasciata bifasciata* (O. F. Müller, 1776) - Isparta: Yukarıgökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 3 specimens: 27.VI.2007, 19.VII.2007, 7.VIII.2007.

19 - *Alosterna anatolica* Adlbauer, 1992 (Fig. 6) - **Mersin:** 30 km NW Gülnar: Köseçobanlı / Taşdüştü, old *Quercus* sp., 1480 m, leg. M. Coskun & N. Jansson; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 4 ♀♀ specimens: 24.VI.2006, 22.V.2009.

Remark. An uncommon species, endemic to Turkey, previously known only from the mountains north of Antalya (Adlbauer, 1992; Özdikmen, 2011). It is a new record for both Burdur and Mersin provinces. Host plants and bionomics of immature stages are unknown. Adults are usually collected on flowering oaks and different bushes. All specimens collected during our surveys are females.

20 - *Anoploclera rufipes lucidipes* Sama, 1999 - **Mersin:** Devrent 30 km N. Erdemli, 1139 m, hollow oak, leg. N. Jansson & M. Coskun. 1 specimen ♀: 23.V.2005.

21 - *Necydalis ulmi* (Chevrolat, 1838) (= *N. hadullai* Szallies, 1994) **n. syn.** (Fig. 7) - **Isparta:** Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park - hollow *Quercus*, leg. N. Jansson & M. Avci. 1 specimen: 27.VI.2007.

Remark. *N. hadullai* was described according to a single specimen from Isparta: Kovada s. Eğirdir. It was regarded as a synonym of *N. ulmi* by Özdikmen & Turgut (2006), but restored by G. Sama & Lóbl (2010). The study of the present specimen, in fact a topotype, confirms that the synonymy is correct.

22 - *Alocerus moesiacus* Frivaldszky, 1837 - **Isparta:** Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park - hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & Mustafa Avci; **Mersin:** 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus*, leg. N. Jansson & M. Coskun; **Mersin:** Kizilen, 50 km N. Erdemli, 1250 m, old oak, leg. N. Jansson & M. Coskun. 12 specimens: 24.V.2006, 26.VI.2006, 26.VII.2006, 07.VIII.2007, 30.VIII.2008, 30.VIII.2009, 11.VIII.2005.

Remark. This species was recorded only by Adlbauer (1992) from Isparta province; it is a new record for both Burdur and Mersin provinces.

23 - *Trichoferus pallidus* (Olivier, 1790) (Fig. 8) - **Isparta:** Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park - hollow *Quercus*, leg. N. Jansson & M. Avci. 1 ♂ specimen: 11.IX.2007.

24 - *Stromatium unicolor* (Olivier, 1795) - **Mersin:** 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus*, leg. N. Jansson & M. Coskun. 1 specimen: 26.VIII.2006.

25 - *Cerambyx cerdo cerdo* Linnaeus, 1758 - **Mersin:** 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus*, leg. N. Jansson & M. Coskun; **Mersin:** Kizilen, 50 km N. Erdemli, 1250 m, old oak, leg. N. Jansson & M. Coskun. 6 specimens: 11.VIII.2005, 24.VI.2006, 28.VIII.2006.

26 - *Cerambyx welensii* (Küster, 1845) - **Isparta:** Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park - hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 2 specimens: 19.VII.2007, 26.VI.2009.

Remark. A new record for Burdur province.

27 - *Calchaenesthes oblongomaculata* (Guérin-Ménéville, 1844) - **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 1 specimen: 28.VI.2009.

Remark. An uncommon species known to occur throughout the East Mediterranean region from Greece, Bulgaria and Romania to Jordan. In Turkey it is known from the Taurus mountains between Antalya and Hatay. This is a new record for Burdur province.

28 - *Stenomalus (Obriopsis) bicolor* (Kraatz, 1862) - **Mersin:** 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus*, leg. N. Jansson & M. Coskun; **Mersin:** Devrent

30 km N. Erdemli, 1139 m, hollow oak, N. Jansson & M. Coskun. 2 specimens: 23.V.2005, 4.VI.2006.

29 - *Anatolobrium eggeri* Adlbauer, 2004 - Mersin: 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus*, leg. N. Jansson & M. Coskun; **Mersin:** Kizilen, 50 km N. Erdemli, 1250 m, old oak, leg. N. Jansson & M. Coskun. 4 specimens: 11.VIII.2005, 26.VII.2006, 26.VIII.2006.

Remark. Endemic genus and species to the Taurus mountains in southern Turkey, described from 30 km NW Alanya and previously known only from Antalya province (Adlbauer, 2004; Özdikmen & Okutaner, 2006; Turgut & Özdikmen, 2010). This is the first record from the eastern Taurus mountain range (Mersin province). The host plants of immature stages are unknown.

30 - *Axinopalpis gracilis gracilis* (Krynicky, 1832) - Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar, 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 4 specimens: 28.VIII.2006, 27.VI.2007.

Remark. This is a new record for Burdur province.

31 - *Molorchus juglandis* Sama, 1982 - Mersin: Kizilen, 50 km N. Erdemli, 1250 m, old oak, leg. N. Jansson & M. Coskun. 1 specimen: 23.V.2005.

32 - *Callimus angulatus angulatus* (Schränk, 1789) - Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 13 specimens: 17.V.2007, 22.V.2009, 28.VI.2009.

Remark. All specimens collected during our survey are females. This taxon is a new record for Burdur and Isparta provinces.

33 - *Delagrangeus angustissimus angustissimus* Pic, 1892 - Mersin: Kizilen, 50 km N. Erdemli, 1250 m, old oak, leg. N. Jansson & M. Coskun. 1 specimen: 23.V.2005.

Remark. This species develops in dead branches and twigs of Cupressaceae (*Cupressus* and *Juniperus*); its interception by window trap on a oak tree must be regarded as casual.

34 - *Phymatodes testaceus* (Linnaeus, 1758) - Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Mersin:** 30 km NW Gülnar: Köseçobanlı / Taşdüştü, old *Quercus* sp., 1480 m, leg. N. Jansson & M. Coskun; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 10 specimens: 24.V.2006, 26.VII.2006, 7.VI.2007, 17.VI.2007, 19.VII.2007, 28.VI.2009.

35 - *Poecilium magnanii* Sama & Rapuzzi, 1999 - Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 2 specimens: 17.V.2007, 7.VI.2007.

Remark. This rare species was only known from Antalya and Mersin provinces. Morphology and bionomics of immature stages are unknown; the type series was collected by beating flowering oak trees.

36 - *Poecilium lividum* (Rossi, 1794) - Mersin: 30 km NW. Gülnar: Köseçobanlı / Taşdüştü - hollow *Quercus*, leg. N. Jansson & M. Coskun; **Mersin:** Devrent 30 km N. Erdemli, 1139 m, hollow oak, leg. N. Jansson & M. Coskun. 2 specimens: 23.V.2005, 24.V.2006.

37 - *Poecilium kasnaki* Sama n. sp. (Figs. 9-11)

Material examined. Holotype ♂. Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, 17.V.2007, leg. N. Jansson & M. Avci; 12 paratypes from the same locality as follows: 1 ♂, 3 ♀♀: 07.VI.2007 (w-trap 12; w-trap 17/5), 1 ♂: 17.V.2007 (w-trap 21); 3 ♂♂: 17.V.2007 (2, w-trap 24; 1 w-trap ?); 2 ♂♂: 7.VI.2007 (1, w-trap 3), (1, w-

trap 29); 1 ♀: 27.VI.2007 (1 w-trap-1); 1 ♀: Burdur: Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla, 36°57'40"N 29°27'53"E - hollow *Quercus* sp., leg. N. Jansson & Mustafa Avci, 22.V.2009 (w-trap-7). Holotype in coll. G. Sama; paratypes in coll. N. Jansson, G. Sama and the Insect Museum, Süleyman Demirel University, Isparta.

Description of the holotype ♂.

Length: 5 mm. Body black except yellowish-brown elytra. Pronotum shining, coarsely and deeply punctate, without microsculpture, sparsely clothed with long greyish hairs; elytra yellowish indistinctly darkened on the disc; densely and deeply punctate, clothed with golden erect hairs of medium length intermixed with longer setae of the same colour. Antennae extending to about $\frac{3}{4}$ of elytra, the segments 1st, 3rd and 4th segments similar in length, the 5th longer than each of the preceding; all segments clothed with erect hairs. Legs blackish, 1st segment of hind tarsi about as long as the two preceding combined.

Variability in paratypes: The body length varies from 4,5 to 7mm. Female differ from male by antennae shorter, hardly reaching the middle of elytra, and the shallow elytral punctation; all paratypes have yellowish-brown elytra except one female which has elytra bluish on the disk.

Discussion: The new species belongs to the *P. pusillum* (Fabricius, 1787) species group; because of the totally black abdomen and the short antennae it chiefly resembles *P. wrzecionkoi* Rapuzzi & Sama, 2010 from Syria. This species differs from *P. kasnaki* n. sp. by the black-bluish elytral coloration, pronotum finely and densely microsculptured, elytra roughly, indistinctly punctate and very densely microsculptured in male.

38 - *Xylotrechus antilope antilope* (Schoenherr, 1817) - Isparta: Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Burdur:** Gölhisar 120 km W. Antalya, 7 km SW. Altinyayla - hollow *Quercus* sp., leg. N. Jansson & M. Avci. 4 specimens. 07.VI.2007, 28.VI.2009.

Remark. This interesting species was mentioned in Turkey only from the north-western provinces: Bursa, İstanbul, Kırklareli and Manisa (Özdikmen, 2008). The present records constitute the first ones for both Burdur and Isparta provinces and thereby for the Mediterranean region of Turkey.

39 - *Plagionotus arcuatus* (Linnaeus, 1758) - Isparta: Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 2 specimens: 06.VI.2007, 11.IX.2007.

40 - *Clytus rhamni* Germar, 1817 - Mersin: Devrent 30 km N. Erdemli, 1139 m, hollow oak, N. Jansson & M. Coskun. 1 specimen: 7.VII.2005.

41 - *Chlorophorus nivipictus* (Kraatz, 1879) - Isparta: Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci; **Mersin:** 30 km NW Gülnar: Köseçobanlı / Tasdüstü, old *Quercus* sp., 1480 m, leg. N. Jansson & M. Coskun. 2 specimens: 06.VII.2007, 26.VII.2006.

Remark. This species is a new record for Isparta province.

42 - *Chlorophorus sartor* (Müller, 1776) - Mersin: 30 km NW Gülnar: Köseçobanlı / Tasdüstü, old *Quercus* sp., 1480 m, leg. N. Jansson & M. Coskun. 1 specimen: 26.7.2006.

43 - *Chlorophorus varius varius* (Müller, 1766) - Mersin: Devrent 30 km N. Erdemli, 1139 m, hollow oak, N. Jansson & M. Coskun. 1 specimen: 11.VIII.2005.

44 - *Deroplia genei genei* (Aragona, 1830) - Isparta: Yukarıgökdere 30 km S. Eğirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 1 specimen: 17.05.2007.

Remark. This uncommon species was only known in Turkey for one specimen collected north of Erdemli (Mersin) by R. Petterson, who reared one specimen from *Quercus* sp.

(Sama, 1996). The present record is the second one for Turkey and the first one for Isparta province.

45 - *Leiopus syriacus abieticola* Sama & Rapuzzi, 2010 (fig. 12) - **Isparta:** Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park – hollow *Quercus*, leg. N. Jansson & M. Avci. 2 specimens: 27.VI.2007, 19.VII.2007. Although intercepted by window traps on *Quercus* trees, this taxon is unrelated to this plant, being ecologically associated with *Abies cilicica*.

Remark. The nominotypical subspecies (*Leiopus syriacus syriacus* Ganglbauer, 1884) is known from Israel, Lebanon (type locality), NW Syria and S Turkey (Hatay prov.) where it develops in dead branches of *Prunus ursina*, *Acer* sp., *Juglans regia*, *Cotoneaster* sp. and *Nerius oleander* (Sama & alii, 2010). It is replaced in southern Turkey by the subspecies *L. s. tauricus* Sama & Rapuzzi, 2010, recorded from the Taurus mountain ridge from Burdur to Adana, where it develops on broadleaf trees, chiefly on *Ficus carica* and *Juglans regia* (Demelt, 1963; Adlbauer, 1988; Sama & alii, 2010). All specimens belonging to the type series of *L. s. abieticola* emerged ex larvae from branches of *Abies cilicica* collected near Göksun (Kahramanmaraş).

LITERATURE CITED

- Adlbauer, K.** 1988. Neues zur Taxonomie und Faunistik der Bockkäferfauna der Türkei. Entomofauna, 9 (12): 257-297.
- Adlbauer, K.** 1992. Zur Faunistik und Taxonomie der Bockkäferfauna der Türkei. II (Coleoptera, Cerambycidae). Entomofauna, 13 (30): 485-509.
- Burakovsky, B.** 1979. Immature stages and bionomics of *Vadonia livida* (F). Annales zoologici, 35 (2): 25-42.
- Dajoz, R.** 2000. Insects and forests. The role and diversity of insects in the forest environment. Intercept Ltd. Editions Technique et Documentation. Paris, Lavoisier publishing: 668 pp.
- Demelt, C.** 1963. Beitrag zur Kenntniss der Cerambycidenfauna Kleinasien und 13. Beitrag zur Biologie palaearktischen Cerambyciden, sowie Beschreibung einer neuer *Obera*-Art. Entomologische Blätter, 59 (3): 132-151.
- Jansson, N. & Lundberg, S.** 2000. Beetles in hollow broadleaved deciduous trees – Two species new to Sweden and the staphylinid beetles (Coleoptera: Staphylinidae) *Hypnogyra glabra* and *Meliceria tragardhi* found again in Sweden. Entomologisk tidskrift 121: 93-97. [In Swedish with English summary].
- McLean, I. F. G. & Speight, M. C. D.** 1993. Saproxylic invertebrates. The European context., p. 21-32, In: K. J. Kirby & Drake, C. M. (Eds). Dead wood matters: the ecology and conservation of saproxylic invertebrates in Britain. English Nature Science, 7: 857 pp.
- Özdikmen, H.** 2008. The Longicorn Beetles of Turkey (Coleoptera: Cerambycidae). Part II – Marmara Region. Munis Entomology & Zoology, 3 (1): 7-152.
- Özdikmen, H.** 2011. The Longicorn Beetles of Turkey (Coleoptera: Cerambycidae) Part IV – Mediterranean Region. Munis Entomology & Zoology, 6 (1): 6-145.
- Özdikmen, H. & Turgut, S.** 2006. An evaluation on the known taxa of Necydalinae and Apatophyseinae from Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 1 (2): 199-204.
- Özdikmen, H. & Turgut, S.** 2009. A synopsis of Turkish Vesperinae Mulsant, 1839 and Prioninae Latreille, 1802 (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 4 (2): 402-423.
- Palm, T.** 1959. Die Holz- und Rindenkäfer der Süd- und Mittelschwedischen Laubbäume (The wood and bark coleoptera on deciduous trees in southern and central Sweden).
- Sama, G.** 1996. Revision du genre *Deroplia* Dejean, 1835 Coleoptera – Cerambycidae. Biocosme Mésogéen, 13 (2): 23-64.

Sama, G. 2002. Atlas of the Cerambycidae of Europe and the Mediterranean Area. I: Northern, Western, Central and Eastern Europe. British Isles and Continental Europe from France (excl. Corsica) to Scandinavia and Urals. Kabourek, Zlin: 173 pp., 36 col. plates.

Sama, G. & Löbl, I. 2010: Cerambycidae, Western Palaearctic taxa, eastward to Afghanistan, excluding Oman and Yemen and the countries of the former Soviet Union, pp. 84 - 334. In: Löbl I. & Smetana A. (eds.): Catalogue of Palaearctic Coleoptera. 6. Chrysomeloidea. Apollo Books, Stenstrup: 924 pp.

Sama G., Rapuzzi P. & Kairouz A. 2010. Catalogue commenté des Cerambycidae du Liban. Quaderno di Studi Naturalistici della Romagna, 30: 131-201.

Speight, C. D. 1989. Saproxylic invertebrates and their conservation. Council of Europe, Strasbourg.

Tauzin, P. 2000. Complement a l'inventaire des Coleopteres Cerambycidae de Turquie. L'Entomologiste, 56 (4): 151-153.

Turgut, S. & Özdikmen, H. 2010. New data for Turkish longhorned beetles fauna from Southern Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 5, suppl.: 859-889.

Warren, M. S. & Key, R. S. 1991. Woodlands: past, present and potential for insects. In Collins, N.M. and Thomas, J.A. (Eds). The conservation of insects and their habitats. Proceedings of the 15th symposium of the Royal Entomological Society of London. Academic Press, Imperial College, London: 155- 211.

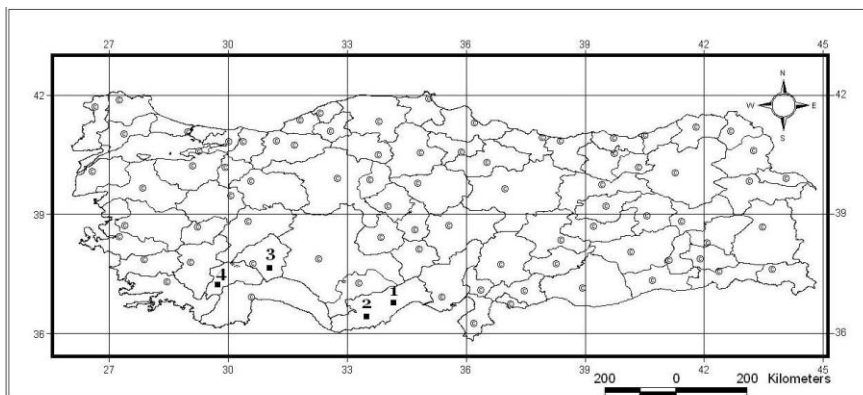


Figure 1. The position of the studied sites in Turkey. 1. Erdemli, 2. Gülнар, 3. Isparta and 4. Gölnhisar.

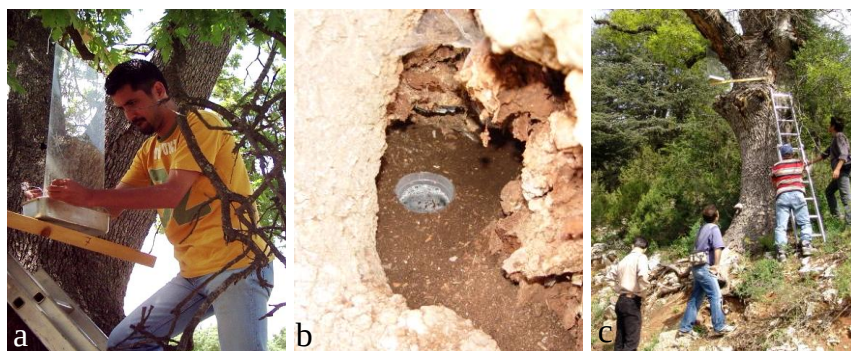


Figure 2. Mounting a window trap (a), a pit-fall trap inside a hollow oak (b), working with the traps on an old oak (c).



Figure 3. Window trap.

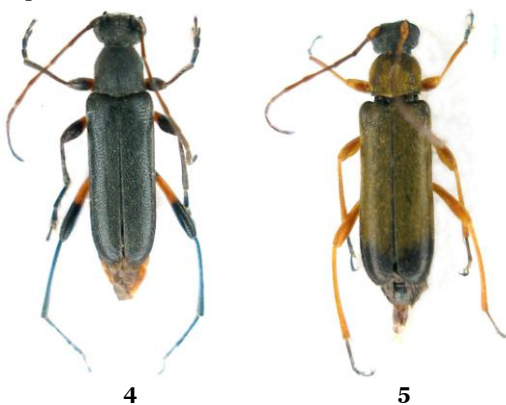


Figure 4-5. *Grammoptera abdominalis* (Stephens, 1831). Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park (4); *Grammoptera ustulata* (Schaller, 1783). Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park (5).



Figure 6-8. *Alosterna anatolica* Adlbauer, 1992 ♀- Mersin: 30 km NW Gülnar: Köseçobanlı / Tasdüstü (6); *Necydalis ulmi* (Chevrolat, 1838). Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park (7); *Trichoferus pallidus* (Olivier, 1790) - Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park (8).

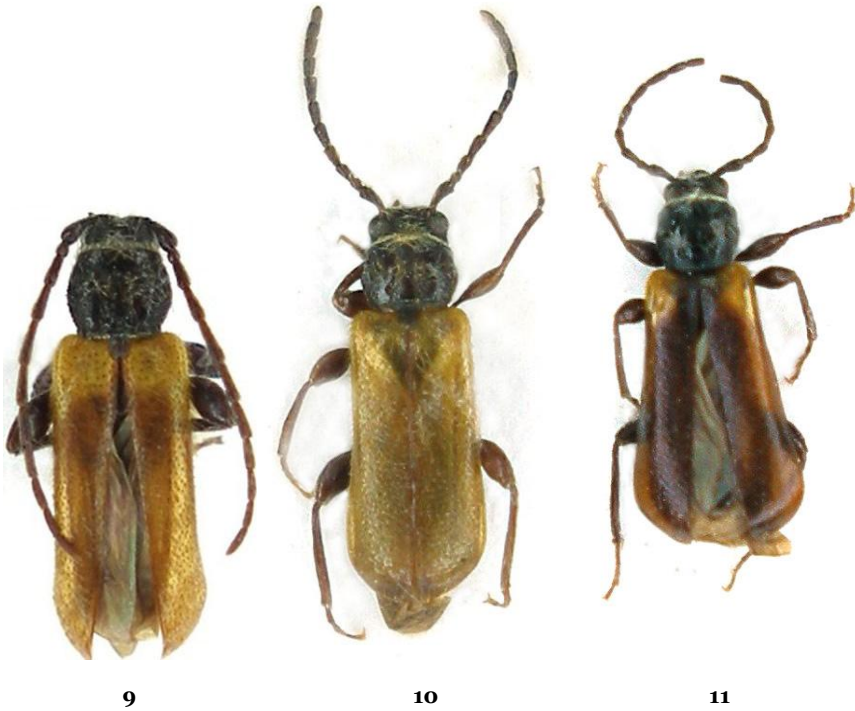


Figure 9-11. *Poecilium kasnaki* Sama n. sp. Holotype ♂ (9); *Poecilium kasnaki* Sama n. sp. – Paratypes ♀♀ (10, 11).



Figure 12. *Leiopus syriacus abieticola* Sama & Rapuzzi, 2010 - Isparta: Yukarigökdere 30 km S. Egirdir: Kasnak Forest National Park.

**NEW NAMES FOR SOME PREOCCUPIED SPECIFIC
EPITHETS IN CHALCOIDEA II: FAMILIES EUPELMIDAE,
EURYTOMIDAE, MYMARIDAE, PERILAMPIDAE,
PTEROMALIDAE, TORYMIDAE
(HYMENOPTERA: PARASITICA)**

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE.
Email: ozdikmen@gazi.edu.tr

[**Özdikmen, H.** 2011. New names for some preoccupied specific epithets in Chalcoidea II: Families Eupelmidae, Eurytomidae, Mymaridae, Perilampidae, Pteromalidae, Torymidae (Hymenoptera: Parasitica). Munis Entomology & Zoology, 6 (2): 832-855]

ABSTRACT. According to the International Code of Zoological Nomenclature (ICZN, 1999), *Eusandalum cyaneum* (Hedqvist, 1970) and *Eusandalum stylatum* (Hedqvist, 1970) (**Eupelmidae: Calosotinae**); *Anastatus madagascariensis* (Risbec, 1952); *Eupelmus orientalis* Ferrière, 1929; *Eupelmus setiger* Perkins, 1910; *Mesocomys orientalis* (Kalina, 1984) and *Zaischnopsis ivondroi* (Risbec, 1952) (**Eupelmidae: Eupelminae**); *Bruchophagus mongolicus* Fan & Liao, 1991; *Bruchophagus niger* (Zeroval, 1971); *Bruchophagus niger* (Girault, 1915); *Bruchophagus nikolskayae* (Szelényi, 1971); *Bruchophagus trjapitzini* Zeroval, 2008; *Eurytoma apantelesi* Narendran, 1994; *Eurytoma atamiensis* (Ashmead, 1904); *Eurytoma compressa* Bugbee, 1939; *Eurytoma japonica* Ashmead, 1904; *Eurytoma lactucae* Zeroval, 2008; *Eurytoma polygraphi* (Yang, 1996); *Eurytoma pusilla* Bugbee, 1945; *Eurytoma robusta* Yang, 1996; *Eurytoma scaposa* Narendran, 1994; *Sycophila flava* Xu & He, 2003 and *Tetramesa sulcata* Szelényi, 1971 (**Eurytomidae: Eurytominae**); *Anaphes angustipennis* (Soyka, 1949); *Anaphes crassicornis* (Soyka, 1949); *Anaphes longicornis* (Soyka, 1949); *Cleruchus terebrator* Viggiani, 1970; *Gonatocerus africanus* Risbec, 1956; *Gonatocerus io* Girault, 1938; *Gonatocerus orientalis* Zeya, 1995; *Polynema ciliatum* Perkins, 1910; *Polynema orientalis* (Ogloblin, 1963); *Polynema prolongatum* Soyka, 1956; *Polynema pulchrum* Soyka, 1956 and *Polynema reticulatum* Hincks, 1950 (**Mymaridae**); *Perilampus cyaneus* Brullé, 1846 (**Perilampidae: Perilampinae**); *Cleonymus californicus* Girault, 1917 and *Epistenia rufipes* Cameron, 1913 (**Pteromalidae: Cleonyminae**); *Dipara keralensis* Narendran & Sureshan, 2001 (**Pteromalidae: Diparinae**); *Gastrancistrus citripes* (Girault, 1929) and *Gastrancistrus marylandensis* (Girault, 1916b) (**Pteromalidae: Pireninae**); *Callitula flavipes* (Girault & Dodd, 1915); *Mesopolobus dubius* (Girault & Dodd, 1915); *Mesopolobus minutus* Sureshan & Narendran, 2002; *Pachyneuron coccorum* (Ratzeburg, 1848); *Psilocera rufipes* Graham, 1992; *Pteromalus aeneus* Nees, 1834; *Pteromalus aerosus* Statz, 1938; *Pteromalus clavicornis* Statz, 1938; *Pteromalus decipiens* (Graham, 1969); *Pteromalus obscurus* (Thomson, 1878); *Sphegigaster carinata* Huang, 1990 and *Spintherus dubius* Ashmead, 1894 (**Pteromalidae: Pteromalinae**); *Torymus basalis* (Fonscolombe, 1840) and *Torymus contractus* (Walker, 1874) (**Torymidae: Toryminae**) are not correct because the specific epithets are illegitimate. Accordingly, the following replacement names are proposed for the preoccupied specific names respectively: *Eusandalum africanum* nom. nov. and *Eusandalum namibiaensis* nom. nov. (**Eupelmidae: Calosotinae**); *Anastatus risbeci* nom. nov.; *Eupelmus eurorientalis* nom. nov.; *Eupelmus hawaiiicus* nom. nov.; *Mesocomys kalinae* nom. nov. and *Zaischnopsis madagascariensis* nom. nov. (**Eupelmidae: Eupelminae**); *Bruchophagus pseudomongolicus* nom. nov.; *Bruchophagus nigrella* nom. nov.; *Bruchophagus euniger* nom. nov.; *Bruchophagus gonuli* nom. nov.; *Bruchophagus iranica* nom. nov.; *Eurytoma indiana* nom. nov.; *Eurytoma tulaya* nom. nov.; *Eurytoma mexicana* nom. nov.; *Eurytoma eujaponica* nom. nov.; *Eurytoma zerovali* nom. nov.; *Eurytoma sinensis* nom. nov.; *Eurytoma impar* Bugbee, 1945; *Eurytoma yangi* nom. nov.; *Eurytoma keralensis* nom. nov.; *Sycophila fujianensis* nom. nov. and *Tetramesa sulcatella* nom. nov. (**Eurytomidae: Eurytominae**); *Anaphes germaniacus* nom. nov.; *Anaphes soykai* nom. nov.; *Anaphes*

eulongicornis nom. nov.; *Cleruchus europaensis* nom. nov.; *Gonatocerus camerounensis* nom. nov.; *Gonatocerus ionella* nom. nov.; *Gonatocerus zeyai* nom. nov.; *Polynema perkinsi* nom. nov.; *Polynema uruguayensis* nom. nov.; *Polynema europensis* nom. nov.; *Polynema polandica* nom. nov. and *Polynema englandicus* nom. nov. (**Mymaridae**); *Perilampus eucyaneus* nom. nov. (**Perilampidae: Perilampinae**); *Cleonymus eucalifornicus* nom. nov. and *Epistenia cameroni* nom. nov. (**Pteromalidae: Cleonyminae**); *Dipara eukeralensis* nom. nov. (**Pteromalidae: Diparinae**); *Gastrancistrus pseudocitripes* nom. nov. and *Gastrancistrus eumarylandensis* nom. nov. (**Pteromalidae: Pireninae**); *Callitula euflavipes* nom. nov.; *Mesopolobus girododdi* nom. nov.; *Mesopolobus keralensis* nom. nov.; *Pachyneuron ratzeburgi* nom. nov.; *Psilocera grahami* nom. nov.; *Pteromalus uyari* nom. nov.; *Pteromalus statzi* nom. nov.; *Pteromalus germanicus* nom. nov.; *Pteromalus eudecipiens* nom. nov.; *Pteromalus neobscurus* nom. nov.; *Sphegigaster yunnanensis* nom. nov. and *Spintherus eudubius* nom. nov. (**Pteromalidae: Pteromalinae**); *Torymus fonscolombeii* nom. nov. and *Torymus amurensis* nom. nov. (**Torymidae: Toryminae**)

KEY WORDS. Nomenclatural change, homonymy, replacement name, Hymenoptera, Chalcidoidea.

HYMENOPTERA PARASITICA

CHALCOIDEA

EUPELMIDAE

CALOSOTINAE

Genus *EUSANDALUM*

Eusandalum africanum nom. nov.

Junior secondary homonym: *Eusandalum cyaneum* (Hedqvist, 1970).

Original combination: *Polymoria cyanea* Hedqvist, 1970.

Distribution: South Africa.

Senior homonym: *Eusandalum cyaneum* (Ashmead, 1896).

Original combination: *Ratzeburgia cyanea* Ashmead, 1896.

Distribution: America.

Replacement name: *Eusandalum africanum* **nom. nov.**

pro *Eusandalum cyaneum* (Hedqvist, 1970) **syn. nov.**

Etymology: From the distribution area of the species.

Eusandalum namibiaensis nom. nov.

Junior secondary homonym: *Eusandalum stylatum* (Hedqvist, 1970).

Original combination: *Polymoria stylata* Hedqvist, 1970.

Distribution: Namibia, South Africa.

Senior homonym: *Eusandalum stylatum* (Girault, 1915).

Original combination: *Meseusandalum stylatus* Girault, 1915.

Distribution: Queensland, Australia.

Replacement name: *Eusandalum namibiaensis* **nom. nov.**

pro *Eusandalum stylatum* (Hedqvist, 1970) **syn. nov.**

Etymology: From the type locality Namibia.

EUPELMINAE**Genus ANASTATUS*****Anastatus risbeci* nom. nov.**

Junior secondary homonym: *Anastatus madagascariensis* (Risbec, 1952).
Original combination: *Metacalosoter madagascariensis* Risbec, 1952: 75.
Distribution: Madagascar.

Senior homonym: *Anastatus madagascariensis* (Risbec, 1952).
Original combination: *Oodera madagascariensis* Risbec, 1952: 143.
Distribution: India, Madagascar.

Replacement name: *Anastatus risbeci* **nom. nov.**

pro *Anastatus madagascariensis* (Risbec, 1952) **syn. nov.**

Etymology: The name is dedicated to J. Risbec who is the author of the preexisting species *A. madagascariensis*.

Genus EUPELMUS***Eupelmus eurorientalis* nom. nov.**

Junior secondary homonym: *Eupelmus orientalis* Ferrière, 1929.
Distribution: Indonesia.

Senior homonym: *Eupelmus orientalis* (Crawford, 1913).
Original combination: *Bruchocida orientalis* Crawford, 1913.
Distribution: India, Iraq, Niger, South and West Africa.

Replacement name: *Eupelmus eurorientalis* **nom. nov.**

pro *Eupelmus orientalis* Ferrière, 1929 **syn. nov.**

Etymology: From the specific epithet.

***Eupelmus hawaiiicus* nom. nov.**

Junior secondary homonym: *Eupelmus setiger* Perkins, 1910.
Distribution: Hawaii.

Senior homonym: *Eupelmus setiger* (Crosby, 1909).
Original combination: *Charitopella setigera* Crosby, 1909.
Distribution: Mozambique.

Replacement name: *Eupelmus hawaiiicus* **nom. nov.**

pro *Eupelmus setiger* Perkins, 1910 **syn. nov.**

Etymology: From the type locality Hawaii.

Genus MESOCOMYS***Mesocomys kalinai* nom. nov.**

Junior secondary homonym: *Mesocomys orientalis* (Kalina, 1984).
Original combination: *Semianastatus orientalis* Kalina, 1984.
Distribution: Russia.

Senior homonym: *Mesocomys orientalis* Ferrière, 1935
Distribution: Bangladesh, India, Indonesia, Myanmar.

Replacement name: *Mesocomys kalinai* **nom. nov.**

pro *Mesocomys orientalis* (Kalina, 1984) **syn. nov.**

Etymology: The name is dedicated to V. Kalina who is the author of the preexisting species *M. orientalis*.

Genus **ZAISCHNOPSIS**

***Zaischnopsis madagascarensis* nom. nov.**

Junior secondary homonym: *Zaischnopsis ivondroi* (Risbec, 1952).

Original combination: *Metacalosoter ivondroi* Risbec, 1952.

Distribution: Madagascar.

Senior homonym: *Zaischnopsis ivondroi* (Risbec, 1952).

Original combination: *Macreupelmus ivondroi* Risbec, 1952.

Distribution: Madagascar.

Replacement name: *Zaischnopsis madagascarensis* **nom. nov.**

pro *Zaischnopsis ivondroi* (Risbec, 1952) **syn. nov.**

Etymology: From the type locality Madagascar.

EURYTOMIDAE

EURYTOMINAE

Genus **BRUCHOPHAGUS**

***Bruchophagus pseudomongolicus* nom. nov.**

Junior secondary homonym: *Bruchophagus mongolicus* Fan & Liao, 1991.

Distribution: China.

Senior homonym: *Bruchophagus mongolicus* (Zerova, 1971).

Original combination: *Nikanoria mongolica* Zerova, 1971.

Distribution: Mongolia.

Replacement name: *Bruchophagus pseudomongolicus* **nom. nov.**

pro *Bruchophagus mongolicus* Fan & Liao, 1991 **syn. nov.**

Etymology: From the specific epithet and the type locality Inner Mongolia, China.

***Bruchophagus nigrella* nom. nov. and *Bruchophagus euniger* nom. nov.**

Junior secondary homonym: *Bruchophagus niger* (Zerova, 1971).

Original combination: *Nikanoria nigra* Zerova, 1971.

Distribution: Kazakhstan.

Junior secondary homonym: *Bruchophagus niger* (Girault, 1915).

Original combination: *Eurysystole niger* Girault, 1915.

Distribution: Queensland, Australia.

Senior homonym: *Bruchophagus niger* (Girault, 1913).

Original combination: *Phylloxerxenoides niger* (Girault, 1913).

Distribution: Queensland, Australia.

Replacement name: *Bruchophagus nigrella* **nom. nov.**

pro *Bruchophagus niger* (Zerova, 1971) **syn. nov.**

Etymology: From the specific epithet.

Replacement name: *Bruchophagus euniger* **nom. nov.**

pro *Bruchophagus niger* (Girault, 1915) **syn. nov.**

Etymology: From the specific epithet.

***Bruchophagus gonuli* nom. nov.**

Junior secondary homonym: *Bruchophagus nikolskayae* (Szelényi, 1971).
Original combination: *Nikanoria nikolskayae* Szelényi, 1971.
Distribution: Mongolia.

Senior homonym: *Bruchophagus nikolskayae* (Zerova, 1968).
Original combination: *Systole nikolskayae* Zerova, 1968.
Distribution: Ukraine, Bulgaria, Serbia, Russia.

Replacement name: *Bruchophagus gonuli* **nom. nov.**
pro *Bruchophagus nikolskayae* (Szelényi, 1971) **syn. nov.**
Etymology: The name is dedicated to Gönül (Turkey).

***Bruchophagus iranicus* nom. nov.**

Junior secondary homonym: *Bruchophagus trjapitzini* Zerova, 2008.
Distribution: Iran.

Senior homonym: *Bruchophagus trjapitzini* (Zerova, 1978).
Original combination: *Nikanoria trjapitzini* Zerova, 1978.
Distribution: Kazakhstan.

Replacement name: *Bruchophagus iranicus* **nom. nov.**
pro *Bruchophagus trjapitzini* Zerova, 2008 **syn. nov.**
Etymology: From the type locality Iran.

Genus *EURYTOMA****Eurytoma indiana* nom. nov.**

Junior primary homonym: *Eurytoma apantelesi* Narendran, 1994.
Distribution: India, China.

Senior homonym: *Eurytoma apantelesi* Risbec, 1951.
Distribution: Senegal.

Replacement name: *Eurytoma indiana* **nom. nov.**
pro *Eurytoma apantelesi* Narendran, 1994 **syn. nov.**
Etymology: From the type locality India.

***Eurytoma tulaya* nom. nov.**

Junior secondary homonym: *Eurytoma atamiensis* (Ashmead, 1904).
Original combination: *Decatoma atamiensis* Ashmead, 1904.
Distribution: Japan.

Senior homonym: *Eurytoma atamiensis* Ashmead, 1904.
Distribution: Japan.

Replacement name: *Eurytoma tulaya* **nom. nov.**
pro *Eurytoma atamiensis* (Ashmead, 1904) **syn. nov.**
Etymology: The name is dedicated to Tülay Varol Oskay (Turkey).

***Eurytoma mexicana* nom. nov.**

Junior secondary homonym: *Eurytoma compressa* Bugbee, 1939.
Distribution: Mexico and California, America.

Senior homonym: *Eurytoma compressa* (Fabricius, 1794).

Original combination: *Cynips compressa* Fabricius, 1794.

Distribution: Europe, Iran, Russia.

Replacement name: *Eurytoma mexicana* **nom. nov.**

pro *Eurytoma compressa* Bugbee, 1939 **syn. nov.**

Etymology: From the type locality Mexico.

***Eurytoma eujaponica* nom. nov.**

Junior primary homonym: *Eurytoma japonica* Ashmead, 1904.

Distribution: Japan.

Senior homonym: *Eurytoma japonica* Walker, 1873.

Distribution: Japan.

Replacement name: *Eurytoma eujaponica* **nom. nov.**

pro *Eurytoma japonica* Ashmead, 1904 **syn. nov.**

Etymology: From the specific epithet.

***Eurytoma zerovai* nom. nov.**

Junior primary homonym: *Eurytoma lactucae* Zerova, 2008.

Distribution: Iran.

Senior homonym: *Eurytoma lactucae* Bugbee, 1973.

Distribution: America.

Replacement name: *Eurytoma zerovai* **nom. nov.**

pro *Eurytoma lactucae* Zerova, 2008 **syn. nov.**

Etymology: The name is dedicated to M: D. Zerova who is the author of the preexisting species *E. lactucae*.

***Eurytoma sinensis* nom. nov.**

Junior secondary homonym: *Eurytoma polygraphi* (Yang, 1996).

Original combination: *Ipideurytoma polygraphi* Yang, 1996.

Distribution: Sichuan, China.

Senior homonym: *Eurytoma polygraphi* (Ashmead, 1894).

Original combination: *Decatomoidea polygraphi* Ashmead, 1894.

Distribution: Europe, Russia, Canada, America.

Replacement name: *Eurytoma sinensis* **nom. nov.**

pro *Eurytoma polygraphi* (Yang, 1996) **syn. nov.**

Etymology: From the type locality China.

***Eurytoma impar* Bugbee, 1945**

Junior primary homonym: *Eurytoma pusilla* Bugbee, 1945.

Synonym: *Eurytoma impar* Bugbee, 1945.

Distribution: Mexico.

Senior homonym: *Eurytoma pusilla* Boheman, 1836.

Distribution: Sweden.

Replacement name: *Eurytoma impar* Bugbee, 1945

pro *Eurytoma pusilla* Bugbee, 1945 **syn. nov.**

Etymology: From the available synonym name of *E. pusilla*.

***Eurytoma yangi* nom. nov.**

Junior primary homonym: *Eurytoma robusta* Yang, 1996.

Distribution: Shaanxi, China.

Senior homonym: *Eurytoma robusta* Mayr, 1878.

Distribution: Europe, Turkey, Russia.

Replacement name: *Eurytoma yangi* **nom. nov.**

pro *Eurytoma robusta* Yang, 1996 **syn. nov.**

Etymology: The name is dedicated to Z. Q. Yang who is the author of the preexisting species *E. robusta*.

***Eurytoma keralensis* nom. nov.**

Junior primary homonym: *Eurytoma scaposa* Narendran, 1994.

Distribution: Kerala, India and Bulgaria.

Senior homonym: *Eurytoma scaposa* Szelényi, 1974

Distribution: Mongolia, Bulgaria, Ukraine, Russia.

Replacement name: *Eurytoma keralensis* **nom. nov.**

pro *Eurytoma scaposa* Narendran, 1994 **syn. nov.**

Etymology: From the type locality Kerala, India.

Genus *SYCOPHILA****Sycophila fujianensis* nom. nov.**

Junior secondary homonym: *Sycophila flava* Xu & He, 2003.

Distribution: Fujian, China.

Senior homonym: *Eudecatoma flava* (Ashmead, 1881).

Original combination: *Decatoma flava* Ashmead, 1881.

Distribution: America.

Replacement name: *Sycophila fujianensis* **nom. nov.**

pro *Sycophila flava* Xu & He, 2003 **syn. nov.**

Etymology: From the type locality Fujian, China.

Genus *TETRAMESA****Tetramesa sulcatella* nom. nov.**

Junior secondary homonym: *Tetramesa sulcata* Szelényi, 1971.

Distribution: Mongolia.

Senior homonym: *Tetramesa sulcatum* (Ashmead, 1894).

Original combination: *Isosomocharis sulcata* Ashmead, 1894.

Distribution: Florida, America.

Replacement name: *Tetramesa sulcatella* **nom. nov.**

pro *Tetramesa sulcata* Szelényi, 1971 **syn. nov.**

Etymology: From the specific epithet.

MYMARIDAE

Genus *ANAPHES**Anaphes germaniacus* **nom. nov.**

Junior secondary homonym: *Anaphes angustipennis* (Soyka, 1949).
Original combination: *Ferrierella angustipennis* Soyka, 1949.
Distribution: Germany.

Senior homonym: *Anaphes angustipennis* (Debauche, 1948).
Original combination: *Patasson angustipennis* Debauche, 1948
Distribution: Belgium.

Replacement name: *Anaphes germaniacus* **nom. nov.**
pro *Anaphes angustipennis* (Soyka, 1949) **syn. nov.**

Etymology: The name is dedicated to Soyka who is the author of the preexisting species *A. angustipennis*.

Anaphes soykai **nom. nov.**

Junior secondary homonym: *Anaphes crassicornis* (Soyka, 1949).
Original combination: *Mymar crassicornis* Soyka, 1949.
Distribution: Poland, United Kingdom.

Senior homonym: *Anaphes crassicornis* (Walker, 1846).
Original combination: *Panthus crassicornis* Walker, 1846
Distribution: United Kingdom.

Replacement name: *Anaphes soykai* **nom. nov.**
pro *Anaphes crassicornis* (Soyka, 1949) **syn. nov.**

Etymology: The name is dedicated to Soyka who is the author of the preexisting species *A. angustipennis*.

Anaphes eulonicornis **nom. nov.**

Junior secondary homonym: *Anaphes longicornis* (Soyka, 1949).
Original combination: *Fulmekiella longicornis* Soyka, 1949.
Distribution: Poland.

Senior homonym: *Anaphes longicornis* (Walker, 1846).
Original combination: *Mymar longicornis* Walker, 1846
Distribution: Germany, Ireland, United Kingdom.

Replacement name: *Anaphes eulonicornis* **nom. nov.**
pro *Anaphes longicornis* (Soyka, 1949) **syn. nov.**
Etymology: From the specific epithet.

Genus *CLERUCHUS**Cleruchus europaensis* **nom. nov.**

Junior secondary homonym: *Cleruchus terebrator* Viggiani, 1970.
Distribution: Switzerland.

Senior homonym: *Cleruchus terebrator* (Ogloblin, 1959).
Original combination: *Platypatasson terebrator* Ogloblin, 1959.
Distribution: Argentina.

Replacement name: *Cleruchus europaensis* **nom. nov.**

pro *Cleruchus terebrator* Viggiani, 1970 **syn. nov.**

Etymology: From the distribution area of the species.

Genus **GONATOCERUS**

***Gonatocerus camerounensis* nom. nov.**

Junior primary homonym: *Gonatocerus africanus* Risbec, 1956.

Distribution: Cameroon.

Senior homonym: *Gonatocerus africanus* Soyka, 1950

Distribution: Egypt.

Replacement name: *Gonatocerus camerounensis* **nom. nov.**

pro *Gonatocerus africanus* Risbec, 1956 **syn. nov.**

Etymology: From the type locality Cameroon.

***Gonatocerus ionella* nom. nov.**

Junior primary homonym: *Gonatocerus io* Girault, 1938.

Distribution: Australia.

Senior homonym: *Gonatocerus io* Girault, 1915.

Distribution: Queensland, Australia.

Replacement name: *Gonatocerus ionella* **nom. nov.**

pro *Gonatocerus io* Girault, 1938 **syn. nov.**

Etymology: From the specific epithet.

***Gonatocerus zeyai* nom. nov.**

Junior primary homonym: *Gonatocerus orientalis* Zeya, 1995.

Distribution: India.

Senior homonym: *Gonatocerus orientalis* Girault, 1917.

Distribution: Tanzania.

Replacement name: *Gonatocerus zeyai* **nom. nov.**

pro *Gonatocerus orientalis* Zeya, 1995 **syn. nov.**

Etymology: The name is dedicated to S. B. Zeya who is the author of the preexisting species *G. orientalis*.

Genus **POLYNEMA**

***Polynema perkinsi* nom. nov.**

Junior secondary homonym: *Polynema ciliatum* Perkins, 1910.

Distribution: Hawaii, America.

Senior homonym: *Polynema ciliatum* (Say, 1829).

Original combination: *Psilus ciliatus* Say, 1829.

Distribution: Hawaii, America.

Replacement name: *Polynema perkinsi* **nom. nov.**

pro *Polynema ciliata* Perkins, 1910 **syn. nov.**

Etymology: The name is dedicated to R. C. L. Perkins who is the author of the preexisting species *P. ciliatum*.

***Polynema uruguayensis* nom. nov.**

Junior secondary homonym: *Polynema orientalis* (Ogloblin, 1963).
Original combination: *Barypolynema orientalis* Ogloblin, 1963.
Distribution: Uruguay.

Senior homonym: *Polynema orientalis* Girault, 1917.
Distribution: Tanzania.

Replacement name: *Polynema uruguayensis* **nom. nov.**
pro *Polynema orientalis* (Ogloblin, 1963) **syn. nov.**
Etymology: From the type locality Uruguay.

***Polynema soykai* nom. nov.**

Junior secondary homonym: *Polynema palustre* Soyka, 1956.
Distribution: Austria.

Senior homonym: *Polynema palustre* (Soyka, 1940).
Original combination: *Novickyella palustris* Soyka, 1940.
Distribution: Austria.

Replacement name: *Polynema soykai* **nom. nov.**
pro *Polynema palustre* Soyka, 1956 **syn. nov.**
Etymology: The name is dedicated to W. Soyka who is the author of the preexisting species *P. palustre*.

***Polynema europensis* nom. nov.**

Junior secondary homonym: *Polynema prolongatum* Soyka, 1956.
Distribution: Europe.

Senior homonym: *Polynema prolongatum* (Soyka, 1956).
Original combination: *Maidliella prolongata* Soyka, 1956.
Distribution: Netherlands.

Replacement name: *Polynema europensis* **nom. nov.**
pro *Polynema prolongatum* Soyka, 1956 **syn. nov.**
Etymology: From the distribution area of the species.

***Polynema polandica* nom. nov.**

Junior secondary homonym: *Polynema pulchrum* Soyka, 1956.
Distribution: Poland.

Senior homonym: *Polynema pulchrum* (Soyka, 1940).
Original combination: *Novickyella pulchra* Soyka, 1940.
Distribution: Poland.

Replacement name: *Polynema polandica* **nom. nov.**
pro *Polynema pulchrum* Soyka, 1956 **syn. nov.**
Etymology: From the type locality Poland.

***Polynema englandicus* nom. nov.**

Junior secondary homonym: *Polynema reticulatum* Hincks, 1950.
Distribution: United Kingdom.

Senior homonym: *Polynema reticulatum* (Ogloblin, 1946).
Original combination: *Barypolynema reticulatum* Ogloblin, 1946.
Distribution: Argentina.

Replacement name: *Polynema englandicus* **nom. nov.**
pro *Polynema reticulatum* Hincks, 1950 **syn. nov.**
Etymology: From the type locality England.

PERILAMPIDAE

PERILAMPINAE

Genus *PERILAMPUS*

Perilampus eucyaneus **nom. nov.**

Junior secondary homonym: *Perilampus cyaneus* Brullé, 1846.
Synonym: *Taltonos sirsiris* Argaman, 1990 [Unnecessary replacement name for *Perilampus cyaneus* Brullé, 1846. According to the ICZN (1999), Article 59.4 a species group name rejected after 1960 on the grounds of junior secondary homonym is to be reinstated if the two species. So it is an unavailable and invalid name].
Distribution: Canada, Cuba, Mexico, America.

Senior homonym: *Perilampus cyaneus* (Fabricius, 1798).
Original combination: *Ichneumon cyaneus* Fabricius, 1798.
Distribution: France, United Kingdom.

Replacement name: *Perilampus eucyaneus* **nom. nov.**
pro *Perilampus cyaneus* Brullé, 1846 **syn. nov.**
Etymology: From the specific epithet.

PTEROMALIDAE

CLEONYMINAE

Genus *CLEONYMUS*

Cleonymus eucalifornicus **nom. nov.**

Junior secondary homonym: *Cleonymus californicus* Girault, 1917.
Distribution: California, America.

Senior homonym: *Cleonymus californicus* (Crawford, 1916).
Original combination: *Ptinobius californicus* Crawford, 1916.
Distribution: California, America.

Replacement name: *Callitula eucalifornicus* **nom. nov.**
pro *Cleonymus californicus* Girault, 1917 **syn. nov.**
Etymology: From the specific epithet.

Genus *EPISTENIA*

Epistenia cameroni **nom. nov.**

Junior secondary homonym: *Epistenia rufipes* Cameron, 1913.
Original combination: *Lycisca rufipes* Cameron, 1913.
Distribution: Guyana.

Senior homonym: *Epistenia rufipes* Cameron, 1884.
Distribution: Panama.

Replacement name: *Epistenia cameroni* **nom. nov.**
pro *Epistenia rufipes* Cameron, 1913 **syn. nov.**

Etymology: The name is dedicated to P. Cameron who is the author of the preexisting species *E. rufipes*.

DIPARINAE

Genus *DIPARA*

***Dipara eukeralensis* nom. nov.**

Junior secondary homonym: *Dipara keralensis* Narendran & Sureshan, 2001.
Distribution: Kerala, India.

Senior homonym: *Dipara keralensis* Narendran, 2000.
Original combination: *Parurios keralensis* Narendran, 2000.
Distribution: Kerala and Uttar Pradesh, India.

Replacement name: *Dipara eukeralensis* **nom. nov.**
pro *Dipara keralensis* Narendran & Sureshan, 2001 **syn. nov.**
Etymology: From the type locality Kerala, India.

PIRENINAE

Genus *GASTRANCISTRUS*

***Gastrancistrus pseudocitripes* nom. nov.**

Junior secondary homonym: *Gastrancistrus citripes* (Girault, 1929).
Original combination: *Roptroceropseus citripes* Girault, 1929.
Distribution: Australia (Queensland and South Australia).

Senior homonym: *Gastrancistrus citripes* (Thomson, 1876).
Original combination: *Tridymus citripes* Thomson, 1876.
Distribution: Czechia, Hungary, Sweden.

Replacement name: *Gastrancistrus pseudocitripes* **nom. nov.**
pro *Gastrancistrus citripes* (Girault, 1929) **syn. nov.**
Etymology: From the specific epithet.

***Gastrancistrus eumarylandensis* nom. nov.**

Junior secondary homonym: *Gastrancistrus marylandensis* (Girault, 1916b).
Original combination: *Pirene marylandensis* Girault, 1916b.
Distribution: Maryland, America.

Senior homonym: *Gastrancistrus marylandensis* (Girault, 1916a).
Original combination: *Parecrizotes marylandensis* Girault, 1916a.
Distribution: America.

Replacement name: *Gastrancistrus eumarylandensis* **nom. nov.**
pro *Gastrancistrus marylandensis* (Girault, 1916b) **syn. nov.**
Etymology: From the specific epithet.

PTEROMALINAE

Genus *CALLITULA*

***Callitula euflavipes* nom. nov.**

Junior secondary homonym: *Callitula flavipes* (Girault & Dodd, 1915).
Original combination: *Pseudosphegigasterus flavipes* Girault & Dodd, 1915.
Distribution: Queensland, Australia.

Senior homonym: *Callitula flavipes* (Girault, 1913).
Original combination: *Pterosemoidea flavipes* Girault, 1913.
Distribution: South Australia.

Replacement name: *Callitula euflavipes* **nom. nov.**
pro *Callitula flavipes* (Girault & Dodd, 1915) **syn. nov.**
Etymology: From the specific epithet.

Genus **MESOPOLOBUS**

***Mesopolobus girododdi* nom. nov.**

Junior secondary homonym: *Mesopolobus dubius* (Girault & Dodd, 1915).
Original combination: *Hypopteromalus dubius* Girault & Dodd, 1915.
Distribution: Queensland, Australia.

Senior homonym: *Mesopolobus dubius* (Walker, 1834).
Original combination: *Amblymerus dubius* Walker, 1834
Distribution: Europe.

Replacement name: *Mesopolobus girododdi* **nom. nov.**
pro *Mesopolobus dubius* (Girault & Dodd, 1915) **syn. nov.**
Etymology: The name is dedicated to A. A. Girault and A. P. Dodd who are the authors of the preexisting species *M. dubius*.

***Mesopolobus keralensis* nom. nov.**

Junior primary homonym: *Mesopolobus minutus* Sureshan & Narendran, 2002.
Distribution: Kerala, India.

Senior homonym: *Mesopolobus minutus* Dzhankmen, 1982.
Distribution: Kazakhstan.

Replacement name: *Mesopolobus keralensis* **nom. nov.**
pro *Mesopolobus minutus* Sureshan & Narendran, 2002 **syn. nov.**
Etymology: From the type locality Kerala, India.

Genus **PACHYNEURON**

***Pachyneuron ratzeburgi* nom. nov.**

Junior secondary homonym: *Pachyneuron coccorum* (Ratzeburg, 1848).
Original combination: *Pteromalus coccorum* Ratzeburg, 1848.
Distribution: Germany.

Senior homonym: *Pachyneuron coccorum* (Linnaeus, 1758).
Original combination: *Ichneumon coccorum* Linnaeus, 1758.
Distribution: Europe, Morocco, Israel, Russia, Turkmenistan.

Replacement name: *Pachyneuron ratzeburgi* **nom. nov.**
pro *Pachyneuron coccorum* (Ratzeburg, 1848) **syn. nov.**
Etymology: The name is dedicated to J. T. C. Ratzeburg who is the author of the preexisting species *P. coccorum*.

Genus **PACHYNEURON**

***Pachyneuron ratzeburgi* nom. nov.**

Junior secondary homonym: *Pachyneuron coccorum* (Ratzeburg, 1848).

Original combination: *Pteromalus coccorum* Ratzeburg, 1848.
Distribution: Germany.

Senior homonym: *Pachyneuron coccorum* (Linnaeus, 1758).
Original combination: *Ichneumon coccorum* Linnaeus, 1758.
Distribution: Europe, Morocco, Israel, Russia, Turkmenistan.

Replacement name: *Pachyneuron ratzeburgi* **nom. nov.**
pro *Pachyneuron coccorum* (Ratzeburg, 1848) **syn. nov.**
Etymology: The name is dedicated to J. T. C. Ratzeburg who is the author of the preexisting species *P. coccorum*.

Genus **PSILOCERA**

***Psilocera grahami* nom. nov.**

Junior secondary homonym: *Psilocera rufipes* Graham, 1992.
Distribution: Netherlands, Yugoslavia.

Senior homonym: *Psilocera rufipes* (Ashmead, 1896).
Original combination: *Metapon rufipes* Ashmead, 1896.
Distribution: America.

Replacement name: *Psilocera grahami* **nom. nov.**
pro *Psilocera rufipes* Graham, 1992 **syn. nov.**
Etymology: The name is dedicated to M. W. R. Graham who is the author of the preexisting species *P. rufipes*.

Genus **PTEROMALUS**

***Pteromalus uyari* nom. nov.**

Junior primary homonym: *Pteromalus aeneus* Nees, 1834.
Distribution: Germany.

Senior homonym: *Pteromalus aeneus* Fonscolombe, 1832.
Distribution: France.

Replacement name: *Pteromalus uyari* **nom. nov.**
pro *Pteromalus aeneus* Nees, 1834 **syn. nov.**
Etymology: The name is dedicated to Prof. Dr. Tahsin Uyar (Turkey).

***Pteromalus statzi* nom. nov.**

Junior primary homonym: *Pteromalus aerosus* Statz, 1938.
Distribution: Germany.

Senior homonym: *Pteromalus aerosus* Förster, 1841.
Distribution: Germany.

Replacement name: *Pteromalus statzi* **nom. nov.**
pro *Pteromalus aerosus* Statz, 1938 **syn. nov.**
Etymology: The name is dedicated to G. Statz who is the author of the preexisting species *P. aerosus*.

***Pteromalus germanicus* nom. nov.**

Junior primary homonym: *Pteromalus clavicornis* Statz, 1938.
Distribution: Germany.

Senior homonym: *Pteromalus clavicornis* Swederus, 1795.

Distribution: Amur Oblast, Russia.

Replacement name: *Pteromalus germanicus* **nom. nov.**

pro *Pteromalus clavicornis* Statz, 1938 **syn. nov.**

Etymology: From the type locality Germany.

***Pteromalus eudecapiens* nom. nov.**

Junior primary homonym: *Pteromalus decapiens* (Graham, 1969).

Original combination: *Habroclytus decapiens* Graham, 1969.

Distribution: Czechia, Netherlands, Sweden, Switzerland, United Kingdom.

Senior homonym: *Pteromalus decapiens* Förster, 1841.

Distribution: Germany.

Replacement name: *Pteromalus eudecapiens* **nom. nov.**

pro *Pteromalus decapiens* (Graham, 1969) **syn. nov.**

Etymology: From the specific epithet.

***Pteromalus neobscurus* nom. nov.**

Junior primary homonym: *Pteromalus obscurus* (Thomson, 1878).

Original combination: *Etroxys (Habroclytus) obscurus* Thomson, 1878.

Distribution: Europe, Russia, Kazakhstan.

Senior homonym: *Pteromalus obscurus* Nees, 1834.

Distribution: Germany.

Replacement name: *Pteromalus neobscurus* **nom. nov.**

pro *Pteromalus obscurus* (Thomson, 1878) **syn. nov.**

Etymology: From the specific epithet.

Genus *SPHEGIGASTER*

***Sphegigaster yunnanensis* nom. nov.**

Junior secondary homonym: *Sphegigaster carinata* Huang, 1990.

Distribution: Yunnan, China.

Senior homonym: *Chrysolampus carinatus* (Förster, 1861).

Original combination: *Sphegigaster carinatus* Förster, 1861.

Distribution: Switzerland.

Replacement name: *Sphegigaster yunnanensis* **nom. nov.**

pro *Sphegigaster carinata* Huang, 1990 **syn. nov.**

Etymology: From the type locality Yunnan, China.

Genus *SPINTHERUS*

***Spintherus eudubius* nom. nov.**

Junior secondary homonym: *Spintherus dubius* Ashmead, 1894.

Distribution: Grenada, St. Vincent & Grenadines.

Senior homonym: *Spintherus dubius* (Nees, 1834).

Original combination: *Pteromalus dubius* Nees, 1834.

Distribution: Europe, Turkey, Caucasus, Russia, Central Asia.

Replacement name: *Spintherus eudubius* **nom. nov.**

pro *Spintherus dubius* Ashmead, 1894 **syn. nov.**

Etymology: From the specific epithet.

TORYMIDAE

TORYMINAE

Genus *TORYMUS*

***Torymus fonscolombei* nom. nov.**

Junior secondary homonym: *Torymus basalis* (Fonscolombe, 1840).

Original combination: *Cynips basalis* Fonscolombe, 1840.

Distribution: France.

Senior homonym: *Torymus basalis* (Walker, 1833).

Original combination: *Callimome basalis* Walker, 1833.

Distribution: England, France, Germany, Ireland, Netherlands, Sweden, Ukraine.

Replacement name: *Torymus fonscolombei* **nom. nov.**

pro *Torymus basalis* (Fonscolombe, 1840) **syn. nov.**

Etymology: The name is dedicated to E. L. J. H. Boyer de Fonscolombe who is the author of the preexisting species *T. basalis*.

***Torymus amurensis* nom. nov.**

Junior secondary homonym: *Torymus contractus* (Walker, 1874).

Original combination: *Callimome contractus* Walker, 1874.

Distribution: Amur Oblast, Russia.

Senior homonym: *Torymus contractus* Dalman, 1820.

Distribution: Sweden.

Replacement name: *Torymus amurensis* **nom. nov.**

pro *Torymus contractus* (Walker, 1874) **syn. nov.**

Etymology: From the type locality Amur Oblast, Russia.

LITERATURE CITED

André, E. 1881. Notes Hyménoptérologiques. 1. Chalcidites. Annales de la Société Entomologique de France, (6) 1: 341.

Annecke, D. P. & Mynhardt, M. J. 1979. On the type-species and three new species of *Prococcophagus* Silvestri from South Africa (Hymenoptera: Aphelinidae). Journal of the Entomological Society of Southern Africa, 42 (2): 293-296.

Annecke, D. P. & Mynhardt, M. J. 1981. The species of the *asterolecanii*-group of *Metaphycus* Mercet (Hymenoptera: Encyrtidae) from South Africa with notes on some extralimital species. Journal of the Entomological Society of Southern Africa, 44 (1): 55-56.

Argaman, Q. 1990. A synopsis of *Perilampus* Latreille with descriptions of new genera and species (Hymenoptera: Perilampidae), I. Acta Zoologica Hungarica, 36 (3-4): 205.

Arifa, N. & Khan, M. A. 1992. Some new chalcid parasitoids (Hymenoptera: Eulophidae) recorded from India. Journal of the Bombay Natural History Society, 88 (3): 437-438.

Ashmead, W. H. 1881. On some new species of Chalcididae from Florida. Canadian Entomologist, 13 (6): 134.

Ashmead, W. H. 1888. Descriptions of some new North American Chalcididae. III: Euderinae (Hymenoptera: Chalcidoidea). Canadian Entomologist, 20 (6): 102.

Ashmead, W. H. 1894. Descriptions of new parasitic Hymenoptera. Transactions of the American Entomological Society, 21: 322, 331, 344.

Ashmead, W. H. 1896. Descriptions of new parasitic Hymenoptera. Transactions of the American Entomological Society, 23: 229.

Ashmead, W. H. 1896. On the genera of the Eupelminae. Proceedings of the Entomological Society of Washington, 4: 11.

Ashmead, W. H. 1900. Notes on some New Zealand and Australian parasitic Hymenoptera, with descriptions of new genera and species. Proceedings of the Linnean Society of New South Wales, 25: 333.

Ashmead, W. H. 1904. Descriptions of new Hymenoptera from Japan. II. Journal of the New York Entomological Society, 12 (3): 149, 150-151, 162, 165.

Báez, M. & Askew, R. R. 1999. New records of Chalcidoidea (Hymenoptera) from the Canary Islands. Boletín de la Asociación Española de Entomología, 23 (1-2): 77-79.

Bingham, C. T. 1906. New species of Braconidae and Chalcididae from N. Queensland bred by F.P. Dodd. Transactions of the Entomological Society of London, 1906: 127.

Blanchard, E. E. 1936. Apuntes sobre calcidoideos argentinos, nuevos y conocidos. Revista de la Sociedad Entomológica Argentina, 8: 27.

Boheman, C. H. 1836. Skandinaviska Pteromaliner. (Fortsättning) Kongliga Vetenskaps-Akademiens Handlingar, 1836: 252-253.

Bouček, Z. 1959. A study of central European Eulophidae, I: Eulophinae (Hymenoptera). Sborník Entomologického Oddelení Národního Muzea v Praze, 33: 159.

Brullé, M. A. 1846. [In Lepeletier de Saint-Fargeau.] Histoire Naturelle des Insectes: Hyménoptères IV. pp. 573, Plate 39, Paris.

Bugbee, R. E. 1939. A discussion of the *Eurytoma rhois* complex with a description of a new species (Eurytomidae). Annals of the Entomological Society of America, 32 (2): 418.

Bugbee, R. E. 1945. Eight new species of the genus *Eurytoma* from Mexico and Guatemala (Hymenoptera, Eurytomidae). Parts V and VI. Quadrata and corpulentus groups. Annals of the Entomological Society of America, 38 (1): 54, 56.

Bugbee, R. E. 1973. New species of the genus *Eurytoma* from the United States and Canada (Hymenoptera: Eurytomidae). Journal of the Georgia Entomological Society, 8 (1): 11-12.

Cameron, P. 1884. Fam. Chalcididae. [continued] Biologia Centrali-Americana. Insecta. Hymenoptera. (Families Tenthredinidae-Chrysididae), 1: 130.

Cameron, P. 1907. Descriptions of species of parasitic Hymenoptera, chiefly in the collections of the South African Museum, Cape Town. (Second paper) Annals of the South African Museum, 5: 212.

Cameron, P. 1913. The Hymenoptera of the Georgetown Museum. Part V. Timehri, Guyana, (3) 3: 123.

Cameron, P. 1913. On some new and other species of Hymenoptera in the collections of the Zoological Branch of the Forest Research Institute, Dehra Dun. Part I. On the Parasitic Hymenoptera reared at Dehra Dun, northern India, from the lac (*Tachardia*) and sal insects. Indian Forest Records, 4 (2): 103.

Crawford, J. C. 1913. Descriptions of new Hymenoptera, no 6. Proceedings of the United States National Museum, 45: 247.

Crawford, J. C. 1916. Some new American Hymenoptera. Insecutor Inscitiae Menstruus, 4: 142.

Cristóbal, U. L. 1936. Tetrastichus lopezi - Blanchard. Bol. inf. Lab. Zool., ent. agric. La Plata, 1936: 1.

Crosby, C. R. 1909. Chalcid-flies reared from galls from Zumbo East Africa. Brotéria, Lisboa (Zoologia), 8: 85.

Dalman, J. W. 1820. Försök till Uppställning af Insect-familjen Pteromalini, i synnerhet med afseende på de i Sverige funne Arter. Kungliga Svenska Vetenskapsakademiens Handlingar, 41 (1): 178, Table VIII.

- Debauche, H.R.** 1948. Étude sur les Mymarommidae et les Mymaridae de la Belgique (Hym., Chalcidoidea). Mémoires du Musée Royal d'Histoire Naturelle de Belgique, 108: 248 pp.
- De Santis, L.** 1964. Encirtidos de la Republica Argentina (Hymenoptera: Chalcidoidea). Anales de la Comisión de Investigación Científica Provincia de Buenos Aires Gobernación, 4: 129.
- Doutt, R. L.** 1961. The hymenopterous egg parasites of some Japanese leafhoppers. Acta Hymenopterologica, Tokyo, 1 (3): 310.
- Dzhanokmen, K. A.** 1982. A new genus and two new species of the family Pteromalidae (Hymenoptera) of the fauna of the USSR. Zoologicheskii Zhurnal, 61 (10): 1601.
- Fabricius, J. C.** 1787. Mantissa Insectorum sistens species nuper detectas, 1: 273. Copenhagen.
- Fabricius, J. C.** 1794. Entomologia Sistematica. Copenhagen. 4: 455.
- Fabricius, J. C.** 1798. Supplementum Entomologiae systematicae. Copenhagen. pp. 231.
- Fabricius, J. C.** 1804. Systema Piezatorum, 2: 160 A.C. Reichard, Brunsvigae.
- Fan, Y. & Liao, D.** 1991. Four new species of the seed chalcids of genus *Bruchophagus* Ashmead (Hymenoptera; Eurytomidae) injurious to huangchi (*Astragalus* spp.). Entomotaxonomia, 13 (4): 285, 286-287, 292.
- Ferrière, C.** 1929. Chalcidiens gallicoles de Java. Annales de la Société Entomologique de France, 98: 155.
- Ferrière, C.** 1935. Notes on some bred exotic Eupelmidae (Hym. Chalc.). Stylops, IV: 150.
- Ferrière, C.** 1936. The parasites of the coffee leaf-miners (*Leucoptera* spp.) in Africa. Bulletin of Entomological Research, 27 (3): 486-487.
- Fonscolombe, E. L. J. H. Boyer de.** 1832. Monographia chalciditum galloprovinciae circa aquas degentum. Annales des Sciences Naturelles (1) (Zoologie), 26: 302.
- Fonscolombe, E. L. J. H. Boyer de.** 1840. Addenda et errata ad monographium chalciditum galloprovinciae circa aquas sextias degentum. Annales des Sciences Naturelles, (2) 13: 187, 190.
- Förster, A.** 1841. Beiträge zur monographie der Pteromalinen Nees 1 Heft: 15, 17, 41. Aachen.
- Förster, A.** 1856. Hymenopterologische Studien. 2. Chalcidiae und Proctotrupii. Aachen. pp. 37.
- Förster, A.** 1861. Ein Tag in den Hoch-Alpen. Programm der Realschule zu Aachen, 1860-1861: 34.
- Gahan, A. B.** 1922. Descriptions of miscellaneous new reared parasitic Hymenoptera. Proceedings of the United States National Museum, 61: 17.
- Girault, A. A.** 1911. Beiträge zur Kenntnis der Hymenopteren fauna von Paraguay auf Grund der Sammlungen und Beobachtungen von Prof. J.D. Anistis. IX New chalcidoid genera and species from Paraguay. Zoologische Jahrbücher, Abteilung für Systematik, 31: 404.
- Girault, A. A.** 1913. Australian Hymenoptera Chalcidoidea - IV. Memoirs of the Queensland Museum, 2: 164, 169, 212, 214, 217, 222, 223, 240, 244, 262.
- Girault, A. A.** 1913. A few new chalcidoid Hymenoptera Hymenoptera from Queensland, Australia. Bulletin of the Wisconsin Natural History Society (new series), 11: 45.
- Girault, A. A.** 1913. New genera and species of chalcidoid Hymenoptera in the South Australia Museum, Adelaide. Transactions of the Royal Society of South Australia, 37: 82-83, 103.
- Girault, A. A.** 1914. New genera and species of the chalcidoid Hymenoptera belonging to the family Eulophidae from Australia. (continued) Societas Entomologica, Frankfurt, 29: 10.
- Girault, A. A.** 1915. Australian Hymenoptera Chalcidoidea IV. Supplement. Memoirs of the Queensland Museum, 3: 204, 220, 264.

- Girault, A. A.** 1915. Australian Hymenoptera Chalcidoidea VI. Supplement. Memoirs of the Queensland Museum, 3: 329, 333.
- Girault, A. A.** 1915. Australian Hymenoptera Chalcidoidea - VII. The family Encyrtidae with descriptions of new genera and species. Memoirs of the Queensland Museum, 4: 34.
- Girault, A. A.** 1915. Australian Hymenoptera Chalcidoidea, XI. The family Eurytomidae with descriptions of new genera and species. Memoirs of the Queensland Museum, 4: 263.
- Girault, A. A.** 1915. Australian Hymenoptera Chalcidoidea - XIV. The family Chalcididae with descriptions of new genera and species. Memoirs of the Queensland Museum, 4: 360.
- Girault, A. A.** 1916a. New miscellaneous chalcidoid Hymenoptera with notes on described species. Annals of the Entomological Society of America, 9 (3): 305.
- Girault, A. A.** 1916b. *Pirene marylandensis* n.sp. (Chalcidoid Hymenoptera). Bulletin of the Brooklyn Entomological Society, 11: 88.
- Girault, A. A.** 1917. Descriptions hymenopterorum chalcidoidicarum variorum cum observationibus. Private publication. Glenndale, Maryland. V. pp. 5.
- Girault, A. A.** 1917. Notes on chalcid flies, chiefly from California. Journal of Entomology and Zoology, 9: 11.
- Girault, A. A.** 1917. Some new Mymaridae and a new *Signiphora* in the collections of the Zoological Museum, Berlin. (continued) Societas Entomologica, Frankfurt, 32: 13, 19-20.
- Girault, A. A.** 1920. New genera and species of chalcid-flies from Australia. Insector Inscitiae Menstruus, 8 (1-3): 48.
- Girault, A. A.** 1922. New chalcid flies from eastern Australia (Hymenoptera, Chalcididae). I. Insector Inscitiae Menstruus, 10: 39.
- Girault, A. A.** 1923. New Encyrtidae from Australia - I. Insector Inscitiae Menstruus, 11: 47.
- Girault, A. A.** 1929. Notes on, and descriptions of, chalcid wasps in South Australian Museum. Concluding paper. Transactions of the Royal Society of South Australia, 53: 320.
- Girault, A. A.** 1938. New Trichogrammatidae and Mymaridae from Australia (Hym.). Revista de Entomologia, Rio de Janeiro, 9: 393.
- Graham, M. W. R. de V.** 1969. The Pteromalidae of north-western Europe (Hymenoptera: Chalcidoidea). Bulletin of the British Museum (Natural History) (Entomology), Supplement, 16: 548-549.
- Graham, M. W. R. de V.** 1987. A reclassification of the European Tetrastichinae (Hymenoptera: Eulophidae), with a revision of certain genera. Bulletin of the British Museum (Natural History) (Entomology), 55 (1): 357.
- Graham, M. W. R. de V.** 1992. Second revision of western European Psilocera (Hym., Pteromalidae) with descriptions of three new species. Entomologist's Monthly Magazine, 128: 16, 20.
- Habu, A.** 1960. A revision of the Chalcididae (Hymenoptera) of Japan with description of sixteen new species. Bulletin of National Institute of Agricultural Sciences, Tokyo (C), 11: 195.
- Hansson, C.** 1994. Re-evaluation of the genus *Closterocerus* Westwood (Hymenoptera: Eulophidae), with a revision of the Nearctic species. Entomologica Scandinavica, 25: 3, 15, 20.
- Hansson, C.** 2004. Eulophidae of Costa Rica (Hymenoptera: Chalcidoidea), 2. Memoirs of the American Entomological Institute, 75: 37, 106.
- Hedqvist, K. J.** 1970. Hymenoptera, Chalcidoidea, Eupelmidae. South African Animal Life. Results of the Lund University Expedition in 1950-1951. XIV: 424-426 (Eds: Hanstrom, B.; Brinck, P.; Rudebeck, G.) Swedish Natural Research Council, Stockholm, Sweden.
- Hincks, W. D.** 1950. Notes on some British Mymaridae (Hym.). Transactions of the Society for British Entomology, 10: 188.

- Hoffer, A.** 1965. Príspevek k poznání druhu cel. Encyrtidae (Hym., Chalcidoidea) zjištených v přirozených formacích dřevin podél horního toku Vltavy a na některých sumavských rašelinistích. Ref. Entom. Symp. Opava, 1965: 101-102.
- Hoffer, A.** 1968. Zwei Gattungen der Familie Encyrtidae (Hym., Chalcidoidea) neue für Europa. Acta Entomologica Bohemoslovaca, 65: 383.
- Holmgren, A. E.** 1868. Häft 12. Hymenoptera. Kongliga Svenska Fregatten Eugenies Resa omkring Jorden. Vetenskapliga Iakttagelser, ii Zoologii; Insecta, pp. 434 Stockholm [Puna Island.].
- Howard, L. O.** 1881. Report of the parasites of Coccidae in the collections of the U.S. Department of Agriculture Part III. Report. United States Department of Agriculture. Washington. (Entomology), 1880: 365.
- Howard, L. O.** 1885. Descriptions of North American Chalcididae from the collections of the U.S. Department of Agriculture and of Dr C.V. Riley, with biological notes. (First paper). Together with a list of the described North American species of the family. Bulletin of the United States Department of Agriculture, Bureau of Entomology, 5:10.
- Howard, L. O.** 1897. On the Chalcididae of the Island of Grenada. Journal of the Linnean Society (Zoology), 26:168, 176.
- Howard, L. O.** 1898. On some new parasitic insects of the subfamily Encyrtinae. Proceedings of the United States National Museum, 21: 232.
- Huang, D-W.** 1990. On the Chinese species of the genus *Sphegigaster* Spinola (Hymenoptera: Pteromalidae: Miscogasterinae). Sinozoologica, 7: 270-271, 281.
- Huang, J.** 1994. Systematic studies on Aphelinidae of China (Hymenoptera: Chalcidoidea). Contributions of the Biological Control Research Institute, Fujian Agricultural University Special Publication, 5: 14-15, 266-267. Chongqing Publishing House, Chongqing, China.
- Huang, J., Lin, X. L. & Lin, C. F.** 1992. Systematic studies of Aphelinidae III. The species of *Archenomus* Howard from China (Hymenoptera, Aphelinidae). Journal of Fujian Agricultural College, 21 (2): 164, 168-171.
- Kalina, V.** 1984. New genera and species of Palaearctic Eupelmidae (Hymenoptera, Chalcidoidea). Silvacultura Tropica et Subtropica, Prague, 10: 19-22, 28.
- Khan, M. A.** 1996. Parasitic wasps of genus *Pediobius* Walker (Hymenoptera: Eulophidae) from northern India. Journal of Insect Science, 9 (2): 104-105, 109.
- Khan, M. A., Agnihotri, M. & Sushil, S. N.** 2005. Taxonomic studies of eulophid parasitoids (Hymenoptera: Chalcidoidea) of India. Pantnagar Journal of Research, 2 (1) (Special Suppl.): 46-48, 141, 144-145, 180, 182-183, 185, 187-188, 193-195, 230.
- Khan, M. Y. & Shafee, S. A.** 1988. Descriptions of eight new species of *Tetrastichus* Haliday (Hymenoptera: Eulophidae) from India. Indian Journal of Systematic Entomology, 5 (2): 46-48.
- Kostjukov, V. V.** 1977. Comparative morphology of chalcids of the subfamily Tetrastichinae and the systematics of the genus *Tetrastichus* Haliday 1844 (Hymenoptera, Eulophidae). Entomologicheskoe Obozrenie, 56 (1): 192.
- Kostjukov, V. V.** 1978. Hymenoptera II. Chalcidoidea 13. Eulophidae (Tetrastichinae). Opred.Nasek Evrop.Chasti SSSR. pp. 450-451.
- Kostjukov, V. V.** 1990. New species of the eulophid genus *Tetrastichus* Haliday (Hymenoptera, Chalcidoidea, Eulophidae) from far eastern Russia. Novosti sistematiki nasekomikh Dalnego Vostoka. pp. 49.
- Linnaeus, C.** 1758. Systema naturae (10th Edition). Stockholm. 1: 567.
- Masi, L.** 1911. Contribuzioni alla conoscenza dei Calcididi Italiani (parte IV). Bollettino del Laboratorio di Zoologia Generale e Agraria della R. Scuola Superiore d'Agricoltura, Portici, 5: 149.
- Masi, L.** 1917. Chalcididae of the Seychelles islands. (With an appendix by J.J.Kieffer.). Novitates Zoologicae, 24: 213-214.

- Masi, L.** 1932. H. Sauters Formosa - Ausbeute Chalcididae (Hym.). II. Teil. (Fortsetzung). Konowia, 11: 236-238.
- Masi, L.** 1940. Descrizioni di Calcididi raccolti in Somalia dal Prof. G. Russo con note sulle species congeneri. Bollettino del R. Laboratorio di Entomologia Agraria di Portici, 3: 316.
- Mayr, G.** 1876. Die europäischen Encyrtiden. Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien, 25: 730.
- Mayr, G.** 1878. Arten der Chalcidier-Gattung *Eurytoma* durch Zucht erhalten. Verhandlungen der Kaiserlich Königlich Zoologisch-Botanischen Gesellschaft in Wien, 28: 300, 304, 309.
- Mayr, G.** 1906. Neue Feigen-Insekten. Wiener Entomologische Zeitung, 25: 166.
- Mercet, R. G.** 1921. Fauna Iberica. Himenopteros Fam. Encirtidos. Museo Nacional de Ciencias Naturales, Madrid. pp. 101, 366, 562.
- Myartseva, S. N.** 1984. Parasitic Hymenoptera of the family Encyrtidae (Hymenoptera, Chalcidoidea) of Turkmenistan and adjacent region of central Asia. Akademiya Nauk Turkmenkoy SSR Institut Zoologii, Ashkhabad. pp. 141-142, 227, 230.
- Myartseva, S. N.** 1987. Paraziticheskiye pereponchatokriliye roda *Metaphycus* Mercet (Hymenoptera, Encyrtidae) srednyey Azii. Entomologicheskoe Obozrenie, 66 (2): 382-386.
- Myartseva, S. N. & Kokanova, E. O.** 1997. Chalcid wasps (Hymenoptera, Chalcidoidea) - parasitoids of moth *Apotomis lutozana* Kenn. in Turkmenistan. Izvestiya Akademii Nauk Turkmenkoy SSR (Seriya Biologicheskikh Nauk), 1996 (3): 49-51.
- Myartseva, S. N., Kokanova, E. O. & Durdeyev, S. K.** 1998. The complex of parasitoids of the *Elaeagnus* tortricid in Turkmenistan. Problems of Desert Development (Problemy Osvoeniya Pustyn'), 2: 54-56.
- Myartseva, S. N., Kokanova, E. O. & Durdeyev, S. K.** 1999. Complex of parasitoids on *Apotomis lutozana* Kenn. in Central Asia. Selevinia, 1996-1997: 19-20.
- Myartseva, S. N., Ruiz-Cancino, R. & Coronado-Blanco, J. M.** 2007. A review of parasitoids (Hymenoptera: Chalcidoidea) of *Trialeurodes floridensis* (Hemiptera: Aleyrodidae) with description of a new species from Mexico. Florida Entomologist, 90 (4): 636-637.
- Myartseva, S. N. & Evans, G. A.** 2008. Genus *Encarsia* Förster of Mexico (Hymenoptera: Chalcidoidea: Aphelinidae). A revision, key and description of new species. Serie avispa parasiticas de plagas y otros insectos, 3: 44, 48, 49, 69-71, 74-76, 200-2002.
- Myartseva, S. N. & González-Hernández, A.** 2008. Description of two new species of *Encarsia* Förster (Hymenoptera: Aphelinidae) and new records of species of this genus from Chiapas and Jalisco, México. Acta Zoologica Mexicana (Nueva Serie), 24 (2): 103-108.
- Narendran, T. C.** 1994. Torymidae and Eurytomidae of Indian subcontinent (Hymenoptera: Chalcidoidea) pp. 210, 217, 225, 245-246.
- Narendran, T. C., Mini, T. V. & Karmaly, K. A.** 2000. A new species of *Parurios* Girault (Hymenoptera: Pteromalidae: Diparinae) from Kerala (India). Bulletin of Pure and Applied Sciences (A), 19 (2): 137-139.
- Narendran, T. C. & Sureshan, P. M.** 2001. Descriptions of three new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from India. Zoos' Print Journal, 16 (4): 452-453.
- Narendran, T. C., Girish Kumar, P., Santhosh, S. & Sinu, P. A.** 2005. A study on the taxonomy of *Diglyphomorphyomyia* Girault (Hymenoptera: Eulophidae) of India. Journal of Advanced Zoology, 26 (1): 29-31.
- Nees ab Esenbeck, C. G.** 1834. Hymenopterorum Ichneumonibus affinium, Monographiae, genera Europaea et species illustrantes. Stuttgart und Tübingen. 2: 98, 99, 118, 171, 174, 422.
- Ogloblin, A. A.** 1946. Descriptions of new genera and species of Mymaridae (Hymenoptera: Chalcidoidea). Iowa State College Journal of Science, 20 (3): 282.

- Ogloblin, A.** 1959. Dos especies nuevas del género *Platypatasson* (Hym. Mymaridae). Revista de la Sociedad Entomológica Argentina, 21: 71.
- Ogloblin, A. A.** 1963. Dos especies nuevas del género *Barypolynema* de la Republica Oriental del Uruguay (Fam. Mymaridae, Hymenoptera). Revista de la Sociedad Uruguaya de Entomología, Montivideo, 5: 8.
- Peck, O.** 1985. The taxonomy of the Nearctic species of *Pediobius* (Hymenoptera: Eulophidae), especially Canadian and Alaskan forms. Canadian Entomologist, 117 (6): 670-671.
- Perkins, R. C. L.** 1910. Fauna Hawaiiensis. Supplement to Hymenoptera. 2 part 6 pp. 634, 666. London.
- Perkins, R. C. L.** 1912. Parasites of insects attacking sugar cane. Bulletin of the Hawaiian Sugar Planters' Association Experiment Station (Entomology Series), 10: 12.
- Ranaweera, D. J. W.** 1950. Three new species of *Tetrastichus*. Indian Journal of Entomology, 9: 12.
- Ratzeburg, J. T. C.** 1848. Die Ichneumoniden der Forstinsekten in entomologischer und forstlicher Beziehung. Berlin. 2: 197.
- Riley, C. V., Ashmead, W. H. & Howard, L. O.** 1894. Report upon the parasitic Hymenoptera of the island of St. Vincent. Journal of the Linnean Society (Zoology), 25: 159.
- Risbec, J.** 1951. 1. Les Chalcidoïdes de l'Afrique occidentale française. Mémoires de l'Institut Français d'Afrique Noire, Ifan-Dakar, 13: 82, 89, 96, 338.
- Risbec, J.** 1952. Contribution à l'étude des chalcidoïdes de Madagascar. Mémoires de l'Institut Scientifique de Madagascar (E), 2: 75, 127, 143, 146-147.
- Risbec, J.** 1956. Hyménoptères parasites du Cameroun. (2e Contribution) Bulletin de l'Institut Français d'Afrique Noire (A), 18: 153.
- Risbec, J.** 1958. Contributions à la connaissance des hyménoptères chalcidoïdes et proctotrupoïdes de l'Afrique noire. Annales du Musée Royal Congo Belge Tervuren (Zoologie), 64: 58.
- Ruschka, F.** 1922. Chalcididenstudien. III. Die europäischen Arten der Gattung *Chalcis* Fabr. Konowia, 1: 227.
- Say, T.** 1829. Descriptions of a new species of Hymenoptera of the United States. Contributions of the Maclurian Lyceum to the Arts and Sciences, Philadelphia, 1 (3): 80.
- Sharkov, A. V.** 1988. New species of encyrtids (Hymenoptera, Encyrtidae) from southern far east of the USSR and Japan. Entomologicheskoe Obozrenie, 67 (4): 833.
- Sheng, J. K. & Zhan, G. X.** 2000. A new species of *Chrysonotomyia* Ashmead (Hymenoptera: Eulophidae) from China. Systematic and faunistic research on Chinese insects. Proceedings of the 5th National Congress on Insect Taxonomy.. (Ed: Zhang, Y.L.) China Agriculture Press. pp. 258-259.
- Shi, Z. Y., Si, S. G. & Wang, H. Z.** 1994. Two new species of the genus *Anagyrus* Howard, 1896 (Hymenoptera: Encyrtidae) from China. The Fauna and Taxonomy of Insects in Henan, 1: 158-150, 165.
- Shi, Z. Y., Wang, H. Z., Si, S. G. & Wang, G. P.** 1994. Two new species of the genus *Cheiloneurus* from China (Hymenoptera: Encyrtidae). Acta Agriculturae Universitatis Henanensis, 28 (1): 25-28.
- Soyka, W.** 1940. Neue Arten der Gattung *Novickiella* Soyka. Entomologisches Nachrichtenblatt, Burgdorf, 4 (3): 24-25.
- Soyka, W.** 1949. Die systematische Stellung der Familie der "Mymaridae" und deren Aufteilung (Chalcidoidea, Hymenoptera). Entomologisches Nachrichtenblatt, Burgdorf, 3 (1): 12-15.
- Soyka, W.** 1950. New and little known alaptids and mymarids from Egypt. Bulletin de la Société Fouad Ier d'Entomologie, Le Caire, 34: 126.
- Soyka, W.** 1956. Momographie der Polynemagruppe. Abhandlungen der Zoologisch-Botanischen Gesellschaft in Wien, 19: 27-28, 33, 80, 89.

- Statz, G.** 1938. Neue Funde parasitischer Hymenopteren aus dem Tertiär von Rott am Siebengebirge. *Decheniana* (A), 98 (1): 94-95, 98-99.
- Steffan, J. R.** 1958. Brachymeria (Hym. Chalcididae) parasite de *Anomis flava* F. à Madagascar. *Entomophaga*, 3 (3): 278.
- Storozheva, N. A., Kostjukov, V. V. & Efremova, Z. A.** 1995. 46. Family Eulophidae. Keys to Insects of the Russian Far East, IV (2): 394, 453-454, 456-457, 459, 462-463, 465, 475, 482, 484-485, 487-488 (Ed: Lera, P.A.) Dal'nauka, Vladivostok.
- Sureshan, P. M. & Narendran, T. C.** 2002. Three new species of *Mesopolobus* Westwood (Hymenoptera: Chalcidoidea: Pteromalidae) from India. *Entomon*, 27 (1): 81, 83.
- Swederus, N. S.** 1795. Beskrifning på et nytt genus *Pteromalus* ibland Insecterna; (Forts.*). Kungliga Svenska Vetenskapsakademiens Handlingar, 16 (4): 218.
- Szelényi, G.** 1971. Notes on eurytomid genera, with descriptions of new species (Hym., Chalcidoidea). Results of the zoological researches of Dr. K. Kaszab in Mongolia. *Acta Zoologica Academiae Scientiarum Hungaricae*, 17: 126-128, 135-137.
- Szelényi, G.** 1974. Mongolian eurytomids (Hymenoptera: Chalcidoidea). *Acta Zoologica Academiae Scientiarum Hungaricae*, 20 (3/4): 433-434.
- Szelényi, G.** 1976. New chalcid flies from Hungary (Hymenoptera, Eulophidae). *Annales Historico-Naturales Musei Nationalis Hungarici*, 68: 277.
- Szelényi, G.** 1978. Four new eulophid wasps from Hungary (Hymenoptera: Chalcidoidea). *Acta Zoologica Academiae Scientiarum Hungaricae*, 24 (1/2): 222.
- Thomson, C. G.** 1876. Hymenopteren Scandinaviae. Tom. IV. *Pteromalus* (Svederus). Lund. 4: 197.
- Thomson, C. G.** 1878. Hymenoptera Scandinaviae 5. *Pteromalus* (Svederus) continuation. Lund. pp. 113.
- Timberlake, P. H.** 1922. Descriptions of new genera and species of Hawaiian Encyrtidae (Hymenoptera), III. Proceedings of the Hawaiian Entomological Society, 5 (1): 157, 159.
- Trjapitzin, V. A.** 1962. Encyrtidae (Hymenoptera) - parasites of *Nipponaclerda turanica* (Arch.) (Homoptera, Acleridae) in Nogai steppe. *Zoologicheskij Zhurnal*, 41 (4): 568.
- Trjapitzin, V. A.** 1964. New encyrtids (Hymenoptera, Encyrtidae) which are parasites of scale insects in the Maritime Territory. *Zoologicheskij Zhurnal*, 43 (10): 1463.
- Trjapitzin, V. A.** 1967. Encyrtids (Hymenoptera, Encyrtidae) of the Maritime Territory. *Trudy Zoologicheskogo Instituta. Akademiya Nauk SSSR. Leningrad*. 41: 185.
- Xu, Z. H. & He, J. H.** 2003. Eurytomidae. Fauna of Insects of Fujian Province of China, 7: 483-484, 485-486.
- Xu, Z. H. & Jiang, D.** 1991. Description of a new species *Metaphycus ericeri* (Hymenoptera: Encyrtidae) from China. *Acta Agriculturae Universitatis Zhejiangensis*, 17 (2): 203-204.
- Xu, Z. H. & Lou, J. X.** 2004. Three new record genera of Tetracneminae (Hymenoptera: Encyrtidae) from China with descriptions on three new species. *Entomotaxonomia*, 26 (2): 139-140, 142.
- Viggiani, G.** 1970. Description of the male of *Eustochus atripennis* Hal. 1833 and of new terricolous species *Cleruchus Enoch*, with remarks on *Anagrella* Bkdf. (Hym., Mymaridae). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 43: 139.
- Walker, F.** 1833. Monographia Chalciditum. (Continued.) *Entomological Magazine*, 1 (2): 125.
- Walker, F.** 1834. Monographia Chalciditum. (Continued.) *Entomological Magazine*, 2 (1): 30.
- Walker, F.** 1834. Monographia Chalciditum. (Continued.) *Entomological Magazine*, 2 (4): 344.
- Walker, F.** 1846. Descriptions of the Mymaridae. (And Errata and Addenda: viii.). *Annals and Magazine of Natural History*, 18: 49-54.

- Walker, F.** 1871. Part III. - Torymidae and Chalcididae. Notes on Chalcididae. E.W. Janson, London. pp. 42.
- Walker, F.** 1873. Economy of Chalcididae (continued). Entomologist, 6: 398.
- Walker, F.** 1874. Descriptions of Amurland Chalcididae. Cistula Entomologica, 1 (9): 311, 313.
- Westwood, J. O.** 1833. Further notices of the British parasitic hymenopterous insects; together with the 'Transactions of a fly with a long tail', observed by Mr. E.W. Lewis; and additional observations. Magazine of Natural History, 6: 420.
- Wiebes, J. T.** 1981. The fig insects of La Réunion (Hymenoptera, Chalcidoidea). Annales de la Société Entomologique de France, 17 (4): 563-564.
- Yang, Z. Q.** 1996. Parasitic wasps on bark beetles in China (Hymenoptera), Science Press, Beijing. pp. 39, 56-57, 274-275, 279, 302, 304-305, 333-334.
- Yoshimoto, C. M.** 1976. Revision of the genus *Di cladocerus* (Eulophidae: Chalcidoidea) of America north of Mexico, with particular reference to species attacking larch casebearer (Lepidoptera: Coleophoridae). Canadian Entomologist, 108 (11): 1187-1188.
- Zerova, M. D.** 1968. New species of *Systole* Walk. (Hymenoptera Eurytomidae). Vestnik Zoologii, Kiev, 1968 (4): 22-24.
- Zerova, M. D.** 1971. New species of chalcids of the genus *Nikanoria* Nik (Hymenoptera, Eurytomidae) from central Asia and Mongolia. Entomologicheskoe Obozrenie, 50 (1): 147-148, 154.
- Zerova, M. D.** 1978. Review of chalcids of the genus *Nikanoria* Nik. (Hymenoptera, Chalcidoidea, Eurytomidae) with description of some new species. Entomologicheskoe Obozrenie, 57 (2): 393.
- Zerova, M. D.** 1978. Hymenoptera Parasitica. Chalcidoidea - Eurytomidae. Fauna Ukraini, 11 (9): 239-241.
- Zerova, M. D., Seryogina, L. Y. & Karimpour, Y.** 2008. New species of the chalcidoid wasps of the families Eurytomidae and Torymidae (Hymenoptera, Chalcidoidea) from Iran. Vestnik Zoologii, Kiev, 42 (6): 489-492.
- Zeya, S. B. & Hayat, M.** 1995. A revision of the Indian species of *Gonatocerus* Nees (Hymenoptera: Mymaridae). Oriental Insects, 29: 76, 89-91.
- Zhu, C. D. & Huang, D. W.** 2003. Chinese species of *Diglyphomorphomyia* Girault (Hymenoptera: Eulophidae). Zoological Studies, 42 (3): 445, 447-448.

**PRESENT STATUS OF UZI FLY, *EXORISTA BOMBYCIS*
(LOUIS) (DIPTERA: TACHINIDAE) INCIDENCE ON MUGA
SILKWORM, *ANTHRAEA ASSAMENSIS* HELFER
(LEPIDOPTERA: SATURNIIDAE) IN UPPER ASSAM**

S. G. Eswara Reddy* and R. K. Rajan

* Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles, Govt. of India, Lahdoigarh, Jorhat -785 700 Assam, INDIA. E-mail: ereddy2001@yahoo.com

[Eswara Reddy, S. G. & Rajan, R. K. 2011. Present status of uzi fly, *Exorista bombycis* (Louis) (Diptera: Tachinidae) incidence on muga silkworm, *Antheraea Assamensis* Helfer (Lepidoptera: Saturniidae) in Upper Assam. Munis Entomology & Zoology, 6 (2): 856-858]

ABSTRACT: Field survey was conducted in muga culture (rearings) from different locations of Upper Assam during peak period of infestation i.e. *Jarua* (Dec.09-Jan.2010) and *Chotua* (Feb.-Mar. 2010) to record the present status of uzi fly incidence in muga culture during fifth instar larval stage and at harvesting of cocoons. The results show that, maximum incidence of uzi fly on 5th instar larvae was more during *Chotua* crop (43.0%) followed by *Jarua* crop (19.0%). Similarly, the uzi fly incidence at harvesting (cocoon stage) was more during *Chotua* crop (35.0%) followed by *Jarua* (27.50%).

KEY WORDS: *Antheraea assamensis*, *Exorista bombycis*, seasonal incidence, Assam.

Muga silkworm, *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae), yields golden yellow silk, is unique to Brahmaputra river valley of Assam. It is polyphagous, multivoltine, producing 117 million tonnes of raw silk, accounting to 0.65% of raw silk produced in the country, while rest of the production contributed by other North-Eastern states (Anon, 2009). The silkworm has 5-6 generations in a year viz., *Jethua* (spring: April-May), *Aherua* (summer: June-July), *Bhodra* (late summer: Aug-Sept.), *Kotia* (autumn: Oct.-Nov.), *Jarua* (winter: Dec.-Jan.) and *Chatua* (early spring: Feb-March). The *Jethua* and *Kotia* rearings are considered as commercial crops, *Chotua* and *Bhodra* as seed and *Jarua* and *Aherua* are pre-seed crops. Over years, importance is being given to increase the muga silk production by adopting new technologies (Chakravorty, 2004).

Among different pests reported on muga silkworm, silkworm uzi fly, *Exorista bombycis* is one of the serious endo-parasitoid particularly during Nov.-April causing 20-90% loss in seed growing areas during winter and post winter (Dec.-Mar.) seasons (Anon, 2007). Nearly 50-70% cocoon rejection has been reported in spite of good harvest during winter (Feb.-Mar.) crop (Anon, 1996). To know the present status of uzi fly in muga silkworm, the field survey was conducted during peak season (Dec-Mar.2010). This bench mark information on uzi fly incidence will be more useful to take up management practices for next seasons.

MATERIAL AND METHODS

Field survey was conducted in muga culture (rearings) from 32 farmers in different locations of Upper Assam during peak period of infestation i.e. *Jarua* (Dec.09-Jan.2010) and *Chotua* (Feb.-Mar.2010) to record the incidence of uzi fly during fifth instar larval stage and at harvesting of cocoons. To record the observations at larval stage, 200 larvae was randomly selected in the farmers' field and observed the number of larvae infected with uzi fly then per cent

incidence was calculated. Similarly, during harvesting stage, the number of healthy and uzi pierced cocoons were counted on 100 randomly selected cocoons then per cent incidence was calculated.

RESULTS

Based the survey results during *Jarua* (Dec.2009-Jan.2010) and *Chotua* (Feb.-Mar. 2010) crop seasons in Upper Assam, the uzi fly incidence at 5th instar larvae of muga silkworm was found between 1.80 to 19.0% (average 5.46%) and 6.50 to 43.0% (average 23.16%) during *Jarua* and *Chotua* crop seasons, respectively. Similarly, the uzi fly incidence at harvesting stage was found between 2.50 to 27.50% (average 10.04%) and 12.14 to 35.0% (average 25.59%) during *Jarua* and *Chotua* crop seasons, respectively (Table 1).

DISCUSSION

In the present study, the uzi fly incidence in 5th instar larvae of muga silkworm was more during *Chotua* crop (43.0%) followed by *Jarua* crop (19.0%) in Upper Assam. Present results are supported by the findings of Das *et al.*, (2009) who reported peak incidence of uzi fly on 5th instar larvae was more during *Chotua* crop (39.0%) followed by *Jarua* crop (31.3%). Other workers also reported the uzi fly incidence in upper Assam (2.28-17.20%) and lower Assam (1.0 to 26.0%) during Dec.-Feb. (Anon, 2003). Similarly, the uzi fly incidence at harvesting (cocoon stage) in the present study was more during *Chotua* crop (35.0%) followed by *Jarua* (27.50%). The present results are agreement with earlier workers (Anon, 2006) those who reported 50-70% cocoons are infested with uzi fly in East Garo Hills, West Khasi Hills of Meghalaya and parts of lower Assam during late *Jarua* crop (Table 1).

ACKNOWLEDGEMENTS

Authors thankful to the Director, Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles: Govt. of India, Lahdoigarh, Jorhat, Assam (India).

LITERATURE CITED

- Anonymous.** 1996. Annual report, Regional Muga Research Station, Boko, Assam (India). pp. 17.
- Anonymous.** 2003. Annual report, Central Muga Eri Research & Training Institute, Central Silk Board, Lahdoigarh, Jorhat, Assam (India). pp 12.
- Anonymous.** 2006. Annual report, Central Muga Eri Research & Training Institute, Central Silk Board, Lahdoigarh, Jorhat, Assam (India).
- Anonymous.** 2007. A diagnostic manual for disease and pests of muga silk worm and their host plants. Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles: Govt. of India, Lahdoigarh, Jorhat, Assam (India). p. 1-47.
- Anonymous.** 2009. Annual report, Central Silk Board, Bangalore, Karnataka (India). pp. 113.
- Chakravorty, R.** 2004. Diversity of muga and eri sericulture and its prospects in Himalayan states. Proceedings of the National workshop on potential and strategies for sustainable development of Vanya silks in the Himalayan states. Nov. 8-9, 2004. p. 9-16.

Das, K., Gogoi, S. N., Das, R. & Chakravorty, R. 2009. Effect of abiotic factors on uzi fly, *Exorista sorbillans* Wiedemann infestation in *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae). Bulletin of Life Sciences, 15 (3): 50-55.

Table 1: Incidence of uzi fly, *Exorista bombycis* (Louis) on muga culture in Upper Assam (India).

Crop/Season	Percent incidence at 5 th instar larvae			
	Min	Max	Average	Range
<i>Jarua</i> (Dec. 2009-Jan 2010)	1.80	19.0	5.46	1.80-19.0
<i>Chotua</i> (Feb.2010-Mar. 2010)	6.50	43.0	23.16	6.50-43.0
Crop/Season	Percent incidence at harvesting of cocoons			
	Min	Max	Average	Range
<i>Jarua</i> (Dec. 2009-Jan. 2010)	2.50	27.50	10.04	2.5-27.50
<i>Chotua</i> (Feb.2010-Mar. 2010)	12.14	35.00	25.59	12.14-35.0

**NEW SUBSPECIES OF *BRACHYTA INTERROGATIONIS*
(LINNAEUS, 1758) FROM CAUCASUS
(COLEOPTERA: CERAMBYCIDAE)**

Maxim A. Lazarev*

* Bolshaia Serpuhovskaia str. 34, building 4, apartment 79, Moscow 115093 RUSSIA. E-mail: cerambycidae@fromru.com

[Lazarev, M. A. 2011. New subspecies of *Brachyta interrogationis* (Linnaeus, 1758) from Caucasus (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 6 (2): 859-865]

ABSTRACT: Three new subspecies are described: *Brachyta interrogationis shapsugorum* ssp. n. from the environs of Podkhrebtovoe of Krasnodar Region; *B. interrogationis miroshnikovi* ssp. n. from Lagonaki Plateau in Adygeya Republic, Karachaevo-Cherkessiya and Georgia; *B. interrogationis lederi* ssp. n. from Dagestan. Each subspecies is characterized by pronotal sculpture and character of elytral design.

KEY WORDS: Coleoptera, Cerambycidae, *Brachyta*, new subspecies, Russia, Georgia.

Cerambycidae fauna of Caucasus with Transcaucasia is still very poorly investigated. The current publication continues my regular study of Caucasian Cerambycidae species by species (Lazarev, 2009a, 2009b, 2010a, 2010b, 2010c).

Up to now the taxonomy of many big groups rest uncertain. Very doubtful is the genera structure in the tribe Phytoeciini Mulsant, 1839, number of subgenera in *Xylotrechus* Chevrolat, 1860 and *Stictoleptura* Casey, 1924, the species or subspecies relations in genus *Agapanthia* Audinet-Serville, 1835 inside several groups of species: “dahli-group”, “subchalybaea-group”, “violacea-group”, “cardui-group”, as well as subspecies composition in *Brachyta caucasica* Rost, 1892, *Cortodera alpina* (Ménétriés, 1832), *C. colchica* Reitter, 1890, *Stictoleptura tonsa* (K. Daniel & J. Daniel, 1891), *Clytus arietis* (Linnaeus, 1758), *Dorcadion sulcipenne* Küster, 1847 and *D. cinerarium* Fabricius, 1787.

Caucasian populations of *Brachyta interrogationis* (Linnaeus, 1758) are strongly distant and totally isolated from the main area of the species. *B. interrogationis* does not have continuous area in Caucasus, but represented by three isolated populations and each more or less peculiar morphologically. The species is very rare in Caucasus and represented in collections by very few number of specimens, but available materials are enough to accept each known population as a distinct subspecies on the base of elytral design and pronotal sculpture.

B. interrogationis (distributed all along Eurasia from the Atlantic to the Pacific), is characterized by great number of individual variability inside each population. All Caucasian populations seem to be (as far as it is known) are contrary rather stable, each with special configuration of elytral spots, besides all Caucasian specimens have elongated prothorax, relatively longer than in European populations.

Only populations from European Russia (from Polar area to Rostov Region) are used here for representation of the nominative subspecies, as the more close geographically for Caucasian taxa. The subspecies structure of Siberian and Kazakhstan populations is very complicated and needs special study.

Several abbreviations are used in the text:

ZMM – Zoological Museum of Moscow University

MA – collection of A. I. Miroshnikov (Krasnodar)

ML – collection of M. A. Lazarev (Moscow)

***Brachyta interrogationis shapsugorum* ssp. n.**

(Fig. 1)

Type locality. Glades above the forest areas near Podkhrebtovoe (about 44°23'N, 38°59'E) in Krasnodar Region – according to the label of the holotype.

Description. Only one male known. Antennae black with a little lightened bases of 3-5th joints. Prothorax with deep anterior and posterior constrictions covered by yellowish pubescence. Pronotum convex, with dense punctation; the distance between dots always less than diameter of each. Dense long dorsal pubescence consists mostly of recumbent setae. Short and narrow glabrous line without punctation. Scutellum triangular, a little transverse, with indistinct grayish pubescence. Elytra yellow with black spots, just a little tapering posteriorly. Elytral suture and epipleurae totally yellow. Each elytron with 6 black spots: two big discal spots, scutellar spot, small humeral, lateral and apical spots. A pair of scutellar spots form with a black scutellum a narrow transverse stripe at elytral base. A narrow yellow line is hardly visible along scutellum borders. Anterior big discal spots with sharpened apices obliquely attenuated. Posterior big discal subround spots reaching epipleurae. Small humeral spots elongated. Small lateral spots triangular not reaching epipleurae. Apical spots rounded, joined with big posterior discal spot by narrow lateral line above epipleurae. Legs black with yellowish bases of all tibiae. Pygidium and postpygidium with small emarginations.

Body length 14.0 mm; width 4.7 mm.

Distribution. Only one locality known - glade above the forest areas near Podkhrebtovoe (about 44°23'N, 38°59'E) in Krasnodar Region.

Differential diagnosis. New subspecies differs from *B. i. miroshnikovi* ssp. n. and *B. i. lederi* ssp. n. by slightly lightened bases of 3rd-5th antennal joints and lightened tibiae, small and conjugated pronotal punctation, smooth pronotal line, totally yellow epipleurae and elytral suture, elytral design.

Material. Holotype: male, "Krasnodar Region, Tuapse District, NNE Podkhrebtovoe env., 44°23'47.40"N, 38°59'19.57" E, 19-27.VI.2006 leg. I.Melnik" – ML.

Etymology. Shapsugs are a self-designation of people/tribe of the Adyghe branch, who are currently living in Tuapse and Sochi districts of Krasnodar Region and in the Republic of Adygea in Russia.

***Brachyta interrogationis miroshnikovi* ssp. n.**

(Figs. 2-6)

Evodinus (s.str.) *interrogationis*, Plavilstshikov, 1936: 198 (Caucasus, Elbrus env., Teberda), part.

Brachyta interrogationis, Miroshnikov, 1990: 27 (Elbrus, Teberda, Arkhyz env., Georgia: Omalo), part.

Type locality. Abadzekh Mt. (2000-2100 m above the level of the sea) at Lagonaki Plateau in Adygeya.

Description. Antennae totally black. Anterior and posterior prothoracic constrictions relatively shallow, without dense setae stripes. Pronotum convex, with dense punctation; the distance between central dots often longer than

diameter of each. Long dorsal pubescence consists of dense recumbent setae and numerous erect setae. Glabrous area in the middle of pronotum relatively wide, partly punctated. Scutellum elongated, rounded apically with dense pubescence. Elytra yellow with black spots, strongly tapering posteriorly in males and hardly tapering in females. Elytral suture with narrow black line. Epipleurae always yellow anteriorly and black apically. In specimens from Teberda epipleurae black only near apices. In specimens from Georgia and Adygeya epipleurae can be black to about humeri. Each elytron with a big black "C"-shaped spot, typical for the species, and with 4 small spots: scutellar, humeral, lateral and apical. A pair of scutellar spots form with a black scutellum a transverse stripe of different width with irregular posterior margin, which is often much wider than scutellum. A narrow yellow line along scutellum borders never visible. "C"-shaped spot can be fused with scutellar spots in Teberda specimens and always reaching epipleurae posteriorly. Humeral spots strongly elongated and fused with black epipleurae if epipleurae are black anteriorly. Lateral spots usually not touching epipleurae also if they are black, but sometimes fused with epipleural line. Apical spots always joined with "C"-shaped spot, sometimes rather wide including black epipleurae. Legs totally black. Pygidium and postpygidium with small emarginations.

Body length in males: 11.5-13.2 mm, in females: 13.0-14.8 mm; body width in males: 4.0-4.7 mm, in females: 4.8-5.2 mm.

Distribution. The subspecies is represented by at least 5 strongly distant populations. The type population is registered on Abadzesh Mt. (2000-2100 m) at Lagonaki Plateau in Adygeya. A population from Teberda was already known to Plavilstshikov (1936). Another population was discovered by V. Dolin in Georgia (Miroshnikov, 1990) – Omalo environs (1800m). Besides the taxon was recorded from Elbrus (Plavilstshikov, 1936) and Arkhyz (Miroshnikov, 1990).

Differential diagnosis. New subspecies differs from *B. i. shapsugorum* ssp. n. by totally black antennae and tibiae, big pronotal punctuation, smooth pronotal line partly punctated laterally, black elytral suture, partly black epipleurae and elytral design. It differs from *B. i. lederi* ssp. n. by elytral design and convex pronotum.

Material. Holotype: male, "Adygeya, Lagonaki Plateau, Abadzesh Mountain, 2000-2100 m, 13.07.2004, A.Miroshnikov" – AM; 10 Paratypes: 1 female with same label – AM; 3 males, 3 females, Georgia, Omalo, 1800 m., 25.06.1988, V.Dolin – AM; 1 male, 1 female, Teberda, P.Elagin – ZMM; 1 female, Teberda, Erkhi canyon, 21.VI., A.Zolotarev – ZMM.

Etymology. The new subspecies is dedicated to a well known specialist on fauna, taxonomy and biology of Palaearctic Cerambycidae - Alexandr Ivanovitch Miroshnikov.

Brachyta interrogationis lederi ssp. n.

(Fig. 7)

Evodinus interrogationis, König, 1899: 394 (Dagt.), part.

Evodinus (s.str.) *interrogationis*, Plavilstshikov, 1915: 370 (Dagestan), part.

Brachyta interrogationis, Miroshnikov, 1990: 27 (Dagestan), part; 2004: 134 (Dagestan), part.

Type locality. Dagestan – according to the label of the holotype.

Description. Only one female known. Antennae totally black. Anterior and posterior prothoracic constrictions shallow without dense hair stripes. Pronotum moderately flat, with dense punctation. Dense dorsal erect pubescence relatively short. Glabrous pronotal line short and narrow, but laterally punctated. Scutellum elongated, rounded apically with dense grayish pubescence. Elytra yellow with black spots, just a little tapering posteriorly. Elytral suture with very narrow black line. Epipleurae yellow anteriorly and black posteriorly. Each elytron with 6 black spots: two big discal spots, scutellar spot, small humeral, lateral and apical spots. A pair of scutellar spots form with a black scutellum a very narrow transverse stripe at elytral base, which is about two times shorter than scutellum. A narrow yellow line between scutellum and scutellar black spots not visible. Anterior discal spots narrow elongated sharpened anteriorly and posteriorly. Posterior discal spots obliquely-transvers, reaching epipleurae. Humeral spots elongated. Small lateral spots oval not reaching epipleurae. Apical spots rounded, joined with big posterior discal spot by narrow lateral line above epipleurae. Legs black with hardly yellowish bases of all tibiae. Pygidium and postpygidium with small emarginations.

Body length 12.4 mm; width - 4.0 mm.

Distribution. Known from Dagestan mountain area.

Differential diagnosis. New subspecies differs from *B. i. shapsugorum* ssp. n. by totally black antennae and tibiae, black elytral suture, smooth pronotal line partly punctated laterally, partly black epipleurae. It differs from *B. i. shapsugorum* ssp. n. and *B. i. miroshnikovi* ssp. n. by the character of pronotal punctation and elytral design.

Material. Holotype: female, "Daghestan Leder. Reitter." – ZMM.

Etymology. The new taxon is dedicated to a great European insect collector Hans Leder, who collected holotype.

ACKNOWLEDGEMENTS

The author is very grateful to A. A. Gusakov and A. L. Ozerov (Zoological Museum of Moscow University), A. I. Miroshnikov (Krasnodar) for providing with the materials for study.

LITERATURE CITED

- Audinet-Serville, J. G. A.** 1835. Nouvelle classification de la famille des longicornes (suite). Annales de la Société Entomologique de France, 4: 5-100, pl. 3.
- Casey, T. L.** 1924. Additions to the known Coleoptera of North America. Memoirs on the Coleoptera 11. Lancaster: Lancaster Press. 347 pp.
- Chevrolat, L. A. A.** 1860. Description d'espèces de *Clytus* propres au Mexique. Annales de la Société Entomologique de France, 8 (3): 451-504.
- Daniel, K. & Daniel, J.** 1891. Revision der mit *Leptura unipunctata* F. und *fulva* Deg. verwandten Arten. Pp. 1-40. In: Coleopteren-Studien I. München: Kgl. Hof-und Universitäts-Buchdruckerei von Dr. C. Wolf & Sohn, [3] + 64 pp.
- Fabricius, J. C.** 1787. Mantissa insectorum, sistens eorum species nuper detectas adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus. Tomus I. Hafniae: C. G. Proft, xx + 348 pp.

- König, E.** 1899. Coleoptera Caucasica. In: Radde G. Die Sammlungen des Kaukasischen Museums. 1. Tiflis. pp. 339-403. [Cerambycidae: pp. 393-397].
- Küster, H. C.** 1847. Die Käfer Europa's. Nach der Natur beschrieben. Mit Beiträgen mehrerer Entomologen. 8. Heft. Nürnberg: Bauer & Raspe, [4] + 100 sheets, 2 pls.
- Lazarev, M. A.** 2009a. Armenian *Dorcadion* (Coleoptera: Cerambycidae) of "cinerarium-group". Studies and reports of District Museum Prague-East. Taxonomical Series, 5 (1-2): 197-220.
- Lazarev, M. A.** 2009b. Taxonomical structure of *Dorcadion* (*Cribridorcadion*) *ciscaucasicum* Jakovlev, 1900 (Coleoptera: Cerambycidae) with the description of a new subspecies from Taman. Eversmannia, Entomological research in the Russia and adjacent regions, 19-20: 10-15, 1 pl.
- Lazarev, M. A.** 2010a. New subspecies of *Plagionotus arcuatus* (Linnaeus, 1758) from Transcaucasia and Kyrgyzstan (Coleoptera: Cerambycidae). Studies and reports of District Museum Prague-East. Taxonomical Series, 6 (1-2): 149-164.
- Lazarev, M. A.** 2010b. New subspecies of *Brachyta rosti* Pic, 1900 from North Caucasus (Coleoptera, Cerambycidae). Lambillionea, 110 (2): 191-196.
- Lazarev, M. A.** 2010c. New species of genus *Dorcadion* (Coleoptera: Cerambycidae) from Transcaucasia. Eversmannia, Entomological research in the Russia and adjacent regions, 21-22: 3-5, 1 pl.
- Ménétriés, E.** 1832. Catalogue raisonné des objets de zoologie recueillis dans un voyage au Caucase et jusqu'aux frontières actuelles de la Perse entrepris par l'ordre de S. M. l'Empereur. St.-Petersbourg: Académie Impériale des Sciences, xxxiii + 272 + iv + [1] pp., 5 pls.
- Miroshnikov, A. I.** 1990. Longicorn beetles of the genus *Brachyta* (Coleoptera, Cerambycidae) from the Caucasus. Vestnik Zoologii, 3: 23-28.
- Miroshnikov, A. I.** 2004. To the knowledge of timber-beetles (Coleoptera, Cerambycidae) of Caucasus. 4. Actual questions of plant protection, agrochemistry, agrosilstudy and insect fauna in Krasnodar Region. Transactions of Kuban State Agricultural University, 409 (437): 133-138.
- Mulsant, E.** 1839. Histoire naturelle des coléoptères de France. Longicornes. Paris: Maison Libraire, Lyon: Imprimerie de Dumoulin, Ronet et Sibuet. 304 pp., 3 pls.
- Plavilstshikov, N. N.** 1915. Espèces eurasiennes du genre *Evodinus* J. Lec. (Coleoptera, Cerambycidae). Revue Russe d'Entomologie, 15 (3): 354-382.
- Plavilstshikov, N. N.** 1936. Cerambycidae (P.1). In: Faune de l'URSS. Insectes Coléoptères. V.21. Moscou, Leningrad: 612 pp.
- Reitter, E.** 1890. Uebersicht der mir bekannten *Cortodera*-Arten aus Europa und den angrenzenden Ländern. Wiener Entomologische Zeitung, 9: 243-246.
- Rost, C.** 1892. *Brachyta bifasciata* Ol. var. *caucasica* Rost. Deutsche Entomologische Zeitschrift, 1891 [1891-1892]: 309.
- Roubal, J.** 1932. *Clytus oblitus* n. sp.. Entomologisches Nachrichtenblatt, 6: 17-18.



Figure 1. *Brachyta interrogationis shapsugorum* **ssp. n.**: Holotype, male, Krasnodar Region, Tuapse District, NNE Podkhrebtovoe env., 44°23'47.40"N, 38°59'19.57"E.

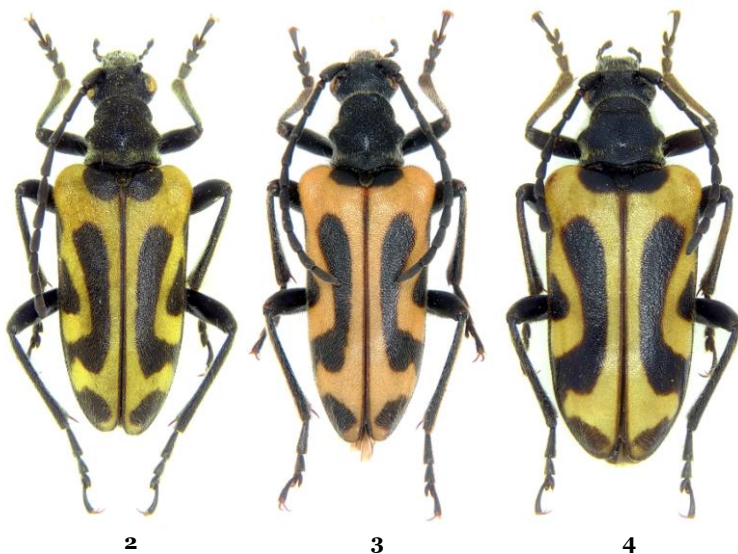


Figure 2-4. *Brachyta interrogationis miroshnikovi* **ssp. n.**: 2. Holotype, male, Adygeya, Lagonaki Plateau, Abadzesh Mountain, 2000-2100 m; 3-4. Paratypus, male, female, Georgia, Omalo, 1800 m.

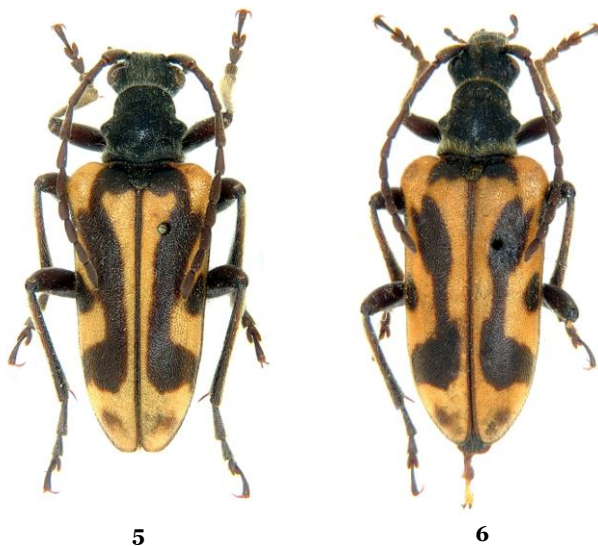


Figure 5-6. *Brachyta interrogationis miroshnikovi* **ssp. n.**: Paratypus, male, female, Teberda.



Figure 7. *Brachyta interrogationis lederi* **ssp. n.**: Holotype, female, Dagestan.

**SOME CYTOGENETIC OBSERVATIONS
OF TWO *DORCADION* DALMAN, 1817 SPECIES
(COLEOPTERA: CERAMBYCIDAE: LAMIINAE: DORCADIINI)**

Atılay Yağmur Okutaner*, Hüseyin Özdikmen,
Eşref Yüksel** and Yavuz Koçak*****

* Giresun University, Sebinkarahisar M.Y.O, Giresun / TURKEY. E-mail: atilayyagmur@gmail.com

** Gazi University, Faculty of Science, Department of Biology, 06500 Ankara / TURKEY. E-mails: (Özdikmen) ozdikmen@gazi.edu.tr; (Yüksel) eyuksel@gazi.edu.tr

*** Ahi Evran University, Faculty of Science & Arts, Department of Biology, Kırşehir, TURKEY. E-mail: ykocak@gmail.com

[Okutaner, A. Y., Özdikmen, H., Yüksel, E. & Koçak, Y. 2011. Some cytogenetic observations of two *Dorcadion* Dalman, 1817 species (Coleoptera: Cerambycidae: Lamiinae: Dorcadiini). Munis Entomology & Zoology, 6 (2): 866-876]

ABSTRACT: The paper gives some cytogenetic observations of *Dorcadion* (*Cribridorcadion*) *anatolicum* Pic, 1900 and *Dorcadion* (*Cribridorcadion*) *scabricolle* (Dlman, 1817) as the first time. Distribution in Turkey with a map and World, chorotype classification of the species, mitotic and meiotic metaphase plaques and karyogram are also given in the text.

KEY WORDS: Cytogenetic, meiotic metaphase, mitotic metaphase, karyogram, *Dorcadion anatolicum*, *Dorcadion scabricolle*, Lamiinae, Cerambycidae.

As known, approximately 1.500.000 species of animals have been described worldwide up to now. 80 % of them consist of insects. At the first views, carried out cytogenetic works have a minor number which is covered only about 1 % of all species. Thus, this considered to be too small.

Cytogenetic works had started in the XIXth century. The number of chromosomes at most of the insects is changed between $n = 4$ and $n = 20$ [extremely $n = 1$ (*Myrmecia croslandi* Taylor, 1991: Formicidae: Hymenoptera) and $n = 217-223$ (*Polyommatus atlantica* (Elwes, 1905))] (de Lesse, 1970; Crosland & Crozier, 1986; Gokhman & Kuznetsova, 2006).

At the present, unaccompanied external morphological taxonomy is not enough for an indisputable classification of some taxa. The remarks on the base of only external morphology are caused discussions and even mistakes on the systematic ranks for many taxa. For example, the status of Vesperidae. Svacha et al. (1997) that included larval morphologies and biologies of a few species, regarded the taxon as a subfamily of Cerambycidae. According to Brustel et al. (2002), Vesperidae is a separate family. Dutrillaux et al. (2007) that included caryotype definition of *Vesperus xatarti*, regarded the taxon as a subfamily of Cerambycidae too. Recently Löbl & Smetana (2010) gave the taxon as a subfamily of Cerambycidae in their catalog. The known differentiations of larval morphologies and obtained cytogenetic data do not encourage the last status. So status of the taxon is still under discussion.

Comparative caryology has more advantage than other methods in taxonomical studies of animals. In fact especially chromosomal characters are essentially morphological characteristics. On the other side, some characters of caryotype which are number of chromosomes, arms of chromosomes, nucleolar organisers, heterochromatic blocks etc., can be intraspecific values.

In particular, cytogenetic works on Cerambycidae have also been realized poorly worldwide until now. For example, Ehara (1956) gave chromosome

numbers of 23 species that were distributed in Japan, belonging to the subfamilies Lepturinae, Cerambycinae and Lamiinae. Teppner (1966) determined chromosome numbers of 20 species that were distributed in Central Europe. Also Teppner (1968) mentioned chromosome numbers of 25 species that were distributed in Central Europe. Kudoh et al. (1972) gave chromosome numbers (both haploid and diploid numbers) of 5 species of the subfamily Lamiinae. Smith & Virkki (1978) revealed a large scaled work on cytogenetic of Coleoptera. They compiled all cytogenetic studies on Coleoptera up to 1978 and gave chromosome numbers of 157 species of Cerambycidae. Vidal (1984) stated chromosome numbers of 3 long-horned species. Vaio et al. (1985) observed meiotic plaques of 2 species of the genus *Trachyderes*. Lachowska et al. (1996) mentioned both haploid and diploid chromosome numbers of *Agapanthia violacea* of the subfamily Lamiinae. Holecova et al. (2002) gave chromosome numbers of 2 long-horned species. Rozek et al. (2004) stated chromosome numbers of 3 long-horned species. Dutrillaux et al. (2007) carried out a caryologic study on the species *Vesperus xatarti* of the subfamily Vesperinae. He stated chromosome number $54 + XX$ for female and $53 + XY_1Y_2$ for male.

As seen below, diploid number of chromosomes of members of long-horned beetles is changed between 10 and 36. Sex-chromosome system of long-horned beetles is parachute type (Xy_p). Most of the diploid chromosomes number is $2n = 20$ ($18AA + Xy_p$) (Smith & Virkki, 1978) (Graph 1).

Anyway, the genus *Dorcadion* Dalman, 1817 and thereby the species *Dorcadion* (*Cribridorcadion*) *anatolicum* Pic, 1900 and *Dorcadion* (*Cribridorcadion*) *scabricolle* have not been investigated cytogenetically until now. In the species, diploid numbers of chromosomes are determined $2n = 24$ and $2n = 20$ in mitotic metaphase respectively.

As known, the genus *Dorcadion* is a very rich and problematic group. Identification of the species of this genus on the base of external morphology, therefore, is difficult. Obtaining new taxonomic characters by cytogenetic works will be useful for both identification of species and classification of the group.

MATERIAL AND METHOD

The specimens were collected from Ankara and Konya provinces of Turkey in 2010 and were deposited in Gazi University, Ankara, Turkey.

The chromosomes are obtained according to Rozek (2004) with some alterations. The method is presented as follows:

The specimens were placed in killing-jar with ethyl acetate to anaesthetize. Abdomens of the specimens were cut and abdominal contents (especially testicle tissue in males, and middle-gut tissue in males and females) were transferred in petri dishes with distilled water. So the tissues were sustained on hold for 10-15 minutes in the hypotonic solution. They were transferred cryotubes with 0.05 % choleicine solution and were maintained for 45-60 minutes in room temperature and then, fixed in 3:1 fresh ethanol-acetic acid solution for at least 1 hour. Small pieces from the treated tissues were taken and mounted on a clear lam. On tissue pieces were dropped 45 % acetic acid and were dissected with using dissection pins and bisturi. Then, tissue pieces were mounted and pressed directly between lam and lamel or lam and lam. These preparates were submerged into liquid nitrogen. Lam and lamel or lam and lam were uncoupled and left for drying. Later, the dry preparates were stained by 4 % Giemsa Phosphate Buffer (pH = 6.8) for 10 minutes and were washed with distilled water. After drying the

preparates were examined under stereo microscope (Leica DMLB). The observed plaques were photographed zoom in (10X).(100X) (Graph 2).

RESULTS AND DISCUSSIONS

Subfamily LAMIINAE Latreille, 1802 Tribe DORCADIINI Latreille, 1825

Genus *DORCADION* Dalman, 1817

Type species: *Cerambyx glycyrrhizae* Pallas, 1773

The genus has Palaearctic chorotype (N Africa to China). It includes 5 subgenera as *Dorcadion* s. str.; *Cribridorcadion* Pic, 1901; *Maculatodorcadion* Breuning, 1942; *Carinatodorcadion* Breuning, 1943; *Acutodorcadion* Danilevsky et al., 2004. Recently, Löbl & Smetana (2010) also added *Megalodorcadion* Pesarini & Sabbadini, 1998 as 6th subgenus.

Almost all subgenera except the subgenus *Acutodorcadion* Danilevsky et al., 2004 were recorded from Turkey. The genus *Dorcadion* is represented by about 200 species in Turkey according to Özdikmen (2010). However, Löbl & Smetana (2010) gave a total of 150 species for Turkish *Dorcadion* (1 species for *Carinatodorcadion*, 140 species for *Cribridorcadion*, 4 species for *Maculatodorcadion* and 5 species for *Megalodorcadion*).

With this work, *D. (Cribridorcadion) anatolicum* Pic, 1900 that is endemic to Turkey and *D. (Cribridorcadion) scabricolle* (Dalman, 1817) that is the widest distributed species in Turkey, were studied taxonomically and cytogenetically.

Dorcadion (Cribridorcadion) anatolicum Pic, 1900

Material examined: Konya prov.: Taşkent, Gevne Valley, 23.III.2010, 1 specimen (Fig. 1)

Records in Turkey: Konya prov. (Pic, 1900; Breuning, 1962); Konya prov.: Akşehir (Demelt, 1963); Konya prov.: Akşehir, Sultan Mts., Ilgın and Kızılören, Antalya prov.: Irmasan pass, Adana prov.-Kahramanmaraş prov.: between Tufanbeyli and Göksun (Braun, 1978); Konya prov.: Dedegöl Mts. (Adlbauer, 1988); Isparta prov.: Eğirdir, Konya prov. (Önalp, 1990); Konya prov.: Taşkent (Çukuryurt pass) (Özdikmen & Hasbenli, 2004); Kahramanmaraş prov.: Göksun (Özdikmen & Okutaner, 2006); Konya prov.: Taşkent (Faşikan plateau), Hadim-Beyreli road (Turgut & Özdikmen, 2010) (Map 1).

Range: Turkey.

Chorotype: Anatolian.

Note: Male genitalia cannot give due to deformation of genitalia during the study.

Dorcadion (Cribridorcadion) scabricolle (Dalman, 1817)

Original combination: *Lamia scabricolle* Dalman, 1817

According to Löbl & Smetana (2010) and Özdikmen (2010), this species has 9 subspecies in the world. It is distributed widely in Turkey and is represented by

five subspecies in Turkey. *D. scabricolle caramanicum* Daniel & Daniel, 1903 (Southern subspecies) occurs in Cilician Taurus (South Turkey), *D. scabricolle paphlagonicum* Breuning, 1962 (Northern subspecies) occurs in Kastamonu province of North Turkey, *D. scabricolle balikesirense* Breuning, 1962 and *D. scabricolle uludaghicum* Breuning, 1970 (Western subspecies) occur in Balıkesir and Bursa provinces of North-West Turkey and the nominative *D. scabricolle scabricolle* Dalman, 1817 occurs in Transcaucasia and Armenia to Anatolia. The other known subspecies of this species are *D. scabricolle nakhiczevanum* Danilevsky, 1999 and *D. scabricolle paiz* Danilevsky, 1999 occur only in Caucasus. According to Braun (1978), *D. sevangense* Reitter, 1889 that described from Transcaucasia as *D. scabricolle* v. *sevangensis* is a distinct species. He mentioned that it separated clearly from *D. scabricolle*. According to Danilevsky (2011), -*sevangense* Reitter, 1889 is a subspecies of *D. scabricolle*.

Besides, Danilevsky (2011) mentioned that “*Dorcadion scabricolle elisabetholicum* Suvorov, 1915 was described from near Elisavetpol (now Giandzha in Azerbajdzhan) on the base of small size of available specimens. According to my series from Khanlar (7km S Giandzha) the local population really consists of relatively small specimens. So, the name can be regarded as valid. In fact each population of *D. scabricolle* is more or less peculiar”. So this taxon is presented as a subspecies of this species.

Consequently, this species is the widest *Dorcadion* species in Turkey. The taxonomic status of subspecific level of the species needs to be clarified with future works. The present materials belong to the subspecies, *D. scabricolle paphlagonicum* Breuning, 1962.

***Dorcadion scabricolle paphlagonicum* Breuning, 1962**

Material examined: Ankara prov.: Ayaş, Ankara–Ayaş road, 20.III.2010, 3 specimens; Ankara prov.: Kazan, 22.III.2010, 1 specimen; Ankara prov.: Kızılcahamam, Işık Mt., 26.IV.2010, 4 specimens (Fig. 2).

Records in Turkey: Malatya prov. (Heyden, 1888); Konya prov.: Akşehir (Sultan Mt.) (Bodemeyer, 1900); Antalya prov.: Toros Mts., Niğde prov.: Çamardı as *D. s. v. caramanicum* (Bodemeyer, 1900); Niğde prov.: Çamardı as *D. scabricolle* v. *caramanicum* (Aurivillius, 1922); Cilician Taurus as *D. s. caramanicum* Daniel, 1903 / Niğde prov.: Bolkar Dağları-Maden (=Çamardı) as *D. s. m. bulghardaghense* Breuning, 1946 / Kastamonu prov. as *D. s. paphlagonicum* Breuning, 1962, *D. s. m. subbasalireductum* Breuning, 1962, *D. s. m. humeralibivittatum* Breuning, 1962 / Balıkesir prov. *D. s. balikesirense* Breuning, 1962 (Breuning, 1962); Konya prov.: Akşehir (Demelt, 1963); Sivas prov.: Zara, Çorum prov.: Boğazkale (Perissinotto & Luchini, 1966); Erzurum prov. (Breuning et Villiers, 1967); Bursa prov.: Uludağ as *D. s. m. corpulentum* (Breuning et Villiers, 1967); Bursa prov.: Uludağ as *D. scabricolle balikesirense* (Breuning et Villiers, 1967); Van prov.: Özalp *D. s. m. corpulentum* (Fuchs et Breuning, 1971); Yozgat prov.: Central (Fuchs et Breuning, 1971); Van prov.: Kuzgunkiran as *D. s. paphlagonicum* (Fuchs et Breuning, 1971); Malatya prov.: Arguvan (Gfeller, 1972); Konya prov.: Akşehir (Tuatay et al., 1972); Konya prov.: Akşehir (Cankurtaran), Kayseri prov.: Bakırdağı, Ankara prov.: Central / Kızılcahamam (Central / Güvem), Çorum prov.: Yazılıkaya, Yozgat prov., İçel prov.: Sertavul pass, Kahramanmaraş prov.: Göksun / Elbistan, Adana prov.: Saimbeyli / Tufanbeyli, Bilecik prov.: Söğüt (Braun, 1978); Balıkesir prov., Bursa prov., Uşak prov., Isparta prov., Ankara prov., Kastamonu prov., İçel prov.,

Kayseri prov., Kahramanmaraş prov., Erzurum prov., Van prov., Ağrı prov., Ardahan prov. (from map in Braun, 1978); Erzurum prov. and near (Özbek, 1978); Konya prov.: Sertavul pass, Gümüşhane prov.: Köse (Sama, 1982); Turkey (Danilevsky & Miroshnikov, 1985; Özdikmen, 2006); Erzurum prov.: İspir, Ankara prov.: Güvem (Adlbauer, 1988); Konya prov.: Akşehir / Sultandağ, Ankara prov.: Central / Gölbaşı / Çal Mt. / Hüseyin Gazi Mt., Erzurum prov., Van prov., Kars prov.: Central / Kağızman, Niğde prov.: Bulgar-Maden (Çamardı), Afyon prov.: Emirdağ (Önalp, 1990); Yozgat prov.: Yozgat pine grove, Erzincan prov.: Çayırılı (Başköy), Sivas prov.: Tahtikement village, Gümüşhane prov.: Kelkit (Akdağ), Yozgat prov.: Yozgat National Park (Özdikmen & Hasbenli, 2004); Konya prov.: Akşehir (Özdikmen et al., 2005); Ankara prov.: Çal Mountain (Özdikmen & Demir, 2006); Kahramanmaraş prov.: Göksun (Central / Küçükşu plateau / Korkmaz) (Özdikmen & Okutaner, 2006); Ankara prov.: Ayaş, Kızılcahamam (Işık Dağı) (Özdikmen et al., 2009); Konya prov.: Bozkır (Kuruçay-Ahırlı) (Turgut & Özdikmen, 2010); Kahramanmaraş prov.: Afşin (Emirilyas village, Mağaraözü district) (Özdikmen et al., 2010) (Map 2).

Range: Caucasus (Armenia, Azerbaijan, Georgia), Turkey, Iran.

Chorotype: SW-Asiatic (Anatolo-Caucasian + Irano-Caucasian + Irano-Anatolian).

Cytogenetics: First of all, we must to state that observation density of chromosomes is low due to a low of mitotic and meiotic activations in the examined material. Long-horned beetles have also holometabolous development such as other members of the order Coleoptera. The larval, pupal and imaginal stages of holometabolous insects in terms of observed mitotic and meiotic activities are displayed diversity. This case was evaluated by Teppner (1968) with regard to spermatogenesis. He stated that meiosis is started in pre-pupal stage; spermatogenesis is accelerated in last instar larva and is continued in adult. He also mentioned these findings are varied among the subfamilies. In respect to this, spermatogenesis that occurring in last instar larvae, decelerates in adult stages in the subfamilies Lepturinae and Aseminae, while it is continued with the same density in adult stages in Cerambycinae and Lamiinae. Moreover, duration of meiosis differs from stage to stage.

In the present work, cytogenetic researches carried out on the adult due to the larval and pupal identification are very difficult.

Observed chromosomes of long-horned beetles are small. Centromere regions and length of arms of the chromosomes are not clear. The chromosomes, therefore, evaluated only on account of the number.

With regard to the present study, haploid number of chromosomes for the species *D. anatolicum* was determined as $n = 11 + X_y$ in meiotic metaphase from testicle tissues (Fig. 4), and diploid number of chromosomes was determined as $2n = 24$ in mitotic metaphase from testicle tissues (Fig. 5).

Also, diploid number of chromosomes was determined as $2n = 20$ in mitotic metaphase from testicle tissues (Fig. 6).

As a result of this study, number of chromosomes is varied in the genus *Dorcadion*. Probably, determination of chromosomal number variance can aid to solve some systematic problems of this group.

* This work supported by the projects by GAZİ UNIVERSITY (project number 05/2008-44). The data are derived from the Ph. D. thesis of A. Y. Okutaner.

LITERATURE CITED

- Adlbauer, K.** 1988. Neues zur Taxonomie und Faunistik der Bockkäferfauna der Türkei (Coleoptera, Cerambycidae). Entomofauna, 9 (12): 257-297.
- Aurivillius, C.** 1922. Cerambycidae: Lamiinae I. Coleopterorum Catalogus auspiciis et auxilio W. Junk editus a S. Schenckling. Pars 73. Berlin: 1-322.
- Bodemeyer, H. E. V.** 1900. Quer durch Klein Asien, in den Bulghar Dagh; Eine Naturwissenschaftliche studien-Reise. Coleopterologisches, 196 pp.
- Braun, W.** 1978. Die Dorcadienausbeute der Forschungsreisen von w. Heinz 1963-1977 Faunistische Aufstellung Beschreibung einer neuen Unerart und Bemerkungen zur Systematik Wenig bekannter Arten (Coleoptera, Cerambycidae). Nachrichtenblatt der Bayerischen Entomologen, pp. 11-116.
- Breuning, S.** 1962. Revision der Dorcadionini. Entomologische abhandlungen und berichte aus dem staatliche museum für tierkunde in Dresden, 27: 1-665.
- Breuning, S. & Villiers, A.** 1967. Cerambycides de Turqie (2. note). L' Entomologiste, 23 (3): 59-64.
- Brustel, H., Berger, P. & Cocquempot, C.** 2002. Catalogue des Vesperidae et des Cerambycidae de la faune de France (Coleoptera). Ann. Soc. Entomol. Fr. (n.s.), 38 (4): 443-461.
- Crosland, M. W. J. & Crozier, R. H.** 1986. *Myrmecia pilosula*, an ant with only one pair of chromosomes. Science, 231 (4743): 1278.
- Danilevsky, M. L.** 2011. Systematic list of longicorn beetles (Cerambycoidea) of the territory of the former USSR. Available from: <http://www.cerambycidae.net>.
- Danilevsky, M. L. & Miroschnikov, A. I.** 1985. Timber-Beetles of Caucasus (Coleoptera, Cerambycidae), the key. Krasnodar, 419 pp.
- Demelt, C. V.** 1963. Beitrag zur Kenntnis der Cerambycidenfauna Kleinasiens und 13. Beitrag zur Biologie palaearkt. Cerambyciden, sowie Beschreibung einer neuen *Oberea*-Art. Entomologische Blätter, 59 (3) : 132-151.
- Dutrillaux, A. M., Moulin, S. & Dutrillaux, B.** 2007. Presence d'un caryotype tres original a 53-54 chromosomes chez *Vesperus xatarti* Mulsant, 1839 (Coleoptera : Cerambycidae: Vesperinae). Annales de la Societé entomologique de France (N. S.), 43 (1): 81-86.
- Ehara, S.** 1956. A Comparative Histology of Male Gonads in Some Cerambycid Beetles with Notes on the Chromosomes. Jour. Fac. Sci. Hokkaido Univ. Ser., 6 (12): 309-316.
- Fuchs, E. & Breuning, S.** 1971. Die Cerambycidenausbeute der Anatolienexpedition 1966-67 des Naturhistorischen Museums, Wien. Annalen Naturhistorischen Museum Wien, 75: 435-439.
- Gfeller, W.** 1972. Cerambycidae (Coleoptera) der Türkei-Persienexpedition 1970 der Herren Dr. H. c. W. Wittmer und U. v. Botmer, Mitteilungen der Entomologischen Gesellschaft Basel, 22 (1): 1-8.
- Gokhman, V. E. & Kuznetsova, V. G.** 2006. Comparative insect karyology: Current state and applications. Entomological Review, 86 (3): 352-368.
- Heyden, L.** 1888. Neue und interessante Coleopteren aus Malatia in Mesopotamien. Deutsche Entomologische Zeitschrift, 32 (1): 72-78.
- Holecova M., Lachowska, D. & Karagyan, G.** 2002. Karyological notes on six beetle species from Armenia (Coleoptera: Tenebrionidae, Cerambycidae, Curculionidae). Folia biol. (Krakow), 50: 9-12.
- Kudoh K., Kondoh I. & Saitoh K.** 1972. Chorosome Studies of Beetles IV. A Further Chorosome Survey of Five Species of the Subfamily Lamiinae (Cerambycidae). Kontyu., 40: 293-296.
- Lachowska, D., Rozek, M. & Holecova, M.** 1996. A cytogenetic study on eight beetle species (Coleoptera:Carabidae, Scarabaeidae, Cerambycidae, Chrysomelidae) from Central Europe. Folia Biologica, 44 (3-4): 99-103.
- De Lesse, H.** 1970. Les nombres de chromosomes chez les lépidoptères rophalocères en Amérique Centrale et Colombie. Arm. Soc. Ent. France, 6: 347-358.

Löbl, I. & Smetana, A. (Ed.) 2010. Catalogue of Palaearctic Coleoptera, Vol. 6. Stenstrup: Apollo Books, 924 pp.

Perissinotto, A. & Luchini, S. R. 1966. Coleotteri Raccolti Nel Vicino e Medio Oriente Nota I. *Dorcadion* Dalm. (Coleoptera, Cerambycidae). Bollettino della Societa Entomologica Italiana, 96 (9-10): 147-149.

Pic, M. 1900. Descriptions. Pp. 11-16. Matériaux pour servir à l'étude des longicornes. 3ème cahier, 3re partie. Lyon: Imprimerie Jacquet Frères, 33 pp.

Önalp, B. 1990. Systematic researches on *Dorcadion* Dalman, 1817 species in Turkey (Coleoptera, Cerambycidae: Lamiinae), I. H. Ü. Eğitim Fakültesi Dergisi, 5: 57-102.

Özbek, H. 1978. *Hylotrupes bajulus* (L.) Serville in Erzurum and the near, and some others longhorn beetles. Atatürk Üniversitesi Ziraat Fakültesi Dergisi, 9 (1): 31-44.

Özdikmen, H. 2006. Contribution to the knowledge of Turkish longicorn beetles fauna (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 1 (1): 71-90.

Özdikmen, H. 2010. The Turkish *Dorcadiini* with zoogeographical remarks (Coleoptera: Cerambycidae: Lamiinae). Munis Entomology & Zoology, 5 (2): 380-498.

Özdikmen, H. & Demir, H. 2006. Notes on longicorn beetles fauna of Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 1 (1): 157-166.

Özdikmen, H., Güven, M. & Gören, C. 2010. Longhorned beetles fauna of Amanos Mountains, Southern Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 5, suppl.: 1141-1167.

Özdikmen, H. & Hasbenli, A. 2004. Contribution to the knowledge of longhorned beetles (Coleoptera, Cerambycidae) from Turkey, Subfamily Lamiinae. J. Ent. Res. Soc., 6 (2): 25-49.

Özdikmen, H. & Okutaner, A. Y. 2006. A very interesting longicorn beetle, *Anatolobrium eggeri* Adlbauer, 2004, from Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 1 (1): 169-170.

Özdikmen, H., Özdemir, Y. & Turgut, S. 2005. Longhorned Beetles Collection of the Nazife Tuatay Plant Protection Museum, Ankara, Turkey (Coleoptera, Cerambycidae). J. Ent. Res. Soc., 7 (2): 1-33.

Özdikmen, H., Turgut, S. & Güzel, S. 2009. Longhorned beetles of Ankara region in Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 4 (1): 59-102.

Rozek, M. 2004. A new chromosome preparation technique for Coleoptera (Insecta). Chromosome Research, 2 (1): 76-78.

Rozek, M., Lachowska, D., Petitpierre, E. & Holecova, M. 2004. C-bands on chromosomes of 32 beetle species (Coleoptera: Elateridae, Cantharidae, Oedemeridae, Cerambycidae, Anthicidae, Chrysomelidae, Attelabidae and Curculionidae). Hereditas, 140: 161-170.

Sama, G. 1982. Contributo allo studio dei coleotteri Cerambycidae di Grecia e Asia Minore. Fragmenta Entomologica, Roma, 16 (2): 205-227.

Smith, S. G. & Virkki, N. 1978. Animal cytogenetics. vol.3: Insecta, part 5: Coleoptera. Gebrüder Borntraeger, Berlin-Stuttgart.

Svacha P., Wang J. J. & Chen S. C. 1997. Larval morphology and biology of *Philus antennatus* and *Heterophilus punctulatus*, and systematic position of the Philinae (Coleoptera: Cerambycidae and Vesperidae). Annales de la Société entomologique de France (N. S.), 33 (3): 323-369.

Teppner, H. 1966. Chromosomenzahlen einiger Mitteleuropäischer Cerambycidae (Coleoptera) (Chromosome Numbers of some Central European Cerambycidae). Chromosoma (Berl.), 19: 113-125.

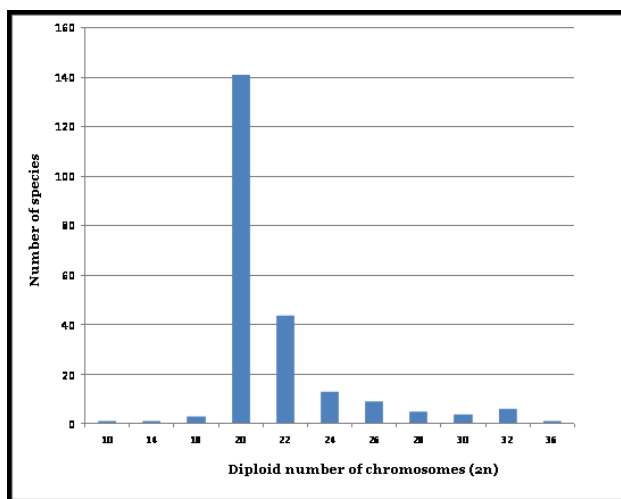
Teppner, H. 1968. Chromosomenzahlen einiger Mitteleuropäischer Cerambycidae (Coleoptera) II (Chromosome Numbers of some Central European Cerambycidae II). Chromosoma (Berl.), 25: 141-151.

Tuatay, N., Kalkandelen, A. & Aysev, N. 1972. Bitki Koruma Müzesi Böcek Kataloğu (1961-1971). T. C. Tarım Bakanlığı, Ankara, 53-55.

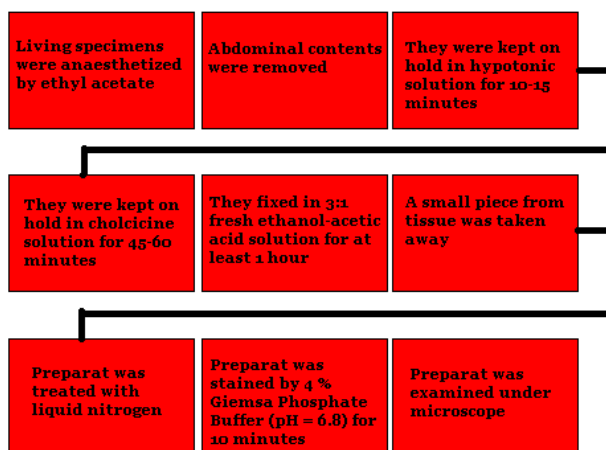
Turgut, S. & Özdikmen, H. 2010. New data for Turkish longhorned beetles fauna from Southern Turkey (Coleoptera: Cerambycidae). *Munis Entomology & Zoology*, 5, suppl.: 859-889.

de Vaio, E.S., da Silva, A., Crivel, M., Postiglioni, A., Ponce de Leon, R. & Leira, M. S. 1985. Comparative Description of Male Meiosis in Two Species of Cerambycines (Coleoptera: Cerambycidae). *Rev. Brasil. Genet.*, 8 (2): 263-269.

Vidal, O. R. 1984. Chrosome Numbers of Colopectra From Argentina. *Vidal Genetica*, 65: 235-239.



Graph 1. Diploid number of chromosomes – Number of species in Cerambycidae.



Graph 2. The main steps of the used method for cytogenetic researches.



Figure 1. Habitus of *D. anatolicum* (dorsal view).



Figure 2. Habitus of *D. scabricolle* (dorsal view).

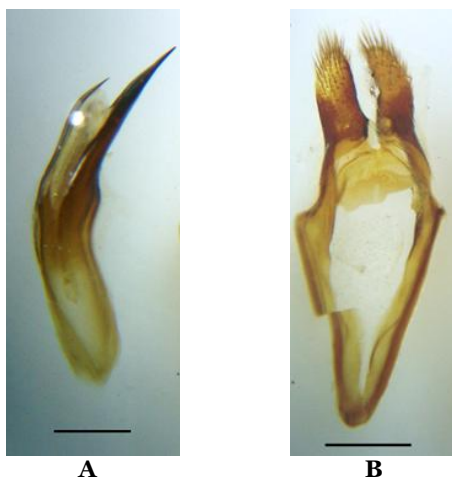


Figure 3. Male genitalia of *D. scabricolle*. A. Aedeagus, B. Paramers.

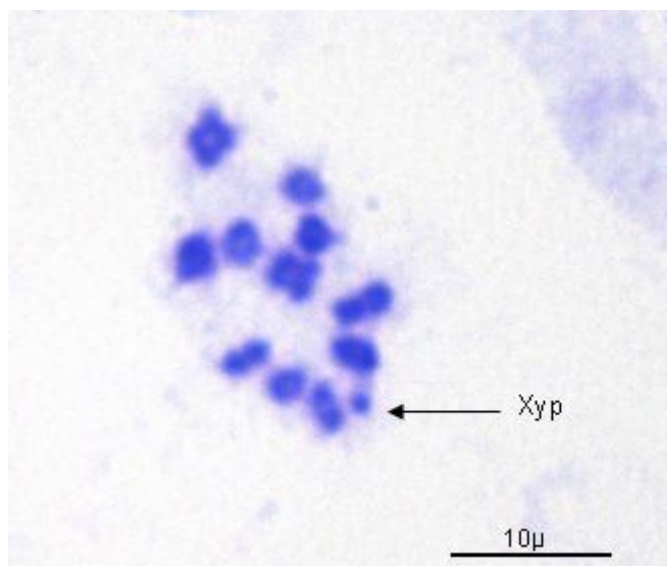


Figure 4. Meiotic metaphase plaque from testicle tissue of *D. anatolicum* ($n = 11 + X_{yp}$).

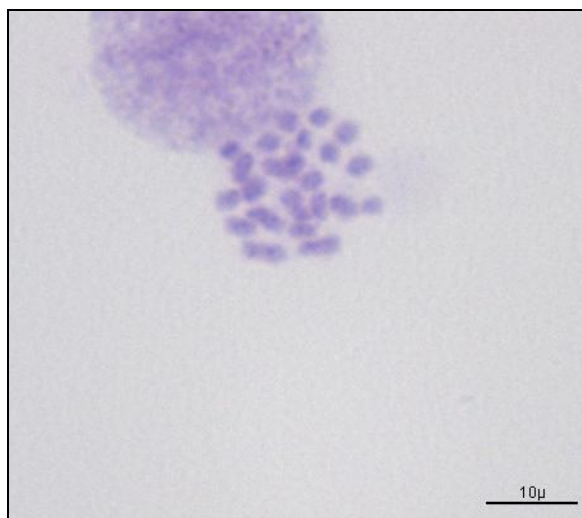


Figure 5. Mitotic metaphase plaque from testicle tissue of *D. anatolicum* ($2n = 24$).

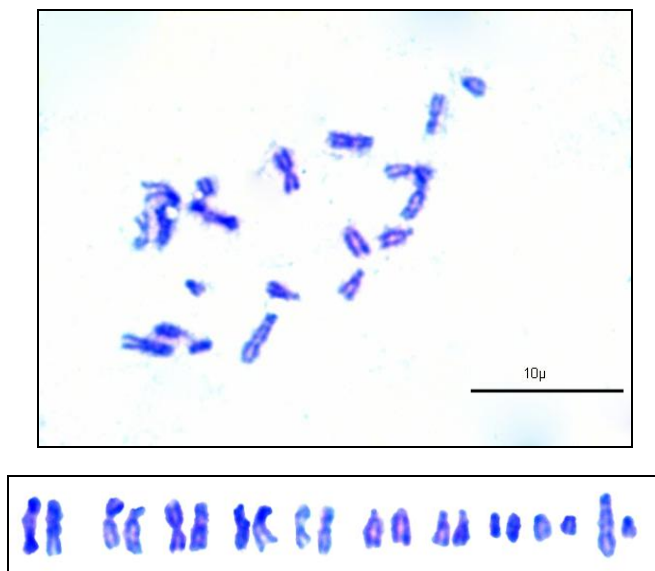
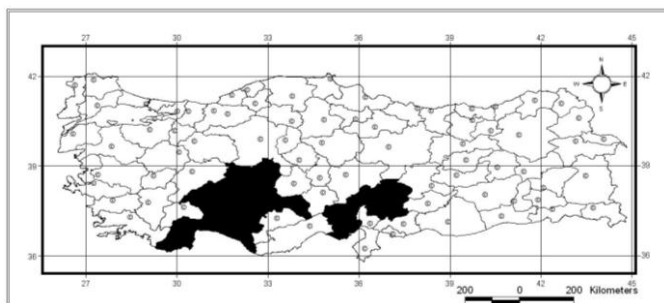
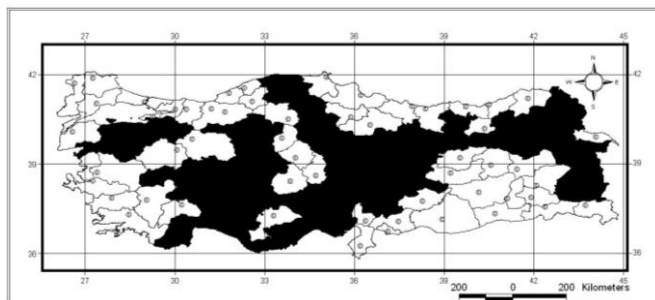


Figure 6. Mitotic metaphase plaque from testicle tissue and karyogram of *D. scabricolle* ($2n = 20$).



Map 1. Distribution in Turkey of *D. anatolicum* (in respect to provinces).



Map 2. Distribution in Turkey of *D. scabricolle* (in respect to provinces).

**PROPOSITION OF A NEW COMBINATION,
CHRYSSO ANGULA (TIKADER) FOR THE INDIAN ENDEMIC
THERIDULA EMERTON AND A NEW SYNONYMY FOR
CHRYSSO PSEUDOTHERIDULA SILIWAL
 (ARANEAE: THERIDIIDAE)**

Souvik Sen*, Sumana Saha and Dinendra Raychaudhuri***

* Entomology Laboratory, Department of Zoology, University of Calcutta, 35, Ballygunge Circular Road, Kolkata- 700019, INDIA. E-mails: souvik_ind_06@yahoo.co.in; dinendrarccu@gmail.com

** Department of Zoology, Lady Brabourne College, Govt. of West Bengal, P- 1/2, Suhrawardy Avenue, Kolkata- 700017, INDIA. E-mail: sahasumana2010@gmail.com

[Sen, S., Saha, S. & Raychaudhuri, D. 2011. Proposition of a new combination, *Chrysso angula* (Tikader) for the Indian endemic *Theridula* Emerton and a new synonymy for *Chrysso pseudotheridula* Siliwal (Araneae: Theridiidae). Munis Entomology & Zoology, 6 (2): 877-881]

ABSTRACT: The two Indian endemic *Theridula* Emerton species are transferred to *Chrysso* O. P. Cambridge. *Theridula swataie* Biswas et al. and *Chrysso pseudotheridula* Siliwal are considered as junior synonyms of *C. angula* (Tikader). Diagnosis of *C. angula* (Tikader) is revised and accordingly illustrated.

KEY WORDS: Taxonomy, *Theridula angula*, new combination, *T. swataie*, *Chrysso pseudotheridula*, synonymy, India.

Siliwal (2009) described a new theridid *Chrysso pseudotheridula* from North-East India and justifiably suggested the need of taxonomic revision of two endemic *Theridula* Emerton, *T. angula* Tikader, 1970 and *T. swataie* Biswas et al., 1997. She (op. cit.) doubted on the status of both the species under *Theridula*.

During the course of present study representatives of all 3 species in question are at hand. A critical examination of such samples is strongly suggestive of *Theridula swataie* and *Chrysso pseudotheridula* as the junior synonyms of *Chrysso angula* (Tikader) [= *Theridula angula* Tikader]. The following diagnostic characters support their placement in *Chrysso* O. P. Cambridge: cephalothorax longer than wide, anterior row of eyes slightly recurved, AME separated by their diameter or more, promargin of chelicerae with 1-3 large teeth and retromargin toothless, leg I longest, each patella with a retrolateral tubercle, tarsi IV with comb; abdomen longer than wide, extends beyond spinnerets, with hump or posterior extension, often sub triangular in lateral view, a distinct tubercle above the posterior spinnerets; copulatory openings usually indistinct.

Variations observed in the abdominal pattern singly represent each of the species referred above. It is not only true for the females even the males too show such variations. However, in all cases the epigynum-internal genitalia shows a discrete nature. Single coil of the copulatory duct as referred by Siliwal (2009) could not be noticed.

We propose *Theridula angula* be placed in the genus *Chrysso* O. P. Cambridge and both *T. swataie* and *Chrysso pseudotheridula* Siliwal be considered as junior synonyms of *C. angula* (Tikader). Accordingly the revised diagnosis and necessary illustrations are provided for *C. angula* (Tikader).

MATERIAL AND METHODS

Spiders were collected and preserved following Tikader (1987) and Barrion & Litsinger (1995). The materials were studied using Stereo Zoom Binocular Microscope, model Zeiss SV-11. The measurements indicated in the text are in millimeters, made with an eye piece graticule. Leg measurements are shown as: total length (femur, patella, tibia, metatarsus, tarsus).

Abbreviations used: CL= Cephalothorax length, CW= Cephalothorax width, AL= Abdominal length, AW= Abdominal width, TL= Total length, AME= Anterior median eyes, ALE= Anterior lateral eyes, PME= Posterior median eyes, PLE= Posterior lateral eyes; GNP= Gorumara National Park, CWLS= Chapramari WildLife Sanctuary, MWLS= Mahananda WildLife Sanctuary, WB= West Bengal.

All material are in the deposition of Entomology Laboratory, Department of Zoology, University of Calcutta.

TAXONOMY

Chrysso angula (Tikader, 1970) comb. nov.

(Figs.1-19)

Theridula angula Tikader, 1970, Rec. zool. Surv. India, 64: 15.

Theridula swatii Biswas, Saha & Raychaydhuri, 1997, Entomon, 22: 230.

Chrysso pseudotheridula Siliwal, 2009, Biosystematica, 3(1): 5.

Diagnosis: Abdomen rhomboid, angles with black spots, at times continuous with median longitudinal and/or basal marginal bands, with 2 pairs of midlongitudinal sigilla (muscular apodemes); spermatheca bilobed, fertilization ducts short and curved, copulatory openings indistinct; male palpal conductor basally swollen, apically pointed, curved, crossing cymbial margin.

Epigynum - Internal genitalia (Figs. 4 and 5): Spermatheca bilobed, fertilization duct distinct, short and curved, copulatory ducts long, medially incurved, copulatory openings indistinct.

Male palp (Fig. 7): Paracymbium hooded, conductor long, basally swollen, apically pointed, curved, largely crossing cymbial margin, embolus thick, apical tip hook like, smaller than conductor.

Measurements:

Female (Fig.1): CL- 1.0, CW- 0.92, AL- 3.37, AW- 3.10, TL- 4.37.

Inter ocular distance: AME-AME=0.14, ALE-AME=0.05, ALE-ALE=0.37, PME-PME= 0.14, PLE-PME=0.07, PLE- PLE=0.39, AME-PME=0.05.

Legs: I 5.38 (1.46, 0.40, 1.26, 1.66, 0.60); II 3.35 (1.0, 0.30, 0.66, 0.93, 0.46); III 2.42 (0.66, 0.33, 0.43, 0.60, 0.40); IV 4.22 (1.33, 0.40, 0.86, 1.0, 0.63). Leg formula 1423.

Male (fig.6): CL- 0.82, CW- 0.78, AL-1.71, AW-1.17, TL-2.53.

Inter ocular distance: AME-AME=0.14, ALE-AME=0.07, ALE-ALE=0.32, PME-PME= 0.07, PLE-PME=0.08, PLE- PLE=0.32, AME-PME=0.07.

Legs: I 4.50 (1.20, 0.26, 1.00, 1.58, 0.46); II 2.75 (1.0, 0.26, 0.46, 0.77, 0.26); III 1.98 (0.52, 0.26, 0.37, 0.46, 0.37); IV 3.52 (1.20, 0.46, 0.52, 0.88, 0.46). Leg formula 1423.

Variations: Abdomen variably decorated with black as in figs.8-12 and 13-19.

Material examined: 2♀♀, 7th Mile, MWLS, WB, India, 07.ix.2007, coll. S. Sen; 1♂, Laltong, MWLS, WB, India, 15.x.2008, coll. S. Saha; 2♀♀ & 3♂♂, Gorumara, GNP, WB, India, 29.x.2007, coll. D. Raychaudhuri; 3♀♀, Dhupjhora, GNP, WB, India, 03.v.2008, coll. S. Sen; 1♀ & 1♂, Murti, GNP, WB, India, 04.v.2008, coll. S. Sen; 4♀♀, Gorumara, GNP, WB, India, 11.ii.2009, coll. S. Sen; 1♀/1♀, Chapramari, CWLS, WB, India, 07.v.2008/19.xii.2008, coll. S. Sen.

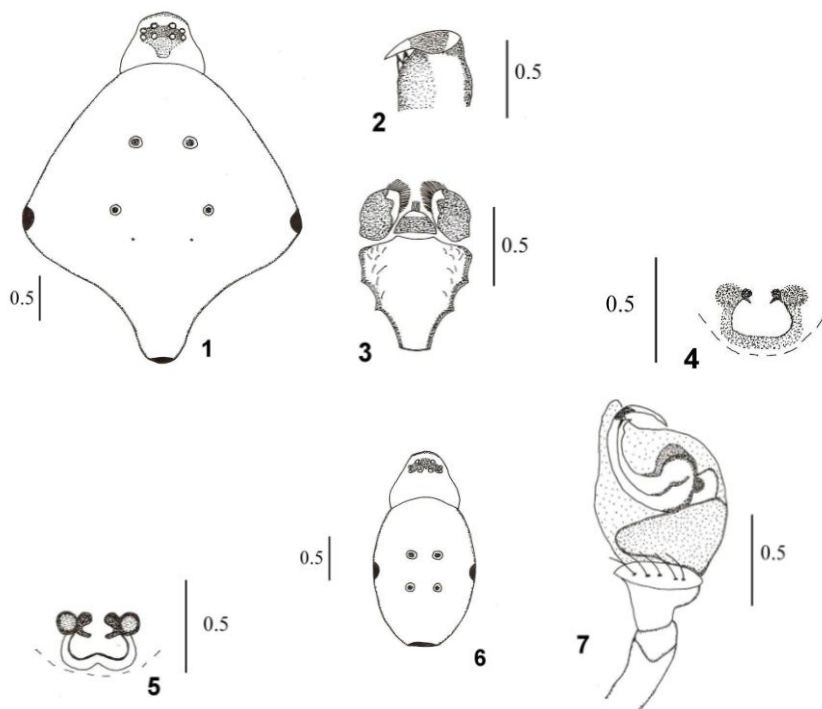
Distribution: India: Andhra Pradesh, Arunachal Pradesh, Kerala, Sikkim, West Bengal (Tikader, 1970; Biswas *et al.* 1997; Sebastian & Peter, 2009; Siliwal, 2009; Platnick, 2011).

ACKNOWLEDGEMENTS

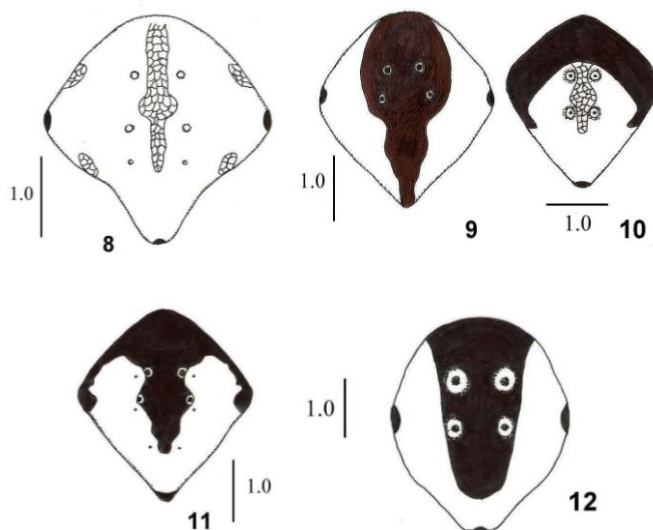
We thank Department of Biotechnology, Govt. of India (BT/PR6391/NDB/51/078/2005 dt. 20.11.2006) for sponsoring the project and Directorate of Forests, Govt. of West Bengal and the Head, Department of Zoology, University of Calcutta for necessary support.

LITERATURE CITED

- Barrion, A. T. & Litsinger, J. A.** 1995. Riceland spiders of South and Southeast Asia. CAB International, UK & IRRI, Philippines: 716 pp.
- Biswas, V., Saha, S. & Raychaudhuri, D.** 1997. Araneidae and Theridiidae of Buxa Tiger Reserve, West Bengal: Genera *Leucauge* White, *Cyrtophora* Stoliczka and *Theridula* Emerton. Entomon, 22: 229-233.
- Platnick, N. I.** 2011. The World spider catalog, version 11.5. American Museum of Natural History. Available from: <http://research.amnh.org/entomology/spiders/catalog/index.html>. (accessed on 3rd February, 2011).
- Sebastian, P. A. & Peter, K. V.** 2009. Spiders of India. Universities Press (India) Pvt. Ltd.: 614 pp.
- Siliwal, M.** 2009. A new species of the genus *Chrysso* O. P.-Cambridge (Araneae: Theridiidae) from Arunachal Pradesh, India. Biosystematica, 3: 5-9.
- Tikader, B. K.** 1970. Spider fauna of Sikkim. Records of Zoological Survey of India, 64: 83 pp.
- Tikader, B. K.** 1987. Hand book of Indian spiders. Zoological Survey of India: 251 pp.



Figures 1-7. *Chrysso angula* (Tikader) comb. nov.: Female: 1. Cephalothorax and abdomen, dorsal view; 2. Chelicerae, ventral view; 3. Maxillae, labium and sternum, ventral view; 4. Epigynum, ventral view; 5. Internal genitalia, dorsal view. Male: 6. Cephalothorax and abdomen, dorsal view; 7. Palp, ventral view.



Figures 8-12. Abdominal variations of *Chrysso angula* (Tikader) comb. nov.



Figures 13-19. Photographic Images: showing abdominal variations in *Chrysso angula* (Tikader) comb. nov.: 13-17: Female habitus; 18-19: Male habitus.

**MASS MULTIPLICATION OF PUPAL PARASITOID,
NESOLYNX THYMUS (GIRAULT) (HYM.: EULOPHIDAE)
 FOR THE MANAGEMENT OF UZI FLY, (DIP.: TACHINIDAE)
EXORISTA BOMBYCIS (LOUIS) IN MUGA SILKWORM
ANTHRAEA ASSAMENSIS HELFER (LEP.: SATURNIIDAE)**

S. G. Eswara Reddy & R. K. Rajan

* Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles, Govt. of India, Lahdoigarh, Jorhat -785 700 Assam, INDIA. E-mail: creddy2001@yahoo.com

[Eswara Reddy, S. G. & Rajan, R. K. 2011. Mass multiplication of pupal parasitoid, *Nesolynx thymus* (Girault) (Hym.: Eulophidae) for the management of uzi fly, (Dip.: Tachinidae) *Exorista bombycis* (Louis) in muga silkworm *Antheraea assamensis* Helfer (Lep.: Saturniidae). Munis Entomology & Zoology, 6 (2): 882-885]

ABSTRACT: Experiments were conducted in the Bio-Control Laboratory, Central Muga Eri Research and Training Institute, Lahdoigarh, Jorhat (Assam) during September-December 2010 to standardize the mass multiplication techniques for pupal parasitoid, *Nesolynx thymus* (Hymenoptera:Eulophidae) on the pupae of housefly, *Musca domestica* (Diptera:Muscidae) in the laboratory to release in the muga silkworm rearing field for the management of Uzi fly, *Exorista bombycis* (Diptera:Muscidae). Results indicates that an initial establishment cost of rupees 0.74 lakh and consumables cost of rupees 0.197 lakh is required for the production of 10 lakh *N. thymus* (1000 pouches) adults for covering 20,000 disease free layings (DFLs) of muga silk worm. It is also indicates that a benefit of rupees 2.03 was obtained at every rupee spent. The collected housefly pupae parasitized by *N. thymus* were kept in a container for 10-12 days in summer and 20-25 days in winter for emergence then 50% honey was provided for *N. thymus* immediately after emergence. The parasitoids were released in the field during evening hours after 8-10 hrs of mating. For 100 Disease free layings (DFLs) of muga silkworm larvae, 60,000 numbers (6 pouches) of parasitoids to be released in the rearing field for six releases @ 10000/release at an interval of 5-7 days, once in 2nd, 3rd, 4th & 5th instar, spinning and grainage stage. The standard protocol for mass multiplication of parasitoid on house fly pupae and its economics, benefit cost ratio (BCR) is discussed.

KEY WORDS: Muga culture, Outdoor rearing, Disease Free Layings, Mass production, Benefit cost ratio.

Muga silkworm, *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae) is semi domesticated, polyphagous, multivoltine and endemic to Assam, yields golden yellow silk. The present production of raw silk in Assam is 117 million tones accounting to 0.65% of raw silk produced in the country, while rest of the production contributed by other North-Eastern states (Anon, 2009). The muga silkworm is reared in 5-6 seasons in a year. The *Jethua* (April-May) & *Kotia* (Oct.-Nov.) rearing are commercial crops, *Chotua* (Feb.-Mar.) & *Bhodia* (Aug.-Sept.) as seed and *Jarua* (Dec.-Jan.) & *Aherua* (June-July) as pre-seed crops. Muga silkworm is attacked by number of parasitoids (*Apanteles* sp., *Exorista bombycis*) and predators (ants, wasps, birds etc.). Among these *E. bombycis* is one of the serious endo-parasitoid particularly during *Jarua* (Dec.-Jan.) and *Chotua* (Feb.-Mar.) seed crops causing 20-90% loss in winter & post winter (Dec.-Mar.) (Anon, 2007) and 50-70% cocoon rejection during Feb.-March (Anon, 1996).

Single female *E. bombycis* prefers to lay eggs directly at inter segmental region of the larval body. After hatching, the maggots penetrates into the larval body and starts feeding on inner tissues/fat bodies then maggots comes out from the body

and pupates in the soil. The silkworm parasitized by Uzi fly in early instars are killed before attaining spinning stage, while those parasitized in the late 4th & 5th instars spin cocoons of weak built and from such cocoons Uzi maggots emerge by piercing, thus rendering cocoons unfit for reeling and reduces the market value. Presence of egg(s) or black scar on the body of the silkworm larvae and maggot emergence hole in the cocoons indicates Uzi infestation (Narayanaswamy & Devaiah, 1998). As per the recent survey results indicates that, maximum infestation of Uzi fly was in 5th instar larvae (43.0%) and at harvesting of cocoons (35.0%) during *Chotua* crop (Mar.-Apr.2010) followed by *Jarua* crop, Dec. 2009-Jan. 2010 (19.0% infestation at larval stage & 27.50% at harvesting stage) reported in Upper Assam (Eswara Reddy, 2010a,b).

Reports indicate that, the parasitoid *N. thymus* was effective in reducing the Uzi fly infestation in mulberry silkworm, *Bombyx mori* L. (Lepidoptera: Bombycidae) under indoor rearing conditions but it is not evaluated for the management of Uzi fly in muga silkworm which is reared under out door conditions on som (*Persea bombycina*) and soalu (*Litsea monopetala*) plantations. Keeping in view that, this study was under taken to standardize the commercial mass production of the *N. thymus* in the laboratory on house fly pupae for the management of Uzi fly in muga silkworm under Assam conditions.

MATERIALS AND METHODS

The laboratory host of housefly, *Musca domestica* (Diptera: Muscidae) was utilized for the mass production of *Nesolynx thymus* (Hymenoptera: Eulophidae) in the laboratory conditions (temperature at 22-25°C and humidity 60-65%) for field release to manage *E. bombycis* in the muga culture. The standardized protocol for the above was given below.

Steps involved in the multiplication of housefly for mass production of *N. thymus* in the laboratory:

1. Prepare one basin of diet for 2.0 ml of housefly eggs by soaking 400-600 grams of dry cow dung cake/powder, 25 grams of dried yeast in 4 liters of water for 12 hrs for fermentation then add 1.20 kg of wheat bran and mix. This diet will be used as a feed for housefly maggots and for attraction of fly to lay eggs. The quantity of the diet required will be varying as per the availability of housefly eggs.
2. To maintain housefly culture initially in the laboratory, keep the little quantity of diet (100-200g) in a Petri dish covered with white cloth then put it out side/in a corridor for 4-5 hours or inside the rearing cage containing houseflies for egg laying on the diet.
3. Collect the eggs during after noon (2-3 pm) and sprinkle on the soaked wheat bran.
4. In the next day, transfer/sprinkle the newly hatched housefly maggots into the round basin containing diet and maggots will feed the diet for 6-7 days.
5. Separate and collect the housefly maggots on 7th day in summer and 9th day in winter by using mosquito net then sprinkle saw dust for pupation.
6. Collect the pupae in 2-3 days after pupation using wire mesh by sieving for parasitization.
7. Keep required quantity of housefly pupae in a rearing cage for further multiplication

8. Keep milk powder and sugar (1:1 ratio) in one Petri dish (container) and cotton swab dipped in water in another Petri dish as feed for adult houseflies in the rearing cage.
9. Keep the diets in a rearing cage 6-7 days after emergence to attract houseflies for egg laying.

Steps involved in the parasitization of housefly pupae by using adult female of *N. thymus* for commercial production:

1. After emergence of parasitoid, *N. thymus* provide feed containing honey and water at the ratio of 1:1 dipped in a cotton swab/thick plastic strip.
2. Allow the emerged adults of *N. thymus* for 8-10 hours for mating.
3. Transfer the 2-3 days old cleaned housefly pupae to the container containing *N. thymus* and allow to parasitize for four days at parasitoid host ratio of 1:20.
4. Collect the housefly pupae after parasitization and keep in a container for 10-12 days in summer and 20-25 days in winter for emergence of *N. thymus* adults.
5. Collect the houseflies if any emerged from un-parasitized pupae on 12th day.
6. Collect the parasitized pupae and pack in a perforated boxes and supply to the farmers
7. Provide honey to parasitoids immediately after emergence and allow 8-10 hours for mating then release in the field during evening hours.

Note: Maintain optimum temperature (20-25°C) and humidity (60-70%) in the laboratory for mass production of parasitoids/house fly cultures in the laboratory.

RESULTS AND DISCUSSION

The experimental results on recommendation, release schedule and economics of mass production of *N. thymus* is presented in the Table 1 & 2.

Recommendation of parasitoid, *N. thymus* for 100 disease free layings (DFL's):

The collected housefly pupae were kept in a container for 10-12 days in summer and 20-25 days in winter for emergence then 50% honey was provided for *N. thymus* immediately after emergence. The parasitoids will be released in the field during evening hours after 8-10 hrs of mating. For 100 Disease free layings (DFLs) of muga silkworm larvae, 60,000 numbers (6 pouches) of parasitoids will be released in the rearing field for six releases @ 10000/release at an interval of 5-7 days, once in 2nd, 3rd, 4th & 5th instar, spinning and grainage stage. The parasitoid to be released in the centre of the field by opening the lid of the container, the parasitoids was comes out in search of Uzi fly pupae for parasitization (Table 1).

Economic indicators for mass production of *N. thymus* in the laboratory:

Standard protocol was developed for mass production of *N. thymus* on *M. domestica* pupae under laboratory conditions by maintaining optimum temperature and relative humidity. Results indicates that, initial establishment cost of rupees 0.74 lakh and consumables cost of rupees 0.197 lakh is required for production of 10 lakh *N. thymus* (1000 pouches) adults for covering 20,000

disease free layings (DFLs) of muga silk worm. It is also indicates that a benefit of rupees 2.03 was obtained at every rupee spent (Table 2).

ACKNOWLEDGEMENTS

Author is highly thankful to the Director, Central Muga Eri Research and Training Institute, Central Silk Board, Jorhat, Assam for providing facilities to carryout the experiments.

LITERAURE CITED

Anonymous. 1996, Annual report, Regional Muga Research Station, Boko, Assam. pp. 17.

Anonymous. 2007. A diagnostic manual for disease and pests of muga silk worm and their host plants. Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles: Govt. of India, Lahdoigarh, Jorhat, Assam. p. 1-47.

Anonymous. 2009, Annual report, Central Silk Board, Bangalore. pp. 113.

Eswara Reddy, S. G. 2010a. Annual report, Central Muga Eri Research & Training Institute, Central Silk Board, Lahdoigarh, Jorhat, Assam. pp. 27-28.

Eswara Reddy, S. G. 2010b. Present Status of Uzi fly, *Exorista bombycis* (Louis) (Diptera:Tachinidae) incidence in muga silkworm, *Antheraea assamensis* Helfer (Lepidoptera:Saturniidae) in Upper Assam. Paper presented in National seminar on Seri-Bio diversity of North East India and its Conservation & Prospects held on 28-29 Jan. 2011.pp.69. Organized by Department of Zoology, Dhing College, Nagaon, Assam (India).

Narayanaswamy, K. C. & Devaiah, M. C. 1998. Silkworm Uzi fly.p.1-232. Zen publishers, No. 1489, 40th Cross, 4th "T" Block, Jayanagar, Bangalore, Karnataka (India).

Table 1. Recommendations and release schedule of parasitoids per 100 DFL's.

Total number of parasitoids to be released	:	60,000 No. (6 pouches)
Number of parasitoids/release	:	10,000 No. (1 pouch)
Number of releases	:	6
Interval of release	:	5-7 days
When to release?		
Larval stage	:	Once in 2 nd , 3 rd , 4 th & 5 th instar
Spinning stage	:	Once
Grainage	:	Once
How to release?	:	Open the lid/muslin cloth covered with container containing parasitoids and keep in the centre of rearing field

Table 2. Economics for mass production/unit/month.

Particulars	Amount (Rs.)
A. Initial Establishment cost	Rs. 74,000.00
B. Depreciation cost @ 5%	Rs. 3,700.00
Monthly expenditure	
C. Consumables	Rs. 13,500.00
D. Building rent	Rs. 2,500.00
Total production cost/unit/month (B+C+D)	Rs.19,700.00
Production capacity/month	1000 pouches
Selling price/pouch	Rs. 40.00
Sale proceed/unit/month (Rs.40 x 1000)	Rs. 40,000.00
Benefit Cost Ratio (BCR)	Rs. 2.03:1.0

EFFECT OF DIFFERENT SEASON ON CROP PERFORMANCE OF PARENTAL STOCK RACES OF BIVOLTINE SILKWORM (*BOMBYX MORI* L.)

**V. K. Rahmathulla, C. M. Kishor Kumar, A. Manjula*
and V. Sivaprasad****

P3 Basic Seed Farm, National Silkworm Seed Organization, Ring Road, Mysore, Karnataka, INDIA- 570 008. *, ** - National silkworm Seed Organization, Head office, Bangalore. E-mail: rahmathullavk@yahoo.co.in

[Rahmathulla, V. K., Kishor Kumar, C. M., Manjula, A. & Sivaprasad, V. 2011. Effect of different season on crop performance of parental stock races of Bivoltine silkworm (*Bombyx mori* L.). Munis Entomology & Zoology, 6 (2): 886-892]

ABSTRACT: Study analyzed the various seasonal (summer, rainy and winter) effects on important cocoon and seed production parameters of parental silkworm stock race rearing conducted during the period of 2007- 2010 at basic seed farm. Popular elite bivoltine pure silkworm races like CSR2, CSR4, CSR6, CSR26, CSR27 and traditional bivoltine pure race NB4D2 were reared. Performances of the different races were analyzed and studied the seasonal effects. All the races showed better productivity and quality in rainy and winter season when compared to summer season. The results indicated that rearing performance and seed production parameters were comparatively better for CSR2, CSR6, CSR26 and CSR27 during rainy season. The traditional bivoltine dumb-bell race NB4D2 and elite bivoltine dumb-bell race CSR4 performed well during winter season for rearing as well as seed production parameters. During summer most of the rearing and seed parameters of NB4D2 recorded higher when compared to all other races and the rearing parameters like yield /100 dfls (76.61kg), pupation rate (94.29%) and recovery percentage of Dfls (32.75%) recorded comparatively higher than other races. The results of the study conclude that the races NB4D2 and CSR2 have performed well in all the seasons for most of the parameters studied and indicated the stabilized expression for the racial characters.

KEY WORDS: Parental stock races, seasonal effect, rearing and seed production parameters.

Maintenance and multiplication of bivoltine parental stock races of silkworm is very much important in the quality silk production. If proper maintenance and management is not followed in seed crop rearing, the racial characters will show variation and there by affecting seed cocoon quality. Though, a 3 tier system of multiplication of race is practiced in India, the quality of the cocoons produced are not in conformity with the breed characters in many occasions, this may be due to the various factors including the exposure of breeds to adverse environmental conditions. Unlike temperate climate, the tropical climate of India is characterized by wide fluctuation in temperature, humidity and associated micro and macro environmental conditions. The hot environmental conditions of tropics prevailing particularly in summer are not conducive to high yielding productive breeds. However, in order to introduce bivoltine silkworm races in a tropical condition like India, it is highly necessary to have stability in cocoon crop performance under varied agro- climatic conditions. The basic seed farms under Government sectors are established for the purpose of stock maintenance, true to the breed characters and it is most important link in the entire chain of basic seed multiplication. Maintenance of racial characteristics is always a difficult task because in each life-cycle of silkworm, the environmental condition of rearing are different and also varies quality and nutritive value of leaf. Several workers already pointed out the importance of optimum temperature and humidity conditions favorable for seed crop rearing (Reddy et al. 2001; Palit et al. 2003).

Researchers assessed the seasonal effect on seed crop rearing (Bhat, 1989; Kumar et al., 2003; Jaiswal & Gangwar). The present study analyzed the various seasonal effects on important cocoon and seed production parameters of parental stock silkworm rearing.

MATERIAL AND METHODS

Study location- The study area P3 basic seed farm is located in Mysore, Karnataka, India and it has situated at 12° 18'N 76°39'E 12.30°N 76.65° E and has an average altitude of 770 meters (2,526 ft). It is in the southern region of the state of Karnataka, at the base of the famous Chamundi Hills and spreads across an area of 128.42 km². The summer season is from March to middle of June, followed by the monsoon season from middle of June to October and the winter season from November to February middle. The highest temperature recorded in Mysore was 38.5° c (101 ° F) and in winter, temperatures as low as 9.6 °C (49 ° F) have been recorded. The average annual rainfall received by the city is 798.2mm (Fig. 1).

Study material. The parental silkworm races like CSR2, CSR4, CSR6, CSR26, and CSR27 used for the present study were evolved by silkworm breeders of Central Sericulture Research and Training Institute, Mysore with the collaboration of Japanese experts. These breeds are popular for high survivability, high yield and high silk ratio and these races are suitable to rear under Indian environmental conditions. These pure races are using for producing popular bivoltine hybrids and double hybrids and cocoon from these hybrids are producing superior quality bivoltine silk matching with the international standards. The NB4D2 is a traditional bivoltine race in India and commonly used for producing cross breed hybrid (multivoltine x bivoltine).

The study analyzed the various seasonal (summer, Rainy and winter) effects on important cocoon and seed parameters of parental stock rearing conducted during the period of 2007- 2010. Altogether 26 seed crop rearing was conducted during the period of study and the above-mentioned races were reared cellular batches as per the standard recommendation. Quality mulberry leaves of V1 variety was provided to silkworm and performances of the different races were assessed and cocoon yield, quality parameters and seed production parameters were calculated. The data of different years pooled based on season and analyzed the effects of different season on cocoon and seed production parameters. The below mentioned formulae were used for calculation of important cocoon and seed production parameters.

$$\text{Silk ratio} = \frac{\text{Cocoon shell weight}}{\text{Cocoon weight}} \times 100$$

$$\text{Yield/100 dfls} = \frac{\text{Total cocoon harvested (Kg.)}}{\text{No. of Dfls brushed}} \times 100$$

$$\text{Effective rearing rate (ERR) by no or Weight} = \frac{\text{No of cocoon harvested by No. or Kg.}}{\text{No. of larvae brushed}} \times 10000$$

$$\text{Pupation rate} = \frac{\text{No. of live pupae inside cocoon}}{\text{No. of cocoon counted}} \times 100$$

RESULTS AND DISCUSSION

Rearing parameters. All the races showed better productivity in quality and quantity aspects during rainy and winter season when compared to summer season and detailed results are discussed below and presented in Table 1. Hatching percentage was slightly less during summer season when compared to other season. In winter majority of the races hatching percentage was higher however, highest hatching percentage was observed in NB4D2 (96.57%) during summer season.

Effective rearing rate (E.R.R) (yield /10000 larvae) indicates that survivability of the breed and its quantitative performance in weight. The races like CSR2, CSR27, and CSR26 performed well during rainy season when compared to summer and winter. However, the dumbbell races like CSR4 and NB4D2 performed well in winter season. It was interesting to note that the traditional bivoltine race of India (NB4D2) performed equally well in summer season (Effective rearing rate (ERR) by no 9646). E.R.R. of larvae by weight also showed similar trend except CSR4 and NB4D2 all other races performed well in winter season. Highest weight was recorded for CSR6 (18.26 kg) in rainy season. There is direct correlation between metabolic responses of the poikilothermic silkworm to temperature. Food consumption, utilization and subsequent development are greatly influenced by atmospheric temperature and humidity during the crop (Benjamin et al., 1986).

Yield/100 dfl by no and weight also indicates yield performance of the race. Higher value was recorded for majority of the races (CS6, CSR26, and CSR2 & CSR27) during rainy season. But NB4D2 and CSR4 registered better performance during winter season and higher value yield/100 dfls by no. was recorded for NB4D2 (51116) and this race equally performed well in summer season also (48862). Same trend was recorded for yield /100 dfls by weight.

Single cocoon weight was recorded higher during rainy season for majority of the races (CSR6, CSR26, and CSR2 & CSR27). CSR4 race performed comparatively well in winter and higher cocoon weight was recorded (1.748g). Similarly, higher shell weight was recorded for CSR2 (0.42g) and CSR27 (0.45g) during rainy season. Shell ratio was also followed the same trend and registered higher value during rainy season for the above races. Insects evolved a variety of strategies to acquire and accumulate energy from nutrient and water from food in given environmental condition (Muthukrishnan & Pandian, 1987).

Pupation rate also recorded higher during rainy season for CSR6, CSR26, CSR2 and CSR27 and it was recorded higher for CSR4 and NB4D2 during winter season. Cocoon /litre indicate the voluminous nature of cocoon and it was recorded higher during rainy season for CSR2 and CSR27.

Seed production parameters. The study results indicated that melting (dead pupae inside the cocoon) percentage was recorded less for CSR6, CSR26 and CSR27 races during rainy season. CSR4 and NB4D2 recorded less melting percentage during winter season (Table 2). Percentage of pairs and dfls also recorded similar trend and during summer season NB4D2 and CSR4 races were performed well in the above parameters. CSR2 race was performed well in rainy (42.48%) and winter (42.42%). Recovery percentage of dfls was comparatively

low for CSR4 during all the season. However, stabilized performance of rearing recovery percentage of eggs were noticed in CSR2 and NB4D2 races irrespective of season.

COCLUSION

Emphasis should be given to evolve bivoltine breeds suitable to tropical condition for achieving the primary objective of establishing bivoltine sericulture with good quality layings and subsequent raw silk production.

The hot climatic condition of tropic prevailing particularly in summer are contributing to the poor performance of the bivoltine breeds and the most important aspects is that many quantitative characters such as viability and cocoon traits decline sharply when temperature is higher. The study also observed that the traditional bivoltine race NB4D2 and elite race CSR2 irrespective of the season performed well and recorded higher value of yield/100dfls, single cocoon weight and pupation rate during extreme condition of summer. This indicated stable performance of the races and the potentiality of races can be exploited in favourable and unfavourable seasons of southern India.

LITERATURE CITED

- Benchamin, K. V. & Jolly, M. S.** 1986. Studies on ingestion and conversion efficiency in polyvoltine and bivoltine silkworm breeds (*Bombyx mori* L.) Proc. III oriental Entomology Symposium Feb 21-24, Trivandrum, India pp. 195-206.
- Bhat, D. V.** 1989. Temperature and humidity regulation for bivoltine seed rearing: In: Workshop on Sericulture Extension and Management, Central Sericultural Research Training Institute, Mysore, 30-31 August, 1989. p. 65.
- Jaiswal, K. & Gangwar, S. K.** 2003. Comparative study of bivoltine silkworm hybrids of *Bombyx mori* L. under high temperature conditions In: Abstracts of National Seminar on Sustainable Sericulture India, 1-2 February, 2003, Department of Applied Animal Sciences, Babasaheb Bhimrao Ambedkar University, Lucknow, India.p. 62.
- Muthukrishnan, J. & Pandian, T. J.** 1987. Relation between feeding and egg production in some insects. Proceeding of Indian Academy of Science (Anm. Sci.), 96: 171-179.
- Palit, A. K. Suresh Kumar, N. Basavaraja, H. K., Mal Reddy, N. & Kalpana, G. V.** 2003. Stability analysis in bivoltine silkworm breeds for robustness at different temperature at different temperature and humidity condition. Indian J..Seric., 42 (1): 46-49.
- Suresh Kumar, N., Basavaraja, H. K., Kalpana, G. V., Mal Reddy, N. & Dandin, S. B.** 2003. Effect of high temperature and high humidity on the cocoon shape and size of parents, foundation crosses, single and double hybrids of bivoltine silkworm, *Bombyx mori* L. Indian J..Seric., 42 (1): 35-40.
- Vemananda Reddy, G., Venkatachalapathy, M., Manjula, A. & Veeraiah, T. M.** 2001 Influence of temperature during spinning and the impact on reproductive performance of silkworm, *Bombyx mori* L. in summer months.: In: Abstracts of National Seminar on Mulberry Sericulture Research in India, KSSRDI, Thalaghattapura, Bangalore, India, 26-28 November, 2001. p. 183.

Table 1. Performance of silkworm stock races during different seasons.

Season/Race	Fecundity	Hatching (%)	Yield / 10000 larvae (ERR)		Yield / 100 dfls		Single Cocoon Wt.(g)	Single Shell Wt.(g)	Silk ratio (%)	Pupation Rate (%)	No. of cocoons per Liter
			By No.	By Wt. (kg)	By No.	By Wt. (kg)					
Summer											
CSR4	495	92.07	8802	13.77	38008	60.20	1.64	0.34	20.73	91.04	120
NB4D2	536	96.57	9646	15.12	48862	76.61	1.65	0.35	21.18	94.25	107
CSR6	478	88.55	7953	10.20	28295	35.75	1.57	0.35	22.01	86.35	124
CSR26	497.5	90.65	7918	10.05	28335	35.25	1.51	0.33	22.14	86.15	126
CSR2	529.95	93.78	8845	13.54	43038	64.86	1.70	0.39	23.09	91.93	78
CSR27	464.5	90.55	9066	12.31	42205	58.02	1.52	0.35	22.96	86.45	95
Rainy											
CSR4	492.5	92.91	9173	14.83	40485	65.97	1.70	0.37	21.68	92.67	116
NB4D2	548	95.32	9634	16.31	48544	82.49	1.87	0.40	21.32	94.50	97
CSR6	454	94.10	9954	18.26	42526	78.00	1.81	0.38	21.03	94.50	108
CSR26	462	94.89	9923	17.56	43500	77.00	1.77	0.37	21.10	94.80	116
CSR2	537.87	95.57	9448	16.11	47457	80.88	1.77	0.42	23.79	94.60	71
CSR27	476	93.85	9562	17.00	42555	75.54	1.84	0.45	24.28	92.55	70
Winter											
CSR4	490	93.75	9543	15.89	42962	71.75	1.74	0.38	21.88	94.29	112
NB4D2	528	96.44	9809	17.40	51116	90.67	1.81	0.39	21.34	97.50	85
CSR6	507	95.56	8178	12.13	39040	57.90	1.57	0.36	22.65	87.00	118
CSR26	471	93.75	7792	11.96	36423	55.90	1.61	0.37	22.64	86.00	112
CSR2	529.38	96.03	9157	14.60	46284	73.85	1.72	0.40	23.47	90.44	80
CSR27	470	91.25	9089	15.69	42145	69.56	1.70	0.40	23.52	90.34	78

Table 2. Seed production performance of stock races during different seasons.

Season/Race	Melt ing%	Percentage of PAIRS	Recovery of dfls (%)
Summer			
CSR4	2.01	42.57	22.10
NB4D2	2.07	47.43	32.75
CSR6	2.13	39.59	26.09
CSR26	4.75	36.01	23.56
CSR2	3.00	41.57	30.88
CSR27	1.80	37.31	20.46
Rainy			
CSR4	3.51	39.81	24.82
NB4D2	2.52	38.62	31.01
CSR6	1.43	60.00	45.86
CSR26	1.54	55.38	48.92
CSR2	2.62	42.48	35.51
CSR27	1.37	48.21	37.00
Winter			
CSR4	2.75	39.46	27.55
NB4D2	2.79	42.83	33.71
CSR6	3.90	42.67	27.60
CSR26	3.17	45.33	32.27
CSR2	2.49	42.42	33.81
CSR27	1.56	41.23	32.34

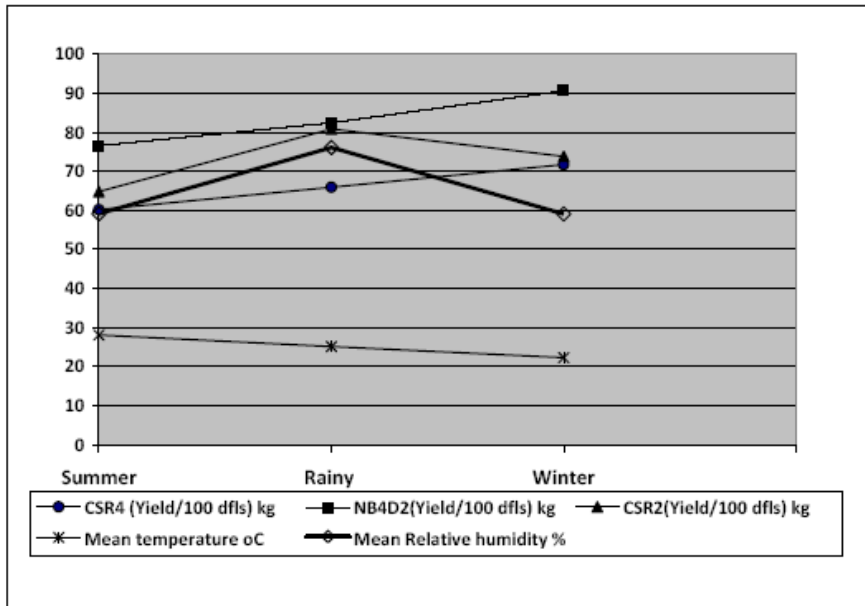


Figure 1. Relation between environmental factors and yield level of different stock races.

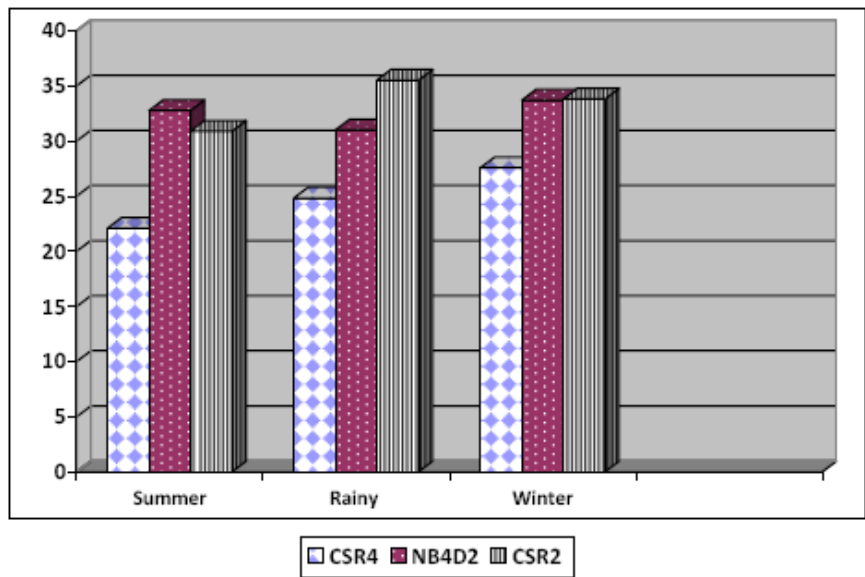


Figure 2. Recovery of DFLs of stock races during different season (%).



Plate 1. Quality mulberry leaves essential for optimum growth of silkworm races.



Plate 2. Matured fifth instar silkworm larva of CSR2 race.



Plate 3. Silkworm moth and laid eggs of CSR2 race.

SOME ADDITIONAL NOTES ON APIONINAE (COLEOPTERA: APIONIDAE) FAUNA OF TURKEY

Serdar Tezcan*, Yusuf Karsavuran* and Esat Pehlivan*

* Department of Plant Protection, Faculty of Agriculture, University of Ege, 35100 Bornova, İzmir/TURKEY. E-mail: serdar.tezcan@gmail.com

[Tezcan, S., Karsavuran, Y. & Pehlivan, E. 2011. Some additional notes on Apioninae (Coleoptera: Apionidae) fauna of Turkey. *Munis Entomology & Zoology*, 6 (2): 893-899]

ABSTRACT: In this paper, some distributional data of 90 species belonging to 11 tribes of Apioninae (Coleoptera: Apionidae) fauna of Turkey housed in the collection of Lodos Entomological Museum, Turkey (LEMT), Ege University, İzmir, Turkey, have been given.

KEY WORDS: Apionidae, Fauna, LEMT, Turkey.

Apionidae fauna of Turkey is quite rich and the studies of Bajtenov & Lodos (1977a,b, 1978a,b, 1980a,b, 1983); Lodos et al. (1978, 2003); Yücel (1991, 1993); Zeren & Yabaş (1984); Hayat et al. (2002) and Pehlivan et al. (2006) have great importance.

In this paper, we would like to evaluate the unpublished Apionidae material of Lodos Entomological Museum, Turkey (LEMT) of Department of Plant Protection, Faculty of Agriculture, Ege University, İzmir, Turkey. Those material have been collected from different localities of Turkey between the years of 1960-1997 by researchers of Plant Protection Department, Faculty of Agriculture, Ege University. Some of them have been published by Prof. Dr. Niyazi Lodos and his colleagues (Lodos et al., 1978; 2003; Pehlivan et al., 2006). Distributional data of some unpublished material have been given in this paper. Those material have been determined by the Late Prof. Dr. Niyazi Lodos and also by Dr. M. S. Bajtenov and Dr. L. Dieckmann. In this paper, classification and nomenclature of Apionidae given by Anonymous (2011) is followed.

RESULTS

APIONINAE

APIONINI

Apion arrogans (Wencker, 1858)

Distribution: Gaziantep (Central province), Mardin (Kızıltepe), Şanlıurfa (Central province-Pınarbaşı). 28 specimens.

Apion cruentatum Walton, 1844

Distribution: Gümüşhane (Kelkit), Sivas (Koyulhisar). 10 specimens.

Apion flavipes Herbst, 1797

Distribution: Adana (Tufanbeyli), Antalya (Finike), Artvin (Borçka), Bitlis (Hizan), İzmir (Ödemiş-Bozdağ), Kahramanmaraş (Göksun), Kayseri (Pınarbaşı), Manisa (Sultanyayla), Muğla (Bodrum, Gelemen), Ordu (Kumru), Samsun (Alaçam, Bafra). 48 specimens.

Apion frumentarium (Linnaeus, 1758)

Distribution: Adıyaman (Central province), Artvin (Borçka), Balıkesir (Kepsut, Manyas), Bilecik (Söğüt), Bitlis (Hizan), Çanakkale (Ayvacık-Küçükkuyu), Diyarbakır (Central province), Erzurum (Şenkaya), İzmir (Bayındır, Bornova, Kemalpaşa), Kütahya (Domaniç), Muğla (Marmaris), Rize (Central province), Sakarya (Taraklı), Samsun (Central province), Tokat (Artova), Trabzon (Akçaabat). 185 specimens.

Apion haematodes (W. Kirby, 1808)

Distribution: Edirne (Central province), İzmir (Ödemiş-Bozdağ), Rize (Central province), Sinop (Gerze). 8 specimens.

***Apion rubens* Stephens, 1839**

Distribution: Edirne (Central province). 1 specimen.

APLEMONINI***Perapion (Perapion) affine* (W. Kirby, 1808)**

Distribution: Bursa (Uludağ), İzmir (Ödemiş-Bozdağ). 2 specimens.

***Perapion (Perapion) hydrolapathi* (Marsham, 1802)**

Distribution: Antalya (Gazipaşa). 6 specimens.

***Perapion (Perapion) oblongum* (Gyllenhal, 1839)**

Distribution: Artvin (Göktaş-Petek). 2 specimens.

***Perapion (Perapion) violaceum* (W. Kirby, 1808)**

Distribution: Bursa (İznik), Muğla (Bodrum). 6 specimens.

***Phrissotrichum (Phrissotrichum) tubiferum* (Gyllenhal, 1833)**

Distribution: Aydın (Kuşadası), Bartın (Kurucaşile), Bilecik (Central province), Bursa (Yenişehir), Çanakkale (Ezine), İzmir (Balçova), Muğla (Milas, Güllük), Niğde (Central province), Trabzon (Central province). 36 specimens.

ASPIDAPIINI***Alocentron (Alocentron) curvirostre* (Gyllenhal, 1833)**

Distribution: Balıkesir (Bigadiç), Bartın (Ulus), Hatay (Belen, Reyhanlı, Yayladağı), İzmir (Ödemiş-Bozdağ, Selçuk, Tire). Konya (Akşehir), Nevşehir (Central province), Van (Muradiye). 25 specimens.

***Aspidapion (Aspidapion) radiolus* (Marsham, 1802)**

Distribution: İzmir (Bornova), Mardin (Yeşilli), Yozgat (Central province). 12 specimens.

***Aspidapion (Koestlinia) aeneum* (Fabricius, 1775)**

Distribution: Antalya (Central province), Balıkesir (Manyas), Kırklareli (Lüleburgaz), Mardin (Central province, Ömerli), Tekirdağ (Central province). 35 specimens.

CERATAPIINI***Ceratapion (Acanephodus) onopordi* (W. Kirby, 1808)**

Distribution: Afyon (Dinar), Ağrı (Taşlıçay), Artvin (Central province), Aydın (Kuşadası), Diyarbakır (Central province, Silvan), Elazığ (Central province), Erzincan (Çayırılı), Erzurum (Central province), Eskişehir (Mahmudiye), Hakkari (Central province), İzmir (Bornova, Selçuk, Tire), Kayseri (Hacılar), Malatya (Central province), Mardin (Nusaybin), Şanlıurfa (Siverek). 35 specimens.

***Ceratapion (Angustapion) beckeri* (Desbrochers, 1875)**

Distribution: Erzurum (Aşkale), İzmir (Ödemiş-Bozdağ), Mardin (Ömerli). 23 specimens.

***Ceratapion (Angustapion) macrorrhynchum* (Eppelsheim, 1888)**

Distribution: Van (Başkale). 1 specimen.

***Ceratapion (Ceratapion) carduorum* (W. Kirby, 1808)**

Distribution: Amasya (Merzifon), Bilecik (Central province), Elazığ (Central province), Erzincan (Central province), İzmir (Bornova, Menemen, Selçuk), Manisa (Central province), Uşak (Central province). 35 specimens.

***Ceratapion (Echinostroma) basicorne* (Illiger, 1807)**

Distribution: Bingöl (Solhan), Elazığ (Central province). 6 specimens.

***Ceratapion (Echinostroma) penetrans* (Germar, 1817)**

Distribution: Bayburt (Central province). 2 specimens.

***Ceratapion (Echinostroma) scalptum* (Mulsant & Rey, 1858)**

Distribution: Artvin (Central province), Aydın (Kuşadası), Bayburt (Central province), Bolu (Mengen), Diyarbakır (Çüngüş, Ergani, Silvan), Erzincan (Central province, Çağlayan), Eskişehir (Mahmudiye), Gaziantep (İslahiye), Kahramanmaraş (Afşin), Kütahya (Tavşanlı), Mardin (Central province), Muğla (Marmaris), Samsun (Bafra), Sirt (Aydınlar), Sivas (Suşehri), Şanlıurfa (Siverek), Trabzon (Central province), Yozgat (Sarıkaya). 44 specimens.

***Diplapion confluens* (W. Kirby, 1808)**

Distribution: Balıkesir (Kepsut), Bolu (Abant, Akçakoca), Diyarbakır (Silvan), Edirne (Central province), Gaziantep (Oğuzeli), Iğdır (Central province), İzmir (Bornova), Kars

(Central province), Kocaeli (İzmit), Malatya (Central province), Muğla (Bodrum, Fethiye), Muş (Solhan), Sinop (Central province), Şanlıurfa (Siverek), Şırnak (Cizre), Tokat (Central province). 20 specimens.

***Diplapion detritum* (Mulsant & Rey, 1858)**

Distribution: İçel (Gülнар). 1 specimen.

***Omphalapion dispar* (Germar, 1817)**

Distribution: Adana (Pozantı), Gaziantep (Oğuzeli), Hatay (Yayladağı), İzmir (Ödemiş-Bozdağ), Kütahya (Simav), Şanlıurfa (Central province-Akziyaret, Siverek). 10 specimens.

***Omphalapion laevigatum* (Paykull, 1792)**

Distribution: Kütahya (Tavşanlı). 1 specimen.

***Omphalapion hookeri* (Kirby, 1808)**

Distribution: İzmir (Ödemiş-Bozdağ). 9 specimens.

EXAPIINI

***Exapion (Exapion) canescens* (Desbrochers, 1889)**

Distribution: Antalya (Manavgat), Kastamonu (Cide). 2 specimens.

***Exapion (Exapion) corniculatum* (Germar, 1817)**

Distribution: İzmir (Ödemiş, Seferihisar). 3 specimens.

***Exapion (Exapion) winkleri* (Wagner, 1912)**

Distribution: Bolu (Mengen), Kastamonu (Cide), Zonguldak (Çaycuma). 33 specimens.

IXAPIINI

***Trichopterapion holosericeum* (Gyllenhal, 1833)**

Distribution: Artvin (Central province), Kırklareli (Vize), Konya (Hadım), Ordu (Perşembe, Ünye), Samsun (Bafra). 49 specimens.

KALCAPIINI

***Kalcapion croceifemoratum* (Gyllenhal, 1839)**

Distribution: Muğla (Bodrum), Osmaniye (Hasanbeyli). 81 specimens.

***Kalcapion flavifemoratus* (Herbst, 1797)**

Distribution: Aydın (Kuşadası), İzmir (Tire), Manisa (Central province-Suİtanyayla). 10 specimens.

***Kalcapion semivittatum* (Gyllenhal, 1833)**

Distribution: İzmir (Bornova, Çeşme), Muğla (Bodrum), Ordu (Ünye), Trabzon (Akçaabat). 50 specimens.

***Melanapion (Melanapion) minimum* (Herbst, 1797)**

Distribution: Kütahya (Central province). 3 specimens.

***Squamapion atomarium* (W. Kirby, 1808)**

Distribution: Sivas (Suşehri). 4 specimens.

***Squamapion elongatum* (Germar, 1817)**

Distribution: Antalya (Kumluca). 6 specimens.

***Squamapion origani* (Planet, 1918)**

Distribution: Artvin (Borçka). 1 specimen.

***Squamapion phocopus* (Eppelsheim, 1888)**

Distribution: Muş (Solhan). 2 specimens.

***Squamapion jordanianum* (Voss, 1965)**

Distribution: Elazığ (Hazar), Mardin (Nusaybin, Ömerli). 3 specimens.

***Taeniapion rufescens* (Gyllenhal, 1833)**

Distribution: Aydın (Bozdoğan), İzmir (Çeşme). 17 specimens.

***Taeniapion rufulum* (Wencker, 1864)**

Distribution: Antalya (Central province), İzmir (Bornova, Çeşme, Tire). 27 specimens.

***Taeniapion urticarium* (Herbst, 1784)**

Distribution: Antalya (Finike), Artvin (Borçka), Erzurum (Central province), Samsun (Kavak), Trabzon (Akçaabat). 35 specimens.

MALVAPIINI

***Pseudapion malvae* (Fabricius, 1775)**

Distribution: Adana (Central province), Ankara (Şereflikoçhisar), Aydın (Kuşadası), Bitlis (Tatvan), Çanakkale (Gökçeada), Elazığ (Central province), İzmir (Dikili, Kemalpaşa, Mordoğan), Manisa (Gördes), Mardin (Nusaybin), Muğla (Dalaman), Tekirdağ (Şarköy), Uşak (Central province). 102 specimens.

***Pseudapion fulvirostre* (Gyllenhal, 1833)**

Distribution: Muğla (Milas, Güllük). 2 specimens.

***Pseudapion rufirostre* (Fabricius, 1775)**

Distribution: Aydın (Kuşadası), Erzincan (Central province), İzmir (Balçova, Bornova). 9 specimens.

***Rhopalapion longirostre* (Olivier, 1807)**

Distribution: Ağrı (Central province), Bingöl (Solhan), Denizli (Pamukkale), Diyarbakır (Devegeçidi), Elazığ (Central province), İzmir (Buca), Mardin (Central province), Siirt (Aydınlı, Central province), Zonguldak (Ereğli). 47 specimens.

OXYSTOMATINI

***Catapion burdigalense* (Wencker, 1859)**

Distribution: Gaziantep (Central province), Hakkari (Şemdinli), Mardin (Ömerli). 14 specimens.

***Catapion corsicum* (Desbrochers, 1888)**

Distribution: Kastamonu (Taşköprü). 1 specimen.

***Catapion cyanellum* (Desbrochers, 1896)**

Distribution: Hakkari (Şemdinli). 4 specimens.

***Catapion lodosi* Hoffmann, 1954**

Distribution: Gaziantep (Central province), Kütahya (Central province). 2 specimens.

***Catapion pubescens* (W. Kirby, 1811)**

Distribution: Balıkesir (Manyas), Çanakkale (Gökçeada), İzmir (Ödemiş), Siirt (Central province). 4 specimens.

***Catapion seniculus* (W. Kirby, 1808)**

Distribution: Antalya (Central province), Artvin (Borçka, Murgul), Aydın (Söke), Balıkesir (Manyas), Bolu (Abant), Çanakkale (Bayramiç), Diyarbakır (Central province), Erzincan (Central province, Çağlayan), Gaziantep (Oğuzeli), Kayseri (Central province), Manisa (Central province, Sultanyayla), Samsun (Bafra), Şanlıurfa (Siverek). 57 specimens.

***Catapion curtulum* (Desbrochers, 1870)**

Distribution: İzmir (Ödemiş-Bozdağ, Tire), Muğla (Bodrum), Samsun (Alaçam), Uşak (Central province). 15 specimens.

***Cyanapion (Bothryorrhynchapion) gyllenhalii* (W. Kirby, 1808)**

Distribution: Ağrı (Taşlıçay), Bilecik (Central province), Van (Başkale). 7 specimens.

***Eutrichapion (Cnemapion) gribodoi* (Desbrochers, 1896)**

Distribution: Bursa (Uludağ), İzmir (Beydağ). 5 specimens.

***Eutrichapion (Cnemapion) vorax* (Herbst, 1797)**

Distribution: Aydın (Kuyucak), Balıkesir (Gönen, Manyas), Bursa (Central province), Denizli (Central province), İzmir (Bayındır, Beydağ, Tire), Kahramanmaraş (Göksun), Van (Saray). 36 specimens.

***Eutrichapion (Eutrichapion) viciae* (Paykull, 1800)**

Distribution: Aydın (Kuşadası), Bilecik (Bozüyük), Çorum (Central province), Denizli (Pamukkale), Isparta (Aksu, Eğirdir), İzmir (Bayındır, Bornova-Pınarbaşı, Menderes-Gümüüşsü, Balçova-İnciraltı, Kemalpaşa, Tire), Kars (Central province), Kocaeli (İzmit-Central province), Kütahya (Tavşanlı), Sivas (Suşehri), Tekirdağ (Central province). 120 specimens.

***Eutrichapion (Psilocalymma) facetum* (Gyllenhal, 1839)**

Distribution: Adana (Kozan), Ağrı (Central province), Bursa (Central province), Erzincan (Central province), Erzurum (Aşkale), Gaziantep (Oğuzeli), İzmir (Bornova, Kemalpaşa, Tire), Malatya (Central province), Muğla (Yatağan), Samsun (Bafra). 44 specimens.

***Eutrichapion (Psilocalymma) punctiger* (Paykull, 1792)**

Distribution: Aydın (Sultanhisar), Denizli (Central province), Diyarbakır (Central province), Edirne (Central province), Muş (Central province). 13 specimens.

***Hemitrichapion (Dimesomyops) pavidum* (Germar, 1817)**

Distribution: Artvin (Borçka). 1 specimen.

***Hemitrichapion (Tinocyba) reflexum* (Gyllenhal, 1833)**

Distribution: İzmir (Ödemiş-Birgi). 2 specimens.

***Hemitrichapion (Tinocyba) insidiosum* (Desbrochers, 1875)**

Distribution: Bitlis (Çukur). 1 specimen.

***Holotrichapion (Apiops) pisi* (Fabricius, 1801)**

Distribution: Artvin (Central province), Balıkesir (Manyas), Bitlis (Hizan), Bolu (Central province), Diyarbakır (Lice), Hakkari (Yüksekova), İzmir (Balçova, Kemalpaşa, Narlıdere, Ödemiş-Bozdağ, Torbalı), Samsun (Tekkeköy), Uşak (Eşme). 308 specimens.

***Holotrichapion (Apiops) pullum* (Gyllenhal, 1833)**

Distribution: Aksaray (Ortaköy), Batman (Kozluk), Diyarbakır (Central province), Erzincan (Çayırılı, Tercan), Erzurum (Central province), Kayseri (Central province), Malatya (Central province), Mardin (Ömerli), Muğla (Köyceğiz), Muş (Hasköy), Osmaniye (Hasanbeyli), Samsun (Central province), Şanlıurfa (Siverek), Tunceli (Central province). 102 specimens.

***Holotrichapion (Legaricapion) gracilicolle* (Gyllenhal, 1839)**

Distribution: İzmir (Ödemiş-Bozdağ), Manisa (Central province, Sultanyayla). 5 specimens.

***Loborhynchapion amethystinum* (Miller, 1857)**

Distribution: Bolu (Abant). 1 specimen.

***Oxystoma cerdo* (Gerstaecker, 1854)**

Distribution: Çorum (Central province). 2 specimens.

***Oxystoma craccae* (Linnaeus, 1767)**

Distribution: Antalya (Kaş), Bursa (İznik, Mudanya), Uşak (Central province). 12 specimens.

***Oxystoma ochropus* (Germar, 1818)**

Distribution: Ağrı (Doğubeyazıt), İzmir (Tire), Ordu (Ünye), Rize (Central province), Samsun (Kavak), Yozgat (Central province). 18 specimens.

***Oxystoma pomonae* (Fabricius, 1798)**

Distribution: Ordu (Ünye), Sinop (Boyabat). 5 specimens.

***Ischnopterapion (Ischnopterapion) loti* (W. Kirby, 1808)**

Distribution: Ağrı (Doğubeyazıt), Bolu (Mengen). 3 specimens.

***Ischnopterapion (Ischnopterapion) modestum* (Germar, 1817)**

Distribution: Bartın (Kurucaşile). 1 specimen.

***Stenopterapion (Stenopterapion) tenue* (W. Kirby, 1808)**

Distribution: Artvin (Central province), Balıkesir (Manyas), Diyarbakır (Silvan), Hakkari (Yüksekova), Iğdır (Central province), İzmir (Narlıdere), Kars (Kağızman), Kayseri (Central province), Samsun (Bafra), Sinop (Central province), Trabzon (Central province). 48 specimens.

PIEZOTRACHELINI***Protapion dissimile* (Germar, 1817)**

Distribution: Adana (Kozan), Artvin (Central province), Aydın (Söke), Çanakkale (Gökçeada), Diyarbakır (Ergani, Silvan), Edirne (Central province), Hakkari (Şemdinli), İçel (Silifke), Kars (Central province), Mardin (Midyat, Ömerli), Muğla (Köyceğiz), Samsun (Bafra), Sinop (Central province), Şanlıurfa (Siverek), Şırnak (Cizre). 44 specimens.

***Protapion assimile* (W. Kirby, 1808)**

Distribution: Erzurum (Central province), Gümüşhane (Şiran). 2 specimens.

***Protapion apricans* (Herbst, 1797)**

Distribution: İzmir (Tire). 2 specimens.

***Protapion brenskei* (Desbrochers, 1895)**

Distribution: Balıkesir (Manyas), Bursa (İznik), İzmir (Bornova-Pınarbaşı, Menemen, Tire), Karaman (Ayrancı), Manisa (Central province-Sultanyayla), Muğla (Köyceğiz), Muş (Solhan). 12 specimens.

***Protapion dentipes* (Gerstaecker, 1854)**

Distribution: İzmir (Bornova, Ödemiş- Bozdağ), Manisa (Central province, Sultanyayla). 5 specimens.

***Protapion fulvipes* (Geoffroy, 1785)**

Distribution: Adana (Tufanbeyli), Antalya (Finike), Ardahan (Damal), Artvin (Borçka), Aydın (Köşk, Kuşadası), Bitlis (Hizan), Bursa (Uludağ), Çanakkale (Gökçeada), İzmir (Ödemiş-Bozdağ, Tire), Kahramanmaraş (Göksun), Kastamonu (Pınarbaşı), Manisa (Central province-Sultanyayla, Gördes), Muğla (Bodrum), Ordu (Kumru, Ünye), Sakarya (Hendek), Samsun (Alaçam, Bafra). 75 specimens.

***Protapion interjectum* (Desbrochers, 1895)**

Distribution: Artvin (Borçka), Aydın (Kuşadası), Gümüşhane (Şiran), İzmir (Ödemiş). 4 specimens.

***Protapion laevicollae* (W. Kirby, 1811)**

Distribution: Bingöl (Solhan), Manisa (Central province-Sultanyayla). 6 specimens.

***Protapion nigrifemur* (W. Kirby, 1808)**

Distribution: Aydın (Kuşadası), İzmir (Ödemiş, Tire), Kars (Central province), Van (Gevaş). 7 specimens.

***Protapion ononidis* (Gyllenhal, 1827)**

Distribution: Bolu (Mengen), Konya (Ereğli), Sinop (Ayancık). 19 specimens.

***Protapion ruficrus* (Germar, 1817)**

Distribution: Ardahan (Göle). 1 specimen.

***Protapion schoenherri* (Boheman, 1839)**

Distribution: Ordu (Kumru), Şırnak (Uludere). 5 specimens.

***Protapion trifolii* (Linnaeus, 1768)**

Distribution: Ağrı (Doğubeyazıt), Aydın (Bozdoğan), Balıkesir (Gönen, Manyas), Batman (Beşiri, Kozluk), Bingöl (Solhan), Bitlis (Hizan), Bursa (Central province), Diyarbakır (Çermik, Silvan), Erzurum (Aşkale), Gaziantep (Central province), Hakkari (Çukurca), İstanbul (Bakırköy), İzmir (Central province, Bornova-Pınarbaşı, Menemen, Selçuk), Karaman (Ayrancı), Kırıkkale (Keskin), Kırşehir (Mucur), Kocaeli (Kandıra), Kütahya (Domaniç), Manisa (Alaşehir, Central province-Sultanyayla), Mardin (Nusaybin, Ömerli), Muğla (Dalaman), Muş (Eşmeşpınar), Samsun (Central province, Bafra), Siirt (Aydınlı). 89 specimens.

***Protapion truquii* (Reiche & Saulcy, 1858)**

Distribution: Artvin (Central province), Balıkesir (Balya, Bigadiç, Gönen, Manyas, Susurluk), Batman (Kozluk), Bilecik (Gölpazarı), Bingöl (Solhan), Bitlis (Tatvan), Diyarbakır (Bismil, Çermik, Çüngüş), Edirne (Keşan), Erzurum (Central province), Hakkari (Central province), İzmir (Beydağ, Bornova, Kiraz, Urla-Zeytinale), Kars (Kağızman), Kocaeli (Gölcük), Manisa (Alaşehir), Mardin (Midyat, Nusaybin, Ömerli), Muğla (Köyceğiz), Muş (Korkut), Samsun (Bafra), Siirt (Central province), Şanlıurfa (Harran, Siverek), Şırnak (Cizre), Van (Gevaş). 280 specimens.

***Protapion varipes* (Germar, 1817)**

Distribution: Ankara (Hasanoğlu), Artvin (Borçka), Aydın (Söke), Erzincan (Tercan). 5 specimens.

***Pseudoprotapion astragali* (Paykull, 1800)**

Distribution: Manisa (Gördes). 8 specimens.

***Pseudoprotapion elegantulum* (Germar, 1818)**

Distribution: Adana (Central province), Antalya (Central province), Samsun (Central province). 14 specimens.

In consequence of this study, it has been observed that a total of 2486 specimens of 90 species belonging to 27 genera of 11 tribes of Apioninae (Apionidae) have been reported from the collection of Lodos Entomological Museum, Turkey (LEMT). Among these *Holotrichapion (Apiops) pisi* (Fabricius,

1801), *Protapion truquii* (Reiche & Sauley, 1858) and *Apion frumentarium* (Linnaeus, 1758) are richer species than others.

ACKNOWLEDGEMENTS

Authors would like to thank Dr. Nilay Gülperçin and Miray Alyürek for their contributions to this paper.

LITERATURE CITED

- Anonymous.** 2011. Apionidae. Fauna Europaea, version 2.4. (18 March, 2011).
- Bajtenov, M. S. & Lodos, N.** 1977a. A new species of *Apion* Hbst. from Turkey (Coleoptera: Curculionidae). Ege Üniversitesi Ziraat Fakültesi Dergisi, 14 (3): 1-5.
- Bajtenov, M. S. & Lodos, N.** 1977b. Espaces nouvelles du genre *Apion* Herbst. (Col.: Curculionidae) de la Turquie orientale. Türkiye Bitki Koruma Dergisi, 1: 5-8.
- Bajtenov, M. S. & Lodos, N.** 1978a. Eine neue Art die Untergattung *Thymapion* aus der Türkei (Coleoptera: Curculionidae). Türkiye Bitki Koruma Dergisi, 2 (2): 93-95.
- Bajtenov, M. S. & Lodos, N.** 1978b. Zwei neue Arten der Untergattung *Ceratapion* Schilsky aus der Türkei (Coleoptera: Curculionidae). Türkiye Bitki Koruma Dergisi, 2: 145-149.
- Bajtenov, M. S. & Lodos, N.** 1980a. Some new species of weevils (Coleoptera: Curculionidae) from Palearctic. Türkiye Bitki Koruma Dergisi, 4: 143-148.
- Bajtenov, M. S. & Lodos, N.** 1980b. Notizen über Apionen (Coleoptera, Curculionidae) in der Türkei. Türkiye Bitki Koruma Dergisi, 4: 229-230.
- Bajtenov, M. S. & Lodos, N.** 1983. Seltene und vom Aussterben bedrohten Arten von Apionen (Col. Curculionidae) der Türkei (Materialen zum "Roten Buch der Insecten der Türkei"). Türkiye Bitki Koruma Dergisi, 7: 91-104.
- Hayat, R., Güçlü, Ş., Özbek, H. & Schön, K.** 2002. Contribution to the knowledge of the families Apionidae and Nanophyidae (Coleoptera: Curculionoidea) from Turkey, with new records. Phytoparasitica, 30 (1): 25-37.
- Lodos, N., Önder, F., Pehlivan, E. & Atalay, R.** 1978. Ege ve Marmara Bölgesinin Zararlı Böcek Faunasının Tesbiti Üzerinde Çalışmalar [Curculionidae, Scarabaeidae (Coleoptera); Pentatomidae, Lygaeidae, Miridae (Heteroptera)]. Gıda-Tarım ve Hayvancılık Bakanlığı, Zirai Mücadele ve Zirai Karantina Genel Müdürlüğü Yayını, Ankara, 301 pp.
- Lodos, N., Önder, F., Pehlivan, E., Atalay, R., Erkin, E., Karsavuran, Y., Tezcan, S. & Aksoy, S.** 2003. Faunistic studies on Curculionidae (Coleoptera) of Western Black Sea, Central Anatolia and Mediterranean Regions of Turkey. Meta Basım, Bornova, İzmir, 83 pp.
- Pehlivan, E., Karsavuran, Y. & Tezcan, S.** 2006. An evaluation on Apionidae (Coleoptera) material housed in the Lodos Entomological Museum (LEMT), İzmir (Turkey). VIIIth European Congress of Entomology, 17-22 September 2006, İzmir, Turkey. Abstract Book, 160 pp., 119.
- Yücel, A.** 1991. Untersuchungen zur Morphologie, Biologie und Schaden von *Apion arrogans* Wencker (Coleoptera, Curculionidae) in Südost Anatolien. Türkiye Entomoloji Dergisi, 15: 223-228.
- Yücel, A.** 1993. Beobachtungen über den Morphologie, Schaden und Verbreitungen von *Apion (Protapion) truquii* Reiche (Coleoptera, Curculionidae) in der provinz Şanlıurfa. Türkiye Entomoloji Dergisi, 17: 169-174.
- Zeren, O. & Yavaş, C.** 1984. Observations on *Apion arrogans* Wencker (Coleoptera: Curculionidae), a new pest of lentil in Gaziantep Province. Türkiye Bitki Koruma Dergisi, 8: 121-124.

**A PROPOSE FOR ACCEPTION OF A SINGLE GENUS AS
JUDOLIA MULSANT, 1863 INSTEAD OF THE GENERA
JUDOLIA MULSANT, 1863 AND *PACHYTODES* PIC, 1891
(COLEOPTERA: CERAMBYCIDAE: LEPTURINAE: LEPTURINI)**

Hüseyin Özdikmen*

* Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 06500 Ankara / TÜRKİYE. E-mail: ozdikmen@gazi.edu.tr

[Özdikmen, H. 2011. A propose for acception of a single genus as *Judolia* Mulsant, 1863 instead of the genera *Judolia* Mulsant, 1863 and *Pachytodes* Pic, 1891 (Coleoptera: Cerambycidae: Lepturinae: Lepturini). Munis Entomology & Zoology, 6 (2): 900-904]

ABSTRACT: The paper presents a propose to use a single generic name, *Judolia* Mulsant, 1863 as valid instead of the genera *Judolia* Mulsant, 1863 and *Pachytodes* Pic, 1891. Since, M. Pic simplistically claimed the name *Pachytodes* as a subgenus of ancient genus *Judolia* Mulsant, 1863. His claim based on only a few speculative characters. In fact the characters of the North American *Judolia* does not allow to definite the subgenus *Pachytodes*.

KEY WORDS: *Judolia*, *Pachytodes*, Lepturini, Lepturinae, Cerambycidae, Coleoptera.

At present, *Judolia* and *Pachytodes* regarded as separate genera in the tribe Lepturini. In this case, the genus *Judolia* has Holarctic chorotype, while the genus *Pachytodes* has Palaearctic chorotype.

The genus *Judolia* was described by Mulsant (1863: 496) on the base of the species *Leptura sexmaculata* (Linnaeus, 1758), *Leptura cerambyciformis* (Schränk, 1781) and *Leptura erratica* (Dalman, 1817). The original description of Mulsant as follows:

Genre Judolia, Judolie,

CARACTÈRES. Tête suivie après les yeux d'une boursofflure des tempes, et brusquement rétrécie après cette boursofflure. Prothorax muni en devant d'un rebord étroit, non suivi d'un sillon transversal; élargi en ligne courbe, à partir de ce rebord, jusqu'aux deux cinquièmes ou un peu plus de ses côtés; subarrondi dans ce point chez les uns; subanguleux chez les autres, rétréci en devant des angles postérieurs: ceux-ci, dilatés en une pointe dépassant un peu la fossette humérale des élytres; sillonné au-devant de la base. Yeux notablement échancrés. Antennes insérées vers l'angle antérieur de l'échancrure des yeux; visiblement moins avancées au bord antérieur de leur base, que celui des yeux; à premier article ordinairement à peine aussi long que le troisième. Élytres plus ou moins rétrécies d'avant en arrière; subarrondies ou obtusément tronquées chacune à l'extrémité; ordinairement un peu débordées par le dernier arceau du dos de l'abdomen. Premier article des tarses postérieurs au moins aussi long que les deux suivants réunis.

According to Löbl & Smetana (2010) and Monné et al. (2007), this genus includes a total of 13 species that 10 of them are distributed only in Nearctic region and 3 of them are distributed only in Palaearctic region, as *J. antecurrens* (Wickham, 1913) [USA, extinct species], *J. cordifera* (Olivier, 1795) [East of USA], *J. gaurotoides* (Casey, 1893) [West-Central of USA (Rocky Mts.)], *J. impura* (LeConte, 1857) [West of USA], *J. instabilis* (Haldeman, 1847) [West of North America, North-West of Mexico], *J. montivagans* (Couper, 1864) [North America (boreal regions), West of USA], *J. quadrata* (LeConte, 1873) [West of Canada – North-Central of USA], *J. scapularis* (Van Dyke, 1920) [West of USA, Mexico], *J. sexspilota* (LeConte, 1859) [South-West of USA, Mexico], *J. swaini* (Hopping, 1922) [West and South-West of USA, Mexico] in Nearctic region, and *J. japonica*

(Tamanuki, 1942) [Japan], *J. parallelopipeda* (Motschulsky, 1860) [European Russia, Siberia, Far East Russia, Japan, Mongolia, Korea], *J. sexmaculata* (Linnaeus, 1758) [Europe (Spain to Ukraine) to Kazakhstan] in Palaearctic region. In addition to this, Danilevsky (2011) stated that «*Leptura (Judolia) sexmaculata* var. *rufimembris* Pic, 1917: 3 was described from “Siberie Or.” Red legs and antennae are impossible in *Judolia parallelopipeda*, but (Danilevsky, 2011b: 316) according to the type (preserved in Pic’s collection in Paris) it is half-colored specimen (a female, see “gallery” in www.cerambycidae.net) of *Judolia parallelopipeda* (Motschulsky, 1860)». Löbl & Smetana (2010) regarded *Judolia rufimembris* (Pic, 1917) as nomen dubium. Finally, Danilevsky (2010) gave it as a synonym of *J. parallelopipeda* (Motschulsky, 1860).

Pachytodes was proposed by Pic (1891) on the base of the species *J. cerambyciformis* and *J. erratica* as a subgenus of *Judolia* Mulsant, 1863 during his study on the collection of Abeille de Perrin. Remaining species *J. sexmaculata* (Linnaeus, 1758) was stayed by Pic (1891) in the nominotypical subgenus.

According to Löbl & Smetana (2010), this genus includes 5 species that all are in Palaearctic region, as *P. cerambyciformis* (Schränk, 1781) [Europe (Portugal and Spain to Caucasus)], *P. cometes* (Bates, 1884) [Far East Russia, Japan, South Korea], *P. erraticus* (Dalman, 1817) [Europe to East Siberia and China (Spain to E Siberia and China)], *P. longipes* (Gebler, 1832) [East Siberia, Far East Russia, Mongolia, Korea, China] and *P. orthotrichus* (Plavilstshikov, 1936) [East Siberia, Mongolia, China (Inner Mongolia)].

In fact, M. Pic (1891) simplistically claimed the name *Pachytodes* as a subgenus of ancient genus *Judolia* Mulsant, 1863. His claim based on only a few speculative characters. These are as follows:

- Body slightly elongated, prothorax has not well marked impressions at the base; elytrons lengthened, a little shrunk.....*Judolia*.
- Body more or less rounded, prothorax has well marked impressions (from inside to outside) on every side at the base, elytrons not shrunk and very attenuated.....*Pachytodes*.

M. Pic’s approach based on only three Palaearctic species as *J. cerambyciformis* and *J. erratica* and *J. sexmaculata*. He never considered any North American species. In fact the characters of the North American *Judolia* does not allow to definite the subgenus *Pachytodes* which even considered as a true genus (see for North American species, <http://bugguide.net>). If Pic’s approach accepts as a true, so at least some North American species (e.g. *J. gaurotoides*, *J. instabilis*, *J. montivagans*) should be belong to the genus *Pachytodes*.

Interestingly, the descriptions of both Mulsant (1863) [*Judolia*] and Pic (1891) [*Pachytodes*] based on the same Palaearctic species as *Leptura sexmaculata* (Linnaeus, 1758), *Leptura cerambyciformis* (Schränk, 1781) and *Leptura erratica* (Dalman, 1817).

Consequently, I propose to combine into a single genus as *Judolia* Mulsant, 1863 of all known species that were included in the genera *Judolia* and *Pachytodes*. This approach is also supported by zoogeographical data. In this case, the Holarctic genus *Judolia* Mulsant, 1863 includes 17 species (with 8 subspecies) in the world fauna as follows (alphabetically on the base of Löbl & Smetana (2010) and Monné et al. (2007)):

Genus JUDOLIA Mulsant, 1863: 496Type species: *Leptura sexmaculata* Linnaeus, 1758*Pachytodes* Pic, 1891: 65 (Type sp.: *Leptura cerambyciformis* Schrank, 1781)*Julodia* Pic, 1891: 12 (Type sp.: *Leptura sexmaculata* Linnaeus, 1758)

cerambyciformis Schrank, 1781: 154 (*Leptura*) E: AB AL AR AU BE BH BU BY
CR CT CZ DE EN FR GB GE GG GR HU IR IT LA LS LT LU MC MD NL NT PL PT
RO SK SL SP ST SZ UK YU A: TR

anticeundulatus Pic, 1915a: 29 (*Leptura*)*beskidicus* Pic, 1915h: 18 (*Leptura*)*bisbistigma* Pic, 1906g: 67 (*Leptura*)*bisquadristigmatus* Pic, 1915a: 29 (*Leptura*)*breveseparatus* Pic, 1953a: 9*decempunctatus* Olivier, 1795: 26 (*Leptura*)*digoniensis* Pic, 1915a: 29 (*Leptura*)*fauconneti* Pic, 1916b: 4 (*Leptura*)*humerifera* Pic, 1915h: 18 (*Leptura*)*lateseparatus* Pic, 1953a: 9*martialis* Pic, 1916b: 4 (*Leptura*)*multiinterrupta* Pic, 1915a: 30 (*Leptura*)*octomaculatus* Schaller, 1783: 299 (*Leptura*)*quadrimaculatus* Scopoli, 1763: 47 (*Leptura*) [HN]*salbachii* Pic, 1908b: 3 (*Leptura*)*sexmaculatus* Panzer, 1795: 272 (*Leptura*)*sempunctatus* Mulsant, 1839: 244 (*Pachyta*)*urbisensis* Pic, 1915a: 29 (*Leptura*)*valesiaca* Pic, 1915a: 29 (*Leptura*)*cometes* Bates, 1884: 218 (*Leptura*) A: FE JA SC*connectus* Nishio, 1950: 20 (*Strangalia*)*cordifera* Olivier, 1795: 25 (*Leptura*) NAR: USA (East)*lunaris* Haldeman, 1847: 59*deceptiva* Casey, 1924: 283*longior* Casey, 1924: 284*erraticus bottcheri* Pic, 1911: 5 (*Leptura*) A: ES KZ WS XIN

erraticus erraticus Dalman, 1817: 490 (*Leptura*) E: AB AL AR AU BH BU BY CR
CT CZ FR GE GG GR HU IT KZ MC MD PL RO SK SL SP ST SZ TR UK YU A: IN
KZ SY TR

akbesianus Pic, 1898a: 6*anticedivisus* Pic, 1914d: 14 (*Leptura*)*anticenotatus* Pic, 1914d: 13 (*Leptura*)*atroapicalis* Pic, 1913c: 186 (*Leptura*)*atrosuturalis* Pic, 1915a: 38 (*Leptura*)*eibesianus* Pic, 1914d: 13 (*Leptura*)*erythrurus* Küster, 1848c: 90 (*Pachyta*)*gasturius* Pic, 1915a: 38 (*Leptura*)*heyrovskyi* Pic, 1924c: 26 (*Leptura*)*hungaricus* Pic, 1913c: 186 (*Leptura*)*italicus* Pic, 1916b: 4*kalavaritanus* Pic, 1913c: 186 (*Leptura*)*quinquepunctatus* Pic, 1915h: 18 (*Leptura*)*ragusai* Pic, 1923d: 3*roberti* Pic, 1915a: 38 (*Leptura*)*rosinae* Pic, 1914d: 13 (*Leptura*)*rufopicalis* Pic, 1913c: 186 (*Leptura*)*rufonotatus* Pic, 1913c: 186 (*Leptura*)*russicus* Pic, 1898h: 54*septemsignatus* Küster, 1848c: 89 (*Pachyta*)*siculus* Pic, 1916b: 4

- subapicalis* Pic, 1914d: 15 (*Leptura*)
testaceofasciatus Pic, 1913c: 186 (*Leptura*)
unijunctus Pic, 1914d: 14 (*Leptura*)
gaurotoides gaurotoides Casey, 1893: 592 (*Leptura*) **NAR:** USA (West-Cent.: Rocky Mts.)
vivarium Casey, 1924: 282
knulli Swaine & Hopping, 1928: 46
gaurotoides auripilis Linsley & Chemsak, 1976: 50 **NAR:** USA (West)
impura LeConte, 1857: 64 (*Leptura*) **NAR:** USA (West)
instabilis Haldeman, 1847: 59 (*Pachyta*) **NAR:** Namer (West), Mexico (North-West)
convexa LeConte, 1850: 332
quadrata Horn, 1886: xiii (not LeConte, 1873)
flaviventris Schaeffer, 1908: 342
pacifica Casey, 1913: 249
trajecta Casey, 1913: 250
japonica Tamanuki, 1942: 179 (*Strangalia*) **A:** JA
longipes Gebler, 1832: 67 (*Pachyta*) **A:** ES FE MG NC NE NO SC
amurianus Pic, 1902f: 19
bodoi Pic, 1914c: 5
nigrosuturalis Pic, 1917g: 3 (*Leptura*)
octoguttatus Pic, 1914c: 5
montivagans montivagans (Couper, 1864: 87) **NAR:** Namer (boreal regions)
sexmaculata Kirby in Richardson, 1837: 182 (not Linnaeus, 1758)
seminigra Casey, 1924: 283
montivagans barberi (Fall, 1907: 250) **NAR:** USA (West)
orthotrichus Plavilstshikov, 1936: 393 (*Judolia*) **A:** ES MG NMO
parallelopipeda Motschulsky, 1860: 146 (*Grammoptera*) **E:** NT **A:** ES FE JA
MG NC SC WS "Korea"
abbreviata Motschulsky, 1875: 143 (*Grammoptera*)
multidisjuncta Pic, 1914c: 5
rufimembris Pic, 1917g: 3 (*Leptura*)
shirarakensis Matsumura, 1911a: 137 (*Leptura*)
quadrata LeConte, 1873: 225 (*Leptura*) **NAR:** Canada (West) - USA (North-Central)
scapularis Van Dyke, 1920: 43 (*Leptura*) **NAR:** USA (West), Mexico
isabellae Hopping, 1922: 162
sexmaculata Linnaeus, 1758: 398 (*Leptura*) **E:** AN AU BY CT CZ EN FI FR GB
GE GR HU IR IT LA LT NR NT PL RO SK SP ST SV SZ UK **A:** KZ
alpestris Pic, 1914c: 5
dentatofasciata Mannerheim, 1852b: 308 (*Grammoptera*)
helvetica Pic, 1914c: 5
milliati Pic, 1945b: 6
rostiana Pic, 1902f: 19 (*Judolia*)
testaceofasciata DeGeer, 1775: 133 (*Leptura*)
trifasciata Fabricius, 1792b: 349 (*Leptura*)
tyrolensis Pic, 1914c: 5
sexspilota LeConte, 1859: 80 (*Leptura*) **NAR:** USA (South-West), Mexico
minuta Casey, 1924: 284
swainei swainei Hopping, 1922: 163 (*Leptura*) **NAR:** USA (West), Mexico
swainei jacintana Linsley, 1940: 256 (*Anoplodera*) **NAR:** USA (South-West)

ACKNOWLEDGEMENT

Thank to Dr. M. L. Danilevsky (RUSSIA) for providing the reference, Pic (1891).

LITERATURE CITED

Bartlett, T. (Ed.) 2011. *Judolia*, BugGuide. Available from: <http://bugguide.net>.

Danilevsky, M. L. 2010. Additions and corrections to the new Catalogue of Palaearctic Cerambycidae (Coleoptera) edited by I. Löbl & A. Smetana, 2010. Part II. Russian Entomological Journal, 19 (4): 313–324.

Danilevsky, M. L. 2011. Systematic list of longicorn beetles (Cerambycoidea) of the territory of the former USSR. Available from: <http://www.cerambycidae.net>.

Löbl, I. & Smetana, A. (Ed.) 2010. Catalogue of Palaearctic Coleoptera, Vol. 6. Stenstrup: Apollo Books, 924 pp.

Mulsant, E. 1863. [pp. 481-590]. In: Histoire naturelle des coléoptères de France. Longicornes. Ed. 2. Paris: Magnin, Blanchard et Cie, successeurs de Louis Janet, 590 pp.

Monné, M. A., Bezark, L. G. & Hovore, F. T. 2007. Checklist of the Cerambycidae, or longhorned beetles (Coleoptera) of the Western Hemisphere. 2007 Version 1 (updated through 31 December 2006). Available from: http://www.zin.ru/animalia/coleoptera/pdf/Western_Hemisphere_Checklist_15_May_2007.pdf.

Pic, M. 1891. Supplement. pp. 63-65. Matériaux pour servir à l'étude Des longicornes. Premier cahier. Lyon: L. Jacquet.

**REPORT OF THE EPIGEAN ARTHROPOD FAUNA
IN THE "LAGUNA DON TOMAS", SANTA ROSA
(LA PAMPA, ARGENTINA)**

José L. Pall*, Romina G. Kihn, Lucas Cheme Arriaga*
and Estela Quirán***

* Facultad de Ciencias Exactas y Naturales, UNLPam, Uruguay 151, CP 6300, Santa Rosa, La Pampa, ARGENTINA. E-mail: pall.joseluis@gmail.com

** Universidad Nacional del Sur, Departamento de Geología, San Juan 670, CP 8000, Bahía Blanca, Buenos. Aires, ARGENTINA.

[Pall, J. L., Kihn, R. G., Arriaga, L. C. & Quiran, E. 2011. Report of the Epigeal arthropod fauna in the "Laguna Don Tomas", Santa Rosa (La Pampa, Argentina). Munis Entomology & Zoology, 6 (2): 905-911]

ABSTRACT: In this study a relay of the arthropods' families was made in adjoining zones next to the wetland area known as "Laguna Don Tomás" in Santa Rosa city, La Pampa, Argentina. Diversity and abundance of Arthropod families present in the area were analyzed; also measured was the variability in community composition during the different seasons of the year. A total of 4 classes of arthropods, distributed in 16 orders, 46 families and 52 morphs were obtained, in which the family Formicidae was the most abundant in all samples. The number of families varied seasonally, being higher during spring and summer dropping during winter months.

KEY WORDS: Arthropods, Laguna Don Tomás, Formicidae.

Wetlands are systems characterized by a high primary productivity that subsequently feeds a trophic network including zooplankton, arthropods, macro-invertebrates, reptiles, birds and mammals directly or indirectly related to the water mass. However, productivity is so high that a big part of the biomass produced is not consumed directly and dies (Márquez, 2003), generating an excess of organic matter that together with humidity allows growth of mushrooms, bacteriae, detritivorous invertebrates and terrestrial arthropods.

Richness and abundance of arthropods in wetlands depend on several factors such as their palaeoecological record, climatic regime, dimensions, water mass characteristics, habitat heterogeneity, vegetation and management conditions (Amat-García & Blanco, 2003). Composition and richness of arthropod species in wetlands are also related with several anthropic factors such as filling deposits, livestock establishment, trash accumulation and residual waters (Amat-García & Quitiaquez, 1998).

Insect proliferation in wetlands, especially dipterians, is exploited as food resource by birds that are very well represented in these ecosystems. Other groups of vertebrates such as amphibians and some mammals also have insectivorous diets. Pollination of native plants in these environments is carried out by some species of insects, evidencing, the trophic and ecological importance of arthropods in these ecosystems.

Studies on arthropods diversity in temperate region wetlands are of great interest from a methodological point of view, such as the work of Keiper et al. (2002) in wetlands of North America, in which the composition, richness, population abundance, nutritious habits and distribution of these organisms was evaluated.

Wetlands in Argentina have remained poorly known, although Bar et al. (2004) have worked in Esteros del Iberá (Corrientes Province). At the present,

studies on arthropod biodiversity are important in order to increase the knowledge of the faunas present in the different environments. In La Pampa Province, there are even less studies of this nature, and the ones available are related to other types of ecosystem such as grasslands (Pall, 2009 pers. com.; Pall et al., 2010 pers. com. unpublished).

The present work was carried out in the periphery of "Laguna Don Tomás", located in La Pampa Province, Argentina, which is a hypereutrophic water-body highly affected by the adjoining city —Santa Rosa, the capital of La Pampa province (Echaniz et al., 2008).

The aim of this work was to carry out a report of the terrestrial arthropod fauna from the areas near the "Laguna Don Tomás" water-mass, analyzing the diversity and abundance of the families present, as well as the variability in the composition of the community during the different seasons of the year.

MATERIALS AND METHODS

Study Area:

"Laguna Don Tomás" (36° 18' 18.31 " S and 64° 18' 49.02 " W), is a shallow hypereutrophic body of water highly modified, located west of Santa Rosa City (Figure 1 and 2). It is surrounded by three basins built to avoid flooding of the city; average depth is 2.3 m (which varies according to the rain times) and surface area is 135.2 has. Maximum length and width are 1565 and 1181 m, respectively (Echaniz et al., 2008).

In the surroundings of the lagoon there are places that have been anthropically modified and where the vegetable composition is variable, with halophilous vegetation and psammophilous grasslands covering the flooding areas. It is located physiographically in the oriental region of humid-dry climate, with an average of annual precipitations of 600 mm.

A recreational park was built next to the lagoon and fishing is also practiced by many people, which influences directly or indirectly the fauna inhabiting the environment.

Methods:

Four sampling sites were chosen, in the vicinities areas of the water-body, representing all the different environments occurring in the "Laguna Don Tomás" Wetland.

At each site, two 80 m long transects (separated by 30 m) were defined. Five pit-fall traps of 7 cm in diameter (Agosti *et al.*, 2000) and 750 c.c. of capacity were placed at 20 m one from the others in each transect and their location was recorded with GPS. Each trap contained 70% alcohol and some detergent drops to avoid break-down of the arthropods and evaporation of the liquid during warm days. Captures were carried out during one year (2008-2009), in every season; vegetation samples were also collected.

The collected material was identified and later housed in the Invertebrate II laboratory of the Facultad de Ciencias Exactas y Naturales (FCEyN) at the Universidad Nacional de La Pampa (UNLPam). The taxonomic identification of families was carried out by naked eye and with binocular magnifying glasses and using the keys and diagnosis of Triplehorn et al. (2005), Sáenz & De la Llana (1990) and Bolton et al. (2007).

RESULTS

A total of 6555 specimens belonging to 4 classes, 16 orders and 46 families were obtained (Table 1). The most representative family was Formicidae (Insecta: Hymenoptera), which maintained a high number of individuals during all the samplings. Thus, it was considered as the dominant family (90%). A total of 4795 specimens were counted in all the samplings.

Fluctuation in the diversity of arthropod families could be related to the time of the year, with a higher number of individuals and families during spring and summer. Although the Formicidae was the most abundant, there were also other families that were present but in smaller number (Table 1), rendering the Class Insecta the most diverse in these environments.

Arthropod richness was higher during the spring months, with 30 families represented, while in summer only 26 were recorded. In cold months the number drops to 21 families in autumn and 8 in winter, with only 311 specimens counted in the latter (Figure 3 and 4).

Due to the great number of specimens in the family Formicidae (Figure 5), they were taxonomically identified using the keys previously mentioned and the work of Fernández (2003). Their nutritious habit was also determined.

Plant composition of the sampled places:

There are some plant species shared by some of the sampled sites: Sites A and C had a quite similar plant composition, sharing *Hordeum murinum*, *Medicago minimum*, *Daucus pusillus* and *Bromus brevis*. Sites D and A share *Daucus pusillus* and *Plantago patagonica*. Sites B, C and D share *Distichlys sp.*, *Cenchrus pausiflorus*, *Conyza bonariensis*, and *Jaraba ichu* occur at site A, *Salicornia ambigua* at site B, *Taraxacum officinale* at site C and *Cynodon dactylon* at site D.

DISCUSSION

As asserted by Bar et al. (2004), insects were the most representative group, mainly in the warm months between spring and summer. Their numbers drop (specimens and families) during the coldest months in autumn and winter. Diversity can be attributed to the space heterogeneity related with the complex structure of the biotopes that offer numerous microhabitats.

In agreement with Keiper et al. (2002), we consider that wetlands in temperate areas are very important from a methodological point of view because they offer diverse habitats for insect capture. This was demonstrated in the present work, where a great number of specimens was collected in different areas, which qualitative and quantitative data contributing to assess the diversity in the environments that harbor them.

The present diversity in the study area coincides with the diversity found in other places of La Pampa Province studied in previous works (Pall, et al. personal com.).

CONCLUSIONS

A total of 4 classes of arthropods was obtained, distributed in 16 orders and 46 families, of which the Formicidae was the most numerous in all samples. It was represented by 5 species with their respective nutritious habits: *Pheidole bergi*, *Solenopsis saevissima*, *Crematogaster quadriformis*, (omnivorous) *Acromyrmex striatus* (cutter) and *Linepithema humile* (generalist).

Arthropod fauna diversity in the periphery of the “Laguna Don Tomás” drops sharply during the winter months because of the more restricted availability of food resources and unfavorable climatic conditions for reproduction.

The similarity in the vegetable composition is related to the great anthropic effect suffered by the study area and the proximity among the sampling places.

This work represents the first contribution towards the knowledge of the arthropod fauna of areas near “Laguna Don Tomás”. Information provided in this study constitutes a tool for characterizing the wetland, as well as for the assessment of current biodiversity considering feasibility of creating a municipal and/or provincial reserve in the studied area.

LITERATURE CITED

- Agosti, D., Majer, J. D., Alonso, L. E. & Schults, T. R.** 2000. Ants. Standard methods for measuring and monitoring biodiversity. Smithsonian Institution Press.
- Amat-García, G. & Blanco, E.** 2003. Artropofauna de los humedales de la Sabana de Bogotá. Págs. 90-106 en: Empresa de Acueducto y Alcantarillado de Bogotá (EAAAB) y Conservación internacional – Colombia (eds.). Los Humedales de Bogotá y la Sabana. Tomo I, Bogotá.
- Amat-García, G. & Quitiaquez, G.** 1998. Un estudio de la entomofauna de humedales: El Humedal Juan Amarillo en Bogotá. Págs. 107-123 en: E. Guerrero (ed.). Una aproximación a los humedales en Colombia. Fondo FEN Colombia - Unión Mundial para la Naturaleza (UICN), Bogotá.
- Bar, M. E., Oscherov, E. B., Damborsky, E. B., Miryam, P., Avalos, G. & Rubio, G.** 2004. Comunidad de Arthropoda de la Cuenca de Iberá, Corrientes. Comunicaciones científicas y técnicas, Universidad Nacional del Nordeste. 4 pp.
- Bolton, B., Alpert, G., Ward, P. S. & Naskrecki, P.** 2007. Bolton's Catalogue of Ants of the World. Harvard University Press. CD.
- Echaniz, S.A., Vignatti, A. M. & Bunino, P. C.** 2008. El zooplancton de un lago somero hipereutrófico de la región central de Argentina: cambios después de una década. Biota Neotrop. 8 (4): 63-71 pp.
- Fernández, F. (Ed).** 2003. Introducción a las hormigas de la Región Neotropical. Instituto de Investigación de Recursos Biológicos A. von Humboldt, Bogotá, Colombia; 398 pp.
- Keiper, J. B., Walton, W. E. & Foote, B. A.** 2002. Biology and Ecology of higher Diptera from Freshwater Wetlands. Annual Review of Entomology 47: 207-232 pp.
- Márquez, G. E.** 2003. Bienes y servicios ecológicos de los humedales. Págs. 13-28 en: Empresa de Acueducto y Alcantarillado de Bogotá (EAAAB) y Conservación Internacional – Colombia (eds.). Los humedales de Bogotá y la Sabana. Tomo II, Bogotá.
- Pall, J. L., Coscarón, M. C. & Quirán, E. M.** 2010. Presence of *Solenopsis tetracantha* Emery (Insecta: Hymenoptera) in the province of La Pampa, Argentina. Mun. Ent. Zool., 5 (Suppl.): 1200-1201 pp.
- Pall, J. L., Bernardos, J. N. & Quiran, E. M.** 2008. Biodiversidad de la Mirmecofauna (Insecta: Hymenoptera) asociada a Agroecosistemas del centro de la República Argentina. Trabajo de tesina para la obtención de título de grado, defendida diciembre de 2008.
- Sáenz, M. R. & De La Llana, A. A.** 1990. Entomología sistemática. Universidad Nacional Agraria. Managua, Nicaragua. 224 pp.
- Triplehorn, C. A., Johnson, N. F., Borror, D. J. & De Long, D. M.** 2005. Introduction to the study of insects. Thomson Brook/Cole, México, D. F. 864 pp.

ACKNOWLEDGEMENTS

We wish to thank Marina Cock for the vegetation analysis, Jorge Marani for the authorization of samplings and Miguel Griffin for their comments.

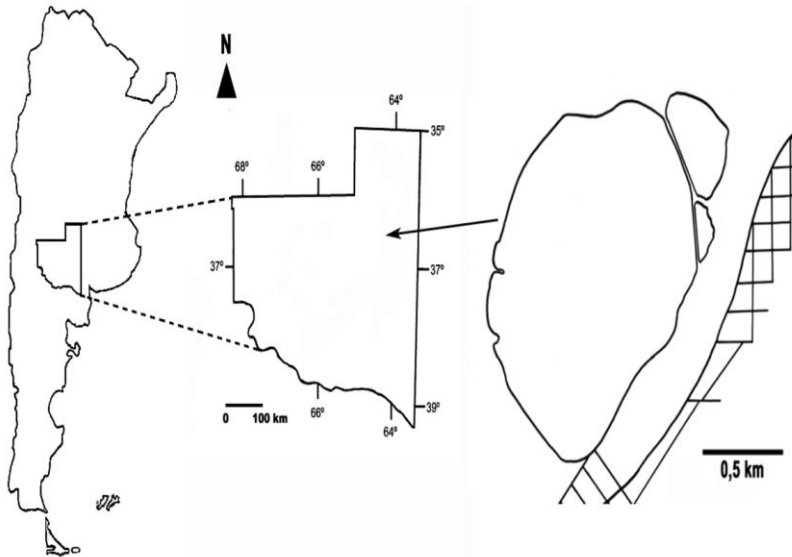


Figure 1. Outline of “Laguna Don Tomás”, showing its geographical location in La Pampa Province, in the central region of Argentina.



Figure 2. Satellite Image of the wetland "Laguna Don Tomás". Asterisks (*) indicate the 4 sampling sites. Image extracted from Google Earth, year 2009.

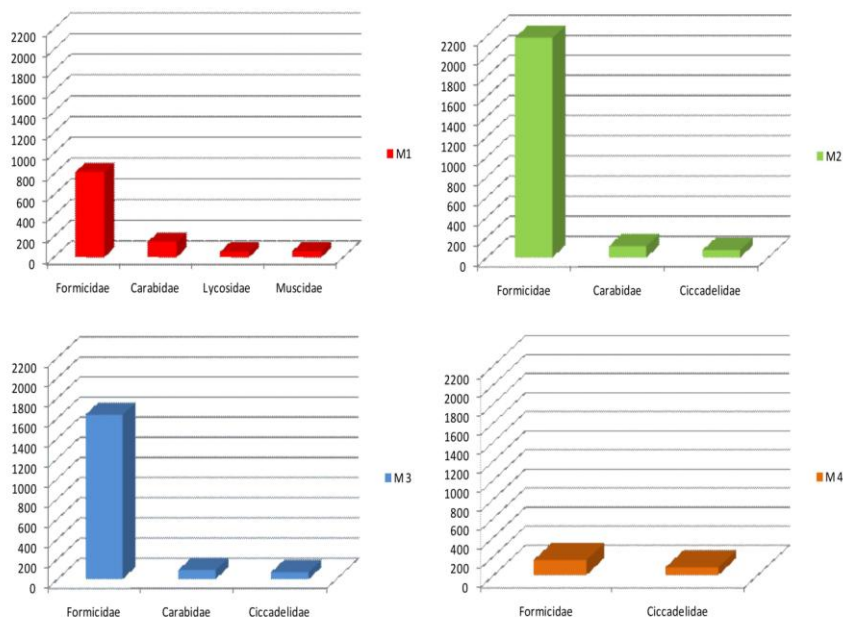


Figure 3. Distribution of the families that presented higher percentage of individuals (n: greater than 50) during the four samplings carried out during 2008-2009 in the “Laguna Don Tomás”, La Pampa Province, Argentina, that had N greater than two specimens per family; M1: first sampling (Spring), M2: second sampling (Summer), M3: third sampling (Autumn) and M4: fourth sampling (Winter).

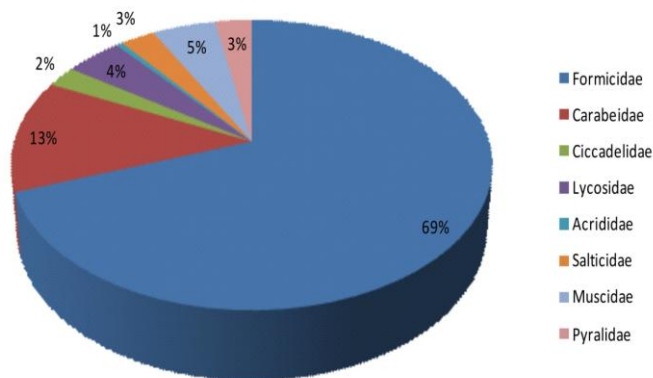


Figure 4. Distribution of the richness of most representative families during the four samplings carried out during 2008-2009 in Laguna Don Tomás, La Pampa, Argentina; M1: first sampling (Spring), M2: second sampling (Summer), M3: third sampling (Autumn) and M4: fourth sampling (Winter).

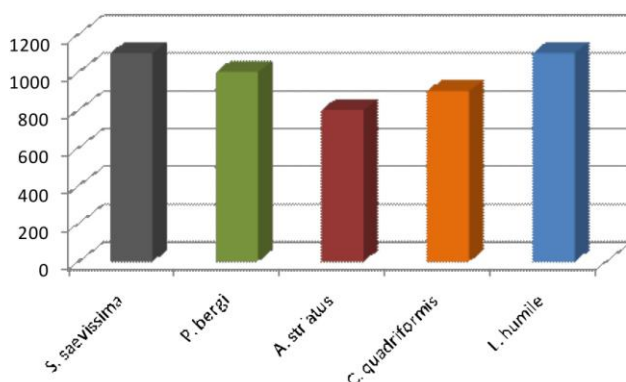


Figure 5. Distribution of Formicidae richness during the four samplings carried out during 2008-2009 in “Laguna Don Tomás”, La Pampa, Argentina.

Table 1. Taxonomic arrangement of family distribution obtained during the four samplings of 2008-2009 in “Laguna Don Tomás”, La Pampa, Argentina.

Class	Order	Family
Aracnida	Araneida	Lycosidae
		Salticidae
		Sicaridae
		Thomisidae
Aracnida	Escorpionida	Bothriuridae
Insecta	Acarí	Opillioacaridae
Insecta	Hymenoptera	Formicidae
		Vespidae
		Mutillidae
		Braconidae
		Syrphidae
Insecta	Lepidoptera	Pyralidae
		Pieridae
Insecta	Homoptera	Cicadellidae
		Aphididae
Insecta	Coleoptera	Coccinellidae
		Dasytidae
		Elateridae
		Scarabaeidae
		Chrysomelidae
		Aichophilidae
		Carabidae
		Curculionidae
Insecta	Orthoptera	Acrididae
		Grillotalpidae
		Grillidae
Chilopoda	Scolopendromorpha	Litholiidae
Insecta	Heteroptera	Reduviidae
		Pentatomidae
		Lygaeidae
		Rhopalidae
Insecta	Diptera	Muscidae
		Calliphoridae
		Culicidae
		Drosophilidae
		Simuliidae
		Tephritidae
		Chloropidae
Insecta	Dictyoptera(Mantodea)	To determining
Insecta	Dermaptera	Labiduridae
		Labiidae

**SOME CYTOGENETIC OBSERVATIONS OF
MORIMUS ORIENTALIS REITTER, 1894
(COLEOPTERA: CERAMBYCIDAE: LAMIINAE: LAMIINI)**

Atılay Yağmur Okutaner*, Hüseyin Özdikmen,
Eşref Yüksel** and Yavuz Koçak*****

* Giresun University, Sebinkarahisar M.Y.O, Giresun / TURKEY. E-mail: atilayyagmur@gmail.com

** Gazi University, Faculty of Science, Department of Biology, 06500 Ankara / TURKEY. E-mails: (Ozdikmen) ozdikmen@gazi.edu.tr; (Yüksel) eyuksel@gazi.edu.tr

*** Ahi Evran University, Faculty of Science & Arts, Department of Biology, Kırşehir, TURKEY. E-mail: ykocak@gmail.com

[Okutaner, A. Y., Özdikmen, H., Yüksel, E. & Koçak, Y. 2011. Some cytogenetic observations of *Morimus orientalis* Reitter, 1894 (Coleoptera: Cerambycidae: Lamiinae: Lamiini). Munis Entomology & Zoology, 6 (2): 912-919]

ABSTRACT: The paper gives some cytogenetic observations of *Morimus orientalis* Reitter, 1894 as the first time. Distribution in Turkey with a map and World, chorotype classification of the species, mitotic and meiotic metaphase plaques and karyogram are also given in the text.

KEY WORDS: Cytogenetic, meiotic metaphase, mitotic metaphase, karyogram, *Morimus orientalis*, Lamiinae, Cerambycidae.

As known, approximately 1.500.000 species of animals have been described worldwide up to now. 80 % of them consist of insects. At the first views, carried out cytogenetic works have a minor number which is covered only about 1 % of all species. Thus, this considered to be too small.

Cytogenetic works had started in the XIXth century. The number of chromosomes at most of the insects is changed between $n = 4$ and $n = 20$ [extremely $n = 1$ (*Myrmecia croslandi* Taylor, 1991: Formicidae: Hymenoptera) and $n = 217-223$ (*Polyommatus atlantica* (Elwes, 1905))] (de Lesse, 1970; Crosland & Crozier, 1986; Gokhman & Kuznetsova, 2006).

At the present, unaccompanied external morphological taxonomy is not enough for an indisputable classification of some taxa. The remarks on the base of only external morphology are caused discussions and even mistakes on the systematic ranks for many taxa. For example, the status of Vesperidae. Svacha et al. (1997) that included larval morphologies and biologies of a few species, regarded the taxon as a subfamily of Cerambycidae. According to Brustel et al. (2002), Vesperidae is a separate family. Dutrillaux et al. (2007) that included caryotype definition of *Vesperus xatarti*, regarded the taxon as a subfamily of Cerambycidae too. Recently Löbl & Smetana (2010) gave the taxon as a subfamily of Cerambycidae in their catalog. The known differentiations of larval morphologies and obtained cytogenetic data do not encourage the last status. So status of the taxon is still under discussion.

Comparative caryology has more advantage than other methods in taxonomical studies of animals. In fact especially chromosomal characters are essentially morphological characteristics. On the other side, some characters of caryotype which are number of chromosomes, arms of chromosomes, nucleolar organisers, heterochromatic blocks etc., can be intraspecific values.

In particular, cytogenetic works on Cerambycidae have also been realized poorly worldwide until now. For example, Ehara (1956) gave chromosome numbers of 23 species that were distributed in Japan, belonging to the subfamilies Lepturinae, Cerambycinae and Lamiinae. Teppner (1966) determined chromosome numbers of 20 species that were distributed in Central Europe. Also Teppner (1968) mentioned chromosome numbers of 25 species that were distributed in Central Europe. Kudoh et al. (1972) gave chromosome numbers (both haploid and diploid numbers) of 5 species of the subfamily Lamiinae. Smith & Virkki (1978) revealed a large scaled work on cytogenetic of Coleoptera. They compiled all cytogenetic studies on Coleoptera up to 1978 and gave chromosome numbers of 157 species of Cerambycidae. Vidal (1984) stated chromosome numbers of 3 long-horned species. Vaio et al. (1985) observed meiotic plaques of 2 species of the genus *Trachyderes*. Lachowska et al. (1996) mentioned both haploid and diploid chromosome numbers of *Agapanthia violacea* of the subfamily Lamiinae. Holecova et al. (2002) gave chromosome numbers of 2 long-horned species. Rozek et al. (2004) stated chromosome numbers of 3 long-horned species. Dutrillaux et al. (2007) carried out a caryologic study on the species *Vesperus xatarti* of the subfamily Vesperinae. He stated chromosome number $54 + XX$ for female and $53 + XY_1Y_2$ for male.

As seen below, diploid number of chromosomes of members of long-horned beetles is changed between 10 and 36. Sex-chromosome system of long-horned beetles is parachute type (Xy_p). Most of the diploid chromosomes number is $2n = 20 (18AA + Xy_p)$ (Smith & Virkki, 1978) (Graph 1).

Anyway, the genus *Morimus* Brullé, 1832 and thereby the species *Morimus orientalis* Reitter, 1894 have not been investigated cytogenetically until now. The first and single cytogenetic study on Turkish long-horned species is Okutaner et al. (2011). Diploid number of chromosomes of *Morimus orientalis* Reitter, 1894 is determined $2n = 24$ in mitotic metaphase.

As known, the genus *Morimus* is a problematic group. Some members of *Morimus* resemble each other external morphologically. Identification of these species on the base of external morphology, therefore, is very difficult. Obtaining new taxonomic characters by cytogenetic works will be useful for both identification of species and classification of the group.

MATERIAL AND METHOD

The specimen was collected from Bolu province of Turkey in 2010 and was deposited in Gazi University, Ankara, Turkey.

The chromosomes are obtained according to Rozek (2004) with some alterations. The method is presented as follows:

The specimens were placed in killing-jar with ethyl acetate to anaesthetize. Abdomens of the specimens were cut and abdominal contents (especially testicle tissue in males, and middle-gut tissue in males and females) were transferred in petri dishes with distilled water. So the tissues were sustained on hold for 10-15 minutes in the hypotonic solution. They were transferred cryotubes with 0.05 % cholicine solution and were maintained for 45-60 minutes in room temperature and then, fixed in 3:1 fresh ethanol-acetic acid solution for at least 1 hour. Small pieces from the treated tissues were taken and mounted on a clear lam. On tissue pieces were dropped 45 % acetic acid and were dissected with using dissection pins and bisturi. Then, tissue pieces were mounted and pressed directly between lam and lamel or lam and lam. These preparates were submerged into liquid nitrogen. Lam and lamel or lam and lam were uncoupled and left for drying.

Later, the dry preparates were stained by 4 % Giemsa Phosphate Buffer (pH = 6.8) for 10 minutes and were washed with distilled water. After drying the preparates were examined under stereo microscope (Leica DMLB). The observed plaques were photographed zoom in (10X).(100X) (Graph 2).

RESULTS AND DISCUSSIONS

Subfamily LAMIINAE Latreille, 1802

Tribe LAMIINI Latreille, 1802

Genus *MORIMUS* Brullé, 1832

Type species: *Lamia lugubris* Fabricius, 1792 = *Cerambyx asper* Sulzer, 1776.

The genus *Morimus* has a problematic group as *M. asper* and related taxa. Some old species that are *M. funereus*, *M. verecundus*, however, are regarded as a subspecies of *M. asper*, and *M. ganglbaueri* is regarded as a synonym of *M. asper* by some authors (e.g. Sama, 2002; Sama & Löbl in Löbl & Smetana, 2010). However, Sama's proposal does not seem useful to take into consideration both morphological differences and distribution areas of the taxa. Recently, Sama & Löbl in Löbl & Smetana (2010) gave the distribution areas of these taxa as follows:

- The range of *M. asper asper*: South Europe (Spain, France, Italy, Switzerland, Yugoslavia, Croatia, Albania, Greece).
- The range of *M. asper funereus*: Italy, Hungary, Czechia, Austria, Slovakia, Slovenia, Yugoslavia, Croatia, Albania, Bosnia-Herzegovina, Macedonia, Romania, Bulgaria, Greece, Moldavia, Ukraine.
- The range of *M. asper verecundus*: Ukraine, European Russia, Caucasus (Azerbaijan, Armenia, Georgia), Turkey, Iran, Turkmenistan.

In respect to this, at least *M. verecundus* (Faldermann, 1836) is a separate species. This proposal has also been supported by Danilevsky (2011). On the other side, according to Danilevsky (2010), *M. asper ganglbaueri* Reitter, 1894 that occurs Bosnia-Herzegovina, Croatia and Yugoslavia, is a good subspecies. He stated that "for the distinguishing characters and distribution see Mikšić (1971), Mikšić & Korpić (1985)". Consequently, we accepted that *M. funereus* and *M. ganglbaueri* are the subspecies of *M. asper* and *M. verecundus* is a separate species.

So, this Palaearctic + Oriental genus, *Morimus* Brullé, 1832, is represented by 12 species (with 3 subspecies) in the whole world. With regard to this, *M. asper* is the most widely distributed member of the genus.

The members of the genus are distributed from Europe (Spain to Caucasus) to Central Asia (Turkmenistan) and China in Palaearctic region, and India, Myanmar, S China, Thailand, Vietnam and Malaysia in Oriental region.

A total of four species occur in Palaearctic region. Three of them are represented only in Palaearctic region as *M. asper* (Sulzer, 1776), *M. orientalis* Reitter, 1894 and *M. verecundus* (Faldermann, 1836). The species, *M. assamensis* Breuning, 1936 occurs in both Palaearctic and Oriental regions. None of them is endemic.

A total of nine species occur in Oriental region. Eight of them are represented only in Oriental region as *M. granulipennis* Breuning, 1939, *M. inaequalis* Waterhouse, 1881, *M. indicus* Breuning, 1936, *M. lethalis* Thomson, 1857, *M. misellus* Breuning, 1938, *M. ovalis* Breuning, 1943, *M. plagiatus* Waterhouse, 1881 and *M. sexmaculipennis* Breuning, 1961. Seven of them except *M. lethalis* are endemic to different countries: *M. granulipennis* and *M. ovalis* to Myanmar;

M. inaequalis, *M. indicus*, *M. misellus* and *M. plagiatus* to India, and *M. sexmaculipennis* to Malaysia. Again, *M. assamensis* Breuning, 1936 occurs in both Palaearctic and Oriental regions.

In Turkey, the genus is represented by 3 species as *M. asper* (Sulzer, 1776), *M. orientalis* Reitter, 1894 and *M. verecundus* (Faldermann, 1836) (Özdikmen, 2007 and 2008).

***Morimus orientalis* Reitter, 1894**

Material examined: Bolu prov.: Central, 25.IV.2010, 1 specimen.

Records in Turkey: Sakarya prov.: Sapanca (Gökdağ) (Bodemeyer, 1900); İstanbul prov.: Alem Mt., Sakarya prov.: Sapanca (Gökdağ) (Bodemeyer, 1906); Turkey (Winkler, 1924-1932; Lodos, 1998; Sama, 2002; Tozlu et al., 2003); İstanbul prov.: Polonezköy, Alem Mt. (Demelt & Alkan, 1962; Demelt, 1963; İren & Ahmed, 1973); Erzurum prov. and env. (Özbek, 1978) (Map 1).

Range: Europe (Bulgaria, European Turkey), Turkey.

Chorotype: Turano-Mediterranean (Balkano-Anatolian).

Remark: This species is recorded for the first time from Bolu province in Turkey.

Cytogenetics: First of all, we must to state that observation density of chromosomes is low due to a low of mitotic and meiotic activations in the examined material. Long-horned beetles have also holometabolous development such as other members of the order Coleoptera. The larval, pupal and imaginal stages of holometabolous insects in terms of observed mitotic and meiotic activities are displayed diversity. This case was evaluated by Teppner (1968) with regard to spermatogenesis. He stated that meiosis is started in pre-pupal stage; spermatogenesis is accelerated in last instar larva and is continued in adult. He also mentioned these findings are varied among the subfamilies. In respect to this, spermatogenesis that occurring in last instar larvae, decelerates in adult stages in the subfamilies Lepturinae and Aseminae, while it is continued with the same density in adult stages in Cerambycinae and Lamiinae. Moreover, duration of meiosis differs from stage to stage.

In the present work, cytogenetic researches carried out on the adult due to the larval and pupal identification are very difficult.

Observed chromosomes of long-horned beetles are small. Centromere regions and length of arms of the chromosomes are not clear. The chromosomes, therefore, evaluated only on account of the number.

With regard to the present study, haploid number of chromosomes for the species *M. orientalis* was determined as $n = 11 + X_{yp}$ in meiotic metaphase from testicle tissues (Fig. 1), and diploid number of chromosomes was determined as $2n = 24$ in mitotic metaphase from testicle tissues (Fig. 2). This results are the same with that of *D. anatolicum* (Okutaner et al., 2011).

* This work supported by the projects by GAZİ UNIVERSITY (project number BAP-05/2008-44). The data are derived from the Ph. D. thesis of A. Y. Okutaner.

LITERATURE CITED

Bodemeyer, H. E. V. 1900. Quer durch Klein Asien, in den Bulghar Dag; Eine Naturwissenschaftliche studien-Reise. Coleopterologisches, 196 pp.

Bodemeyer, H. E. V. 1906. Beitrage zur Käferfauna von Klein Asien. Deutsche Entomologische Zeitschrift, 2: 417-437.

Brustel, H., Berger, P. & Cocquempot, C. 2002. Catalogue des Vesperidae et des Cerambycidae de la faune de France (Coleoptera). Ann. Soc. Entomol. Fr. (n.s.), 38 (4): 443-461.

- Crosland, M. W. J. & Crozier, R. H.** 1986. *Myrmecia pilosula*, an ant with only one pair of chromosomes. *Science*, 231 (4743): 1278.
- Danilevsky, M. L.** 2010. Additions and corrections to the new Catalogue of Palaearctic Cerambycidae (Coleoptera) edited by I. Löbl and A. Smetana, 2010.- *Russian Entomological Journal*, 19 (3): 215-239.
- Danilevsky, M. L.** 2011. Systematic list of longicorn beetles (Cerambycoidea) of the territory of the former USSR. Available from: <http://www.cerambycidae.net>.
- Demelt, C. V.** 1963. Beitrag zur Kenntnis der Cerambycidenfauna Kleinasiens und 13. Beitrag zur Biologie palaearkt. Cerambyciden, sowie Beschreibung einer neuen *Oberia*-Art. *Entomologische Blätter*, 59 (3) : 132-151.
- Demelt, C. V. & Alkan, B.** 1962. Short information of Cerambycidae Fauna of Turkey. *Bitki Koruma Bülteni*, 2 (10): 49-56.
- Dutrillaux, A. M., Moulin, S. & Dutrillaux, B.** 2007. Presence d'un caryotype tres original a 53-54 chromosomes chez *Vesperus xatarti* Mulsant, 1839 (Coleoptera : Cerambycidae: Vesperinae). *Annales de la Societé entomologique de France* (N. S.), 43 (1): 81-86.
- Ehara, S.** 1956. A Comparative Histology of Male Gonads in Some Cerambycid Beetles with Notes on the Chromosomes. *Jour. Fac. Sci. Hokkaido Univ. Ser.*, 6 (12): 309-316.
- Gokhman, V. E. & Kuznetsova, V. G.** 2006. Comparative insect karyology: Current state and applications. *Entomological Review*, 86 (3): 352-368.
- Holecova, M., Lachowska, D. & Karagyan, G.** 2002. Karyological notes on six beetle species from Armenia (Coleoptera: Tenebrionidae, Cerambycidae, Curculionidae). *Folia biol. (Krakow)*, 50: 9-12.
- İren, Z. & Ahmed, M. K.** 1973. Microlepidoptera and pests of fruit-trees in Turkey. *Bitki Koruma Bülteni*, Ankara, 1: 41-42 (1973).
- Kudoh K., Kondoh I. & Saitoh K.** 1972. Chorosome Studies of Beetles IV. A Further Chorosome Survey of Five Species of the Subfamily Lamiinae (Cerambycidae). *Kontyu.*, 40: 293-296.
- Lachowska, D., Rozek, M. & Holecova, M.** 1996. A cytogenetic study on eight beetle species (Coleoptera: Carabidae, Scarabaeidae, Cerambycidae, Chrysomelidae) from Central Europe. *Folia Biologica*, 44 (3-4): 99-103.
- De Lesse, H.** 1970. Les nombres de chromosomes chez les lépidoptères rophalocères en Amérique Centrale et Colombie. *Arm. Soc. Ent. France*, 6: 347-358.
- Löbl, I. & Smetana, A. (Ed.)** 2010. Catalogue of Palaearctic Coleoptera, Vol. 6. Stenstrup: Apollo Books, 924 pp.
- Okutaner, A. Y., Özdikmen, H., Yüksel, E. & Koçak, Y.** 2011. Some cytogenetic observations of two *Dorcadion* Dalman, 1817 species (Coleoptera: Cerambycidae: Lamiinae: Dorcadiini). *Munis Entomology & Zoology*, 6 (2): ...-...
- Özbek, H.** 1978. *Hylotrupes bajulus* (L.) Serville in Erzurum and the near, and some others longhorn beetles. *Atatürk Üniversitesi Ziraat Fakültesi Dergisi*, 9 (1): 31-44.
- Ozdikmen, H.** 2007. The Longicorn Beetles of Turkey (Coleoptera: Cerambycidae) Part I—Black Sea Region. *Munis Entomology & Zoology*, 2: 179-422.
- Özdikmen, H.** 2008. The Longicorn Beetles of Turkey (Coleoptera: Cerambycidae) Part II – Marmara Region. *Munis Entomology & Zoology*, 3 (1): 7-152.
- Rozek, M.** 2004. A new chromosome preparation technique for Coleoptera (Insecta). *Chromosome Research*, 2 (1): 76-78.
- Rozek, M., Lachowska, D., Petitpierre, E. & Holecova, M.** 2004. C-bands on chromosomes of 32 beetle species (Coleoptera: Elateridae, Cantharidae, Oedemeridae, Cerambycidae, Anthicidae, Chrysomelidae, Attelabidae and Curculionidae). *Hereditas*, 140: 161-170.
- Sama, G.** 2002. Atlas of the Cerambycidae of Europe and the Mediterranean Area, Volume I, Kabourek, Zlin, 173 pp.

Smith, S. G. & Virkki, N. 1978. Animal cytogenetics. vol.3: Insecta, part 5: Coleoptera. Gebruder Borntraeger, Berlin–Stuttgart.

Svacha P., Wang J. J. & Chen S. C. 1997. Larval morphology and biology of *Philus antennatus* and *Heterophilus punctulatus*, and systematic position of the Philinae (Coleoptera: Cerambycidae and Vesperidae). Annales de la Société entomologique de France (N. S.), 33 (3): 323–369.

Teppner, H. 1966. Chromosomenzahlen einiger Mitteleuropäischer Cerambycidae (Coleoptera) (Chromosome Numbers of some Central European Cerambycidae). Chromosoma (Berl.), 19: 113–125.

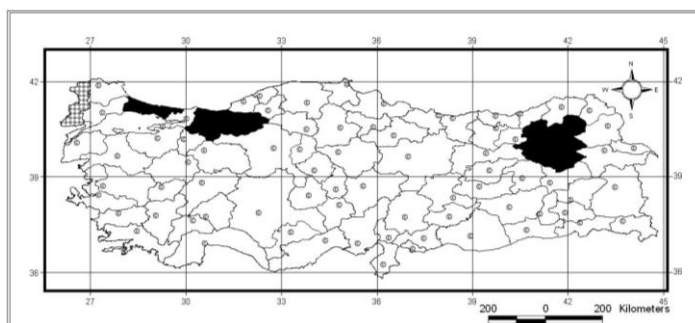
Teppner, H. 1968. Chromosomenzahlen einiger Mitteleuropäischer Cerambycidae (Coleoptera) II (Chromosome Numbers of some Central European Cerambycidae II). Chromosoma (Berl.), 25: 141–151.

Tozlu, G., Rejzek, M. & Özbek, H. 2002. A contribution to the knowledge of Cerambycidae (Coleoptera) fauna of Turkey. Part I: Subfamilies Prioninae to Cerambycinae. Biocosme Mésogéen, Nice, 19 (1-2): 55–94.

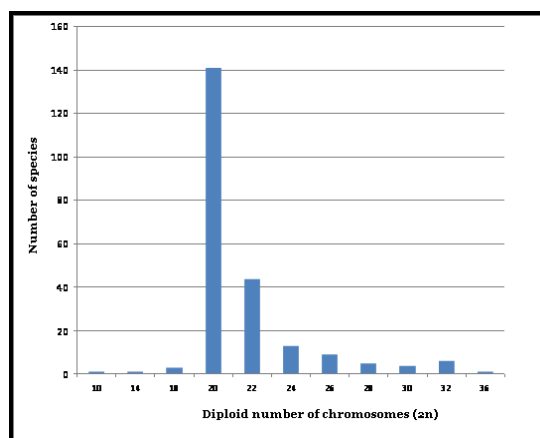
de Vaio, E.S., da Silva, A., Crivel, M., Postiglioni, A., Ponce de Leon, R. & Leira, M. S. 1985. Comparative Description of Male Meiosis in Two Species of Cerambycines (Coleoptera: Cerambycidae). Rev. Brasil. Genet., 8 (2): 263–269.

Vidal, O. R. 1984. Chromosome Numbers of Coleoptera From Argentina. Vidal Genetica, 65: 235–239.

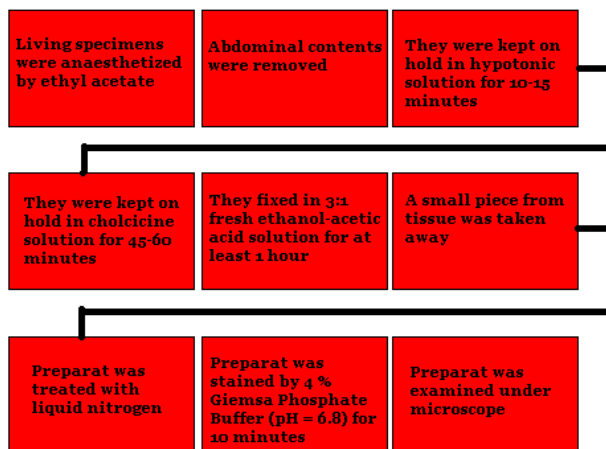
Winkler, A. 1924–1932. Catalogus Coleopterorum regionis palaearcticae. Verlag von Albert Winkler, 1135–1226.



Map 1. Distribution in Turkey of *M. orientalis* (in respect to provinces).



Graph 1. Diploid number of chromosomes – Number of species in Cerambycidae.



Graph 2. The main steps of the used method for cytogenetic researches.

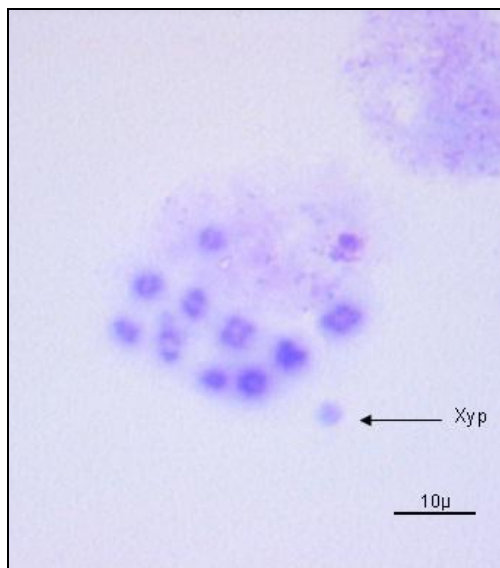


Figure 1. Meiotic metaphase plaque from testicle tissue of *M. orientalis* ($n = 11 + X_{yp}$).

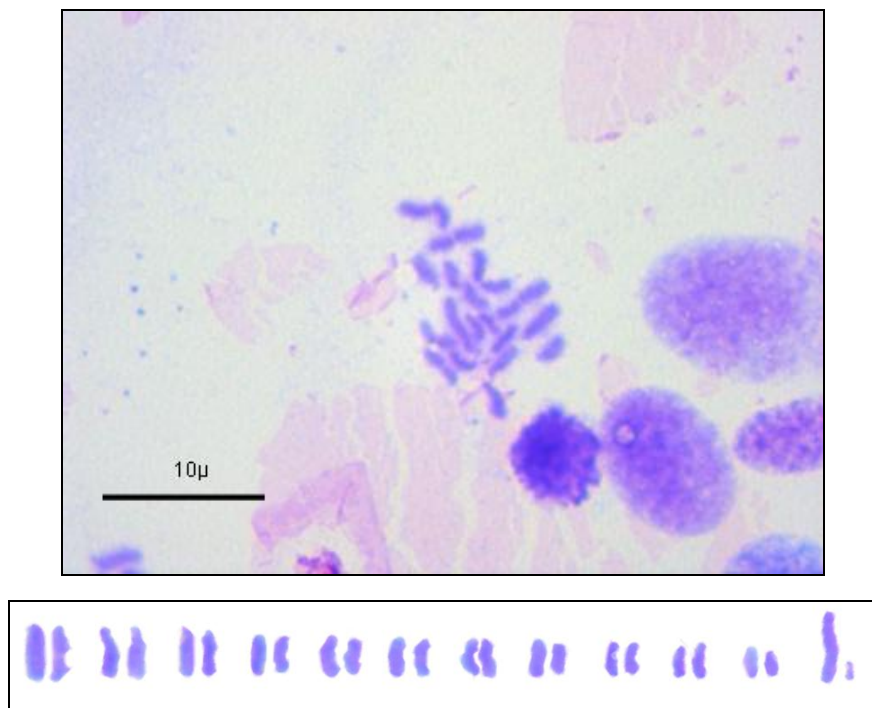


Figure 2. Mitotic metaphase plaque from testicle tissue and karyogram of *M. orientalis* ($2n = 20$).

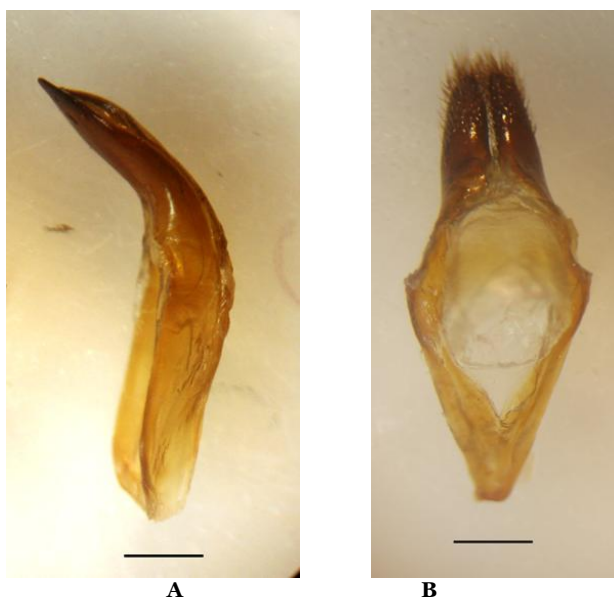


Figure 3. Male genitalia of *M. orientalis*. A. Aedeagus, B. Paramers.

GROWTH AND IONIC COMPOSITION OF THE ANTENNAE OF VARIEGATED GRASSHOPPER, *ZONOCERUS VARIEGATUS* (L., 1758) (ORTHOPTERA: PYRGOMORPHIDAE).

K. O. Ademolu*, A. A. Balogun and A. B. Idowu

* Biological Sciences Department, University of Agriculture, Abeokuta P.M.B 2240, Abeokuta, Ogun State, NIGERIA. E-mail: kennyademolu@yahoo.com

[Ademolu, K. O., Balogun, A. A. & Idowu, A. B. 2011. Growth and ionic composition of the antennae of variegated grasshopper, *Zonocerus variegatus* (L., 1758) (Orthoptera: Pyrgomorphidae). Munis Entomology & Zoology, 6 (2): 920-924]

ABSTRACT: This study examines the growth pattern and the ionic composition (Na^+ , K^+ , Ca^{2+} , Mg^{2+} , Zn^{2+} , Fe^{2+} , Po_4^{2-} , Cl^-) of the antennae of *Zonocerus variegatus* during its post embryonic development. The antennal length (cm) and number of antennal segments increased steadily during development with the adult stage having significantly ($P < 0.05$) higher values than the lower instars. The growth gradient between the 6th instar and the adult stage was greater than that within the lower instars. Also, the growth rate of the body length (0.415x) was faster than the antennal length (0.215x). The 1st and 2nd instar stages of development had significantly higher ionic concentrations than the later instars and the adult stage. The relationship between these results and the behavior of the *Z. variegatus* is discussed.

KEY WORDS: *Z. variegatus*, antennae, growth rate, ionic composition.

The antennae are the most important sensory organs for insects, bearing not only the sensilla of olfaction, but also of those of taste, mechano, hygro, thermo perception and sometimes sensors of CO_2 (Hansson, 1999).

For many insects, antenna is of utmost importance not only in search for food for themselves or their offspring, but for intraspecific communications as well (Hansson, 1995; Zacharuk & Shields, 1991).

In *Zonocerus variegatus* and other acrids, the size of antennae and antennal lobe increased with each moult from first instar to the adult stage (Yondeowei, 1974) with special sensillum types such as pheromones receptors finally arising in the adult.

The attraction of *Z. variegatus* to siam weed *Chromolaena odorata* (L.) leaves and inflorescences in the field had been attributed to olfactory clues and not visual (Modder, 1984) indicating that the antenna is used in the response.

The life cycle of *Z. variegatus* is built around six nymphal stages and adult stage (Toye, 1982; Yondeowei, 1974) and the nymphal development is usually completed in 3-5 months, while the adults lives up to 15 weeks (Muse, 2003). The behavior and food preferences of each nymphal stage differs: while the 1st-3rd instars have gregarious habit, aggregating or crowding around *C. odorata* and prefer weeds like *C. odorata*, *Ageratum conyzoides*, *Aspillia lacifolia*, *Tridax procubens*, later instars on the other hand, are dispersed and prefer cassava (*Manihot esculenta*) leaves (Chapman, 1986; Tamu, 1990). These differences in the life cycle of grasshoppers are coupled to differences in morphological and physiology features of the sensory organs (Anton et al., 1996).

In the recent times, electrophysiology and electroantennogram (EAG) had been used extensively in insect pest control and it gives a good knowledge of the insect and of host-plant interaction which could be used in producing an effective trap-bait system.

However, there is scarce information on the physiology of the antennae of *Z. variegatus* in literature the little present are on its morphometrics and descriptions (Youdeowei, 1974 and Chapman et al., 1977). The focus of this study is to examine the growth and ionic composition of the antennae of *Z. variegates*.

MATERIALS AND METHODS

Newly hatched first instar nymphs of *Z. variegatus* were collected from uncultivated farm land near Students Union Building of University of Agriculture, Abeokuta, Nigeria. They were reared in wire mesh cages (30x30x45cm) situated at the insectary of the Department of Biological Sciences of the University. They were maintained till they reached adult stage on fresh leaves *C. odorata* and *M. esculenta*. The identification of each of the six nymphal stages was done based on the description of Chapman et al., (1977) and Youdeowei (1974). After each moult, evidenced by the exuviae, antennectomy was done on each instar stage. This was done with fine scissors and it involved the removal of the whole flagella and pedicel segments of both sides.

Measurements

The antennal length and number of segments each of the antennae of each nymphal stage was measured using calibrated microscope. The body weight of each stage of development was taken using sensitive electronic balance (Mettler PM-11 UK). 30 replicates of each nymphal stage were used.

Ionic Analysis

The ionic composition of the antennal was determined by method of A.O.A.C (1990). 0.5g of the antennal sample of each instar stage was oven dried and well ground samples were weighed into 250ml flask for wet ashing by the addition of 25ml of HNO_3 , 4ml of HCl and 2ml of H_2SO_4 . This mixture was then heated for 5 minutes and diluted with distilled water to 100ml. Magnesium (Mg^{2+}), Zinc (Zn^{2+}) calcium (Ca^{2+}) and iron (Fe^{+}) were determined by using Atomic Absorption spectrophotometry (AAS) (Pye unican UK model SP9). Sodium (Na^{+}) and potassium (K^{+}) were also determined through flame photometer (Corning, UK model 405) while phosphate (PO_4^{2-}) and chloride (Cl^{-}) were analyzed by colorimetric method using spectronic 20 (Gallenkamp, UK). All these analyses were done in triplicates.

Statistical Analysis

The data collected were analyzed by one-way analysis of variance (ANOVA) and significantly different means were separated using Student-Newman-Keuls (SNK) test. Regression analysis was used to determine the growth rate of the body parts and the relationship among the measured parameters.

RESULTS

There was a gradual increase in the length and number of segments on the antennae as the insect moult from 1st instar to the adult stage, the antennal length of the 1st instar was 0.19 cm while the adult was 1.75cm. Similar trend was recorded for the body length and body weight (Table 1). The adult stage had significantly higher ($P < 0.05$) antennal length than other early stages of development, while the antennal segments of 5th instar to adult stage were significantly more than those of 1st-3rd instars.

The growth gradient or slope between the 6th instar and adult stage was greater than that within other lower stages of development (Figure 1). Similarly, the growth rate of the antennal length (0.2154x) was slower than the growth rate of body length (0.415x). Furthermore, regression analysis reveals a strong and positive relationship between the antennal length and body weight (+0.96) (Figure 2).

The ionic composition of the antennae of *Z. variegatus* during post embryonic development is shown in table 2. There were significant differences ($P < 0.05$) in the concentrations of the ions across the developmental stages. The concentrations of Na^+ , K^+ , Mg^{2+} , Zn^{2+} , Ca^{2+} were significantly higher in early instars (1st-2nd) than the latter instars (5th-adult). However, no significant difference ($P > 0.05$) was observed in the concentrations of the anions (PO_4^{2-} and Cl^-) across the developmental stages. Of the eight (8) ions detected in the antennal of *Z. variegatus* during development Cl^- followed by K^+ recorded the highest concentrations. Furthermore, the total concentration of ions in the 1st and 2nd instars were 88.13 mg/mol and 87.64 mg/mol respectively while the 6th and adult stage antennae had total concentration of 51.83mg/mol and 69.56mg/mol respectively (Table 2).

The total concentration of ions in the antenna of each developmental stage is shown in Figure 3. The 1st and 2nd instar stages recorded higher total concentrations of ions than later instars. A drop in total concentration was observed at the 3rd instar stage which rose up again at the 4th instar stage, but later dropped during 5th and 6th stages of development. The adult stage however witnessed a rise in the total concentration but not as high as that of the 1st and 2nd instar stages of development.

DISCUSSION

The length of the antennae and number of segments on them progressively increased during post embryonic development. Chapman *et al.*, (1977) made similar observation on *Z. variegatus* fed different food plants in Ibadan, Nigeria. This is also in agreement with the results of other electrophysiologists (Anton *et al.*, 2002; Anton *et al.*, 1996 and Hansson *et al.*, 1996) that antennal lobe of *Schistocerca gregaria* increased in size during development due to increased number and size of glomeruli.

The size of the antennae might provide explanation for the differences in the behavior of *Z. variegatus* during development as the short length of the antennae of the lower instar (1st-3rd) might not allow them to perceive or detect very well odor far off from them thus resulting in the gregarious or crowding habit. On the other hand, the long antennal length of the adult stage allows for easy perception of both near and far odor making them to be dispersed widely in the field. Changes in the peripheral olfactory input between developmental stages had been reported to cause a behavioral switch in *S. gregaria* (Ochieng' *et al.*, 1998). During post embryonic development of Cricket *Gryllus bimaculatus* both the quantity and quality of sensory inputs periodically change at the time of ecdysis. The longer cercal filiform hairs are more sensitive to air current than short ones in the adult stage (Kanou *et al.*, 1988). In a related experiment, Wasserman and Itagaki (2003) observed that maxillary palps of Flesh fly, *Neobelleiria bullata* (Diptera: Sarcophagidae) were less sensitive to plant oriented odorants than the antennae because of the anatomical position relative to the source of the odour.

In many hemimetabolans, additional antennal flagellomeres and sensillum are formed with pheromones receptors finally arising in the adult stage (Hansson,

1999). The present study correlated this fact as the growth slope between the 6th conster and adult stage was greater than that of the lower instars. This is consistent with the increasing number of reception neurons during post embryonic development. This phenomenon might perhaps be due to the reproductive activities that in pronounced and unique in the adult stage of *Z. variegatus* which specifically requires the use of antennae for courtship (mate location and identification) and mating behaviors in addition to food selection peculiar to all instars. This parallels the observation of Ochieng' et al. (1998) that the number of olfactory sensillum reached a significantly higher number at the last stage of development in gregarious adult locust, *S. gregaria*. Similarly, the enzymatic activities of the adult *Z. variegatus* femoral muscles were significantly ($P < 0.05$) higher than the early instar stages (Ademolu et al., 2009).

Antennal length forms a good indication or reflection of the body weight of *Z. variegatus* as there existed a strong and positive relationship between the two body measurements. Idowu (1995) likewise reported that a strong relationship existed between the body size and the repellent gland size of *Z. variegatus*. Thus, in laboratory experiments, antennal length could serve as an estimate of body weight if weighing balances are not available.

The ionic concentrations of antennae of the lower instar (1st-2nd) were significantly higher than the later stages of development. Similarly, high concentrations of K^+ , Na^+ and Cl^- in the antennae of early instars are noteworthy. Na^+ and K^+ are known to play vital roles in transmission of impulses in the cells (Ademolu et al., 2007). The higher concentrations of these ions in the lower instars might probably be accountable for the gregarious and quiescent nature at these early stages of development, because high concentrations of these ions leads to decrease in resting potential of the cells and thus reduce their sensory function (Chapman, 1990). Ignell et al., (1998) similarly observed that projection neurons (PNS) of the adult gregarious locust, *S. gregaria* responded significantly more frequently to phenylacetone nitril (PAN) than PNS of lower gregarious instars.

High concentrations of K^+ and Cl^- were observed in the antennae of *Z. variegatus* in their study. This is not unexpected as phytophagous insects like *Z. variegatus* commonly have high concentrations of K^+ and Cl^- in their tissues due to the plant origin of their foods (Chapman, 1990).

CONCLUSION

We have been able to show both morphologically and physiologically that the later instars and adult stage of *Z. variegatus* will be more sensitive than the lower instars. We therefore opine that traps baited with attractive odor will best work for later instars and adult stage that have higher response capability or excitability than the lower instars. Hence, use of olfactory pheromone will do better in later stages of development than lower instars where other IPM techniques might be applied.

LITERATURE CITED

Ademolu, K. O., Idowu, A. B. & Olatunde, G. O. 2009. Morphometrics and enzymes activities in the femoral muscles of variegated grasshopper *Zonocerus variegatus* (Orthoptera: Pyrgomorphidae) during post embryonic development. International Journal of Tropical Insect Science, 29: 53-56.

Ademolu, K. O., Idowu, A. B. & Amusan, A. A. A. 2007. Chemical analysis of tissues of *Zonocerus variegatus* (L.) (Orthoptera: Pyrgomorphidae) during post embryonic development in Abeokuta, south-western, Nigeria. Nigerian Journal of Entomology, 24: 24-34.

Anton, S., Ignell, R. & Hansson, B. S. 2002. Developmental changes in the structure and function of the central olfactory system in gregarious and solitary desert locusts. *Microscopy Research, and Techniques*, 56: 281-291.

Anton, S. & Hansson, B. S. 1996. Antennal lobe interneurons in the desert locust *Schistocerca gregaria* (Forsk.) Processing of Aggregation pheromones in Adult male and female. *Journal of comparative neurology*, 370: 85-96.

A. O. A. C. 1990. Association of official analytical chemist (ed. W. Horwitz 13th ed. Washington. 1142 pp.

Chapman, R. F. 1990. The insect: structure and function. The English language. Book society and Hodder and Stoughton, Great Britain. 968 pp.

Chapman, R. F. 1986. Bionomics of the variegated grasshopper (*Zonocerus variegatus*) in West and Central Africa. *Annual Review of Entomology*, 31: 479-505.

Chapman, R. F., Cook, A. G., Mitchell, G. A. & Page, W. W. 1977. Description and morphometrics of nymphs of *Zonocerus variegatus* (Orthoptera: Acridoidea). *Bulletin of Entomology Research*, 67: 427-437.

Hansson, B. S. 1995. Olfaction in Lepidoptera. *Experientia*, 51: 1003-1022.

Hansson, B. S., Ochieng', S. A., Grosmaître, Y., Anton, S. & Njagi, P. G. N. 1996. Physiological responses and central nervous projections of antennal olfactory receptor neurons in the adult desert locust *Schistocerca gregaria* (Orthoptera: Acrididae). *Journal of comparative physiology*, A 179: 157-167.

Hansson, B. S. 1999. Insect olfaction. Springer-verlag Berlin Heidelberg, Germany. Pp. 16-24.

Idowu, A. B. 1995. Structure of the repellent gland of *Zonocerus variegatus*. *Journal of African Zoology*, 107: 247-252.

Ignell, R., Anton, S. & Hansson, B. S. 1998. Central Nervous processing of behavioural relevant odours in solitary and gregarious fifth instar locust *Schistocerca gregaria*. *Journal of comparative physiology*, A. 183: 453-465.

Kanou, M., Osawa, T. & Shimozawa, T. 1988. Ecdysial growth of the filiform hairs and sensitivity of the cercal sensory system of the cricket *Gryllus bimaculatus*. *Journal of comparative physiology*, A. 162: 573-579.

Modder, W. W. D. 1984. The attraction of *Zonocerus variegatus* (L) (Orthoptera: Pyrgomorphidae) to the weed *Chromolaena odorata* and associated feeding behavior. *Bulletin of Entomology Research*, 74: 239-247.

Ochienga', S. A., Hallberg, E. & Hansson, B. S. 1998. Fine structure and distribution of antennal sensilla of the desert locust *Schistocerca gregaria* (Orthoptera: Acridoidea). *Cell and Tissue Research*, 291: 525-536.

Muse, W. A. 2003. Effect of sex, age, starvation and feeding, isolation and crowding and oviposition on longevity of *Zonocerus variegatus* (L) (Orthoptera: Pyrgomorphidae). *Journal of Biological Research and Biotechnology*, 1 (2): 11-20.

Tamu, G. 1990. Feeding behavior of the variegated grasshopper *Zonocerus variegates* Ph.D. Thesis, University of Ibadan. 205 pp.

Toye, S. A. 1982. Studies on the Biology of the Grasshopper pest *Zonocerus variegatus* (L) (Orthoptera pyrgomorpha) in Nigeria. *Insect Science Application*, 3: 1-7.

Wasserman, S. L. & Itagaki, H. 2003. The olfactory responses of the antenna and maxillary palp of the Fleshfly, *Neobellieria bullata* (Diptera; sarcophagidae) and their sensitivity to blockage of nitric oxide synthase. *Journal of insect physiology*, 49: 271-280.

Youdeowel, A. 1974. Dissection of the variegated grasscopper, *Zonocerus variegatus* (L). Oxford University Press. Ibadan, Nigeria. pp. 69-73.

Zacharuk, R. U. & Shields, V. D. 1991. Sensilla of immature insects. *Annual Review of Entomology*, 36: 331-354.

REDESCRIPTION OF GENUS *BARIMONONYCHUS* PAJNI & KOHLI, 1982 (COLEOPTERA: CURCULIONIDAE) FROM INDIA

B. Ramesha* and V. V. Ramamurthy*

* Division of Entomology, Indian Agricultural Research Institute, New Delhi, 110012, INDIA. E-mails: rameshakau@rediffmail.com; vvrento@gmail.com

[Ramesha, B. & Ramamurthy, V. V. 2011. Redescription of genus *Barimononychus* Pajni & Kohli, 1982 (Coleoptera: Curculionidae) from India. *Munis Entomology & Zoology*, 6 (2): 925-928]

ABSTRACT: *Barimononychus* redescribed for its essential generic characters along with the lone species known viz., *B. kazirangensis* with the addition of genitalia structures and morphometry.

KEY WORDS: *Barimononychus*, Baridinae, redescription, India.

Genus *Barimononychus* is represented from India with only one species. Pajni & Kohli (1982) described it from India, and it differs from all other genus of Baridinae: with the head separated from rostrum by a transverse depression, frons between eyes a little narrower than the base of rostrum; antennae with seventh segment of funicle completely annexed to club; all femora sulcate beneath, tarsi with a single claw; prosternum depressed longitudinally in the middle, prosternal process as broad as a coxa, mesosternal process depressed or oblique. Voucher specimens are available with the National Pusa Collection, Division of Entomology, Indian Agricultural Research Institute, New Delhi.

MATERIALS AND METHODS

The material for the study is from the National Pusa Collection (NPC), Division of Entomology, Indian Agricultural Research Institute, New Delhi. All the taxonomic characters, except genitalia studied in intact specimens. For genitalia, specimens were processed following Supare et al. (1990), and taxonomic characters and genitalia studied using Leica M205FA Leica MZ16A Wild stereozoom microscopes. Photographs were captured using software Leica application Suit ver. 2.8.2 on a Leica DFC290 camera mounted on Leica MZ16A stereozoom microscope. Illustrations were made using a drawing tube fitted with camera lucida and scales of magnification provided in the illustrations. The body size given in the descriptions is excluding rostrum, as regards total length; and length from anterior margin of pronotum to end of pygidium in case of standard length.

Barimononychus Pajni & Kohli, 1982

Barimononychus Pajni & Kohli, 1982: 366. Type species: *Barimononychus kazirangensis* Pajni & Kohli, 1982: 367; gender: Masculine.

General colour black. Head 1.2x as broad as long, separated from the rostrum by a deep transverse incision, frons narrower than base of rostrum (Fig. 1). Rostrum 0.58x as long as head and pronotum combined, curved, narrowed dorsoventrally from base to apex and then gradually widened at apex (Fig. 2). Eyes 2.3x as wide as long. Antennae inserted at 0.54x of length from base of rostrum, scape slender, 5x as long as broad, almost impunctate, funicle widening distally, funicular segment seven continuous with the club (Fig. 3). Prothorax bisinuate at posterior margin, broadly truncate at anterior margin, not produced

over the head when viewed in profile, as broad as long (Fig. 4). Scutellum generally transverse, 0.62x as broad as long. Elytra oblong, 0.7x as wide as prothorax, deeply striate (Fig. 5). Sternum with prosternum longitudinally impressed in middle, procoxae as wide as its intercoxal process, hind margin of the prosternum produced in the middle, mesosternum transversely impressed, its intercoxal process 1.7x as broad as a coxae; metasternum elongate, 1.7x as long as median coxae, episterna not much narrowed in the middle, their upper basal angle almost rectangular. Venter with the pygidium transverse, dorsally not visible. Legs with the femora weakly clavate, unarmed, sulcate beneath (Figs. 6, 7), tibiae slightly widened distally, each with oblique mucro at inner angle and long curved uncus at external angle, with outer setose fringe of corbel incomplete and inner absent, tarsi with joint 3 broadly lobate, with single claw (Fig. 8).

***Barimononychus kazirangensis* Pajni & Kohli, 1982**

(Figs. 1-26)

Barimononychus kazirangensis Pajni & Kohli, 1982:317

General colour black. **Head** with close punctations 1.2x as broad as long. **Rostrum** 0.58x as long as head and pronotum combined, gently curved, gradually widening, at middle 0.78x as broad as apex, 1.3x as broad as base, almost compressed laterally, without any sub basal dilation (Figs. 1, 2). **Antennae** brownish yellow, inserted at 0.54x of length from base of rostrum, scape slender, 5x as long as broad, almost impunctate; first segment of the funicle as long as second and third combined, third as long as broad, segments three to seven transverse and as long as broad, funicle 1.6x as long as club (Fig. 3). **Prothorax** as broad as long, with weak constriction at the apex, gently rounded at the sides, anterior margin broadly truncate, posterior margin bisinuate, at middle 1.6x as broad as apex, 1.05x as broad as base, dorsum gently convex longitudinally, set with close shallow punctations, not confluent in curves, with narrow smooth median line (Fig. 4). **Scutellum** strongly transverse sparsely punctuate, and 0.62x as broad as long. **Elytra** oblong, without deep subapical impressions and without large obtuse posterior calli, at middle 1.27x as broad as apex and base; striae shallow, with row of punctations upto middle, and elongated beyond it, striae 10 complete; intervals flat, 3x as broad as a striae, with a row of distant punctations carrying indistinct seta (Fig. 5). **Elytral vestiture** absent. **Legs** coarsely punctate, each punctation containing a grey seta, femur clavate (Fig. 6), unarmed shallowly sulcate beneath (Fig. 7); tibia thinner, not dilated at apex, armed with small mucro at inner angle and stout curved uncus at outer angle; tarsus thick, claw single (Fig. 8). Profemur as long as mesofemur, 0.91x as long as metafemur. Protibia 1.25x and 1.33x as long as meso and metatibia respectively. First tarsal segment 1.5x as long as broad, 1.5x as long as second, 1.2x as long as third tarsal. Third tarsal segment 1.2x as broad as long, fourth tarsal segment 3x as long as broad. **Prosternum** without deep transverse sulcus behind apex, with large round punctation, and without fovea. Procoxae as broad as its intercoxal process. **Mesosternum** plate like, shallowly depressed at base and raised at apex, its intercoxal process 1.7x as broad as mesocoxae. **Metasternum** depressed in the middle with longitudinal impressed line, intercoxal process in the metasternum 1.2x as broad as metacoxae. **Venter** black, ventrite one and two separated with distinct segmentation, strongly punctate and each with broad setae, anterior margin of first ventrite dome shaped, posterior margin shallowly sinusoidal, 2.5x as broad as long, 2x as long as second, second ventrite 4.4x as broad as long, and as long as three and four combined. Third as

long as fourth ventrite, ventrite five 2.5x as broad as long, its posterior margin rounded (Fig. 9); **Pygidium** distinctly punctate, and 2.1x as broad as long.

Female genitalia with spermatheca more sclerotised at distal arm, distal arm as long as proximal arm, angle between proximal and distal arms acute, nodulus small, tapering towards apex, ramus tubular, cornu bent and strongly pointed (Figs. 10, 12). **Spiculum ventrale** with shaft stump like, as long as basal plate, basal plate 1.6x as long as broad, its apical end truncate without hairs (Figs. 11, 13).

Male genitalia with apophyses 2.3x as long as median lobe, 1.5x as long as tegmen; median lobe moderately sclerotised, parallel sided from base to behind the middle, apex convex, at middle 1.2x as broad as apex and as broad as base (Figs. 14-19). **Tegmen** as long as manubrium, and as long as paramere, manubrium gradually tapering, its apex tubular (Figs. 20, 22). **Spiculum gastrale** uniformly thick, curved at apex, 15x as long as broad (Figs. 21, 23).

Total length: 2.37±0.14 mm; **Standard length:** 2.1 mm; **Breadth:** 0.98±0.10 mm.

Specimens examined: 7 specimens, INDIA: Assam: Kaziranga, bushes, 23.iv.1979, Coll. unknown; 5 specimens 26.iv.1978, Coll. unknown; 3 specimens, Nagaland: Rangapahar, 21.iv.1979, Coll. unknown; 1 specimen, Assam, 1976, Coll. unknown.

Distribution: INDIA: Assam: Kaziranga; Nagaland: Rangapahar.

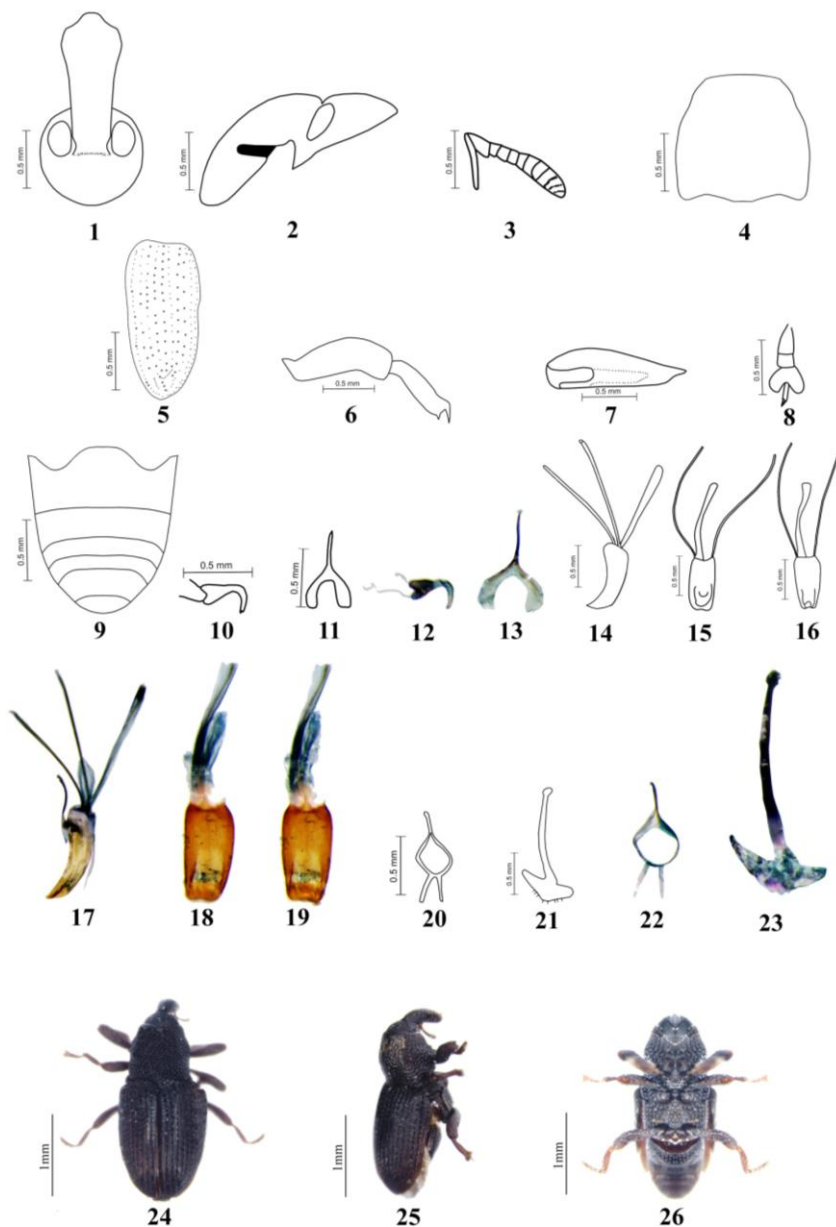
ACKNOWLEDGEMENTS

Senior author gratefully acknowledges the Kerala Agricultural University for providing deputation for study purpose.

LITERATURE CITED

Pajni, H. R & Kohli, S. K. 1982. *Barimononychus*, a new genus from India (Col. Curculionidae. Baridinae). The Coleopterists Bulletin, 36(2): 366-370.

Supare, N. R., Ghai, S. & Ramamurthy, V. V. 1990. A revision of *Tanymecus* from India and adjacent countries (Coleoptera: Curculionidae). Oriental Insects, 24: 1-126.



Figures 1-26. *Barimononychus khazirangensis*. 1. Rostrum, dorsal view; 2. Rostrum, lateral view; 3. Antennae; 4. Thorax, dorsal view; 5. Elytron, dorsal view; 6. Femur, dorsal view; 7. Femur ventral view; 8. Tarsal claw; 9. Venter; 10-13. Female genitalia: 10, 12. Spermatheca; 11, 13. Spiculum ventrale; 14-23. Male genitalia: 14-19. Median lobe, lateral, dorsal and ventral view; 20, 22. Tegmen; 21, 23. Spiculum gastrale; 24-26. Habitus: dorsal, lateral and ventral view.

CONTRIBUTIONS TO THE DERMAPTERA FAUNA OF TURKEY

**Serdar Tezcan*, Yusuf Karsavuran*,
Esat Pehlivan* and Sinan Anlaş****

* Department of Plant Protection, Faculty of Agriculture, University of Ege, 35100 Bornova, İzmir/TURKEY. E-mail: serdar.tezcan@gmail.com

** Department of Biology, Faculty of Science, University of Ege, 35100 Bornova, İzmir/TURKEY. E-mail: sinan.anlas@gmail.com

[Tezcan, S., Karsavuran, Y., Pehlivan, E. & Anlaş, S. 2011. Contributions to the Dermaptera fauna of Turkey. *Munis Entomology & Zoology*, 6 (2): 929-931]

ABSTRACT: In this paper, some distributional data on nine species belonging to four families of Dermaptera fauna of Turkey housed in the collection of Lodos Entomological Museum, Turkey (LEMT), Ege University, İzmir, Turkey, have been given.

KEY WORDS: Dermaptera, Fauna, LEMT, Turkey.

Publications on Turkish Dermaptera fauna started with Werner (1901) and then continued with the studies of Burr (1947, 1952a,b), Weidner (1957), Maran (1977), Haas & Henderickx (2002). In addition to these, studies of Önder et al. (1999), Kocarek (2007), Tezcan & Kocarek (2009) and Anlaş et al. (2010) have great importance in this field.

In this paper, we would like to contribute new distributional records to Turkish Dermaptera fauna based on the material collected between the years of 1970-2010 from different localities of Turkey. Material housed in the collection of Lodos Entomological Museum, Turkey (LEMT), Ege University, İzmir, Turkey.

RESULTS

Anisolabididae

***Euborellia annulipes* (Lucas, 1847)**

Material: İzmir, Bornova, 15.I.1972, under stone (1). Totally 1 specimen.

Forficulidae

***Anechura bipunctata* (Fabricius, 1781)**

Material: Bayburt, Kop, 10.VII.1978, (2); Gümüşhane, Torul, 10.VII.1978, weeds, (1); Kars, Central province, 16.VII.1982, under stone, (3). Totally 6 specimens.

***Forficula aeticola* Brunner, 1882**

Material: İzmir, Bozdağ, 1200 m, 30.XII.1971, under stone, (1); Yozgat, Çekerek, 07.VIII.1979, *Iris* sp., (3). Totally 4 specimens.

***Forficula auricularia* Linnaeus, 1758**

Material: Ankara, Çubuk, 03.VIII.1979, *Malus domestica*, (2), Kızılcahamam, 12.VII.1979, *Pyrus communis*, (1); Antalya, Kaş, 01.VIII.1985, on the ground, (1), 02.VIII.1985, under stone, (2), Saklıkent, 26.VII.1985, *Verbascum* sp., (1); Artvin, Hopa, 07.VII.1978, *Rubus* sp., (1), Karagöl, 03.V.1979, under stone, (1); Aydın, Germencik, 04.VIII.1974, under stone, (1); Bartın, Amasra, 17.VII.1979, *Juglans regia*, (1), Ulus, 12.VII.1979, *Quercus* sp., (1); Bolu, Mudurnu, 14.VII.1979, *Prunus domestica*, (1); Çanakkale, Bozcaada, 18.IX.1985, weeds, (2); Çankırı, Central province, 03.VIII.1979, *Malus domestica*, (3); Çorum, Central province, 05.VIII.1979, *Quercus* sp., (1), *Prunus armeniaca*, (1), *Pyrus elaeagnifolia*, (1); Edirne, Lalapaşa, 02.VI.1971, under stone, (1); Eskişehir, Mihaliçcik, 09.VII.1979, weeds, (1); Giresun, Şebinkarahisar, 12.VII.1978, weeds, (1); İzmir, Bornova, 15.V.1977, weeds, (1), Konak, Gültepe, 14.IV.1977, weeds, (1); Kahramanmaraş, Göksun, 1450 m, 21.VII.1984, *Cirsium* sp., (2); Karabük, Eflani, 03.VIII.1979, *Ulmus* sp., (2), Eskipazar, 18.VII.1979, *Prunus domestica*, (1);

Kayseri, Hacılar, 10.VIII.1979, weeds, (2), Himmetdede, 08.VIII.1979, *Prunus armeniaca*, (1); **Kırıkkale**, Keskin, 25.VI.1980, *Pyrus communis*, (2); **Konya**, Akşehir, 21.IV.1979, under stone, (1), Kulu, 02.V.1979, weeds, (1); **Manisa**, Central province, 10.V.1999, (1), Akhisar, 26.XI.1973, under stone, (1); **Mersin**, Arslanköy, 08.VII.1986, *Quercus* sp., (1), 08.VII.1986, (1), Gülnar, 04.VII.1986, *Styrax* sp., (1); **Muğla**, Fethiye, 09.VIII.1975, *Pinus* sp., (2); **Nevşehir**, Avanos, 16.VIII.1979, *Salix* sp., (2); **Ordu**, Mesudiye, 14.VII.1978, weeds, (1); **Sivas**, Koyulhisar, 12.VII.1978, *Quercus* sp., (2); **Tekirdağ**, Central province, 01.VI.1973, *Fraxinus* sp., (1); **Uşak**, Eşme, 23.V.1998, (2); **Yozgat**, Çekerek, 07.VIII.1979, *Iris* sp., (1), dung, (1), Sorgun, 08.VIII.1979, *Salix* sp., (1); **Zonguldak**, Ereğli, Çayköy, 21.VI.1989, *Corylus avellana*, (1). Totally 57 specimens.

Forficula lurida Fischer, 1853

Material: **Adana**, Kozan, 03.V.1985, *Triticum aestivum*, (3), Tufanbeyli, 12.VII.1986, *Berberis* sp., (2); **Adıyaman**, Nemrut, 28.IV.1985, under stone, (1); **Ankara**, Kızılcahamam, 12.VII.1979, *Populus* sp., (1), *Malus domestica*, (1); **Antalya**, Central province, 17.V.1986, *Prunus dulcis*, (1), Dağ, 17.V.1986, *Quercus ilex*, (2), Demre, 01.VIII.1985, *Quercus* sp., (6), 21.V.1986, *Triticum aestivum*, (3), on the ground, (1), under stone, (1), Elmalı, 21.V.1986, under stone, (1), Kaş, 03.V.1972, (1), 01.VIII.1985, *Quercus* sp., (3), *Ceratonia siliqua*, (3), on the ground, (1), 21.V.1988, under stone, (1), Kumluca, 10.V.1986, under stone, (1), Sineklibel, 02.VIII.1985, *Quercus* sp., (1); **Artvin**, Central province, 08.VII.1978, *Tamarix* sp., (1), Sarp, 08.VII.1978, weeds, (2); **Bahkesir**, Havran, 28.IV.1991, under stone, (4), 12.VII.1991, under stone, (1); **Bartın**, Ulus, 17.VII.1979, *Quercus* sp., (1), under stone, (1); **Bolu**, Central province, 27.V.1980, *Quercus* sp., (1), Mengen, 14.VIII.1979, on the ground, (2), Mudurnu, 14.VII.1979, weeds, (1); **Bursa**, İznik, 26.IV.1985, *Prunus domestica*, (1); **Çanakkale**, Central province, 30.VI.1975, weeds, (2), 01.VI.1997, weeds, (1), Eceabat, Seddülbahir, 31.V.1975, *Malva* sp., (2), Gökçeada, 26-29.V.1975, weeds, (2), 26.V.1975, weeds, (1); **Gaziantep**, Central province, 06.VI.1985, *Rosa* sp., (2), *Pyrus communis*, (1), İslahiye, Fevziye, 03.VI.1985, *Pinus* sp., (2); **Giresun**, Şebinkarahisar, 12.VII.1978, under stone, (1), weeds, (2), *Crataegus* sp., (1); **Gümüşhane**, Torul, 10.VII.1978, on the ground, (1); **Hatay**, Soğukoluk, 30.V.1985, *Diospyros kaki*, (1); **İzmir**, Balçova, 18.V.1971, (1), 29.V.1977, under stone, (1), 11.V.1978, under stone, (1), Bergama, Göçbeyli, 28.I.2003, under stone, (1), Bornova, 25.III.1977, under stone, (2), 04.IV.1977, weeds, (1), 25.V.1977, weeds, (1), 28.V.1977, under stone, (1), Kemalpaşa, Savandağ, 05.V.1994, *Prunus avium*, (1), Konak, Gültepe, 14.IV.1977, weeds, (1); **Kahramanmaraş**, Central province, 11.VI.1985, *Acacia* sp., (1), Ahır Dağı, 10.VI.1985, *Elaeagnus angustifolia*, (1), Gökşun, 1450 m, 21.VII.1984, *Cirsium* sp., (5), 02.V.1986, (1), Pazarcık, 07.VI.1985, *Quercus* sp., (1); **Karabük**, Central province, 29.V.1989, *Prunus domestica*, (2), Eflani, 18.VII.1979, weeds, (1), 03.VIII.1979, *Ulmus* sp., (1), Eskipazar, 29.V.1980, *Verbascum* sp., (1); **Karaman**, Bucakışla, 26.IV.1979, weeds, (1), under stone, (1); **Kastamonu**, Central province, 19.VII.1979, *Pinus* sp., (1), Cide, 03.VI.1980, *Laurus* sp., (1), Küre, 19.VII.1979, *Malus domestica*, (1), weeds, (1); **Kırklareli**, Vize, 02.VI.1975, weeds, (1); **Kilis**, Central province, 26.IV.1986, on the ground, (1); **Manisa**, Akhisar, 31.V.1978, under stone, (1); **Mardin**, Yeşilli, 13.VI.1975, *Juglans regia*, (1); **Mersin**, Anamur, 18.IV.1985, *Cistus* sp., (2), Cehennemdere, 29.V.1985, under stone, (2), Gözne, 26.IV.1985, weeds, (1), Gülnar, 19.IV.1985, dung, (1), 04.VII.1986, *Styrax* sp., (1), Güzeloluk, 06.VII.1986, under stone, (1), Silifke, Kırabasi, 05.VII.1986, *Juniperus* sp., (1), Uzuncaburç, 880 m, 05.VII.1986, weeds, (1); **Muğla**, Fethiye, 09.VIII.1975, *Pinus* sp., (1); **Ordu**, Gökçöy, 12.VII.1978, under stone, (1), Mesudiye, 14.VII.1978, weeds, (1); **Osmaniye**, Düziçi, 07.V.1985, *Triticum aestivum*, (1), Gavurdağı, 08.VI.1985, *Quercus* sp., (2), *Rubus* sp., (1), *Salix* sp., (1); **Tekirdağ**, Central province, 01.IV.1976, *Fraxinus* sp., (2); **Tokat**, Artova, 02.VII.1978, under stone, (1), on the ground, (1); **Trabzon**, Maçka, 08.VII.1978, weeds, (1); **Zonguldak**, Devrek, 29.V.1980, *Fagus* sp., (2). Totally 128 specimens.

Forficula smyrnensis Audinet & Serville, 1839

Material: **Antalya**, Dağ, 17.V.1986, *Quercus ilex*, (1); **Hatay**, Soğukoluk, 30.V.1985, *Diospyros kaki*, (1); **Mersin**, Anamur, 03.VII.1988, (1), Çamlıyayla, 10.VII.1986, *Populus* sp., (1), Fındıkpınarı, 1300 m, 07.VII.1986, (1). Totally 5 specimens.

***Guanchia hincksi* (Burr, 1947)**

Material: **Antalya**, Central province, 19.V.1988, (1); **Balıkesir**, Central province, 26.IV.1975, *Quercus* sp., (1); **Isparta**, Eğirdir, 08.VIII.1975, *Fraxinus* sp., (1); **İzmir**, Kemalpaşa, Örnekköy, 21.VIII.1994, *Prunus avium*, (1); **Mersin**, Gözne, 26.IV.1985, *Pinus* sp., (1), Tarsus, 29.IV.1985, weeds, (1); **Yozgat**, Çekerek, 07.VIII.1979, *Iris* sp., (1). Totally 7 specimens.

Labiduridae***Labidura riparia* (Pallas, 1773)**

Material: **Ankara**, Central province, 07.1990, on the ground, (1); **İzmir**, Bornova, 06.VI.1976, under stone, (1), Kemalpaşa, Ören, 28.VIII.1998, pitfall trap, (1). Totally 3 specimens.

Spongiphoridae***Isolaboides kosswigi* (Burr, 1947)**

Material: **İzmir**, Ödemiş, Bozdağ, 30.XII.1971, under stone, (4), 30.XII.1972, (1), Kiraz, 25.I.1972, *Ulmus* sp., (1). Totally 6 specimens.

LITERATURE CITED

- Anlaş, S., Haas, F. & Tezcan, S.** 2010. Dermaptera (Insecta) fauna of Bozdağlar Mountain, Western Turkey. Linzer biologischen Beiträge, 42 (1): 389-399.
- Burr, M.** 1947. Two new species of Dermaptera from Turkey. Proceedings of the Royal Entomological Society of London (B), 16: 60-65.
- Burr, M.** 1952a. Field notes from Anatolia. IX. A circular tour. Entomologist's Record, 64: 309-315.
- Burr, M.** 1952b. On the distribution of Turkish Dermaptera. Revue de la Faculté des Sciences de l'Université d'Istanbul, Série B, 17 (2): 131-134.
- Haas, F. & Henderickx, H.** 2002. Dermaptera from Cyprus and Turkey. Beiträge zur Entomologie, 52 (1): 235-239.
- Kocarek, P.** 2007. *Guanchia brignolii* Vigna Taglianti, 1974 in Turkey (Dermaptera: Forficulidae). Acta Entomologica Slovenica, 15 (1): 91-94.
- Maran, J.** 1977. 34. Wissenschaftliches Ergebnis der zoologischen Expedition des Nationalmuseums in Prag nach der Türkei. Dermaptera. Acta Entomologica Musei Nationalis Pragae, 39: 253-261.
- Önder, F., Pehlivan, E., Karsavuran, Y., Tezcan, S. & Kismali, Ş.** 1999. Catalogue of the collection of Dermaptera preserved in the Prof. Dr. Niyazi Lodos Museum, İzmir, Turkey. Ege Üniversitesi Ziraat Fakültesi Dergisi, 36 (1-3): 157-162.
- Tezcan, S. & Kocarek, P.** 2009. Dermaptera fauna of the ecologically managed cherry orchards in western Turkey. Munis Entomology & Zoology, 4 (2): 572-576.
- Weidner, H.** 1957. Die Ohrwürmer der Türkei. Entomologische Mitteilungen aus dem Zoologischen Staatsinstitut und Zoologischen Museum Hamburg, 10: 290-305.
- Werner, F.** 1901. Die Dermapteren und Orthopteren Kleinasiens. Sitzungsberichte der kaiserlichen Akademie der Wissenschaften. Mathematisch-naturwissenschaftliche Classe, 110: 259-306.

**FIRST RECORD OF THE SPIDER GENUS *INDOSMODICINUS*
FROM CHINA, WITH DESCRIPTION OF THE HITHERTO
UNKNOWN MALE OF *INDOSMODICINUS BENGALENSIS*
(ARANEAE: THOMISIDAE)**

**Feng Zhang*, Dong-Sheng Hu*
and Dinendra Raychaudhuri****

* College of Life Science, Hebei University, Baoding, Hebei 071002, CHINA. E-mail: dudu06042001@163.com

** Entomology Laboratory, Department of Zoology, University of Calcutta, 35, Ballygunge Circular Road, Kolkata- 700019, INDIA. E-Mail: dinendrarccu@gmail.com

[Zhang, F., Hu, D.-S. & Raychaudhuri, D. 2011. First record of the spider genus *Indosmodicinus* from China, with description of the hitherto unknown male of *Indosmodicinus bengalensis* (Araneae: Thomisidae). Munis Entomology & Zoology, 6 (2): 932-936]

ABSTRACT: The genus *Indosmodicinus* Sen, Saha & Raychaudhuri, 2010 is reported for the first time from China, with the description and illustrations of the hitherto unknown male.

KEY WORDS: Thomisidae, Smodicinini, *Indosmodicinus*, new male morph, first record, China.

Presently, the tribe Smodicinini Ono, 1993 includes 4 genera: *Smodicinus* Simon, 1895, *Parasmodix* Jézéquel, 1966, *Smodicinodes* Ono, 1993 and *Indosmodicinus* Sen, Saha & Raychaudhuri, 2010. Smodicinine spiders are characterized by a sclerotized prosomal crest with 4 or 6 tubercles furnished with strong setae at each tip (Ono, 1993). The genera *Smodicinus* (type species *S. coroniger* Simon, 1895) and *Parasmodix* (type species *P. quadrituberculata* Jézéquel, 1966) are monotypic, and known so far from Africa; the other two genera, *Smodicinodes* (includes four species: type species *S. kovaci* Ono, 1993; *S. schuendingeri* Benjamin, 2002; *S. hupingensis* Tang, Yin & Peng, 2004; *S. yaoi* Tang & Li, 2010), and *Indosmodicinus*, however a monotypic (known by type species *I. bengalensis* Sen, Saha & Raychaudhuri, 2010 from India) till date known from Asia (Platnick, 2011).

While studying the thomisids of Hainan Island, China, we could find smodicinine taxa. These include the female of *I. bengalensis*. A male specimen of the said taxa with general habitus and pattern very similar to the female *I. bengalensis* could also be found. While confirming the status of the recorded *I. bengalensis* we have re-examined the type material deposited in the Entomology Laboratory, Department of Zoology, University of Calcutta, Regn. No. EZC 0020-09, and affirm that they are the same species.

Record of *Indosmodicinus* for the first time from China relimits its north ward distribution. The knowledge about the taxa gets further expanded with the first record of the male morph of the species in question. We therefore, describe & illustrate the said morph.

MATERIAL AND METHODS

Collected specimens were preserved in 75% alcohol and examined, drawn and measured under a Tech XTL-II stereomicroscope equipped with an Abbe drawing device. Photographs were taken using the Free Angle Observation System VHX-

100. All measurements given in the text are in millimeters. Materials are in the deposition of of Hebei Universtiy Museum, Baoding, China (MHBU).

Abbreviations used are: A, atrium; ALE, anterior lateral eyes; AME, anterior median eyes; AME–ALE, distance between AME and ALE; AME–AME, distance between AME; Cd, copulatory duct; Co, copulatory opening; As, anterior spermatheca; E, embolus; Fd, fertilization duct; MOA, median ocular area; Pce, proximal cymbial extension; PLE, posterior lateral eyes; PME, posterior median eyes; PME–PLE, distance between PME and PLE; PME–PME, distance between PME; Ps, posterior spermatheca; Rta, retrolateral tibial apophysis; Sd, sperm duct; T, tegulum; Vta, ventral tibial apophysis.

TAXONOMY

Indosmodicinus Sen, Saha & Raychaudhuri, 2010

Indosmodicinus Sen, Saha & Raychaudhuri, 2010: 345. Type species: *Indosmodicinus bengalensis* Sen, Saha & Raychaudhuri, 2010, by original designation.

Diagnosis. See Sen, Saha & Raychaudhuri (2010).

Remark. Benjamin (2002) discussed the status of the genera *Smodicinus*, *Parasmodix* and *Smodicnodes*. He further commented that a single genus might accommodate all the taxa following a thorough phylogenetic analysis. Sen *et al.* (2010) proposed the new genus *Indosmodicinus* for the new *Smodicini* species from India, and offered sharp differences from all known *smodicini* genera. A generic appraisal and rearrangement is however not the scope of the present work and should be done on a broader scale.

Indosmodicinus bengalensis Sen, Saha & Raychaudhuri, 2010

(Figs. 1–11)

Indosmodicinus bengalensis Sen, Saha & Raychaudhuri, 2010: 345, f. 1–7.

Description

Male: Total length 3.45. Carapace 1.40 long, 1.20 wide; Abdomen 1.80 long, 1.40 wide. Carapace (Fig. 2) dark brown, with a sclerotized crest extending all through posteriorly, further extended over the abdomen, broad anteriorly and narrow posteriorly; raised behind the anterior eye row, with a middle longitudinal yellow band extending from base to apex, bearing a long seta at the base; with 3 pairs of developed tubercular projections on the edge, each projection long, pointed, extending much beyond carapace. Among them anterior pair finger-shaped, broad at base; median pair outwardly and downwardly curved; posterior pair bifurcate apically, inner one further bifid; except anterior pair, tip of each projections with a short, dagger-shaped sting. Eight eyes in two rows, black, lateral eyes large, median eyes small, posterior eye row much wider than the anterior, ALEs on a tubercular base, situated at outer basal angle of the anterior pair of projection, PLEs situated at the inner basal half of the same projection; MOA trapezoid. Eyes measurements: AME 0.09, ALE 0.20, PME 0.07, PLE 0.18; AME–AME 0.23, AME–ALE 0.21, PME–PME 0.50, PME–PLE 0.38. MOA length 0.40 with front width 0.38 and back width 0.64. Clypeus dark brown, broad, anterolateral angles with 2 strong, claw-shaped tubercular projections, anterior margin with 8 long setae. Chelicerae dark brown, flat, anteriorly pale and scopulate, with one promarginal tooth and no retromarginal tooth. Endites, labium and sternum dark brown. Endites and labium (Figs. 4 and 6) distinctly

longer than wide, length almost equal. Legs long, yellow, with white and brown bands, each femur with a small dorsal spine. Leg measurements: I 4.70 (1.50, 0.62, 1.15, 0.95, 0.48); II 4.90 (1.55, 0.62, 1.22, 1.03, 0.48); III 3.77 (1.20, 0.42, 0.90, 0.80, 0.45); IV 4.09 (1.32, 0.38, 1.00, 0.94, 0.45). Leg formula: 2143. Abdomen dorsum grey, pentagonal, with a caudal hump (Fig. 2); decorated with brown, with a pair of posteromedian spots, encircled by yellow circular band, each band with a transverse white band running outwardly. Venter light brown, with a pair of white spots laterally below the epigastric furrow, lateral margins dark brown. Spinnerets brown.

Palp: Tibia with blunt and digitiform ventral tibial apophysis; retrolateral tibial apophysis short, with pointed tip, covered by cymbial extension in ventral view; cymbium modified, with a proximal extension containing the embolar tip, without dorsal outgrowth; tegulum disk-shaped, without apophysis; embolus with a wide base, tapering and long, winding one and a half way around tegulum (Figs 9–11).

Female: Total length 4.42. Carapace 1.75 long, 1.54 wide; Abdomen 2.45 long, 1.91 wide. Carapace whitish grey. Eye measurements: AME 0.08, ALE 0.24, PME 0.07, PLE 0.18; AME–AME 0.29, AME–ALE 0.23, PME–PME 0.60, PME–PLE 0.51. MOA length 0.50 with front width 0.45 and back width 0.75. Endites and labium (Figs. 3 and 5) distinctly longer than wide, but length of labium much short than that of endites. Femur I with a distinctly protuberance (Fig. 1). Leg measurements: I 5.30 (1.83, 0.72, 1.15, 1.10, 0.50); II 5.71 (1.90, 0.72, 1.35, 1.21, 0.53); III 4.52 (1.55, 0.50, 1.07, 0.98, 0.42); IV 5.00 (1.75, 0.45, 1.17, 1.18, 0.45). Leg formula: 2143. Abdomen dorsum grey, pentagonal, with a caudal hump; decorated with black, with 3 pair of spots, anteromedian two pairs round and small, posteromedian pair diagonal brown line, encircled by yellow circular band (Fig. 1); venter dark brown, with whitish grey spots. Other characteristics same as the male.

Epigynum: atrium slightly longer than wide, and two sclerotized lip-shaped margins concealing oblique fertilization ducts; spermathecae bilobed, with an anterior, large chamber and a posterior, small chamber; copulatory ducts long, convoluted (Figs 7–8).

Material examined. 1♂, China: Hainan, Lingshui County, Diaoluo Mountain (E 109°52', N 18°43'), 6 June 2009, Chao Zhang leg.; 1♀, Ledong County, Jianfengling Mountain (E 108°48', N 18°42'), 1 June 2009, Chao Zhang leg.; 2♀ juveniles, Ledong County, Jianfengling Mountain, 12 November 2008, Ming-Sheng Zhu leg.

Distribution. China, India.

ACKNOWLEDGEMENTS

We are grateful to Dr. Chao Zhang for collecting valuable specimens. This work was supported by the National Natural Science Foundation of China (No. 31071885, 30970325, 31093430) to Dr. Feng Zhang.

LITERATURE CITED

- Benjamin, S. P.** 2002. *Smodicinodes schwendingeri* sp. n. from Thailand and the first male of *Smodicinodes* Ono, 1993, with notes on the phylogenetic relationships in the tribe Smodicinini (Araneae: Thomisidae). Revus Suisse De Zoologie, 109: 3–8.
- Jézéquel, J. F.** 1966. Araignées de la savane de Singrobo (Côte d'Ivoire). V.-Note complémentaire sur les Thomisidae. Bulletin Du Muséum National D'histoire Naturelle, 37: 613–630.
- Ono, H.** 1993. An interesting new crab spider (Araneae, Thomisidae) from Malaysia. Bulletin of National Science Museum, Tokyo (A), 19: 87–92.
- Platnick, N. I.** 2011. The world spider catalog, version 11.5. American Museum of Natural History. Available from <http://research.amnh.org/entomology/spiders/catalog/index.html> (accessed 2 March 2011).
- Sen, S., Saha, S. & Raychaudhuri, D.** 2010. A new spider genus of the tribe Smodicinini (Araneae: Thomisidae) from India. Munis Entomology & Zoology, 5: 344–349.
- Simon, E.** 1895. Descriptions d'arachnides nouveaux de la famille des Thomisidae. Annales de la Société Entomologique de Belgique, 39: 432–443.
- Tang, G., Yin, C. M. & Peng, X. J.** 2004. Description of the genus *Smodicinodes* from China (Araneae, Thomisidae). Acta zootaxonomica sinica, 29: 260–262.
- Tang, G. & Li, S. Q.** 2010. Crab spiders from Xishuangbanna, Yunnan Province, China (Araneae, Thomisidae). Zootaxa, 2703: 1–105.

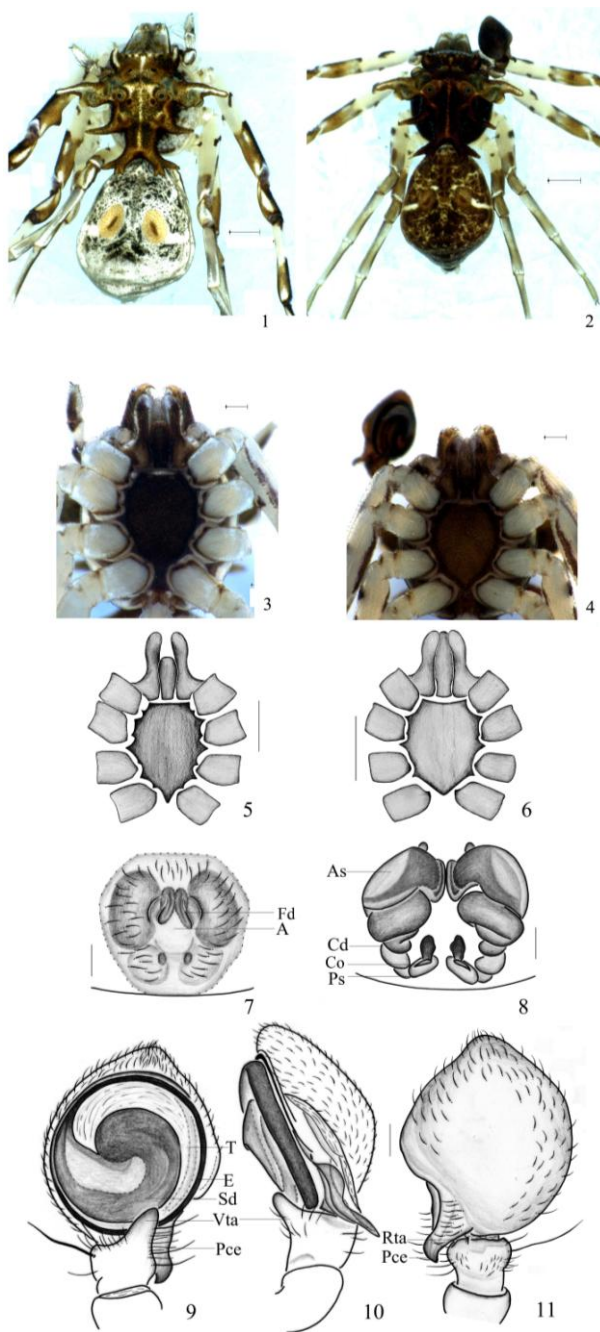


Figure 1-11. *Indosmodicinus bengalensis* Sen, Saha & Raychaudhuri, 2010. 1. Female (dorsal view), 2. Male (dorsal view), 3. Endites of female, 4. Endites of male, 5. Labium of female, 6. Labium of male, 7-8. Epigynum of female, 9-11. Palp of male.

**A SYNOPSIS OF TURKISH CERTALLINI FAIRMAIRE, 1864
WITH A CYTOGENETIC OBSERVATION (COLEOPTERA:
CERAMBYCIDAE: CERAMBYCINAE)**

Atılay Yağmur Okutaner*, Hüseyin Özdikmen,
Eşref Yüksel** and Yavuz Koçak*****

* Giresun University, Sebinkarahisar M.Y.O, Giresun / TURKEY. E-mail: atilayyagmur@gmail.com

** Gazi University, Faculty of Science, Department of Biology, 06500 Ankara / TURKEY. E-mails: (Ozdikmen) ozdikmen@gazi.edu.tr; (Yüksel) eyuksel@gazi.edu.tr

*** Ahi Evran University, Faculty of Science & Arts, Department of Biology, Kırşehir, TURKEY. E-mail: ykocak@gmail.com

[Okutaner, A. Y., Özdikmen, H., Yüksel, E. & Koçak, Y. 2011. A synopsis of Turkish Certallini Fairmaire, 1864 with a cytogenetic observation (Coleoptera: Cerambycidae: Cerambycinae). Munis Entomology & Zoology, 6 (2): 937-943]

ABSTRACT: All taxa of the tribe Certallini fairmaire, 1864 in Turkey and the world fauna are evaluated. Some new faunistical data and some cytogenetic observations of *C. ebulinum* are given in the text.

KEY WORDS: *Certallum*, Certallini, cytogenetic observation, Cerambycinae, Cerambycidae.

Certallini Fairmaire, 1864 is a tribe of the subfamily Cerambycinae. In the tribe, the eyes have fine facets. The first abdominal segment is very long, almost so a length as all remaining together. The anterior cotyloid cavities closed, whereas the middle ones are opened towards the external part. The prosternal process is slightly wide. The tarsi are robust, with the femurs claviform.

The tribal name was regarded as Cartallini Fairmaire, 1864 by some authors (e.g. Villiers, 1978) on the base of the type genus *Cartallum* Serville, 1834. *Cartallum*, however, was an unjustified emendation of *Certallum* Dejean, 1821. So now commonly accepted (e.g. Vives, 2000; Bousquet et al., 2009; Löbl & Smetana, 2010) that the valid tribal name should be Certallini Fairmaire, 1864 (from Cartallites Fairmaire, 1864). Anyway, Bousquet et al. (2009) stated that “As far as we know, Villiers (1979: 292) acted as First Reviser and chose Certallini as the valid name for this taxon”.

Subfamily Cerambycinae Latreille, 1802

Tribe Certallini Fairmaire, 1864

Cartallites Fairmaire, 1864 [“31 December”]: 149.

Type genus: *Cartallum* Audinet-Serville, 1834 (unjustified emendation of *Certallum* Dejean, 1821 not in prevailing usage).

Pytheitae Thomson, 1864 [“31 December”]: 153.

Type genus: *Pytheus* Newman, 1840 [Type sp.: *Pytheus jugosus* Newman, 1840 by monotypy. *Erionispites* Chapuis, 1875: 301 (based on *Erionispa* Chapuis, 1875). (Nomen nudum).

The members of tribe are distributed in Palaearctic, Madagascar and Australian regions in the whole world. It is represented only by 1 genus, *Certallum* Dejean, 1821, in Palaearctic region.

Genus CERTALLUM Dejean, 1821

Certallum Serville, 1834: 94 [unjustified emendation of *Certallum* Dejean, 1821]. Type sp.: *Saperda ruficollis* Fabricius, 1787: 150.

Type species: *Saperda ruficollis* Fabricius, 1787 = *Cerambyx ebulinus* Linnaeus, 1767.

The Palaearctic genus has only 3 species as *C. ebulinum* (Linnaeus, 1767), *C. martini* Sama, 1990 that occurs only in North Africa (Algeria and Tunisia), and *C. thoracicum* (Sharp, 1880). Two species, except *C. martini*, occur in Turkey.

***Certallum ebulinum* (Linnaeus, 1767)**

Original combination. *Cerambyx ebulinus* Linnaeus, 1767.

Synonyms. *Saperda ruficollis* Fabricius, 1787; *Cerambyx monspeliense* Gmelin, 1790; *Certallum tricolor* Chevrolat, 1882; *Cartallum nigricolle* Pic, 1891.

Material examined. Kırşehir prov.: Kırşehir, 29.V.2008, 1 specimen; Ankara prov.: Ayaş, Ayaş-Beypazarı road, exit of Ayaş, 30.V.2008, 1 specimen; Ankara prov.: Beypazarı, İnözü Valley, 21.V.2009, 3 specimens (Fig. 1).

Records from Turkey. Adana prov.: Toros Mts. (Pozantı, Bolkar Mts.) (Villiers, 1959); İstanbul prov.: Polonez village / Alem Mt. / Beykoz / Anadoluhisarı / Çengelköy, İzmir prov.: Central env. / Kemalpaşa / Efes / Bergama, Antalya prov.: Central env. / Belkis (Aspendos, Cumali) / Antitoros Mts. (Bey Mts., Korkuteli) / Alanya and near, Isparta prov.: Eğirdir and near (Demelt & Alkan, 1962); Bursa prov.: İznik, Amasya prov., ?Yozgat prov.: Sırıklı, Ankara prov.: Çubuk (Villiers, 1967); Osmaniye prov.: Central / Toprakkale, Hatay prov.: Arsuz / Yenışehir / Antakya (Reyhanlı), Osmaniye prov.: Bahçe, Adana prov.: Ceyhan (Yumurtaalık, Misis), Erzincan prov.: Central as *Certallum ebulinum ruficolle* (Fuchs et Breuning, 1971); Amasya prov., Balıkesir prov.: Gönen, Çanakkale prov.: Biga (Gfeller, 1972); Adana prov.: Pozantı, İçel prov.: Bolkar Mts. (Namrun, Çamlıyayla) / Tarsus, Ankara prov., Konya prov.: Akşehir (Tuatay et al., 1972); İzmir prov.: Bornova (Gül-Zümreoğlu, 1972); İzmir prov.: Çeşme / Menemen / Bornova / Kemalpaşa / Karabağlar, Aydın prov.: Kuyucak / Kızıldere / Germencik, between İzmir-Balıkesir provinces, Denizli prov.: Sarayköy, Manisa prov.: Keçiliköy / Alaşehir (Gül-Zümreoğlu, 1975); Sinop prov.: Dranaz Mt. (Sama, 1982); Konya prov., Osmaniye prov.: Nurdağı pass (Adlbauer, 1988); European Turkey (Althoff & Danilevsky, 1997; Sama, 2002); Bilecik prov., Bursa prov., Adana prov., Ankara prov., Hatay prov.: Antakya, Antalya prov., Manisa prov., İzmir prov., Aydın prov., Denizli prov., Isparta prov. (Lodos, 1998); Adıyaman prov.: Karadut village as *Certallum ebulinum ruficolle* (Rejzek & Hoskovec, 1999); Adana prov.: Balcalı, Antalya prov.: Side, Diyarbakır prov.: Silvan, Hatay prov.: Dörtöl (İcadiye) / Kuzuculu / Erzincan / İskenderun (Sarımazı), İçel prov.: Tarsus (Çamlıyayla), İzmir prov.: Selçuk (Efes), Muğla prov.: Gökova (Tozlu et al., 2002); İzmir prov.: Kemalpaşa (Armutlu) (Tezcan & Rejzek, 2002); İçel prov.: Bulgar Mt. (Namrun), Adana prov.: Toroslar (Pozantı), Konya prov.: Akşehir / Gözli, Ankara prov.: Central / Elmadag / Polatlı / Yenimahalle / Ayaş, Şanlıurfa prov.: Ceylanpınar, Gaziantep prov.: Nizip / İslahiye, İçel prov.: Silifke, Trabzon prov.: Merzifonlu, Manisa prov.: Salihli, Aydın prov., Osmaniye prov., İzmir prov.: Menemen, Nevşehir prov.: Avanos, Çankırı prov.: Eldivan (Özdikmen et al., 2005); Aksaray prov.: Hasan Mt. (Aşağı Dikmen) / Ağzıkarahan / entry of Nevşehir-Aksaray / exit of Ankara (Ekedik stream) / entry of Nevşehir / Belisırma, Nevşehir prov.: Göre, Ankara prov.: Şereflikoçhisar / Şereflikoçhisar-Ankara road, Niğde prov.: Bor-Altunhisar / exit of Ulukışla-Adana / entry of Kayseri-Niğde, İçel prov.: Mut-Karaman road (Karabağ, Hatıra forest), Konya prov.: Ereğli-Ulukışla road (Özdikmen, 2006); Kahramanmaraş prov.: Kahramanmaraş-Andırın road (Körsülü bridge env. / Karbasan village env.) / Türkoğlu (Şekeroba env.) / Pazarcık (Özdikmen & Okutaner, 2006); Ankara

prov.: Kayaş, Kızılcahamam (Işık Mt.), Şereflikoçhisar (Özdikmen et al., 2009); Antalya prov.: Gündoğmuş-Akseki road, Konya prov.: Seydişehir (Çavuş village) (Turgut & Özdikmen, 2010); Gaziantep prov.: Nurdağı (Exit of İslahiye), Hatay prov.: İskenderun-Arsuz / Erzin (Gökdere village) / Belen / Akbez (Güzelsuşağı village) / Arsuz (Akçalı) / Erzin (Erzin İçmeler district), Osmaniye prov.: Kesmeburun village (Castabala (Hierapolis)) / Karagedik village / between Kumarlı-Kazmaca villages / Fakuşağı village / Sarpınağzı village / Çardak village / Bahçe / Osmaniye-Gaziantep road / Akyar village / Zorkun road (Çiftmazı) / Kuşçubeli pass / entry of Yarpuz (Özdikmen et al., 2010) (Map 1).

Range. Europe (Portugal, Spain, France, Malta, Greece, Bulgaria, European Turkey, Ukraine, European Russia), Caucasus (Azerbaijan, Armenia, Georgia), Turkey, Iran, Iraq, Israel, Jordan, Lebanon, Syria, Cyprus, North Africa (Algeria, Egypt, Libya, Morocco, Tunisia).

Chorotype. Turano-Europeo-Mediterranean.

Remarks. It distributes widely in Turkey. The species is recorded for the first time for Kırşehir province in Turkey.

Cytogenetics. Diploid number of chromosomes of members of long-horned beetles is changed between 10 and 36. Sex-chromosome system in this group is parachute type (Xy_p). Most of the diploid chromosomes number is $2n = 20$ ($18AA + Xy_p$) (Smith & Virkki, 1978).

As seen above, the specimens were collected from Kırşehir and Ankara provinces of Turkey in 2008-2009 and were deposited in Gazi University, Ankara, Turkey.

The chromosomes are obtained according to Rozek (2004) with some alterations. The method is presented as follows:

The specimens were placed in killing-jar with ethyl acetate to anaesthetize. Abdomens of the specimens were cut and abdominal contents (especially testicle tissue in males, and middle-gut tissue in males and females) were transferred in petri dishes with distilled water. So the tissues were sustained on hold for 10-15 minutes in the hypotonic solution. They were transferred cryotubes with 0.05 % choleicine solution and were maintained for 45-60 minutes in room temperature and then, fixed in 3:1 fresh ethanol-acetic acid solution for at least 1 hour. Small pieces from the treated tissues were taken and mounted on a clear lam. On tissue pieces were dropped 45 % acetic acid and were dissected with using dissection pins and bisturi. Then, tissue pieces were mounted and pressed directly between lam and lamel or lam and lam. These preparates were submerged into liquid nitrogen. Lam and lamel or lam and lam were uncoupled and left for drying. Later, the dry preparates were stained by 4 % Giemsa Phosphate Buffer (pH = 6.8) for 10 minutes and were washed with distilled water. After drying the preparates were examined under stereo microscope (Leica DMLB). The observed plaques were photographed zoom in (10X).(100X).

First of all, we must to state that observation density of chromosomes is low due to a low of mitotic and meiotic activations in the examined material. In the present work, cytogenetic researches carried out on the adult.

Observed chromosomes of long-horned beetles are small. Centromere regions and length of arms of the chromosomes are not clear. The chromosomes, therefore, evaluated only on account of the number.

With regard to the present study, diploid number of chromosomes was determined as $2n = 22$ in mitotic metaphase from testicle tissue of male (Fig. 2).

***Certallum thoracicum* (Sharp, 1880)**

Original combination. *Cartallum thoracicum* Sharp, 1880.

Synonyms. *Cartallum laevicolle* Pic, 1895; *Cartallum diversipes* Pic, 1928.

Records from Turkey. Mesopotamia as *C. thoracicum* ssp. *laevicolle* Pic, 1895 (Winkler, 1924-1932); Gaziantep prov., İzmir prov.: Kemalpaşa, on *Spartium junceum* (Demelt, 1963); South-East Turkey (Lodos, 1998) (Map 2).

Range. Turkey, Iran, Iraq, Israel, Jordan, Lebanon, Syria.

Chorotype. SW-Asiatic.

Remarks. Probably, it distributes only in South Turkey.

A short key for *Certallum* species from Sama (2002)

1. Antennal segments black (only 3rd and 4th sometimes brownish); pronotum with very dense punctuation.....***C. martini* Sama, 1990**
 - Antennal segments mostly or entirely red, rarely antennae black (*C. thoracicum* ab. *nigripes* Plavilstshikov); if so then pronotum sparsely punctate.....**2**
2. Pronotum sparsely punctuate; antennae distinctly shorter.....***C. thoracicum* (Sharp, 1880)**
 - Pronotum very densely punctuate; antennae longer, with slender and longer segments.....***C. ebulinum* (Linnaeus, 1767)**

* This work supported by the projects by GAZİ UNIVERSITY (project number BAP-05/2008-44). The data are derived from Ph. D. thesis of A. Y. Okutaner.

LITERATURE CITED

- Adlbauer, K.** 1988. Neues zur Taxonomie und Faunistik der Bockkäferfauna der Türkei (Coleoptera, Cerambycidae). Entomofauna, 9 (12): 257-297.
- Althoff, J. & Danilevsky, M. L.** 1997. A Check-List of Longicorn Beetles (Coleoptera, Cerambycoidea) of Europe. Slovensko Entomološko Društvo Štefana Michielija. Ljubljana, 64 pp.
- Audinet-Serville, J. G. A.** 1834. Nouvelle classification de la famille des longicornes (suite). Annales de la Société Entomologique de France, 3: 5-110.
- Bousquet, Y., Heffern, D. J., Bouchard, P. & Nearns, E. H.** 2009. Catalogue of family-group names in Cerambycidae (Coleoptera). Zootaxa, 2321: 1-80.
- Dejean, P. F. M. A.** 1821. Catalogue des Coleopteres de la collection de M. L. Baron Dejean. Paris: Crevot, VIII + 136 pp.
- Demelt, C. V.** 1963. Beitrag zur Kenntnis der Cerambycidenfauna Kleinasiens und 13. Beitrag zur Biologie palaearkt. Cerambyciden, sowie Beschreibung einer neuen Oberea-Art. Entomologische Blätter, 59 (3) : 132-151.
- Demelt, C. V. & Alkan, B.** 1962. Short information of Cerambycidae Fauna of Turkey. Bitki Koruma Bülteni, 2 (10): 49-56.

- Fairmaire, M. L.** 1864. [new taxa]. In: Jacquelin du Val, P. N. C. & Fairmaire, L.: Genera des coleopteres d'Europe...Paris, pp. 149-150.
- Fuchs, E. & Breuning, S.** 1971. Die Cerambycidaenausbeute der Anatolienexpedition 1966-67 des Naturhistorischen Museums, Wien. Annalen Naturhistorischen Museum Wien, 75: 435-439.
- Gfeller, W.** 1972. Cerambycidae (Coleoptera) der Türkei-Persienexpedition 1970 der Herren Dr. H. c. W. Wittmer und U. v. Botmer. Mitteilungen der Entomologischen Gesellschaft Basel, 22 (1): 1-8.
- Gül-Zümreoğlu, S.** 1972. Catalogue of Insect and common pests (1928-1969). T. C. Publications of Agriculture Ministry, Bornova, İzmir, 119 pp.
- Gül-Zümreoğlu, S.** 1975. Investigations on taxonomy, host plants and distribution of the Longhorned Beetles (Cerambycidae-Coleoptera) in Aegean Region. T. C. Ministry of Food, Agriculture and Stockbreeding, No : 28, , İstiklal Press, İzmir, 208 pp.
- Lodos, N.** 1998. Entomology of Turkey VI (General, Applied and Faunistic). Ege Ü. Ziraat Fak. Yayınları No: 529, E. Ü. Faculty of Agriculture Press, İzmir, 300 pp.
- Löbl, I. & Smetana, A.** (Ed.) 2010. Catalogue of Palaearctic Coleoptera, Vol. 6. Stenstrup: Apollo Books, 924 pp.
- Özdikmen, H.** 2006. Contribution to the knowledge of Turkish longicorn beetles fauna (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 1 (1): 71-90.
- Özdikmen, H., Güven, M. & Gören, C.** 2010. Longhorned beetles fauna of Amanos Mountains, Southern Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 5, suppl.: 1141-1167.
- Özdikmen, H. & Okutaner, A. Y.** 2006. The longhorned beetles fauna (Coleoptera, Cerambycidae) of Kahramanmaraş province. G. U. Journal of Science 19 (2): 77-89.
- Özdikmen, H., Özdemir, Y. & Turgut, S.** 2005. Longhorned Beetles Collection of the Nazife Tuatay Plant Protection Museum, Ankara, Turkey (Coleoptera, Cerambycidae). J. Ent. Res. Soc., 7 (2): 1-33.
- Özdikmen, H., Turgut, S. & Güzel, S.** 2009. Longhorned beetles of Ankara region in Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 4 (1): 59-102.
- Rejzek, M. & Hoskovec, M.** 1999. Cerambycidae of Nemrut Dağı National Park (Anatolia, South-East Turkey). Biocosme Mésogéen, Nice, 15 (4): 257-272.
- Rozek, M.** 2004. A new chromosome preparation technique for Coleoptera (Insecta). Chromosome Research, 2 (1): 76-78.
- Sama, G.** 1982. Contributo allo studio dei coleotteri Cerambycidae di Grecia e Asia Minore. Fragmenta Entomologica, Roma, 16 (2): 205-227.
- Sama, G.** 2002. Atlas of the Cerambycidae of Europe and the Mediterranean Area, Volume I, Kabourek, Zlin, 173 pp.
- Smith, S. G. & Virkki, N.** 1978. Animal cytogenetics. vol.3: Insecta, part 5: Coleoptera. Gebrüder Borntraeger, Berlin-Stuttgart.
- Tezcan, S. & Rejzek, M.** 2002. Longhorn beetles (Coleoptera: Cerambycidae) recorded in cherry orchards in Western Turkey. Zoology in the Middle East, 27: 91-100.
- Tozlu, G., Rejzek, M. & Özbek, H.** 2002. A contribution to the knowledge of Cerambycidae (Coleoptera) fauna of Turkey. Part I: Subfamilies Prioninae to Cerambycinae. Biocosme Mésogéen, Nice, 19 (1-2): 55-94.
- Tuatay, N., Kalkandelen, A. & Aysev, N.** 1972. Bitki Koruma Müzesi Böcek Kataloğu (1961-1971). T. C. Tarım Bakanlığı, Ankara, 53-55.
- Turgut, S. & Özdikmen, H.** 2010. New data for Turkish longhorned beetles fauna from Southern Turkey (Coleoptera: Cerambycidae). Munis Entomology & Zoology, 5, suppl.: 859-889.
- Villiers, A.** 1959. Cérambycides de Turquie. L'Entomologiste, 15 (1-2): 7-11.

Villiers, A. 1967. Coléoptères Cérambycides de Turquie (1. Partie) - L'Entomologiste, 23 (1): 18-22.

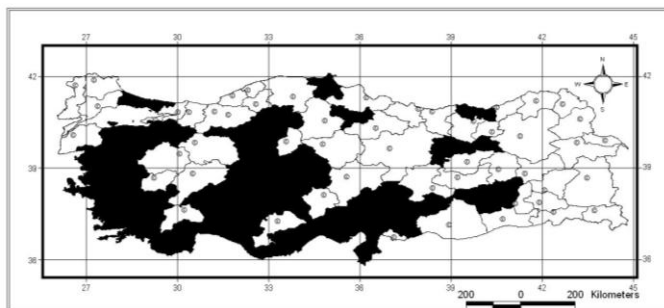
Villiers, A. 1978. Faune des Coleopteres de France, 1. Cerambycidae. Paris, 636 pp.

Vives, E. 2000. Coleoptera, Cerambycidae. Fauna Iberica, Vol. 12. Museo Nacional de Ciencias naturales. CSIC. Madrid, 715 pp.

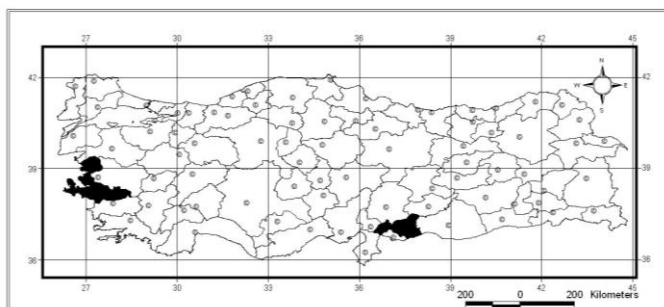
Winkler, A. 1924-1932. Catalogus Coleopterorum regionis palaearcticae. Verlag von Albert Winkler, 1135-1226.



Figure 1. Habitus of *C. ebulinum*.



Map 1. Distribution in Turkey of *C. ebulinum* (in respect to provinces).



Map 2. Distribution in Turkey of *C. thoracicum* (in respect to provinces).

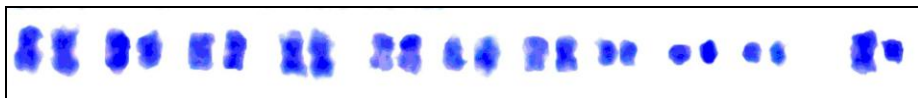
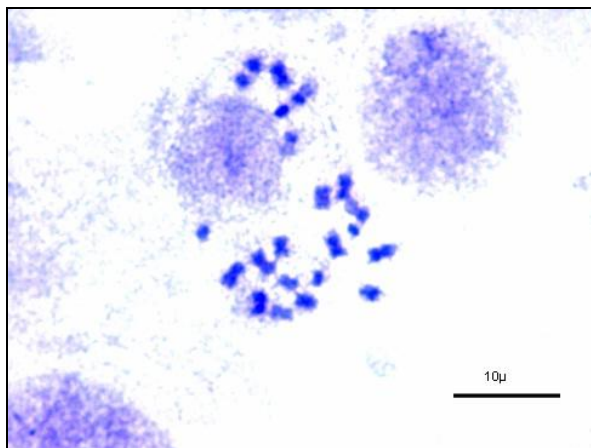


Figure 2. Mitotic metaphase plaque from testicle tissue and karyogram of *C. ebulinum* ($2n = 22$).



Figure 3. Male genitalia of *C. ebulinum* (aedeagus).

THE *MEGALUROTHRIPS* GENUS-GROUP IN IRAN (THYSANOPTERA: THIRIPIDAE)

Majid Mirab-balou & Xue-xin Chen*

* Institute of Insect Sciences, Zhejiang University, 268 Kaixuan Road, Hangzhou 310029, CHINA. E-mail: xxchen@zju.edu.cn

[Mirab-balou, M. & Chen, X.-X. 2011. The *Megalurothrips* genus-group in Iran (Thysanoptera: Thripidae). Munis Entomology & Zoology, 6 (2): 944-952]

ABSTRACT: The genus *Megalurothrips* Bagnall of *Megalurothrips* genus-group (Thysanoptera: Thripidae) is recorded in Iran for the first time. This is the third member of this group recorded from Iran after *Odontothrips* and *Pezothrips*, two genera previously reported in Iran. *Odontothrips loti* (Haliday) is newly recorded for fauna of Iran. A key is provided to distinguish these three genera, with comments on each genus and its species. The list of their host plants and map of distribution in Iran is given, respectively.

KEY WORDS: Thripidae, *Megalurothrips* genus-group, *Megalurothrips*, *Odontothrips*, *Pezothrips*, key, new record, host plants, Iran.

The family Thripidae is currently interpreted as comprising rather more than 2000 described species, which are grouped into four subfamilies, i.e. Panchaetothripinae, Dendrothripinae, Sericothripinae and Thripinae with 125/35, 95/13, 140/3 and 1700/225 species/genera, respectively (Masumoto, 2010). Currently, eight genus-groups are used instead of the formal tribal classification, as follows: *Anaphothrips* genus-group, *Frankliniella* genus-group, *Thrips* genus-group, *Megalurothrips* genus-group, *Taeniothrips* genus-group, *Mycterothrips* genus-group, *Scirtothrips* genus-group and *Trichromothrips* genus-group (Mound & Palmer, 1981; Masumoto & Okajima, 2005, 2006, 2007; Mound & Masumoto, 2009).

Megalurothrips genus-group now comprises six genera, i.e. *Ceratothripodes*, *Ceratothrips*, *Megalurothrips*, *Pezothrips*, *Odontothripella* and *Odontothrips* (Mound & Palmer, 1981). Mound & Palmer (1981) indicated the following characters for this group: Antennae 8-segmented (Fig. 24); ocellar setae pair I present (Figs. 12-14); median metanotal setae at anterior margin (Fig. 16); metanotal spinula absent (Fig. 15); tergite VIII with posteromarginal comb usually interrupted (Figs. 18, 25); and sternal discal setae absent (Figs. 19, 26).

In Iran only two genera have been recorded within *Megalurothrips* genus-group, i.e. *Odontothrips* and *Pezothrips* with three and one species, respectively (Mound, 2011). In this paper, *Megalurothrips* Bagnall, the third member of this group is recorded in Iran for the first time. In addition, a fourth species of genus *Odontothrips*, namely *O. loti* (Haliday), is recorded for the first time for fauna of Iran. A key is provided to distinguish these three genera, with comments on each genus and their species. The list of their host plants (Table 1) and map of distribution in Iran (Fig. 28) is given, respectively.

MATERIALS AND METHODS

The specimens were collected from different sites of Iran during 2008-2010 by using sweep net and also by shaking the host-plants over a white plate and using a small brush for transfer thrips to 70% alcohol. The method for preparing and mounting thrips on slides follows Mirab-balou & Chen (2010). All descriptions, measurements and photos were made with a Leica DM IRB

microscope and with a Leica Image 1000 system. All specimens are deposited in the Institute of Insect Sciences, Zhejiang University, Hangzhou, China (ZJUH).

Key to genera of *Megalurothrips* group in Iran

1. Upper vein in forewing with long gap of setal row and two setae at distal half (Fig. 6); male with numerous small glandular areas on sternites III-VII (Fig. 27)..... *Pezothrips* Karny
- Upper vein in forewing without long gap of setal row, or with short gap near apex and two distal setae (Fig. 7); male without glandular area on abdominal sternites (Fig. 19)..... 2
2. Antennal segment VI sense cone with enlarged base (Fig. 24); fore tibiae usually with 1 or 2 claw-like processes at apex; fore tarsi often with 1 or 2 small tubercles (Figs. 8, 10-11)..... *Odontothrips* Amyot & Serville
- Antennal segment VI with normal sense cone (Fig. 3); fore tibiae without claws (Fig. 9)..... *Megalurothrips* Bagnall

I. Genus *Megalurothrips* Bagnall, 1915 (New record)

This genus has thirteen species (Mound, 2011) that all breed in the flowers of Fabaceae and some are pests of cultivated legumes (Masumoto, 2010). This genus, the third member of *Megalurothrips* genus-group in Iran, is recorded here for the first time. This genus is distinguished by the following characters: Head wider than long, with transverse striations posteriorly (Fig. 14); interocular setae longest; postocular setae developed; eyes large, about half as long as head (Fig. 14); antennal segment I with a pair of dorso-apical setae (Fig. 5), III and IV each with large forked sense cones (Fig. 4); pronotum with developed posteroangular setae; forewing banded, with upper vein almost complete or interrupted beyond middle; posterior vein with complete row of setae; mesosternal spinula present (Fig. 15); abdominal tergite VIII with a patch of microtrichia anterior to the spiracle (Fig. 18); tergite IX not completely divided longitudinally; and sternites without discal setae. In this genus, only *M. distalis* is collected from Iran.

Megalurothrips distalis (Karny, 1913) (New record)

Diagnosis. *Female macroptera.* Body dark brown; antennae 8-segmented, with long sense cones on segments III and IV (Fig. 4); segments III and IV subequal in length (Fig. 4); antennal segment III brown; head and prothorax wider than long (Fig. 14); eyes normal, ocellar setae pair III placed near the front ocelli and 3-4 times as long as the distance between their bases; maxillary palpi 3-segmented (Fig. 17) pronotum with long posteroangular and posteromarginal setae; forewings with brown cross-bands, basal portion pale, distal apex brown; with 2 distal setae and 13-18 basal setae on upper vein. Fore femora brown with pale apices, fore tibiae uniformly light brown, all tarsi yellowish. Metanotum with widely spaced, transverse striate; median setae situated at anterior margin, campaniform sensilla present. Median setae on abdominal tergites short and close together or far apart; tergite VIII with comb of microtrichia on posterior margin interrupted medially (Fig. 18); tergites IX and X each with long, dark apical setae and pointed at apex. Sternite VII with median pair of posteromarginal setae anterior to posterior margin. Ovipositor well developed. Male with numerous lanceolate, sternal discal setae.

Measurements of female in μm (width). Body 2150 (420). Head 198 (150), compound eye 85; distance between to compound eyes 65. Antenna 365; I 35 (37), II 45 (28), III 66 (26), IV 76(26), V 36 (18), VI 57 (28), VII 11 (6) and VIII 13 (4); maxillary palpi 65. Pronotum 190 (255); antero-angular setae 28, posteroangular setae 65; forewing 1000; hind wing 880; abdominal tergite IX setae 170, X 78.

Material examined. IRAN: Hamedan Province: Charmsazi, 3♀ from marguerite (*Leucanthemum vulgare*), 15.vi.2009; coll. M. Mirab-balou; ZJUH.

Distribution. Iran (Hamedan Province); China, Korea, India, Indonesia, Sri Lanka, Philippines, Fiji (Reyes, 1994; Mirab-balou et al., 2011).

II. Genus *Pezothrips* Karny, 1907

This genus includes nine species in the world (Mound, 2011), of which one species, namely *P. bactrianus* (Pelikan), has been reported from Iran (zur Strassen, 2003).

***Pezothrips bactrianus* (Pelikan, 1968)**

Diagnosis. Body brown to dark brown, fore tibiae and tarsus yellow, middle and hind legs brown to dark brown; antennal segment III yellow, the rest brown. Head with three pairs of ocellar setae. Pronotum with two pairs of long posteroangular setae and four posteromarginal setae; metanotum with median setae situated at anterior margin, campaniform sensilla present; mesothorax furca with spinula; forewing with two distal setae, clavus with five setae (Fig. 6). Abdominal tergites II-V with S1setae shorter and weaker than S2; tergite VIII with complete comb; sternites without discal setae; sternite VII with median setae clearly anterior to posterior margin. Male with numerous small glandular areas on sternites III-VII (cf. Fig. 27); tergite IX with two thick setae in middle.

Material examined. IRAN: Kermanshah Province: Mahidasht, 1♀ from wheat, 1♀ from sunflower, 14.vi.2009; Choqa Narges, 1♂ from sunflower, 14.vi.2009. **Hamedan Province:** Juraqan, 3♀ from *Viola odorata*, 14.v.2009; Robat-e Sheverin, 16♀ 2♂ from *Centaurea* sp., 8.vi.2009.

Distribution. Iran (Hamedan and Kermanshah provinces); Turkey, Tajikistan (zur Strassen, 2003).

III. Genus *Odontothrips* Amyot & Serville, 1843

The genus *Odontothrips* included 30 species in the world (Mound, 2011), three of which have been recorded from Iran (Mound, 2011). A key is provided for identifying these species in Iran, including a newly recorded species, *O. loti* (Haliday).

Key to species of *Odontothrips* in Iran

[* included from published descriptions]

1. Distal fore tarsal segment with one or two small hooks or tubercles on inner margin (Figs. 8, 11)..... **2**
- Distal fore tarsal segment without small hooks or tubercles (Fig. 10)..... **3**
2. Fore tibia with one stout claw (Fig. 11); abdominal tergites II-VIII weakly striate lateral to the median setae only; male genitalia with a single pair of stout endothelial spines (Fig. 22)..... **loti (Haliday)**
- Fore tibia without stout claw (Fig. 8); distal fore tarsal segment with one or two small hooks or tubercles on inner margin (Fig. 8); median area of pronotum of males and females without lines of sculpture (Fig. 20); male genitalia with 3-4 pairs of endothelial spines, the distal 2-3 pairs set apart from the basal pair, which are usually larger (Fig. 23)..... **meliloti Priesner**
3. Forewings distinctly shaded (Fig. 7); apex of fore tibia with two small teeth (Fig. 10); antennal segment II dark, III pale; male with two pairs of fairly stout endothelial spines on the genitalia..... **confusus Priesner**
- Forewings pale except at the extreme apex; pronotum and abdominal tergites II-VIII without lines of sculpture medially..... **phlomidinus Priesner**

***Odontothrips loti* (Haliday, 1852) (New record)**

This species was identified based on the descriptions by Pitkin (1972), Han (1997), zur Strassen (2003) and Hoddle et al. (2010).

Diagnosis. *Female macroptera.* Body brownish to dark brown, tarsi paler, antennal segment III yellow, IV light brown (Fig. 1); forewings brown with white transverse band sub-basally. Head wider than long, ocellar setae pair III arising on or just outside anterior margins of ocellar triangle. Pronotum with 2 pairs of long posteroangular setae and 4 pairs of posteromarginal setae; apex of fore tibiae with small claw near outer margin (Fig. 11); metanotum with median setae long situated at anterior margin, campaniform sensilla present; mesothoracic furca with spinula; forewing upper vein with small gap sub-apically; second vein with complete row of setae. Abdominal tergites without sculpture medially; VIII with posteromarginal comb broadly interrupted medially; sternites without discal setae, median pair of marginal setae on sternite VII arise far in front of margin.

Male macroptera. Male smaller than female, with a pair of small stout setae on tergite IX (cf. Fig. 21); sternites without glandular areas; genitalia with two stout spines (Fig. 22).

Measurements of female in μm (width). Body 1710 (460). Head 130 (200), compound eye 80; distance between to compound eyes 60. Antenna 360; I 23 (25), II 29

(22), III 45 (19), IV 43(16), V 26 (14), VI 41 (17), VII 8 (5) and VIII 14 (4). Pronotum 170 (250); posteroangular setae 70; forewing 820 (70); hind wing 730(50).

Measurements of male in μm (width). Body 1500 (360). Head 115 (185); Antenna 270; Pronotum 140 (220); forewing 730 (65); hind wing 640 (50).

Material examined. IRAN: Zanjan Province: Yengijeh, 1♀ 3♂ from *Securigera varia*, 25.vi.2009.

Distribution. Iran (Zanjan Province); China, Russia, North America, Europe, Japan (zur Strassen, 2003; Mirab-balou et al., 2011).

***Odontothrips confusus* Priesner, 1926**

This species was identified based on the descriptions by Pitkin (1972) and zur Strassen (2003). It distributes in most part of Iran (Fig. 28) and inhabits inflorescences of alfalfa and clover (Table 1). This species is distinguished from its congeners by the following characters: Antennal segment II dark, III pale; forewing lower vein with 14-15 setae; and fore tarsi without tubercles but fore tibiae with two small denticles on inner side of apex.

Material examined. IRAN: Hamedan Province: Abbasabad, 6♀ 8♂ from alfalfa (*Medicago sativa*), 2♀ from *Cicer arietinum*, 20.vii.2009; 1♀ from wheat, 8.vi.2009; Aliabad-e Varkaneh, 1♀ from wheat, 8.vi.2009; Amzajerd, 1♀ from potato, 28.vi.2009; AsadAbad, 1♀ from *Melilotus officinalis*, 2♀ 1♂ from *Plantago major*, 9.vi.2009; Azandarian, 4♀ 2♂ from alfalfa, 18.vii.2009; Cheshmeh Malek, 1♂ from *Cynodon dactylon*, 25.v.2009; Eram Bld., 1♀ from *M. officinalis*, 23.vi.2009; Eram Bld., 3♀ 1♂ from alfalfa, 1♀ from *Aster* sp., 1♂ from *Verbascum* sp., 6♀ 4♂ from *Trifolium pratense* 22.vii.2009; Ganjnameh, 2♀ 1♂ from *Lotus goebelia*, 20.vi.2009; Ganjnameh, 4♀ 3♂ from alfalfa, 17.vii.2009, 4♀ 1♂ from *Trifolium pratense*; Heydareh, 8♀ 2♂ from alfalfa, 13.vii.2009; Heydareh-ye Qazi Khan, 3♀ 2♂ from alfalfa, 14.vii.2009, 1♀ from *Cuscuta* sp., 14.vii.2009; Kurijan, 1♀ from alfalfa, 7.vii.2009; Literature College, 2♀ from alfalfa, 19.v.2008; Nahavand (Gian), 1♀ from *Echium vulgare*, 3♀ from alfalfa, 4.vii.2009; Ostadan, 1♀ from *Euphorbia* sp., 29.vi.2009; Qahavand, 1♀ from *Centaurea solstitialis*, 4.v.2009, 1♀ from alfalfa, 7.viii.2010; Robat-e Sheverin, 1♀ from *M. officinalis*, 8.vi.2008; Saïdieh, 7♀ from *Onobrychis viciifolia*, 1♀ from *Dactylis glomerata*, 4♀ 1♂ from alfalfa, 1♀ from *Euphorbia* sp., 1♀ 2♂ from *Lolium perenne*, 1♂ from *Convolvulus arvensis*, 3.vi.2009; Tuyserkan, 6♀ 1♂ from alfalfa, 16.vii.2009; YeknAbad, 2♀ from alfalfa, 25.v.2008. **Kordestan Province:** Bijar, 7♀ from alfalfa, 12.vii.2009. **Qazvin Province:** Takestan, 2♀ from *Onopordon acanthium*, 30.vi.2009. **Zanjan Province:** Yengijeh, 1♀ 1♂ from *Achillea millefolium*, 2♀ 1♂ from wheat, 1♂ from *Convolvulus arvensis*, 25.vi.2009.

Distribution. Iran (Fars, Kerman, Yazd, Golestan, Lorestan, Alborz, Khorasan-e-shomali, Hamedan, Kordestan, Qazvin and Zanjan Provinces) (Minaei & Alich, 2000; Kheyrandish Koshkoei et al., 2000; Teraz & Kheyrandish Koshkoei, 2002; Mohaghegh & Kheyrandish Koshkoei, 2002; Jafari & Fallahzadeh, 2004; Alavi, 2004; Pirafka et al., 2006); China, Hungary, Germany, Czechoslovakia (zur Strassen, 2003; Mirab-balou et al., 2011).

***Odontothrips meliloti* Priesner, 1951**

This species was identified based on the descriptions by Pitkin (1972) and zur Strassen (2003). It was reported in Iran for the first time by Minaei et al. (2002) from Fars Province. This species is distinguished from its congeners by the following characters: Antennal segment III yellow, IV brown with basal yellow (Fig. 2); pronotum without lines of sculpture medially in both sexes; and base of sense cone on antennal segment VI greatly enlarged, maximum diameter more than one-third of total length of the sense cone.

Material examined. IRAN: Hamedan Province: Eram Bld., 6♀ 1♂ from *Melilotus officinalis*, 5.vi.2009; Ghaem Sq., 1♀ from *Poa bulbosa*, 15.v.2008; Heydareh-ye Qazi Khan, 1♀ from *M. officinalis*, 14.vii.2010; Literature College, 1♀ 1♂ from *Medicago hispida*, 19.v.2008; Sadd-e-Ekbatan, 2♀ 2♂ from *M. officinalis*, 7.vi.2009; YeknAbad, 1♀ from *Glycyrrhiza glabra*, 19.v.2009. **Kermanshah Province:** Huker, 1♂ from wheat, 15.vi.2009. **Kordestan Province:** Bijar, 2♀ from *M. officinalis*, 1♀ from *Sisymbrium irio*, 12.vii.2009. **Qazvin Province:** Takestan, 1♂ from *Onopordon acanthium*, 30.vi.2009. **Zanjan Province:** Yengijeh, 1♀ from *Achillea millefolium*, 25.vi.2009.

Distribution. Iran (Fars, Hamedan, Kermanshah, Kordestan, Qazvin and Zanjan Provinces); China, Southern England, France, Germany, Hungary, Czechoslovakia (Minaei et al., 2002; zur Strassen, 2003; Mirab-balou et al. 2011).

***Odontothrips phlomidinus* Priesner, 1954**

This species has been recorded from Northern Fars Province (Ardekan Mountains) by Priesner (1954). Pitkin (1972) stated the following characters for distinguishing this species: lack small hooks or tubercles on the distal tarsal segment of the fore tarsal; forewings pale except the extreme apex as in *O. elbaensis*, from which it may be distinguished by the absence of lines of sculpture medially on the pronotum and abdominal tergites II-VIII.

Distribution. Iran (Fars Province) (Priesner, 1954; Pitkin, 1972).

ACKNOWLEDGEMENTS

We are grateful to Prof. Tong Xiao-li of South China Agricultural University, Guangzhou-China for his supplying some references; and Prof. Feng Ji-nian of Northwest A. & F. University, Yangling, Shaanxi-China for supplying some materials in Thrips & Coccid Systematic Research Laboratory. We also thanks Dr. Vassilis Vasilou of Agricultural Research Institute of Cyprus for sending us some thrips specimens, especially *Pezothrips kellyanus*.

LITERATURE CITED

- Alavi, J.** 2004. New records of two species of Thysanoptera for Iran from Bodjourn (Khorasan Province). Proceedings of the 16th Iranian Plant Protection Congress, p. 110.
- Han, Y. F.** 1997. Economic insect fauna of China, FASC. 55 (Thysanoptera). Science Press, Beijing, China, 510 pages (In Chinese).
- Hoddle, M. S., Mound, L.A. & Paris, D.L.** 2010. Thrips of California. Cd-rom published by CBIT Publishing, Queensland. Available at: http://www.lucidcentral.org/keys/v3/thrips_of_california.html.
- Jafari, R. & Fallahzadeh, M.** 2004. Faunistic study of Thysanoptera on wheat in Lorestan province. Proceedings of the 16th Iranian Plant Protection Congress, p. 106.
- Kheyrandish Koshkoei, M., Moharramipour, S. & Kamali, K.** 2000. A report on Thysanoptera suborder Terebrantia in Kerman and records of four new species for Iran fauna. Proceedings of the 14th Iranian Plant Protection Congress, p. 355.
- Masumoto, M. & Okajima, S.** 2005. *Trichromothrips* Priesner (Thysanoptera: Thripidae) of Japan and Taiwan, with descriptions of four new species and a review of the *Trichromothrips* genus group of genera. Zootaxa, 1082: 1-27.
- Masumoto, M. & Okajima, S.** 2006. A revision of and key to the world species of *Mycterothrips* Trybom (Thysanoptera: Thripidae). Zootaxa, 1261: 1-90.
- Masumoto, M. & Okajima, S.** 2007. The genus *Scirtothrips* Shull (Insecta: Thysanoptera: Thripidae) and three related genera in Japan. Zootaxa, 1552: 1-33.
- Minaei, K. & Alich, M.** 2000. Faunistic study of the order Thysanoptera in Fars Province. Proceedings of the 14th Iranian Plant Protection Congress, p. 336.
- Minaei, K., Alich, M. & Asadi, G. H.** 2002. Introduction to species of Thripidae (Thysanoptera: Thripidae) in Shiraz region. Iranian Journal of Agricultural Science, 12(3): 61-66.
- Mirab-balou, M., Tong, X.L., Feng, J.N. & Chen, X.X.** 2011. Insecta, Thysanoptera in China. Check List (Journal of Species Lists and Distribution), Brazil, (under review).
- Mirab-balou, M. & Chen, X.X.** 2010. A new method for preparing and mounting thrips for microscopic examination. Journal of Environmental Entomology, 32(1): 115-121.
- Mohaghegh, H. & Kheyrandish Koshkoei, M.** 2002. The first faunistic study of Thysanoptera in Yazd area. Proceedings of the 15th Iranian Plant Protection Congress, pp. 182-183.

Mound, L. A. & Palmer, J. M. 1981. Phylogenetic relationships between some genera of Thripidae (Thysanoptera). *Entomologica Scandinavica*, 15: 153-17.

Mound L. A. 2011. Thysanoptera (Thrips) of the world-a checklist. Available at: <http://www.ento.csiro.au/thysanoptera/worldthrips.html>. (accessed 2010-10-15).

Mound, L. A. & Masumoto, M. 2009. Australian Thripinae of the *Anaphothrips* genus-group (Thysanoptera), with three new genera and thirty-three new species. *Zootaxa*, 2042: 1-76.

Pirafka, S., Kamali, H. & Manzari, S. 2006. A faunistic study on Thysanoptera in Pakdasht region. Proceedings of the 16th Iranian Plant Protection Congress, p. 77.

Pitkin, B. R. 1972. A revision of the flower-living genus *Odontothrips* Amyot & Serville (Thysanoptera: Thripidae). *Bull. Br. Mus. nat. Hist. (Ent.)*, 26: 371-402.

Priesner, H. 1954. On some Thysanoptera from Persia. *Annals and Magazine of Natural History*, 7(12): 49-57.

Reyes, C. P. 1994. Thysanoptera (Hexapoda) of the Philippine Islands. *Raffles Bulletin of Zoology*, 42: 107-507.

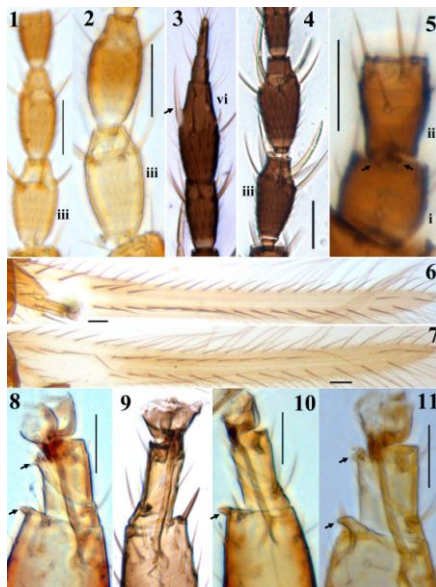
Teraz, A. & Kheyrandish Koshkoei, M. 2002. The first faunistic investigation of Thysanoptera in Jiroft region. Proceedings of the 15th Iranian Plant Protection Congress, p. 184.

zur Strassen, R. 2003. Die terebranten Thysanopteren Europas und des Mittelmeer-Gebietes. *Die Tierwelt Deutschlands*, 74: 1-271.

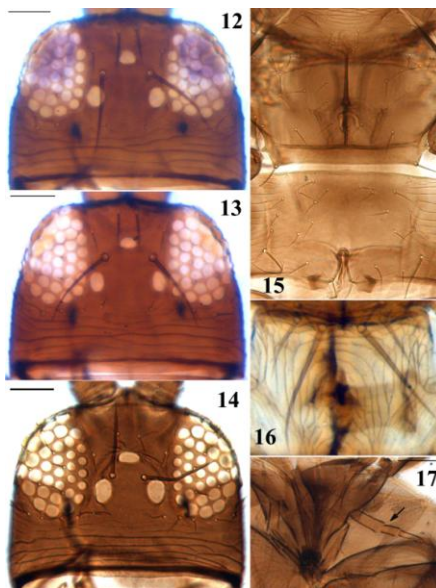
Table 1. Host plants of species of *Megalurothrips* genus-group in Iran.

Host Plants		Thrips species					
Family	Scientific name	1	2	3	4	5	6
ASTERACEAE	<i>Leucanthemum vulgare</i>	+					
	<i>Helianthus annuus</i>		+				
	<i>Centaurea</i> sp.		+	+			
	<i>Onopordon acanthium</i>				+		
	<i>Achillea millefolium</i>			+	+		
	<i>Aster</i> sp.			+			
BORAGINACEAE	<i>Echium vulgare</i>			+			
CONVOLVULACEAE	<i>Cuscuta</i> sp.			+			
	<i>Convolvulus arvensis</i>			+			
CRUCIFERA	<i>Sisymbrium irio</i>				+		
EUPHORBIACEAE	<i>Euphorbia</i> spp.			+			
FABACEAE	<i>Securigera varia</i>						+
	<i>Onobrychis viciifolia</i>			+			
	<i>Astragalus</i> sp.			+			
	<i>Melilotus officinalis</i>			+	+		
	<i>Medicago hispida</i>				+		
	<i>Medicago sativa</i>			+	+		
	<i>Glycyrrhiza glabra</i>			+	+		
	<i>Cicer arietinum</i>			+			
	<i>Trifolium pratense</i>			+			
	<i>Lotus goebelia</i>			+			
	<i>Triticum sativum</i>		+	+	+		
	<i>Poa bulbosa</i>				+		
GRAMINEAE	<i>Cynodon dactylon</i>			+			
	<i>Dactylis glomerata</i>			+			
	<i>Lolium perenne</i>			+			
	<i>Phlomis</i> sp.						+
LAMIACEAE	<i>Plantago major</i>			+			
PLANTAGINACEAE	<i>Verbascum</i> sp.			+			
SCROPHULARIACEAE	<i>Solanum tuberosum</i>			+			
SOLANACEAE	<i>Viola odorata</i>		+				
VIOLACEAE							

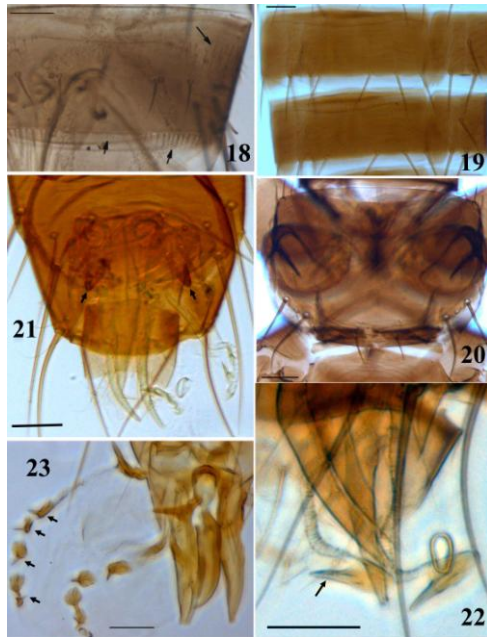
(1) *M. distalis*, (2) *P. bactrianus*, (3) *O. confusus*, (4) *O. meliloti*, (5) *O. loti*, (6) *O. phlomidinus*.



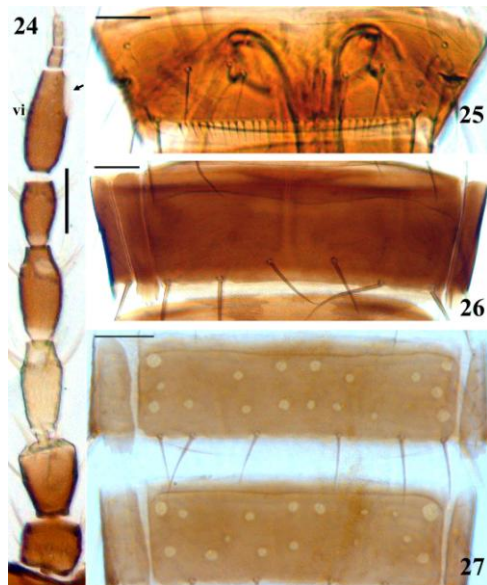
Figures 1-11. *Megalurothrips* genus-group. (1) *O. loti*, antennal segments III-V; (2) *O. meliloti*, antennal segments III-IV; 3-5: *M. distalis*: (3) antennal segments V-VIII, (4) antennal segments III-IV, (5) antennal segments I-II; 6-7: Forewing: (6) *P. kellyanus*, (7) *O. confusus*; 8-11: Fore tibiae- and tarsus: (8) *O. meliloti*, (9) *M. distalis*, (10) *O. confusus*, (11) *O. loti*. (Scale bar= 30 μm).



Figures 12-17. *Megalurothrips* genus-group. 12-14: Head: (12) *O. confusus*, (13) *O. meliloti*, (14) *M. distalis*; (15) *M. distalis*, meso- and mrtasternum; (16) *O. confusus*, metanotum; (17) *M. distalis*, maxillary palpi. (Scale bar= 30 μm).



Figures 18-23. *Megalurothrips* genus-group. (18) *M. distalis*, tergite VIII; (19) *O. confusus*, sternites VI-VII (male); (20) *O. meliloti*, pronotum; (21) *O. confusus*, tergites IX-X (male); (22) *O. loti*, male genitalia; (23) *O. meliloti*, male genitalia. (Scale bar= 30 μ m).



Figures 24-27. *Megalurothrips* genus-group. (24) *O. confusus*, antennae; (25) *P. bactrianus*, tergite VIII; (26) *O. confusus*, sternite VII; (27) *P. kellyanus*, sternites V-VI (male). (Scale bar= 30 μ m).

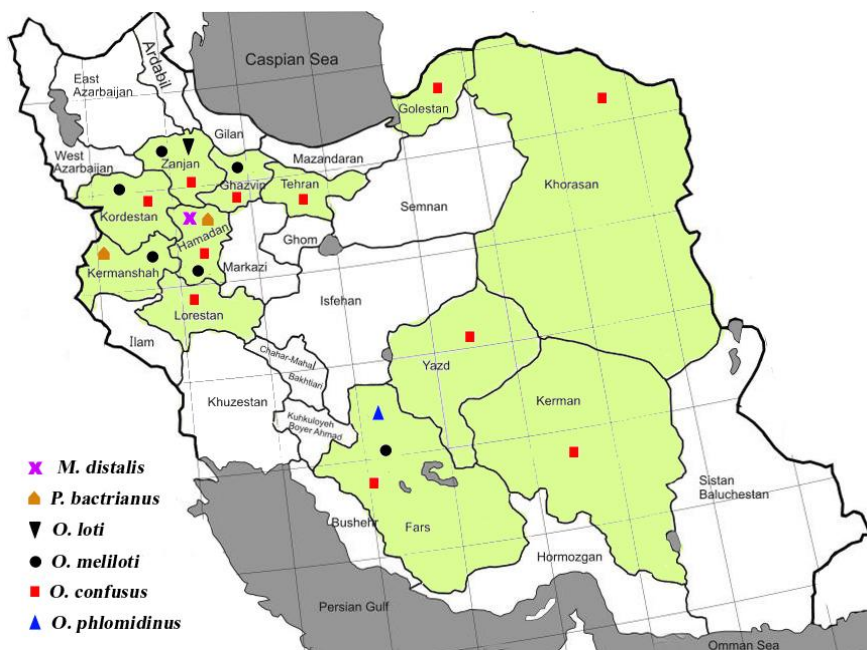


Figure 28. Distribution of *Megalurothrips* genus-groups in Iran.

TOXORHYNCHITES RUTILES ARE EFFECTIVE FOR THE BIOLOGICAL CONTROL OF MOSQUITO LARVAE

S. Sainudeen Sahib*

* PG & Research Dept. of Zoology, S. N. College, Kollam-691001, Kerala, INDIA. E-mail: sainudeenpattazhy@hotmail.com

[Sainudeen Sahib, S. 2011. *Toxorhynchites rutilus* are effective for the biological control of mosquito larvae. Munis Entomology & Zoology, 6 (2): 953-954]

ABSTRACT: The larvae of elephant mosquitoes, belonging to the species *Toxorhynchites rutilus* and the Culicidae family, have been found effective for the biological control of larvae of the other mosquitoes. Elephant mosquito larvae are large, voracious feeder and they feed on the larvae of the other mosquitoes. In the laboratory, the larvae thrived well in a Ph range of 5 to 6 and 4 to 5 mg/l dissolved oxygen.

KEY WORDS: Elephant mosquitoes, Biological control, Voracious feeder.

Elephant mosquitoes generally live in forests and sacred groves. Their larvae are found in tree holes and artificial containers. The adult mosquitoes thrive on plant juices and nectar. They never take blood meals. The adults are very large, voracious feeder and they feed on the larvae of the other mosquitoes. There are eight to nine black spots on the upper surface of the body and the feeding brushes at the head region are very large (Figs. 1, 2).

MATERIALS AND METHODS

Live larvae of elephant mosquitoes were collected from water in tree holes and artificial containers in the Kollam district of Kerala State. The larvae were transferred to white polythene rearing pans filled with dechlorinated water. About 25 larvae were put in each pan and were acclimated to laboratory conditions for three days. The food in the form of dry powder was given. Food consisted of a mixture of brewer's yeast and dog biscuits, finely powdered. After three days fifty other Dipteran larvae were introduced in to each pan containing elephant mosquito larvae. The tests were made at room temperature (27-28°C).

Some salient characteristics of the water were Ph 4 to 5; dissolved oxygen 4 to 5 mg/l; alkalinity-nil; total hardness 210 mg/l. Dead larvae were always removed immediately from the experimental pans. Water quality parameters were analysed by the methods followed by Golterman & Clymo (1969) and APHA (1976).

DISCUSSION

The results indicate that all other Dipteran larvae were not seen within 30 hrs. But elephant mosquito larvae retained in all experimental pans. The same results was obtained in all further experiments. The larval period of elephant mosquito was 10 to 12 days at 28°C. After the larvae completed their development they pupate in the rearing pans. The pupal period lasts 2 to 3 days. I used X^2 to compare the survival of elephant mosquito larvae at different Ph values. The results indicate that all elephant mosquito larvae thrived well in a Ph range of 4 to 5 ($X^2 = 10.30$, $P < 0.01$). Similarly, all elephant mosquito larvae dies in a Ph above 7 ($X^2 = 23.70 < 0.001$).

The present study indicate that the deposit of either larvae or eggs of the elephant mosquito in water bodies could destroy the larvae of the other mosquitoes. The eggs or larvae could be distributed to other aquatic ecosystems by ' seeding ' the area. The larvae hatch and feed on the other larvae and the process can be continued year after year.

LITERATURE CITED

APHA. 1976. Standard methods for the examination of water and waste water. American Health Association, Washington.

Golterman, H. L. & Clymo, R. S. 1969. Methods for chemical analysis of freshwater, Black well Scientific publication, Oxford.

Garrett, C. B. D. 1921. Notes on Helomyzidae and description of new species (Diptera). Insecutor Inscitiae Menstrus, 9: 19-32.

Garter, B. A. R. 1933. Notes on Malayan mosquitoes, IV, Anopheline larvae of the umbros group. Malayan Med. J., 8: 180-189.

Giles, G. M. A. 1900. A hand book of the mosquitoes giving the anatomy and life history of the Culicidae. BaleSons and Danielsson, London.

Giles, G. M. 1904. Notes on some collection of mosquitoes. J. Trop. Med., 1: 365-369.

Gressitt, J. L. 1967. Introduction. Entomology of Antartica. Antartc. Res. Ser., 10: 1-33.



Figure 1. Elephant mosquito.



Figure 2. Larva of Elephant mosquito.

**JUXILYOCYPRIS GEN. NOV. AND REPLACEMENT NAMES
FOR HOMONYM SPECIES OR GENERA OF OSTRACODA
(ARTHROPODA: CRUSTACEA)**

Eugen Karl Kempf*

*University at Cologne, Faculty of Mathematics and Natural Sciences, Institute of Geology and Mineralogy, Zuelpicher Str. 49a, D-50674 Koeln, GERMANY. E-mail: kempf@uni-koeln.de

[Kempf, E. K. 2011. *Juxilyocypris* gen. nov. and replacement names for homonym species or genera of Ostracoda (Arthropoda: Crustacea). Munis Entomology & Zoology, 6 (2): 955-969]

ABSTRACT: The new genus *Juxilyocypris* (Ostracoda) is introduced with *Ilyocypris schwarzbachi* Kempf, 1967 as the type species. In addition, for junior homonyms of ostracod species the following replacement names are proposed: *Bairdia ragusana* nom. nov. for *Bairdia procera* Ciampo, 1981; *Cytheropteron cuneatissimum* nom. nov. for *Cytheropteron cuneatum* Ayress, 1996; *Cytheropteron tesakovae* nom. nov. for *Cytheropteron laeve* Tesakova, 2003; *Cytheropteron vricanum* nom. nov. for *Cytheropteron rectum* Colalongo & Pasini, 1980; *Eucytherura ninetyeastiana* nom. nov. for *Eucytherura tumida* Ayress, Whatley, Downing & Millson, 1995; *Semicytherura aqabana* nom. nov. for *Semicytherura affinis* Bonaduce, Masoli, Minichelli & Pugliese, 1980; *Leptocythere istriana* nom. nov. for *Leptocythere bituberculata* Bonaduce, Ciampo & Masoli, 1976; *Cytheromorpha crotoneana* nom. nov. for *Cytheromorpha reticulata* Colalongo & Pasini, 1980; *Loxoconcha bonaciamma* nom. nov. for *Loxoconcha concentrica* Bonaduce, Ciampo & Masoli, 1976; *Loxoconcha ocellifera* nom. nov. for *Loxoconcha ocellata* Ho in Hou et al., 1982; *Paradoxostoma navigium* nom. nov. for *Paradoxostoma navicula* Bonaduce, Masoli, Minichelli & Pugliese, 1980; *Buntonia calabria* nom. nov. for *Buntonia parva* Colalongo & Pasini, 1980; *Curfsina gerardderooi* nom. nov. for *Curfsina derooi* Weaver, 1982; *Cythereis coronaweaveri* nom. nov. for *Cythereis coronata* Weaver, 1982; *Neocaudites richarddinglei* nom. nov. for *Neocaudites punctatus* Dingle, 1993; *Veenia kallankurichchi* nom. nov. for *Veenia reticulata* Sastry & Mamgain, 1972; *Polycope delicatulina* nom. nov. for *Polycope delicata* Weaver, 1982; *Polycope eilatensis* nom. nov. for *Polycope ornata* Bonaduce, Masoli, Minichelli & Pugliese, 1980; and *Libumella robinsoni* nom. nov. for *Libumella reticulata* Robinson, 1978. For junior homonym ostracod genera the following replacement names are proposed: *Miraculellum* nom. nov. for *Miraculum* Polenova, 1960; *Hadropleuranella* nom. nov. for *Hadropleura* Liebau, 1991; and *Patrizianella* nom. nov. for *Patrizia* Bonaduce & Russo, 1990.

KEY WORDS: new genus, nomenclatural changes, junior homonyms, replacement names, Ostracoda.

**Class Ostracoda Latreille, 1802
Subclass Podocopa Sars, 1866
Order Podocopida Sars, 1866
Suborder Cypridocopina Jones, 1901
Superfamily Cypridoidea Baird, 1845
Family Ilyocyprididae Kaufmann, 1900**

***Juxilyocypris* gen. nov.**

Type species: *Juxilyocypris schwarzbachi* (Kempf, 1967) **comb. nov.**

Original binomen: *Ilyocypris schwarzbachi* Kempf, 1967.

Type locality: Claypit Kaerlich near Koblenz, Germany.

Type horizon: Middle Pleistocene loess deposits.

Holotype: A female carapace, transferred from Geological Institute, University at Cologne (GIK 460) to Senckenberg Museum, Frankfurt (Xe 9730).

Paratypes: 14 specimens in Senckenberg Museum, Frankfurt (Xe 9731a-Xe 9731i) and some specimens in British Museum Natural History, Palaeontology Department, London (Fossil and recent ostracod collections). All specimens from the type locality and type horizon.

Diagnosis: A genus of the ostracod family Ilyocyprididae with a general resemblance to the typical genus *Ilyocypris*, but with very distinct sexual dimorphism in shell morphology. Valves of female and male specimens with a prominently raised and bulged ridge along the anterior margin. Accordingly, in dorsal view the anterior end of the carapace is looking similar to the neck of a bottle (Kempf 1967: plate 1, figs. 7-9). That is very different in comparison with the many species of the genus *Ilyocypris* proper, where in dorsal view the anterior end of the carapace looks wedge-shaped. The posterior half of the valves shows a prominent bulged ridge, as well. In female specimens the ridge starts behind the middle near to the dorsal margin and runs in a curve toward the posteroventral corner, with conical spines being developed at both ends. Along the inner side of the ridge impressions of the ovary may be visible. In male specimens that ridge also starts behind the middle near to the dorsal margin, runs in a curve toward the posteroventral corner at first, but continues along the posterior and even back along part of the dorsal margin. Conical spines are less well developed. Along the inner side of the ridge impressions of four testes may be visible.

All exterior and interior characters of shell morphology have been documented in stereo-pairs of excellent scanning electron micrographs (Kempf, 1975).

Remarks: Since its first description the species has also been found in Pleistocene sediments of some other places in Europe. In more than forty years, however, no living specimens could be found.

In a recent publication (Krstic 2006: 128) the possibility has been expressed that *Ilyocypris schwarzbachi* Kempf might belong to the genus *Fossilyocypris* (recte: *Fossilyocypris*) Schornikov & Krstic, 2004, or otherwise, that it is representing a species toward true *Ilyocypris*.

The differences between *Ilyocypris schwarzbachi* Kempf and *Ilyocypris bella* Sharapova, 1961, the type species of the genus *Fossilyocypris*, are manifold. Therefore, the establishment of a new genus seems to be advisable.

Etymology: The new name is composed of *Ilyocypris* and the prefix Jux, honouring Dr. Ulrich Jux, Emeritus Professor of the University at Cologne, in recognition of his many valuable contributions to quite different fields of palaeontology, geology, and history.

Order Podocopida Sars, 1866
Suborder Bairdiocopina Gruendel, 1967
Superfamily Bairdioidea Sars, 1888
Family Bairdiidae Sars, 1888
Genus *Bairdia* M'Coy, 1844
***Bairdia ragusana* nom. nov.**

Bairdia procera Ciampo, 1981. Boll. Soc. Paleont. Ital. 20 (1) 56. Preoccupied by *Bairdia procera* Seebach, 1857. Zeitschr. Deutsch. Geol. Ges. 9 (2) 200.

Remarks on nomenclatural change: Since the publication of the first volume of "Index and bibliography of marine Ostracoda" (Kempf, 1986) that case of homonymy is known, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures reveals that the Middle Miocene species *Bairdia procera* Ciampo, 1981 differs considerably from the Triassic species *Bairdia procera* Seebach, 1857 in outline of the carapace (dorsal view) and the left valve (lateral view). In addition there is a great difference in geological age of at least 215 million years.

According to the International Code of Zoological Nomenclature (1999) *Bairdia procera* Ciampo, 1981 represents a junior primary homonym, for which *Bairdia ragusana* nom. nov. is herewith introduced as a substitutional new name.

Etymology: The new name refers to the type locality within the Tellaro Formation of the Ragusa Basin (Sicily).

Order Podocopida Sars, 1866
Suborder Bairdiocopina Gruendel, 1967
Superfamily Bairdioidea Sars, 1888
Family Pachydomellidae Berdan & Sohn, 1961
Genus *Miraculellum* nom. nov.

Miraculum Polenova, 1960. Trudy VNIGRI, novaya seriya, 152: 81 (Crustacea: Ostracoda). Preoccupied by *Miraculum* Bolivar, 1903. Boletín de la Sociedad Española de Historia Natural 3: 306 (Insecta: Orthoptera: Episactidae).

Remarks on nomenclatural change: Firstly, the genus *Miraculum* was erected by Bolivar (1903) which is still widely used as an available valid genus name in Orthoptera. Subsequently, a genus *Miraculum* was erected by Polenova (1960) for fossil ostracods. Thus the genus name *Miraculum* Polenova, 1960 is a primary junior homonym of the valid genus name *Miraculum* Bolivar, 1903. Herewith I propose to replace *Miraculum* Polenova, 1960 with the new substitutional name *Miraculellum*.

Type species: *Miraculellum tuberculatum* (Polenova, 1960) **comb. nov.**,
 Original binomen: *Miraculum tuberculatus* (recte: *tuberculatum*) Polenova, 1960.
 Other species:

Miraculellum tuberculatum tuberculatum (Polenova, 1960) **comb. nov.**

Miraculellum tuberculatum simplex (Polenova, 1960) **comb. nov.**

Miraculellum omraense (Polenova in Rozhdestvenskaya, 1962) **comb. nov.** (= nomen nudum, see nomenclatural remarks)

Miraculellum tuberculatum elongatum (Polenova, 1968) **comb. nov.**

Miraculellum tuberculatum laeve (Polenova, 1974) **comb. nov.**

Miraculellum unituberculatum (Zhang & Zhao, 1983) **comb. nov.**

Miraculellum ornatum (Bakharev, 1985) **comb. nov.**

Miraculellum biclivosum (Bakharev in Bakharev & Bazarova, 2004) **comb. nov.**

Miraculellum bisulcatum (Bakharev in Bakharev & Bazarova, 2004) **comb. nov.**

Miraculellum sellidorsatum (Bakharev in Bakharev & Bazarova, 2004) **comb. nov.**

Miraculellum vernaculum (Bazarova in Bakharev & Bazarova, 2004) **comb. nov.**

Miraculellum omraense (Bakharev & Bazarova, 2004) **comb. nov.**

Nomenclatural remarks concerning *Miraculellum omraense*:

For the first time that species was cited in the publication of Rozhdestvenskaya 1962 as *Miraculum omraensis* (recte: *omraense*) Polenova (in litt.). It was not mentioned in the systematic part, but on page 278 in the chapter on the stratigraphic distribution of ostracods and on page 308 in the explanations of plate 8, where the species was documented in figures 4 a, b, and v. No diagnosis, description or holotype designation was given so that this species name has to be regarded as a nomen nudum. In her publications of 1968 and 1974 as well as in all her earlier and later publications Polenova did not mention *Miraculum omraense*.

In their publication of 2004 Bakharev and Bazarova for the first time designated a holotype for *Miraculum omraensis* (recte: *omraense*) and provided both, a diagnosis and a detailed description. In this way they satisfied the criteria of availability and became authors of *Miraculum omraense*.

Etymology: The new name has no special meaning. It is an extension of the original name by inserting a few letters so that a similarity and the neuter ending could be maintained.

Order Podocopida Sars, 1866
Suborder Cytherocopina Baird, 1850
Superfamily Cytheroidea Baird, 1850
Family Cytheruridae G. W. Müller, 1894
Genus *Cytheropteron* Sars, 1866
***Cytheropteron cuneatissimum* nom. nov.**

Cytheropteron cuneatum Ayress, 1996. Revista Espanola de Micropaleontologia 28 (3) 15. Preoccupied by *Cytheropteron cuneatum* Dingle, 1993. Annals of the South African Museum 103: 71.

Remarks on nomenclatural change: Since the publication of volumes 6 (Kempf, 1995) and 11 (Kempf, 2008) of "Index and bibliography of marine Ostracoda" that case of homonymy is known, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures of *Cytheropteron cuneatum* Dingle, 1993 from Quaternary sea-floor sediments off south-western Africa with those of *Cytheropteron cuneatum* Ayress, 1996 from Late Eocene deposits of New Zealand reveals several differences. *Cytheropteron cuneatum* Ayress, 1996 with a length of 0.4 mm is somewhat smaller, but differs above all in lateral and dorsal outline as well as in surface ornamentation. In addition, there is a difference in geological age of about 40 million years.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Cytheropteron cuneatum* Ayress, 1996 represents a junior primary homonym, for which *Cytheropteron cuneatissimum* nom. nov. is herewith introduced as a necessary new name.

Etymology: The species name represents the superlative of the Latin word *cuneatus* (= wedge-shaped) in its neuter form, referring to the wedge-shaped lateral outline of the valves.

***Cytheropteron tesakovae* nom. nov.**

Cytheropteron laeve Tesakova, 2003. Paleontological Journal 37 (suppl. 2) 181. Preoccupied by *Cytheropteron laevis* (recte: *laeve*) Seguenza, 1880. Atti della Reale Accademia Nazionale dei Lincei, Serie 3, 6: 292. In addition, it is preoccupied by *Cytheropteron laeve* Brady & Norman, 1889. Sci. Trans. R. Dublin Soc., Series 2, 4 (2) 210.

Remarks on nomenclatural change: With the publication of volumes 1 and 11 from my database of marine Ostracoda (Kempf, 1986 and 2008) that case of homonymy has been made evident. Until now I could not register any replacement name.

Comparison of the published descriptions and figures of the Recent and well documented *Cytheropteron laeve* Brady & Norman, 1889 with those of the Jurassic *Cytheropteron laeve* Tesakova, 2003 reveals that besides of the great difference in geological age of at least 155 million years there are also distinct differences in size and morphology of the valves.

A comparison with *Cytheropteron laeve* Seguenza, 1880 from the Tertiary of Italy is more difficult, as that species was only described but not figured. However, with a shell length of 0.8 mm and a height of 0.5 mm it is more than double the size of the tiny *Cytheropteron laeve* Tesakova, 2003.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Cytheropteron laeve* Tesakova, 2003 represents a junior primary homonym, for which *Cytheropteron tesakovae* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name is honouring Dr. Ekaterina Mikhaylovna Tesakova in recognition of her valuable contributions to ostracodology and biostratigraphy.

***Cytheropteron vricanum* nom. nov.**

Cytheropteron rectum Colalongo & Pasini, 1980. Boll. Soc. Paleont. Ital. 19 (1) 94. Preoccupied by *Cytheropteron rectum* Brady, 1868. Transact. Linn. Soc. London 26 (2) 476.

Remarks on nomenclatural change: In November 1984 I informed Dr. Colalongo of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the description and figures of the well documented *Cytheropteron rectum* Colalongo & Pasini with the published description of *Cytheropteron rectum* Brady from the Shetland Islands reveals that the size of them is similar, but that there are distinct differences in the morphology of the valves.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Cytheropteron rectum* Colalongo & Pasini, 1980 represents a junior primary homonym, for which *Cytheropteron vricanum* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name refers to the type locality, the Vrica section in Calabria (Southern Italy), where this species occurs from the earliest Pleistocene layers onward.

Genus *Eucytherura* G. W. Müller, 1894

***Eucytherura ninetyeastiana* nom. nov.**

Eucytherura tumida Ayress, Whatley, Downing & Millson, 1995. Records Australian Museum 47: 217. Preoccupied by *Eucytherura tumida* Bonnema, 1941. Natuurhistorisch Maandblad 30: 23.

Remarks on nomenclatural change: In June 1996 I informed Michael Ayress of that case of homonymy, but until now for the Kempf Database Ostracoda I could not register a replacement name.

Comparison of the published descriptions and figures of *Eucytherura tumida* Bonnema, 1941 from the Cretaceous of The Netherlands with those of *Eucytherura tumida* Ayress, Whatley, Downing & Millson, 1995 from Pleistocene deposits of the East Indian Ocean reveals several differences. Above all, there is the great difference in geological age of at least 65 million years. In addition, besides of the generic characters in common, the valves of *Eucytherura tumida* Bonnema, 1941 show a weakly developed median furrow, distinct eye tubercles and, in well preserved specimens, small spinelets on the reticulate surface.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Eucytherura tumida* Ayress, Whatley, Downing & Millson, 1995 represents a junior primary homonym, for which *Eucytherura ninetyeastiana* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name refers to the type locality of this species in the East Indian Ocean at the southern limit of Ninetyeast Ridge. There it occurs in DSDP site 254 at a present water depth of about 1250 m.

Genus *Semicytherura* Wagner, 1957

***Semicytherura aqabana* nom. nov.**

Semicytherura affinis Bonaduce, Masoli, Minichelli & Pugliese, 1980. Boll. Soc. Paleont. Italiana 19: 158. Preoccupied by *Semicytherura affinis* (Sars, 1866) Neale & Howe, 1975. Bull. Amer. Paleontology 65: 426.

Remarks on nomenclatural change: Since the publication of the first volume of "Index and bibliography of marine Ostracoda" (Kempf, 1986) that case of homonymy is known, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

The high latitude species *Semicytherura affinis* (Sars, 1866) Neale & Howe, 1975 had originally been described as *Cytherura affinis* Sars, 1866. According to the comparison of the published descriptions and figures, *Semicytherura affinis* Bonaduce & al., 1980 shows besides of a general similarity distinct differences. It differs above all in the ornamentation of the valves which is composed of longitudinal ridges linked by short perpendicular ridges to form a kind of reticulation. On the contrary, the valves of *Semicytherura affinis* (Sars, 1866) show a pitted surface ornamentation with a mainly faintly developed reticulation which becomes stronger only in the range of anterior and ventral margin. Additional differences are connected with the caudal process.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Semicytherura affinis* Bonaduce & al., 1980 represents a junior primary homonym, for which *Semicytherura aqabana* nom. nov. is herewith introduced as a new name.

Mostafawi (2003) identified *Semicytherura favorum* Bonaduce, Masoli & Pugliese, 1978 in a collection of Recent ostracods from the Persian Gulf and considered *Semicytherura affinis* Bonaduce, Masoli, Minichelli & Pugliese, 1980 to be a junior synonym. Those authors, however, had already mentioned that these two species show the same type of shape and ornamentation, but differ in size, dorsal outline and some details in the reticulation.

Etymology: The new name refers to the type locality of this species within a coral reef environment near to the northern end of the Gulf of Aqaba.

Family Hemicytheridae Puri, 1953**Genus *Hadropleuranella* nom. nov.**

Hadropleura Liebau, 1991. Geologie Paläontologie Westfalen 13: 132 (Crustacea: Ostracoda). Preoccupied by *Hadropleura* Carus, 1890. Prodrum Faunae Mediterraneae, vol. 2: 414 (Mollusca: Gastropoda).

Remarks on nomenclatural change: Firstly, the genus name *Hadropleura* was introduced by Carus (1890) pro *Haedropleura* Monterosato in Bucquoy, Dautzenberg & Dollfus, 1883. It is still widely used parallel to *Haedropleura* as a genus name in Gastropoda, Turridae. Subsequently, *Hadropleura* was erected by Liebau (1991) for a genus of Ostracoda.

Thus, the genus name *Hadropleura* Liebau, 1991 is a primary junior homonym of *Hadropleura* Carus, 1890. Herewith I propose to replace *Hadropleura* Liebau, 1991 with the new substitutional name *Hadropleuranella*.

Type species: *Hadropleuranella hadropleura* (Hazel, 1968) **comb. nov.**

Original binomen: *Hermanites hadropleura* Hazel, 1968

Other species: *Hadropleuranella gibsoni* (Hazel, 1968) **comb. nov.**

Hadropleuranella plusculmensis (Schmidt, 1948) **comb. nov.**

Etymology: The new name is composed of *Hadropleura* and the ending -nella. Gender feminin.

Family Leptocytheridae Hanai, 1957**Genus *Leptocythere* Sars, 1925*****Leptocythere istriana* nom. nov.**

Leptocythere bituberculata Bonaduce, Ciampo & Masoli, 1976. Pubblicazioni della Stazione Zoologica di Napoli 40: 29. Preoccupied by *Leptocythere bituberculata* Scheremeta, 1961. Paleontologicheskij Sbornik Lvovskogo Universiteta, 1: 116.

Remarks on nomenclatural change: With the publication of the first volume from my database of marine Ostracoda (Kempf, 1986) that case of homonymy has been made evident. Until now I could not register any replacement name.

According to the comparison of the published descriptions and figures of single valves, the Recent *Leptocythere bituberculata* Bonaduce, Ciampo & Masoli, 1976 differs from the Lower Pannonian *Leptocythere bituberculata* Scheremeta, 1961 in size and outline of the valves, in the position of the two characteristic tubercles, and in other details of surface ornamentation.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Leptocythere bituberculata* Bonaduce, Ciampo & Masoli, 1976 represents a junior primary homonym, for which *Leptocythere istriana* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name refers to the type locality of this species which is situated on the Adriatic Sea floor, nearest to the coast of Istria, Croatia.

Family Loxoconchidae Sars, 1925**Genus *Cytheromorpha* Hirschmann, 1909*****Cytheromorpha crotoneana* nom. nov.**

Cytheromorpha reticulata Colalongo & Pasini, 1980. Boll. Soc. Paleont. Ital. 19 (1) 80. Preoccupied by *Cytheromorpha reticulata* Smith, 1978. Transact. Gulf Coast Ass. Geol. Soc. 28: 557.

Remarks on nomenclatural change: In November 1984 I informed Dr. Colalongo of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures of the two species reveals several differences. With 0.55 mm the valves of male specimens of *Cytheromorpha reticulata* Colalongo & Pasini from the Pliocene and Pleistocene of the Vrica section are about 30%

longer and with an L/H ratio of 2.29 more elongated than those of the Paleocene *Cytheromorpha reticulata* Smith with an L/H ratio of 2.05. Further they differ in the outline in lateral view and the kind of surface reticulation. In addition, there is a difference in geological age of more than 50 million years.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Cytheromorpha reticulata* Colalongo & Pasini, 1980 represents a junior primary homonym, for which *Cytheromorpha crotoneana* nom. nov. is herewith introduced as a necessary new name.

Mostafawi (1986) described the new genus *Ionicythere* within the family Leptocytheridae and mentioned *Ionicythere reticulata* (Colalongo & Pasini, 1980) as a new combination. Consequently, the combination should be changed to *Ionicythere crotoneana* (Kempf, 2011) **nov. comb.** now, if that classification should generally be accepted.

Etymology: The new name refers to the type locality near to the town Crotone in the region Calabria (Southern Italy).

Genus *Loxoconcha* Sars, 1866

***Loxoconcha bonaciamma* nom. nov.**

Loxoconcha concentrica Bonaduce, Ciampo & Masoli, 1976. Pubblicazioni della Stazione Zoologica di Napoli 40: 105. Preoccupied by *Loxoconcha concentrica* Krutak, 1961. Journal of Paleontology 35: 775.

Remarks on nomenclatural change: With the publication of the first volume from my database of marine Ostracoda (Kempf, 1986) that case of homonymy has been made evident. Until now I could not register any replacement name.

According to the comparison of the published descriptions and figures, the Recent *Loxoconcha concentrica* Bonaduce, Ciampo & Masoli, 1976 differs from the Eocene *Loxoconcha concentrica* Krutak, 1961 by its smaller size, the outline of the valves, and its well developed eye tubercles. In addition, there is a difference in geological age of about 40 million years.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Loxoconcha concentrica* Bonaduce, Ciampo & Masoli, 1976 represents a junior primary homonym, for which *Loxoconcha bonaciamma* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name is composed of the initial syllables of Bonaduce, Ciampo and Masoli.

***Loxoconcha ocellifera* nom. nov.**

Loxoconcha ocellata Ho in Hou et al., 1982. Cretaceous-Quaternary ostracode fauna from Jiangsu: 210. Preoccupied by *Loxoconcha ocellata* Bold, 1973. Micropaleontology 18 (1972) (4) 430.

Remarks on nomenclatural change: Since the publication of the first volume of "Index and bibliography of marine Ostracoda" (Kempf, 1986) that case of homonymy is known, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

The comparison of the published descriptions and figures is not easy, but the Quaternary *Loxoconcha ocellata* Ho seems to differ from the Lower Miocene *Loxoconcha ocellata* Bold by its somewhat larger size and the outline of the valves. In addition, there is a difference in geological age of more than 12 million years.

According to the International Code of Zoological Nomenclature (1999) *Loxoconcha ocellata* Ho in Hou et al., 1982 represents a junior primary homonym, for which *Loxoconcha ocellifera* nom. nov. is herewith introduced as the necessary new name.

Hu & Tao (2008) introduced *Hanaiconcha* as a new subgenus within the genus *Loxoconcha*, with *Loxoconcha (Hanaiconcha) mitoui* Hu & Tao, 2008 as the type species. They also created the new combination *Loxoconcha (Hanaiconcha) ocellata* (Ho in Hou et al., 1982). The nomenclatural change to *Loxoconcha (Hanaiconcha) ocellifera* (Kempf, 2011) **nov. comb.** is necessary, if that subgenus will generally be accepted as valid.

Etymology: The new species name is composed of the Latin words ocelli (little eyes) and fera (bearing, carrying).

Family Paradoxostomatidae Brady & Norman, 1889

Genus *Paradoxostoma* Fischer, 1855

***Paradoxostoma navigium* nom. nov.**

Paradoxostoma navicula Bonaduce, Masoli, Minichelli & Pugliese, 1980. Boll. Soc. Paleont. Italiana 19: 174. Preoccupied by *Paradoxostoma navicula* Schornikov, 1965. Bentos, Biologiya Morya: 115.

Remarks on nomenclatural change: Since the publication of the first volume of "Index and bibliography of marine Ostracoda" (Kempf, 1986) that case of homonymy is known, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures of the two species reveals that the valves of *Paradoxostoma navicula* Bonaduce & al., 1980 are very different in appearance: in length they are more than 30 % longer, have an almost straight dorsal margin with weak concavities near both ends, while the ventral margin is very evenly rounded. In detail there are additional differences.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Paradoxostoma navicula* Bonaduce & al., 1980 represents a junior primary homonym, for which *Paradoxostoma navigium* nom. nov. is herewith introduced as a necessary new name.

Etymology: The new Latin species name has the same meaning as *navicula*, namely small boat, and is used as a noun in apposition.

Family Trachyleberididae Sylvester-Bradley, 1948

Genus *Buntonia* Howe in Howe & Chambers, 1935

***Buntonia calabria* nom. nov.**

Buntonia parva Colalongo & Pasini, 1980. Boll. Soc. Paleont. Ital. 19 (1) 68. Preoccupied by *Buntonia parva* Apostolescu, 1963. Revue Inst. Franc. Petrole 18 (12) 1685.

Remarks on nomenclatural change: In November 1984 I informed Dr. Colalongo and in August 1986 Dr. Ciampo of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and illustrations of the two species reveals that besides of a difference in geological age of at least 65 million years the valves of *Buntonia parva* Colalongo & Pasini differ in several aspects. With a length/height ratio of 2.20 they are more elongated than those of *Buntonia parva* Apostolescu from the Senonian of Gambia (L/H = 1.43). There are also differences in the outline of the posterior and ventral margins and in surface ornamentation.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Buntonia parva* Colalongo & Pasini, 1980 represents a junior primary homonym, for which *Buntonia calabria* nom. nov. is herewith introduced as the necessary new name.

With some hesitation Colalongo & Pasini had assigned their species to the genus *Buntonia*. In 1986 Ciampo established the genus *Flexuocythere* and designated *Buntonia parva* Colalongo & Pasini, 1980 as the type species and *Flexuocythere colalongae* Ciampo, 1986 as the only additional species. Now the type species should read *Flexuocythere calabria* (Kempf, 2011) **nov. comb.**, if *Flexuocythere* will generally be accepted as valid.

On the contrary, Ayress & Corregge (1993) considered the genera *Heinia* Bold, 1985 as well as *Flexuocythere* Ciampo, 1986 to be junior synonyms of *Nipponocythere* Ishizaki, 1971, a genus of the family Loxoconchidae. Consequently, they created the new combination *Nipponocythere parva* (Colalongo & Pasini, 1980) which should read *Nipponocythere calabria* (Kempf, 2011) **nov. comb.** now. This has an additional advantage, as otherwise *Nipponocythere parva* Liu, 1989 would represent a homonym. Also in 1993 the new combination *Nipponocythere colalongae* (Ciampo, 1986) has been introduced by Drapala & Ayress.

Etymology: The new name is used as a noun in apposition and refers to the type locality in the region Calabria (Southern Italy), where this species occurs in the Vrica section from the early Pleistocene layers onward.

Genus *Curfsina* Deroo, 1966
***Curfsina gerardderooi* nom. nov.**

Curfsina derooi Weaver, 1982. Monograph Palaeontographical Society 135: 62. Preoccupied by *Curfsina derooi* Jain, 1975. Geophytology 5: 205.

Remarks on nomenclatural change: In May 1986 I informed Dr. Weaver of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures of the two species reveals that the valves of *Curfsina derooi* Jain, 1975 differ in possessing a rib between strongly developed eye spot and muscle node. In addition, they have more and finer denticles along anterior and posterior margin.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Curfsina derooi* Weaver, 1982 represents a junior primary homonym, for which *Curfsina gerardderooi* nom. nov. is herewith introduced as the necessary new name.

Etymology: As originally intended, the new name is honouring Dr. Gerard Deroo in recognition of his contributions to ostracodology.

Genus *Cythereis* Jones 1849
***Cythereis coronaaweaveri* nom. nov.**

Cythereis coronata Weaver, 1982. Monograph Palaeontographical Society 135: 63. Preoccupied by *Cythereis coronata* Esker, 1968. Micropaleontology 14: 323.

Remarks on nomenclatural change: In May 1986 I informed Dr. Weaver of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures of *Cythereis coronata* Weaver, 1982 from the Lower Cenomanian of England with those of *Cythereis coronata* Esker, 1968 from Danian deposits of Tunisia reveals several differences. With about 1.1 mm the length of the valves of *Cythereis coronata* Weaver, 1982 is about one third larger. They exhibit also a larger flattened region following the rib along the anterior margin, while the posterior margin is more distinctly triangular. In addition, there is a difference in geological age of about 30 million years.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Cythereis coronata* Weaver, 1982 represents a junior primary homonym, for which *Cythereis coronaaweaveri* nom. nov. is herewith introduced as a necessary new name.

Etymology: The species name is composed of the Latin word corona (= crown), referring to the crown-like muscle node of the valves, and weaveri, by this honouring Dr. Philip P. E. Weaver for his contributions to ostracodology.

Genus *Neocaudites* Puri, 1960
***Neocaudites richarddinglei* nom. nov.**

Neocaudites punctatus Dingle, 1993. Annals of the South African Museum, 103 (1) 39. Preoccupied by *Neocaudites punctatus* Hu, 1986. Petroleum Geology of Taiwan, 22: 105.

Remarks on nomenclatural change: In July 1995 I informed Dr. Dingle of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures of the two species reveals that the valves of *Neocaudites punctatus* Dingle, 1993 are of similar size, but differ in outline and especially in surface ornamentation.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Neocaudites punctatus* Dingle, 1993 represents a junior primary homonym, for which *Neocaudites richarddinglei* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name is honouring Dr. Richard Vernon Dingle in recognition of his many significant contributions to ostracodology.

Genus *Veenia* Butler & Jones, 1957
***Veenia kallankurichchi* nom. nov.**

Veenia reticulata Sastry & Mamgain in Sastry, Mamgain & Jagannatha Rao, 1972. *Palaeontologia Indica*, n.s., 40: 36. Preoccupied by *Veenia reticulata* Hazel & Paulson, 1964. *Journ. Paleontology* 38 (6) 1055.

Remarks on nomenclatural change: Since the publication of the first volume of "Index and bibliography of marine Ostracoda" (Kemp, 1986) that case of homonymy is known, but until now there is not registered a replacement name in the Kemp Database Ostracoda.

Comparison of the published descriptions and figures of *Veenia reticulata* Sastry & Mamgain, 1972 with those of *Veenia reticulata* Hazel & Paulson, 1964 reveals that both species are of similar size, but in lateral view of the valves there are remarkable differences in outline, especially as far as posterior and ventral margin are concerned.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Veenia reticulata* Sastry & Mamgain, 1972 represents a junior primary homonym, for which *Veenia kallankurichchi* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name refers to the type horizon of this species in sediments of the Kallankurichchi Formation, Ariyalur Group, Upper Cretaceous, India. The name is used as a noun in apposition.

Family (?) Trachyleberididae Sylvester-Bradley, 1948
Genus *Patrizianella* nom. nov.

Patrizia Bonaduce & Russo, 1990. *Boll. Soc. Paleont. Ital.* 29 (3) 273 (Crustacea: Ostracoda). Preoccupied by *Patrizia* Alluaud, 1931. *Afra* 3: 123 (Insecta: Coleoptera).

Remarks on nomenclatural change: Firstly, the genus *Patrizia* was erected by Alluaud (1931) which is still widely used as an available valid genus name in Coleoptera. Bouchard et al. (2011) regard that genus as the type of subtribe Patriziina Basilewsky, 1953 within the subfamily Brachiniinae Bonelli, 1810 and family Carabidae Latreille, 1802.

Subsequently, the genus *Patrizia* was erected by Bonaduce & Russo (1990) for recent Ostracoda.

Thus the genus name *Patrizia* Bonaduce & Russo, 1990 is a primary junior homonym of the valid genus name *Patrizia* Alluaud, 1931. Herewith I propose to replace *Patrizia* Bonaduce & Russo, 1990 with the new substitutional name *Patrizianella*.

Type species: *Patrizianella mascellaroe* (Bonaduce & Russo, 1990) **comb. nov.**

Original binomen: *Patrizia mascellaroi* (recte: *mascellaroe*) Bonaduce & Russo, 1990

Other species: *Patrizianella bonaducei* (Jellinek, 1993) **comb. nov.**

Patrizianella grandis (Jellinek, 1993) **comb. nov.**

Patrizianella nucleuspersici (Jellinek, 1993) **comb. nov.**

Patrizianella opaca (Jellinek, 1993) **comb. nov.**

Patrizianella russoi (Jellinek, 1993) **comb. nov.**

Patrizianella simulatecaeca (Jellinek, 1993) **comb. nov.**

Patrizianella indopacifica (Whatley & Zhao, 1988) **comb. nov.**

Patrizianella ? *lagaghiroboensis* (Apostolescu, 1961) **comb. nov.** (in the sense of Colin & al., 1998)

Remarks on the subfamily Patriziinae Bonaduce & Russo, 1990

In 1990 Bonaduce & Russo also established, doubtfully within the family Trachyleberididae, the subfamily Patriziinae, with the ostracod genus *Patrizia* as the type. In 1993 Jellinek emended the name, as the stem to be used according to the IRZN is Patrizi-,

to Patriziinae. That caused a case of homonymy within the family group names, as Patriziini or Patriziina Basilewsky, 1953 are already used as names for a tribe respectively subtribe within the family Carabidae of the Coleoptera. As a consequence that would require Patrizianellinae as a replacement name, with Patrizianella as the type genus. However, Article 29.5 and Recommendation 29A of the IRZN allow not correctly formed names of the family group, even when created with intention, if homonymy can be avoided in this way. Patriziinae Bonaduce & Russo, 1990 is therefore still to be treated as a valid name of a subfamily within the Ostracoda, with Patrizianella as the type genus.

Etymology: As originally intended, the new name is honouring Dra. Patrizia Mascellaro (1958-1988), who studied Ostracoda for several years and tragically died on December 15, 1988 in a storm in the Bay of Naples, when on duty on Stazione Zoologica di Napoli research vessel Posillipo.

Subclass Myodocopa Sars, 1866
Order Halocyprida Dana, 1852
Suborder Cladocopina Sars, 1866
Superfamily Cladocopoidea Sars, 1866
Family Polycopidae Sars, 1866
Genus *Polycope* Sars, 1866
***Polycope delicatulina* nom. nov.**

Polycope delicata Weaver, 1982. Monograph Palaeontographical Society 135: 99. Preoccupied by *Polycope delicata* Sissingh, 1972. Utrecht Micropaleontological Bulletins 6: 66.

Remarks on nomenclatural change: In August 1986 I informed Dr. Weaver of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

Comparison of the published descriptions and figures of the two species reveals that the valves of *Polycope delicata* Weaver, 1982 are somewhat larger and show a completely different surface ornamentation.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Polycope delicata* Weaver, 1982 represents a junior primary homonym, for which *Polycope delicatulina* nom. nov. is herewith introduced as a necessary new name.

Etymology: The new name has no special meaning. It is an extension of the original name by inserting a few letters so that a similarity could be maintained.

***Polycope eilatensis* nom. nov.**

Polycope ornata Bonaduce, Masoli, Minichelli & Pugliese, 1980. Bollettino Società Paleontologica Italiana 19: 145. Preoccupied by *Polycope ornata* Kotschekova in Kotschekova & Gusseva, 1972. Rannepermskie ostrakody: 20 (The name of the authoress may also be cited as Kochetkova).

Remarks on nomenclatural change: In August 1986 I informed Dr. Bonaduce of that case of homonymy, but until now there is not registered a replacement name in the Kempf Database Ostracoda.

The two species in question cannot be synonymous, as there is an extraordinary difference in geological age of about 275 million years between the Recent *Polycope ornata* Bonaduce & al. and the Lower Permian *Polycope ornata* Kotschekova. In addition, the Recent species with a length of 0.26 mm is about one third smaller and shows a different surface ornamentation of the valves.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Polycope ornata* Bonaduce & al., 1980 represents a junior primary homonym, for which *Polycope eilatensis* nom. nov. is herewith introduced as a necessary new name.

In his literature review, Chavtur (1991: 163) included *Polycope ornata* Bonaduce & al., 1980 in his genus *Micropolycope*. If this change of combination should generally be accepted, it will necessarily lead to *Micropolycope eilatensis* (Kempf, 2011) **comb. nov.**

Etymology: The new name refers to the type locality of this species within the coral reef complex south of Eilat.

Order Leiocopida Schallreuter, 1973
Suborder Leiocopina Schallreuter, 1973
Superfamily Aparchitoidea Jones, 1901
Family Aparchitidae Jones, 1901
Genus *Libumella* Rozhdestvenskaya, 1959
***Libumella robinsoni* nom. nov.**

Libumella reticulata Robinson, 1978. Stratigraphical index of British Ostracoda: 130. Preoccupied by *Libumella reticulata* Copeland, 1962. Bulletin Geological Survey Canada 91: 44.

Remarks on nomenclatural change: In November 1984 I informed Dr. Eric Robinson of that case of homonymy, but until now for the Kempf Database Ostracoda I could not register a replacement name.

Comparison of the published descriptions and figures of the two species reveals that the valves of the Upper Visean *Libumella reticulata* Robinson with a length of about 0.9 mm are distinctly smaller than those of the Lower Devonian *Libumella reticulata* Copeland with a length of 1.2 mm. As Copeland's illustrations are very small light micrographs, other shell characteristics cannot be compared with Robinson's scanning electron micrographs. In geological age there is a difference of at least 50 million years. A synonymy can certainly be excluded.

Consequently, according to the International Code of Zoological Nomenclature (1999) *Libumella reticulata* Robinson, 1978 represents a junior primary homonym, for which *Libumella robinsoni* nom. nov. is herewith introduced as the necessary new name.

Etymology: The new name is honouring Dr. Eric Robinson in recognition of his valuable contributions to ostracodology and biostratigraphy.

LITERATURE CITED

- Alluaud, C.** 1931. Etudes sur les Carabidae africains. Afra - Cahiers d'Entomologie, 3: 16 pp.
- Apostolescu, V.** 1963. Essai de zonation par les ostracodes dans le Cretace du Bassin du Senegal. Revue de l'Institut Francais du Petrole, 18 (12): 1675-1694.
- Ayress, M. A.** 1996. New Species and Biostratigraphy of Late Eocene Cytherurid Ostracoda from New Zealand. Revista Española de Micropaleontologia, 28 (3): 11-36.
- Ayress, M. A. & Corregge, T.** 1993. On *Nipponocythere cuneata* Ayress & Corregge sp. nov. Stereo Atlas of Ostracod Shells, 20 (6): 25-28.
- Ayress, M. A., Whatley, R. C., Downing, S. E. & Millson, K. J.** 1995. Cainozoic and Recent Deep Sea Cytherurid Ostracoda from the South Western Pacific and Eastern Indian Oceans, Part I: Cytherurinae. Records of the Australian Museum, 47 (2): 203-223.
- Bakharev, N. K.** 1985. Zhivetskie ostrakody Salaira [Givetian ostracods from Salair]. Trudy Instituta Geologii i Geofiziki, Akademiya Nauk SSSR, Sibirskoe Otdelenie, 615: 35-48 [In Russian].
- Bakharev, N. K. & Bazarova, L. S.** 2004. Siluriyskie i devonskie ostrakody roda *Miraculum*: novye vidy, filozony [Silurian and Devonian ostracods of the genus *Miraculum*: new species, phylozones]. Novosti paleontologii i stratigrafii 6-7: 75-87 [In Russian].
- Bold, W. A. van den** 1973. Ostracoda of the La Boca Formation, Panama Canal Zone. Micropaleontology 18 (1972) (4): 410-442.
- Bolivar, I.** 1903. Nuevas especies de Eumastacinos. Boletin de la Sociedad Española de Historia Natural 3: 301-307.
- Bonaduce, G., Ciampo, G. & Masoli, M.** 1976. Distribution of Ostracoda in the Adriatic Sea. Pubblicazioni della Stazione Zoologica di Napoli, 40 (1975): 1-154.

- Bonaduce, G., Masoli, M., Minichelli, G. & Pugliese, N.** 1980. Some new benthic marine ostracod species from the Gulf of Aqaba (Red Sea). *Bollettino della Società Paleontologica Italiana*, 19 (1): 143-178.
- Bonaduce, G., Masoli, M. & Pugliese, N.** 1978. Ostracoda from the Gulf of Aqaba (Red Sea). *Pubblicazioni della Stazione Zoologica di Napoli*, 40 (1976) (2): 372-428.
- Bonaduce, G. & Russo, A.** 1990. *Patrizia*, a new marine ostracode genus (Ostracoda: Podocopa) from the Gulf of Aden (Somalia) and Patriziinae new subfamily. *Bollettino della Società Paleontologica Italiana*, 29 (3): 273-277.
- Bonnema, J. H.** 1941. Ostracoden aus der Kreide des Untergrundes der nordöstlichen Niederlande. *Natuurhistorisch Maandblad*, 30 (2): 21-24.
- Bouchard, P. et al.** 2011. Family-group names in Coleoptera (Insecta). *ZooKeys*, 88: 1-972.
- Brady, G. S.** 1868. A monograph of the Recent British Ostracoda. *Transactions of the Linnean Society of London*, 26 (2): 353-495.
- Brady, G. S. & Norman, A. M.** 1889. A monograph of the marine and freshwater Ostracoda of the North Atlantic and of North-western Europe, Section 1, Podocopa. *Scientific Transactions of the Royal Dublin Society, Series 2*, 4 (2): 63-270.
- Carus, J. V.** 1890. *Prodromus Faunae Mediterraneae, sive Descriptio Animalium Maris Mediterranei Incolarum*. Volume 2: 1-854.
- Chavtur, V. G.** 1991. Istoriko-bibliograficheskii obzor i analiz izucheniya sovremennykh ostrakod - miodokop mirovogo okeana [Historic-bibliographical review and analysis of scientific investigations on modern Myodocopida (Ostracoda) of the world oceans], part 2, section B: 1-164 [In Russian].
- Ciampo, G.** 1981. Ostracodi fossili (Oligocene superiore - Serravalliano) del monte Cammarata (Sicilia centro-occidentale) e del Ragusano (Sicilia sud-orientale). *Bollettino della Società Paleontologica Italiana*, 20 (1): 53-72.
- Ciampo, G.** 1986. Ostracodi del limite Tortonian/Messiniano in alcune sezioni italiane. *Bollettino della Società Paleontologica Italiana*, 24 (1985) (1): 29-110.
- Colalongo, M. L. & Pasini, G.** 1980. La Ostracofauna plio-pleistocenica della Sezione Vrica in Calabria (con considerazioni sul limite Neogene/Quaternario). *Bollettino della Società Paleontologica Italiana*, 19 (1): 44-126.
- Copeland, M. J.** 1962. Ostracoda from the Lower Devonian Dalhousie beds, northern New Brunswick. *Geological Survey of Canada Bulletin*, 91: 18-51.
- Colin, J.-P., Tambareau, Y. & Krashennnikov, V. A.** 1998. Maastrichtian and Paleocene ostracode assemblages of Mali (Western Africa). *Dela - Opera SAZU (Slovenska Akademija znanosti in umetnosti v Ljubljani)*, razr. 4, 34 (2): 273-345.
- Dingle, R. V.** 1993. Quaternary ostracods from the continental margin off south-western Africa, Part 2: Minor taxa. *Annals of the South African Museum*, 103 (1): 1-165.
- Drapala, V. & Ayress, M. A.** 1993. On *Nipponocythere colalongoae* (Colalongo & Pasini). *Stereo Atlas of Ostracod Shells*, 20 (5): 17-24.
- Esker, G. C.** 1968. Danian ostracodes from Tunisia. *Micropaleontology*, 14 (3): 319-333.
- Hazel, J. E. & Paulson, O. L.** 1964. Some new ostracode species from the Austinian and Tayloran (Coniacian and Campanian) rocks of the East Texas Embayment. *Journal of Paleontology*, 38 (6): 1047-1064.
- Hou, You-Tang & al.** 1982. Cretaceous-Quaternary ostracode fauna from Jiangsu. I-VI, 1-388 [In Chinese].
- Hu, Chung-Hung** 1986. Pliocene ostracods from Shoushan, Kaohsiung, Southern Taiwan. *Petroleum Geology of Taiwan*, 22: 103-125.
- Hu, Chung-Hung & Tao, Hsi-Jen** 2008. Studies on the ostracod fauna of Taiwan and its adjacent seas. *National Taiwan Museum Special Publication Series*, 13 (part 1) 1-655, (part 2) 657-910 [In Chinese].

International commission of zoological nomenclature. 1999. International Code of Zoological Nomenclature. Fourth Edition. The International Trust for Zoological Nomenclature, London. I-XXIX, 1-306.

Jain, S. P. 1975. Ostracoda from the Bagh beds (Upper Cretaceous) of Madhya Pradesh. *Geophytology*, 5 (2): 188-212.

Jellinek, T. 1993. Zur Ökologie und Systematik rezenter Ostracoden aus dem Bereich des kenianischen Barriere-Riffs. *Senckenbergiana lethaea*, 73 (1): 83-225.

Kempf, E. K. 1967. *Ilyocypris schwarzbachi* n. sp. (Crustacea, Ostracoda) und ein vorläufiges Ostrakoden-Diagramm aus dem pleistozänen Löss von Kärlich (Neuwieder Becken). *Sonderveröffentlichungen, Geologisches Institut der Universität zu Köln*, 13: 65-79.

Kempf, E. K. 1975. On *Ilyocypris schwarzbachi* Kempf. *Stereo-Atlas of ostracod shells*, 2 (38): 239-246.

Kempf, E. K. 1986. Index and bibliography of marine Ostracoda 1, Index A. *Sonderveröffentlichungen, Geologisches Institut der Universität zu Köln*, 50: 1-766.

Kempf, E. K. 1995. Index and bibliography of marine Ostracoda 6, Index A, Supplement 1. *Sonderveröffentlichungen, Geologisches Institut der Universität zu Köln*, 100: 1-244.

Kempf, E. K. 2008. Index and bibliography of marine Ostracoda 11, Index A, Supplement 2. CD-ROM publication by the author.

Kotschetskova, N. M. & Gusseva, E. A. 1972. Rannepermskie ostrakody yuzhnogo i srednego Priuralya [Early Permian Ostracoda of the southern and middle Pri-Urals]: 1-180 [In Russian]. (Kotschetskova is also cited as Kochetkova)

Krstic, N. 2006. Pliocene ostracodes of the Paludinean Beds in the Pannonian Plain, Serbian part. 1-411.

Krutak, P. R. 1961. Jackson Eocene Ostracoda from the Cocoa Sand of Alabama. *Journal of Paleontology*, 35 (4): 769-788.

Liebau, A. 1991. Skulptur-Evolution bei Ostrakoden am Beispiel europäischer "Quadracytheren". *Geologie und Paläontologie in Westfalen*, 13: 1-395.

Mostafawi, N. 1986. *Ionicythere* n. g., eine neue Ostracodengattung aus dem mediterranen Jungtertiär. *Neues Jahrbuch für Geologie und Paläontologie, Monatshefte*, 1986 (6): 380-384.

Mostafawi, N. 2003. Recent ostracods from the Persian Gulf. *Senckenbergiana maritima*, 32 (1-2): 51-75.

Neale, J. W. & Howe, H. V. 1975. The marine Ostracoda of Russian Harbour, Novaya Zemlya, and other high latitude faunas. *Bulletins of American Paleontology*, 65 (282): 381-431.

Polenova, E. N. 1960. Devonskie ostrakody Kuznetskogo basseyna i Minusinskoy kotloviny [Devonian Ostracoda of the Kuznetsk basin and the Minusinsk trough]. *Trudy vsesoyuznogo neftyanogo nauchno-issledovatel'skogo geologo-razvedochnogo instituta (VNIGRI), novaya seriya*, 152: 1-139 [In Russian].

Polenova, E. N. 1968. Ostrakody nizhnego devona Salaira (Tomchumyshskiy gorizont) [Ostracoda from the Lower Devonian of Salair (Tomchumysh horizon)]. 1-154 [In Russian].

Polenova, E. N. 1974. Ostrakody rannego devona arkticheskikh rayonov SSSR [Early Devonian ostracods of the USSR arctic regions]. *Trudy Instituta Geologii i Geofiziki, Akademiya Nauk SSSR, Sibirskoe Otdelenie*, 234: 1-156 [In Russian].

Robinson, E. 1978. The Carboniferous. In: **Bate, R. H. & Robinson, E.** (editors) *A stratigraphical index of British Ostracoda*: 121-166.

Rozhdestvenskaya, A. A. 1962. Srednedevonskie ostrakody zapadnogo sklona yuzhnogo Urala, predural'skogo progiba i platformennoy chasti Bashkirii [Middle Devonian Ostracoda from the western slope of the southern Urals, Pre-Uralian trough and platform parts of Bashkiria]. in: Tyazheva, A. P., Rozhdestvenskaya, A. A. & Chibrikova, E. V. 1962. Brakhiopody, ostrakody i spory srednego i verkhnego devona Bashkirii [Brachiopoda, Ostracoda and spores from the Middle and Upper Devonian of Bashkiria]: 169-349 [In Russian].

Sastry, M. V. A., Mamgain, V. D. & Jagannatha Rao, B. R. 1972. Ostracod fauna of the Ariyalur Group (Upper Cretaceous), Tiruchirapalli District, Tamil Nadu. *Memoirs of the Geological Survey of India, Palaeontologia Indica, New Series*, 40: 1-59.

Scheremeta, V. G. 1961. Nekotorye novye vidy ostrakod iz sarmatskikh i pannonskikh otlozheniy Zakarpatya [Some new species of ostracods from Sarmatian and Pannonian deposits of the Transcarpathians]. *Paleontologicheskii Sbornik Lvovskogo Universiteta*, 1: 113-120 [In Russian]. (Scheremeta is also cited as Sheremeta).

Schornikov, E. I. 1965. K izucheniyu Ostracoda Azovskogo i Chernogo Morey [To the study of the Ostracoda of the Sea of Azov and the Black Sea]. *Bentos, Biologiya Morya*: 103-121 [In Russian].

Seebach, K. von 1857. Entomostraceen aus der Trias Thüringens. *Zeitschrift der Deutschen Geologischen Gesellschaft*, 9 (2): 198-206.

Seguenza, G. 1880. Le Formazioni Terziarie nella Provincia di Reggio (Calabria). *Atti della Reale Accademia Nazionale dei Lincei, Serie 3 (Memorie della classe de scienze fisiche, matematiche e naturali)* 6: 1-446.

Sissingh, W. 1972. Late Cenozoic Ostracoda of the south Aegean Island Arc. *Utrecht Micropaleontological Bulletins* 6: 1-187.

Smith, J. K. 1978. Ostracoda of the Prairie Bluff Chalk, Upper Cretaceous (Maestrichtian) and the Pine Barren Member of the Clayton Formation, Lower Paleocene (Danian) from exposures along Alabama State Highway 263 in Lowndes County, Alabama. *Transactions of the Gulf Coast Association of Geological Societies*, 28 (2): 539-579.

Weaver, P. P. E. 1982. Ostracoda from the British Lower Chalk and Plenus Marls. *Monograph of the Palaeontographical Society*, 135 (1981): 1-127.

Whatley, R. C. & Zhao, Q. 1988. Recent Ostracoda of the Malacca Straits, Part 2. *Revista Española de Micropaleontologia*, 20 (1): 5-37.

Zhang, Li-Jun & Zhao, S. 1983. Early Devonian ostracods of Nei Mongol. *Bulletin of Shenyang Institute of Geology and Mineral Resources*, 7: 133-143 [In Chinese].

ON THE BUPRESTIDAE (COLEOPTERA) SPECIES OF ALMOND ORCHARDS IN THE SOUTHEASTERN AND EASTERN ANATOLIA IN TURKEY

Halil Bolu* and İnanç Özgen*

* Dicle University, Faculty of Agriculture, Plant Protection Department, 21280, Diyarbakır, TURKEY. E-mails: besni@dicle.edu.tr and inancoz@hotmail.com

[Bolu, H. & Özgen, İ. 2011. On the Buprestidae (Coleoptera) Species of Almond Orchards in the Southeastern and Eastern Anatolia in Turkey. Munis Entomology & Zoology, 6 (2): 970-976]

ABSTRACT: The faunistic study on buprestids, conducted during 2002-2004 in the Southeastern and Eastern Anatolia Region in Turkey. In this study 17 Buprestid species, spread areas and abundance were determined in Almond orchards in Turkey. Those species were *Agrilus roscidus* Kiesenweter, *Anthaxia armeniaca* Obenberger, *Anthaxia lucens* Küster, *Anthaxia tractata* Abeille de Perin, *Aurigena lugubris longicollis* Kraatz, *Capnodis tenebricosa* (Oliver), *Capnodis carbonaria* (Klug), *Chalcophorella quadrioculata* (Redt.), *Chalcophorella stigmatica* (Schoenherr), *Chrysobothris affinis* (F.), *Chrysobothris samai* Curletti and Magnani, *Julodis armeniaca* Marseul, *Meliboeus heydeni* Abeille de Perin, *Perotis lugubris* Fabr. *Ptosima flavoguttata* (Illiger), *Sphenoptera (Tropeopeltis) anthaxoides* Reitter and *Sphenoptera (Tropeopeltis) tappesi* Marseul. In this study, *A. roscidus*, *A. armeniaca*, *A. lucens*, *A. tractata*, *A. lugubris longicollis*, *C. carbonaria*, *C. quadrioculata*, *C. affinis*, *C. samai*, *J. armeniaca*, *M. heydeni*, *P. flavoguttata*, *S. anthaxoides* and *S. tappesi* are presented here as a new record for the almond fauna in Turkey. Determined were high populations' density of *A. roscidus* in Diyarbakır, Mardin and Elazığ.

KEY WORDS: Almond, Buprestidae, new record, Turkey.

Almond culture is considered to be of great economic importance in Turkey. Approximately 13% of almond of Turkey is produced in Diyarbakır, Elazığ and Mardin Provinces (Anonymous, 1999), where are located Eastern and Southeastern Turkey.

Over recent years, improvements have been continually introduced into region, concerning both the varieties grown and the agricultural techniques, to guarantee a high quality and quantity of yield, according to the principles of integrated pest management.

Jewel beetles are likely one of the most easily recognizable families due to their striking colors. During the warmer months these beetles are often seen on the flowers of trees and shrubs. They are small to large beetles and range in size from 3 to 65 millimeters in length. They have an elongated body shape which tapers towards the abdomen and a short head, which fits closely into the broader thorax.

Larvae of the peach woodborer *Capnodis tenebrionis* L. and the almond woodborer *Capnodis carbonaria* Klug destroy the roots of both sapling and mature trees of cultivated stonefruits, *Prunus* spp. *C. tenebrionis* occurs widely in North Africa, southern and central Europe, and the Near East and around the Black and the Caspian Seas. Damage caused by *C. tenebrionis* has been reported mainly from southern European and Mediterranean areas (e.g., Garrido, 1984; Mahhou & Dannis, 1992; Tezcan, 1995; Ben-Yehuda et al., 2000). The distribution of *C. carbonaria* overlaps much of the natural distribution of almond *P. amygdalus* Batsch that ranges from Dalmatia to Asia Minor, the Near East, the Caucasus foothills, and the area between the Black and the Caspian Seas.

Economic losses due to *C. carbonaria* have been reported mainly from Israel and Egypt (Ben-Yehuda et al., 1997). Outside of the cultivated lands, both species are rare and seldom found on wild host plants. The species are responsible for the destruction of plantations of almond, apricot (*P. armeniaca* L.), cherry (*P. vulgaris* L.), nectarine and peach [*P. persica* (L.) Batsch], and plum (*P. domestica* L. and other plum species).

The aims of the study were: to determine buprestids species and abundances in Elazığ, Diyarbakır and Mardin Provinces in Turkey.

MATERIAL AND METHODS

This faunal study conducted during 2002-04, is based on the collection of more than 1329 specimen from different parts in Diyarbakır [Çermik (38°15'N, 39°45'E at altitude of about 710m.), Ergani (38°17'N, 39°45'E at altitude of about 1043m.)], Mardin [Akbağ (37°22'N, 40°39'E at altitude of about 970m.), Cevizpınarı (37°20'N, 40°46'E at altitude of about 853 m.), Ömerli (37°24'N, 40°56'E at altitude of about 1133m.) and Yeşilli (37°22'N, 40°51'E at altitude of about 1069m.)] and Eastern Anatolia Region in Elazığ [Center (38°39'N, 39°15'E at altitude of about 998m.), Gezin (38°29'N, 39°20'E at altitude of about 1256m.), Keban (38° 43'N, 53°53'E at altitude of about 1206m.) and Sivrice (38°28'N, 39°18'E at altitude of about 1280m.)] provinces (Fig. 1).

The sampling method was based on the techniques usually applied in orchards, namely knocking the adults out the trees by the frapping method. Trees were selected for sampling inspected once week between March and October. No chemical was applied during this study.

RESULTS AND DISCUSSION

In this study 17 buprestid species, spread areas and abundance were determined in Almond orchard in Turkey. In this study, *Agrilus roscidus*, *Anthaxia armeniaca*, *Anthaxia lucens*, *Anthaxia tractata*, *Aurigena lugubris longicollis*, *Capnodis carbonaria*, *Chalcophorella quadrioculata*, *Chrysobothris affinis*, *C. samai*, *Julodis armeniaca*, *Meliboeus heydeni*, *Perotis lugubris*, *Ptosima flavoguttata*, *Sphenoptera (Tropeopeltis) anthaxoides* and *S. (Tropeopeltis) tappesi* are presented here as a new record for the almond fauna in Turkey. Too many species are uncouned in Diyarbakır with 12 kinds. Elazığ and Mardin had followed this and each of them has 11 species.

A. roscidus's population density was determined almond orchard in Diyarbakır it's followed according to circumstances by *A. armeniaca*, *C. carbonaria*, *A. lucens* and *A. longicollis*. The other species' population densities were determined lower than 1 %. *A. roscidus*'s population density was determined almond orchard in Elazığ that it's followed by *C. carbonaria*. The other species' population densities were determined lower than 1 %. *A. roscidus*'s population density was determined almond orchard in Mardin that it's followed according to circumstances by *A. armeniaca*, *A. lucens*, *A. longicollis* and *C. carbonaria*. The other species' population densities were determined lower than 1 %. Following is the presentation in alphabetical order. In this study 17 Buprestid species, spread areas and abundance were determined in Almond orchards in Turkey (Table 1).

Agrilus roscidus Kiesenweter, 1857

This species was recorded from Diyarbakır, Elazığ and Mardin. It was active from early of June till end of August. The population recorded was very high. It constituted 64 % of the material. *A. roscidus* is a monophagous and oligophagous species are being described

(Królik & Niehuis, 2003). These known so far can be grouped as follows: species living on fruit trees, shrubs and herbaceous plants of the family Rosaceae (*Prunus*, *Pyrus*, *Malus*, *Crataegus*, *Rubus*, *Rosa* etc.). **General Distribution:** Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Corsica, Croatia, Cyprus, Czech Republic, European Turkey, Germany, Hungary, Macedonia, Malta, Moldova, Republic of, Romania, Russia South, Sardinia, Sicily, Slovakia, Slovenia, Spanish mainland, Switzerland, Ukraine, Near East Asian: Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq (Anonymous, 2004). **Distribution in Turkey:** İzmir (Tezcan, 1995), All Turkey (Lodos & Tezcan, 1995), Incl. Imroz I. - Gökçeada, but not those in the Sea of Marmara (Anonymous, 2004).

***Anthaxia armeniaca* Obenberger, 1929**

This species was recorded from Diyarbakır, Elazığ and Mardin. The population recorded was high. It constituted 16.40 % of the material. It was active from middle of April till early of August. *A. armeniaca* is a monophagous species. This species living on pistachio trees ((Lodos & Tezcan, 1995; Yanik et. al., 2001). **General Distribution:** Iran, Iraq, Turkey ((Lodos & Tezcan, 1995). **Distribution in Turkey:** Pistachio tree in Adıyaman, Mardin, Diyarbakır, Siirt and Şanlıurfa (Lodos & Tezcan, 1995), Pistachio tree in Şanlıurfa (Yanik & Yücel, 2001).

***Anthaxia lucens* Küster, 1852**

The specimens were collected in Diyarbakır, Elazığ and Mardin during April and August. It was a common species were constituted 4.4 % of the material. **General Distribution:** Albania, Croatia, Crete, European Turkey, Germany, Hungary, Macedonia, Malta, Sicily, Slovenia, East Palaearctic, Yugoslavia (Anonymous, 2008). **Distribution in Turkey:** Incl. Imroz I. - Gökçeada, but not those in the Sea of Marmara (Anonymous, 2004).

***Anthaxia tractata* Abeille de Perrin, 1901**

This was found only in May from Diyarbakır. The population recorded was very low. It constituted 0.45 % of the material. **General Distribution:** Albania, Croatia, European Turkey, Germany, Hungary, Macedonia, Malta, Sicily, East Palaearctic (Anonymous, 2004). **Distribution in Turkey:** Unknown.

***Aurigena lugubris longicollis* Kraatz, 1881**

This was found during April and September in Diyarbakır, Elazığ and Mardin. It was a common species were constituted 3 % of the material. **General Distribution:** Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, European Turkey, Germany, Hungary, Macedonia, Romania, Russia, Slovakia, Slovenia, Ukraine, Yugoslavia, East Palaearctic (Anonymous, 2004). **Distribution in Turkey:** In Turkey, except for The Black Sea Region and Eastern Anatolia Region, although existed more or less, nearly everywhere it is encountered mainly in surroundings of İçel and Adana (Lodos & Tezcan, 1995).

***Capnodis carbonaria* (Klug, 1829)**

This species was recorded from Diyarbakır, Elazığ and Mardin. It was active from early of April till end of September. The population recorded was high. It constituted 5.79 % of the material. **General Distribution:** Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, European Turkey, Germany, Hungary, Macedonia, Romania, Russia, Slovakia, Slovenia, Ukraine, Yugoslavia, East Palaearctic (Anonymous, 2004). **Distribution in Turkey:** Except for The Northern Black Sea Region and Eastern Anatolia Region, it is more or less encountered nearly on all sides of Turkey (Lodos & Tezcan, 1995), İzmir (Tezcan, 1995).

***Capnodis tenebricosa* (Oliver, 1790)**

This species was recorded from Diyarbakır and Mardin. This was during end of May till August. The population recorded was low in Diyarbakır and Mardin. **General Distribution:** Albania, Bosnia and Herzegovina, Bulgaria, Corsica, Croatia, European Turkey, French mainland, Greek mainland, Italian mainland, Macedonia, Moldova,

Romania, Russia, Sardinia, Slovenia, Ukraine, Yugoslavia (Anonymous, 2004). **Distribution in Turkey:** Southeastern Anatolia (Maçan, 1986), All Turkey (Lodos & Tezcan, 1995), İzmir (Tezcan, 1995).

***Chalcophorella quadrioculata* (Redtenbacher, 1843)**

Two specimens were collected in Çermik II (18.07.2003) and Sivrice (09.05.2003). The population recorded was very low. It was a common species were constituted 0.15 % of the material. **General Distribution:** Syria, Turkey (Anonymous, 2008). **Distribution in Turkey:** Turkey, Akdeniz kıyısı, Hatay, Akbes, Adıyaman, (Anonymous, 2004).

***Chalcophorella stigmatica* (Schoenherr, 1817)**

Two specimens were found only in May (Ömerli 12.05.2003) and June (Cevizpınarı 03.06.2003) from Mardin. The population recorded was very low. It constituted 0.15 % of the material. **General Distribution:** Albania, Bosnia and Herzegovina, Bulgaria, European Turkey, Greek mainland, North Aegean Is., Near East Asian: Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq (Anonymous, 2004). **Distribution in Turkey:** South provinces (Nizamhoğlu, 1961), Southeastern Anatolia (Maçan, 1986), İzmir (Tezcan, 1995).

***Chrysobothris affinis* (Fabricius, 1794)**

This species was recorded from Diyarbakır and Mardin. This was during in May till August. The population recorded was very low in Diyarbakır and Mardin. **General Distribution:** Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Corsica, Croatia, Czech Republic, European Turkey, French mainland, Germany, Greek mainland, Hungary, Macedonia, Malta, Moldova, Norwegian mainland, Republic of, Poland, Portuguese mainland, Romania, Russia, Sardinia, Sicily, Slovakia, Slovenia, Sweden, Switzerland, Ukraine, Yugoslavia, East Palaearctic (Anonymous, 2004). **Distribution in Turkey:** Thrace Region, İstanbul, Kocaeli, İzmir, Muğla, Ankara (Lodos & Tezcan, 1995), İzmir (Tezcan, 1995).

***Chrysobothris samai* Curletti and Magnani, 1998**

Two specimens were found only in Mardin (Akbağ 12.06.2003). **General Distribution:** Turkey (Bolu et al., 2005). **Distribution in Turkey:** Mardin (Bolu et al., 2005).

***Julodis armeniaca* Marseul, 1865**

Three specimens were found only in Diyarbakır (Çermik I 17.06.2003). **General Distribution:** Cyprus, Near East Asian: Turkey, Caucasian Russian republics, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq (Anonymous, 2004). **Distribution in Turkey:** Unknown.

***Meliboeus heydeni* Abeille de Perrin, 1897**

Three specimens were found only in Diyarbakır (Çermik II 03.07.2002. 1, 17.06.2003. 2). **General Distribution:** Israel (Chikatunov, et al., 1999), Turkey (Bolu et al., 2005). **Distribution in Turkey:** Diyarbakır (Bolu et al., 2005).

***Perotis lugubris* (Fabricius, 1777)**

This species was recorded from Diyarbakır and Mardin. This was during in April till August. The population recorded was very low in Diyarbakır and Mardin. **General Distribution:** Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, European Turkey, Germany, Greek mainland, Italian mainland, Macedonia, Romania, Russia, Slovakia, Slovenia, Ukraine, Yugoslavia, East Palaearctic (Anonymous, 2004). **Distribution in Turkey:** İzmit, Ankara, Adana (Nizamhoğlu, 1961), Southeastern Anatolia (Maçan, 1986), Adana, İçel (Lodos & Tezcan, 1995).

***Ptosima flavoguttata* (Illiger, 1803)**

This species was recorded from Elazığ and Mardin. This was during in May till July. **General Distribution:** Albania, Bosnia and Herzegovina, Bulgaria, Corsica, Croatia,

Cyprus, Czech Republic, European Turkey, French mainland, Greek mainland, Hungary, Italian mainland, Macedonia, Malta, Portuguese mainland, Romania, Russia, Sardinia, Sicily, Slovakia, Slovenia, Spanish mainland, Switzerland, Ukraine, Yugoslavia, Near East Asian: Turkey, Caucasian Russian republics, Armenia, Azerbaijan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq, North Africa (Anonymous, 2004). **Distribution in Turkey:** İzmir (Tezcan, 1995), All Turkey (Lodos & Tezcan, 1995).

***Sphenoptera (Troveopeltis) anthaxoides* Reitter, 1895**

This species was recorded from Diyarbakır, Elazığ and Mardin. The population recorded was very low. It constituted 0.15 % of the material. It was active from middle of April till early of August. **General Distribution:** Albania, Crete, Cyprus, Greek mainland, Macedonia, Near East Asian, North Africa (Anonymous, 2004). **Distribution in Turkey:** Unknown.

***Sphenoptera (Troveopeltis) tappesi* Marseul, 1865**

This species was recorded from Diyarbakır, Elazığ and Mardin. The population recorded was low. It constituted 1.74 % of the material. It was active from April till early of September. **General Distribution:** Greece, Cyprus, Syria, Iraq and Turkey (Obenberger, 1930; Derwesh, 1965; Georgiou, 1977; Lodos & Tezcan, 1995). Near East Asian: Turkey, Caucasian Russian republics, Armenia, Azerbaijan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian Peninsula, Iran, Iraq, North Africa (Anonymous, 2004). **Distribution in Turkey:** Aegian region (Lodos & Tezcan, 1995), Diyarbakır (Bolu, 2008).

ACKNOWLEDGEMENTS

The authors are thankful to expert for identification of the buprestids species to Assoc. Prof. Dr. Göksel TOZLU (Atatürk University, Plant Protection Department, Erzurum/Turkey). This study was supported by the Scientific and Technical Research Council of Turkey (TÜBİTAK-Project No: TOGTAG-2886).

LITERATURE CITED

- Anonymous**, 1999. Agricultural Ministry. Plant Protection and Control General Director. Pests of Cereals, Vol. 1: p. 50.
- Anonymous**, 2004. Fauna Europaea. www.faunaeur.org.
- Anonymous**, 2008. http://www.biologie.uni-ulm.de/cgi-bin/query_all/details.
- Ben-Yehuda, S., Assael, F. & Mendel, Z.** 1997. Recent outbreaks of phloem-and wood-boring insects in deciduous orchards in Israel. *Phytoparasitica*, 25:163-164.
- Ben-Yehuda, S., Assael, F. & Mendel, Z.** 2000. Improved chemical control of *Capnodis tenebrionis* L. and *C. carbonaria* Klug (Coleoptera: Buprestidae) in stonefruit plantations in Israel. *Phytoparasitica*, 28: 27-41.
- Bodenheimer, F. S.** 1958. Türkiye'de ziraatta ve ağaçlara zararlı olan böcekler ve bunlarla savaş hakkında bir etüd. Bayur Matbaası, Ankara, 346.
- Bolu, H., Özgen, İ. & Çınar, M.** 2005. Dominancy of Insect Families and Species Recorded in Almond Orchards of Turkey. *Acta Phytopathologica et Entomologica Hungarica*, 40: 145-157.
- Bolu, H.** 2008. A New Host *Sphenoptera tappesi* Marseul (Coleoptera: Buprestidae) for *Dolichomitrus kriechebaumeri* (Schulz) (Hymenoptera: Ichneumonidae) from Turkey. *Turk. J. Zool.*, 32: 225-226.
- Chikatunov, V., Pavliceck, T. & Nevo, E.** 1999. Coleoptera of "Evolution Canyon", Lower Nahal Oren, Mount Carmel, Israel. Part I. Families: Buprestidae, Carabidae, Cerambycidae, Glaphyridae, Hybosoridae, Hydrophilidae, Lucanidae, Scarabaeidae, Tenebrionidae, and Trogidae. Pensoft Publishers, 174.

- Garrido, A.** 1984. Bioecologõ ´Capnodis tenebrionis L. (Coleoptera: Buprestidae) orientaciones para su control. Bull. San. Veg. Plagas.
- Królik, R. & Niehuis, M.** 2003. *Agrilus rhoos*, a new species from Turkey (Coleoptera: Buprestidae), 14: 357-362.
- Lodos, N. & Tezcan, S.** 1995. Entomology of Turkey V. (Buprestidae), Turkey Entomology Association Publication, Bornova, 138.
- Maçan, G.** 1986. Investigations on the Almond pests, their morphology, distribution and economic importance in south eastern region of Turkey. Ministry of Agriculture and Forestry. Research publications series, 5: 71-75.
- Mahhou, A. & Dannis, F. G.** 1992. The almond in Morocco. Hort Technology, 2: 488-492.
- Nizamlioglu, K.** 1962. Türkiye Ziraatına Zararlı Olan Böcekler ve Mücadelesi. Bölüm 2, Meyve Ağacı Zararlıları, İstanbul, 1-11: 1-184.
- Obenberger, J.** 1926. Buprestidae: I, IN: S. Schenkling (ed.) Coleopterorum Catalogus, 84: 1-212.
- Popov, V.** 1962. Spetsiana Entomologia. Zemizdat, Sofiya, 457.
- Talhounk, A. S.** 1977. Contributions to the Knowledge of Almond Pests in East Mediterranean Countries . VII. The Defoliators. Z. Ang. Ent., 80: 138-246.
- Tezcan, S.** 1995. Investigations on the harmful species of Buprestidae (Coleoptera) of cherry orchards in Kemalpasa (İzmir) district (Turkey). Turk. Entomol. Derg., 3: 221-230.
- Yanık, E. & Yücel, A.** 2001. The pistachio (*P. vera* L.) pests, their population development and damage stage in Şanlıurfa province. XI. G.R.E.M.P.A. Meeting (1-4 September , Şanlıurfa), 301-309.



Figure 1. Survey areas Elazığ (1), Diyarbakır (2) and Mardin (3).

Table 1. Buprestidae species, spread areas and abundance of almond orchard in Turkey.

Species	Diyarbakır				Elazığ				Mardin				Total	%
	Çermik I	Ergani I	Çermik II	Ergani II	Gezin	Center	Keban	Sivrice	Akbağ	Cevizpınarı	Ömerli	Yeşilli		
<i>A. roscidus</i>	25	39	96	25	20	10	5	13	510	18	81	9	851	64.0
<i>A. armeniaca</i>	7	6	31	3	-	5	-	17	90	25	33	1	218	16.4
<i>A. lucens</i>	2	5	8	-	3	-	-	4	8	7	7	15	59	4.43
<i>A. tractata</i>	-	-	4	2	-	-	-	-	-	-	-	-	6	0.45
<i>A. longicollis</i>	7	-	4	-	2	-	4	5	5	13	-	-	40	2.91
<i>C. carbonaria</i>	6	11	4	-	4	5	1	8	28	4	-	6	77	5.79
<i>C. tenebriosa</i>	5	-	6	-	-	-	-	-	4	-	-	-	15	1.12
<i>C. quadrioculata</i>	-	-	1	-	-	-	-	1	-	-	-	-	2	0.15
<i>C. stigmatica</i>	-	-	-	-	-	-	-	-	-	2	-	-	2	0.15
<i>C. affinis</i>	-	1	-	-	-	-	-	-	-	2	-	1	4	0.30
<i>C. samai</i>	-	-	-	-	-	-	-	-	2	-	-	-	2	0.15
<i>J. armeniaca</i>	-	3	-	-	-	-	-	-	-	-	-	-	3	0.23
<i>M. heydeni</i>	-	-	3	-	-	-	-	-	-	-	-	-	3	0.23
<i>P. lugubris</i>	3	-	2	-	-	-	-	-	1	3	-	2	11	0.82
<i>P. flavoguttata</i>	-	-	-	-	-	-	-	2	-	2	3	5	12	0.87
<i>S. anthaxoides</i>	-	-	-	1	-	-	-	1	-	1	1	-	4	0.30
<i>S. tappesi</i>	-	-	2	-	-	-	-	12	2	2	-	5	23	1.74
Total	55	65	161	31	29	20	10	63	650	79	125	44	1332	100

**THE POPULATION FLUCTUATIONS OF
LEPIDOSAPHES PISTACIAE (ARCHANGELSKAYA)
(HOMOPTERA: DIASPIDIDAE) PEST OF PISTACHIO TREES
IN SIIRT PROVINCE OF TURKEY**

İnanç Özgen* and Yusuf Karsavuran**

* Dicle University, Faculty of Agriculture Plant Protection Department, Diyarbakır, TURKEY.

** Ege University, Faculty of Agriculture Plant Protection Department, Bornova, İzmir, TURKEY.

[Özgen, İ. & Karsavuran, Y. 2011. The Population Fluctuations of the *Lepidosaphes pistaciae* (Archangelskaya) (Homoptera: Diaspididae) pest of pistachio trees in Siirt Province of Turkey. Munis Entomology & Zoology, 6 (2): 977-982]

ABSTRACT: The present study was carried out to determine population fluctuations of the pest *Lepidosaphes pistaciae* (Archangelskaya) (Homoptera: Diaspididae) at two different pistachio orchards in 2003 and 2004 in Siirt province. The high population level of *L. pistaciae* was determined on pistachio leaves as compared to pistachio shoots and fruits. Populations on the shoots were found to be mature female and they were found to usually pass through winter on 2-3 year-old shoots. *L. pistaciae* eggs began to hatch in May and made the transition on pistachio leaves and it was determined that they reached the maximum level during the middle and towards the end of July. It was observed that the populations formed on fruits were removed with harvest and that the next year's population was formed of the leaf populations. The pest gave one offspring in the province of Siirt. According to the results of this study, it was determined that the pest reached high population levels from time to time at both orchards on which population monitoring was made and it was concluded that while determining for struggle against pests, especially the leaf population should be taken into consideration.

KEY WORDS: Pistachio, *Lepidosaphes pistaciae*, Population fluctuations.

In Turkey, Coccoidea (Homoptera) higher family has 267 species (Kaydan et al., 2007). Of these species, 97 belong to the Diaspididae family. *Lepidosaphes pistaciae* (Archangelskaya) (Homoptera: Diaspididae) located within this family is registered on *Malus sylvestris*, *Pistaciae lentiscus*, *P. terebinthus* and *P. vera* (Kaydan et al., 2005). *L. pistaciae* can be found in our country in the provinces of Bolu, Adana, Antalya, Aydın, Balıkesir, Çanakkale, İzmir (Buca), Manisa, Muğla, Uşak, Gaziantep, Şanlıurfa and Siirt (İleri & Ayfer, 1954; Ulu et al., 1972; Yaşar, 1990; Bolu, 1999).

Although this pest was named as *Pistaciaspis pistaciae* in the former resources, it is currently named as *L. pistaciae* (Yaşar, 1990; Bolu, 2002). This pest was widely encountered in the pistachio fields in the Southeast Anatolian Region, in the Halfeti and Birecik Districts of Şanlıurfa Province, Merkez and Aydınlar District of Siirt Province, Hasankeyf District of Batman Province, Midyat and Ömerli District of Mardin Province, and especially among these fields, 100% infection rate was determined at Siirt Province (Bolu, 1999). Bolu (2002) reported that this species was among the eight species economically detrimental to the pistachio. This pest is among the important pests of pistachio in our neighbor Iran (Masjedian & Seyedoleslami, 2003). There is no study in our country for the population change of this pest. With this study, it was aimed to determine the population changes of *L. pistaciae* in the pistachio orchards of Siirt Province.

MATERIALS AND METHODS

The studies were made in 2003-2004 at totally 2 orchards, one in Merkez and one in Aydınlar district of Siirt that was infected with *L. pistaciae*. Both of these selected orchards have an equal amount of infection.

The population monitoring of *L. pistaciae* started at the shoots of March before the wintered matures commenced to give birth and in April at the leaves and fruits together with the awakening of the eyes. At the month of March, first of all, the wintered mature individuals present on totally fifty shoots, being in five shoots per tree and ten different trees in each orchard, were counted on the shoot. The shoot counts were repeated in the period when the pest started to winter; the individuals were again counted on totally fifty shoots, being five shoots per tree and ten different trees. After the commencement of leaf growing, ten compound leaves were taken from each randomly selected ten trees, accounting to totally 100 compound leaves, and five fruits randomly selected from each 5 fruit bunches from ten trees from each orchard, accounting to totally 50 fruits, which were also brought to the laboratory in transparent polyethylene bags, all the biological periods of the pest were counted and recorded. While determining the biological periods of *L. pistaciae*, Yaşar (1990; Yaşar, 1995) was utilized. Preparations were made and compared with the measurements at the relevant sources. Furthermore, the pistachio saplings were infected with wintered females of the pest, the outing of the moving larvae of the pest and transitions to period II were determined. The shell lengths and body lengths of the females were also measured. The male individuals of the pest were measured and compared with the drawings and photographs at the related sources. During orchard selection, the orchards with a surface area of 10-15 decares were selected. The trees in the selected orchards were at the age of 15-20. The heights of the trees in these orchards were selected as approximately 2-2,5 m. In order to ensure homogeneity in the population monitoring, population follow-ups were made at female trees.

RESEARCH FINDINGS AND DISCUSSION

It was determined that *L. pistaciae* generally passed through winter as mature female at 2-3 year old shoots. The population fluctuations of *L. pistaciae* in the years between 2003 and 2004 on the pistachio leaves at Merkez and Aydınlar locations of Siirt province are shown in Figures 1, 2, 3 and 4.

When the population fluctuations of *L. pistaciae* on the pistachio leaves are examined, it is determined that at both sampling fields, the eggs started to hatch as of May and the leaf populations commenced to form. It was observed that as of the end of May and start of June, the 2nd Period larvae started to develop and simultaneously, the young females started to appear as of the beginning of the month of June. It was determined that the mature females generally occurred as of the end of June, and reached maximum levels as of the middle and end of July. As of this period, the new generation larvae were observed to come out from the mature females starting with the end of August and beginning of September, started to create a population mostly towards the young shoots and that they established the mature female form that they would be in on these shoots during the winter. The mature females formed of new generation larvae completing their biological periods on the leaves were removed with the fall out of the leaves. However, it was seen that the larvae moving on to the shoots and completing their biological periods on the shoot, passed through the winter on the shoots as mature females. When the population density of *L. pistaciae* on the leaves of the

pistachio orchards of Merkez and Aydınlar districts were examined, it was observed that the population density at Merkez orchard in 2003 was higher than the population density of the same orchard in 2004. On the other hand, the population densities at the orchards of Aydınlar districts were almost at the same level for both years.

When the population fluctuations of *L. pistaciae* on the pistachio fruits Merkez and Aydınlar districts of Siirt province was examined, it was observed that, in both orchards, with the expansion of the fruit surface areas towards the end of May, the first lava period of the pest started and the mature females formed by the end of July. However, it was observed that the population density in the fruits was lower as compared to the population on the leaves depending on the size of the surface area, and that the pests were isolated from the tree together with the fruit after the fruits were started to be gathered from the trees.

When the populations of *L. pistaciae* on the leaves and fruits were analyzed, it was determined that, parallel to the area of growth, more individuals were present on the leaves, and that most of the active larvae coming out of new generation females were passing on to young shoots and entered wintering for the offspring of the next year. At the end of the season, it was seen that depending on vegetation, the individuals on the leaves and fruits that had not passed on to the shoots were naturally removed with fall out and harvest.

As a result; it was determined that *L. pistaciae* had a high population density in both of the orchards in 2003 and 2004 both on the leaves and fruits; and that the pest population to come about next year in the trees would in general be dominated by the population on the leaves. Furthermore, it was detected that *L. pistaciae* gave 1 offspring in the pistachio orchards of Siirt province.

ACKNOWLEDGEMENT

We would like to extend our gratitude to Assoc. Prof. Dr. Lerzan Erkiş (Biological Agricultural Consultancy Engineering Services, Erzin, Hatay) who has made the identification of *Lepidosaphes pistaciae*.

LITERATURE CITED

- Bolu, H.** 1999. The Determination of population development and natural enemies, distribution areas of *Suturaspis pistaciae* (Homoptera: Coccoidea) and Coccoidea species on pistachio trees in Southeastern Anatolia Region of Turkey. Institute of Science of Cukurova. University. Doctoral Thesis, p. 94.
- Bolu, H.** 2002. Investigations on the fauna of insects and mites in pistachio areas in South Eastern Anatolia Region of Turkey. *Türk. entomol. derg.*, 26 (3): 197-208.
- Elekçioğlu, N. Z.** 2007. Pest and natural enemy fauna in organic citrus production in the Eastern Mediterranean Region of Turkey. *International Journal of Natural Engineering Sciences*, 1: 29-34.
- Erkiş, L. & Uygun, N.** 1995. Distribution, population fluctuations and natural enemies of the white peach scale, *Pseudolacaspis pentagona* (Targioni - Tozzetti) (Homoptera: Diaspididae) in the east Mediterranean Region of Turkey). *Israel Journal of Entomology*, 29: 191-198.
- İleri, M. & Ayfer, M.** 1954. Pistachio (*Pistacia vera*) pest and diseases. Plant Protection Institute of Adana Publications. No:11, Adana, p. 25.
- Kaydan, B., Ülgentürk, S. & Erkiş, L.** 2005. Checklist of Turkish Coccoidea Species (Homoptera). *Y.Y.Ü. Zir. Fak. Derg.*, 17 (2): 89-106.
- Masjedjan, H. & Seyedoleslami, H.** 2003. Bioecology of Pistachio Oyster Shell Scale, *Lepidosaphes pistaciae* Archangelskaya (Homoptera: Diaspididae) in Isfahan, *J. Sci. & Technol. Agric. & Natur. Resour.*, Vol.6, No: 4, Abstract, p. 194.

Ulu, O., Zümreoğlu, A. & San, S. 1972. The Prestudies on pistachio pests and their parasites and predators in Aegean Region of Turkey. The Annual of Plant Protection Research Institute of Adana., 6: 55.

Ülgentürk, S. & Toros, S. 2000. Preliminary studies on Parasitoids and Predators of Diaspididae (Homoptera: Coccoidea) Species on Park Plants. Journal of Agricultural Sciences of Ankara University Faculty of Agriculture., 6 (4): 106-110.

Yaşar, B. 1990. The investigations on species and in their distribution areas, hosts of of Diaspididae and Coccidae (Homoptera: Coccoidea) on ornamental plant pests in İzmir province. Doctora Thesis. Bornova, p. 303.

Yaşar, B. 1995. The Taxonomical Investigations on Diaspididae (Homoptera: Coccoidea) Fauna of Turkey. 100. Year University of Van Press., Van, p. 289.

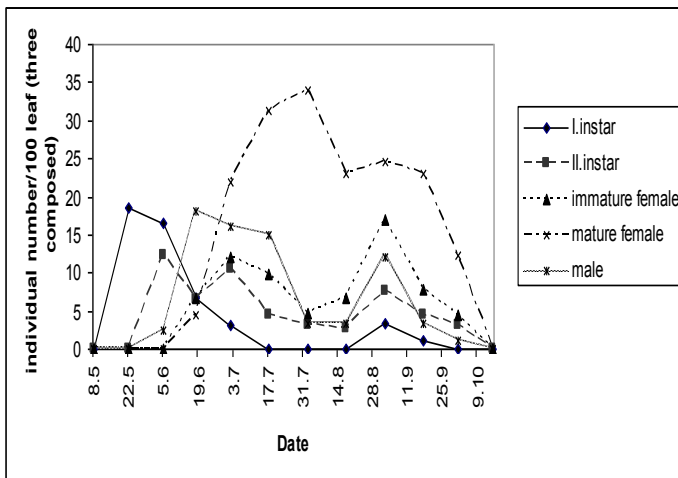


Figure 1. The population Fluctuation of *Lepidosaphes pistaciae* on the pistachio leaves in 2003 at the Merkez (=Central) Orchard of Siirt province.

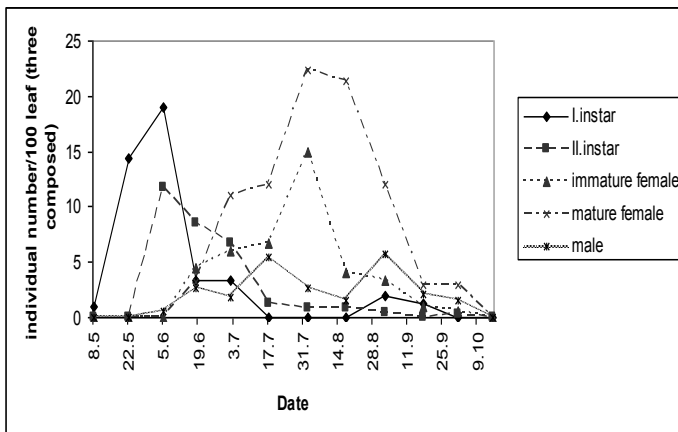


Figure 2. The population Fluctuation of *Lepidosaphes pistaciae* on the pistachio leaves in 2003 at the Aydınlı Orchard of Siirt province.

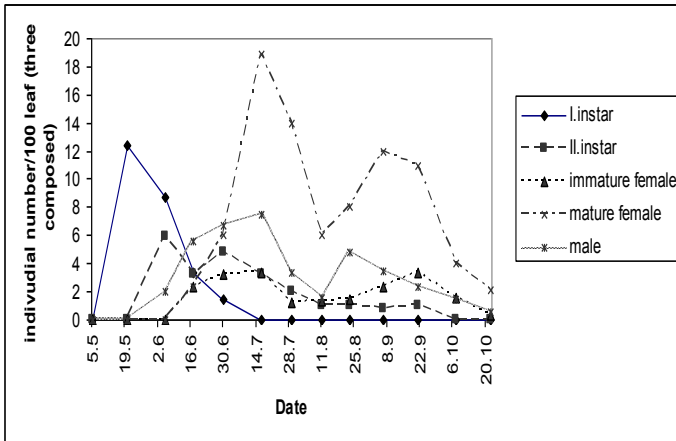


Figure 3. The population Fluctuation of *Lepidosaphes pistaciae* on the pistachio leaves in 2004 at the Merkez (=Central) Orchard of Siirt province.

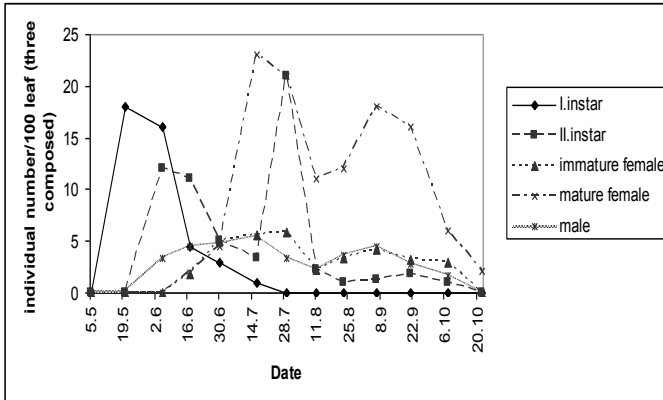


Figure 4. The population Fluctuation of *Lepidosaphes pistaciae* on the pistachio leaves in 2004 at the Aydınlar Orchard of Siirt province.

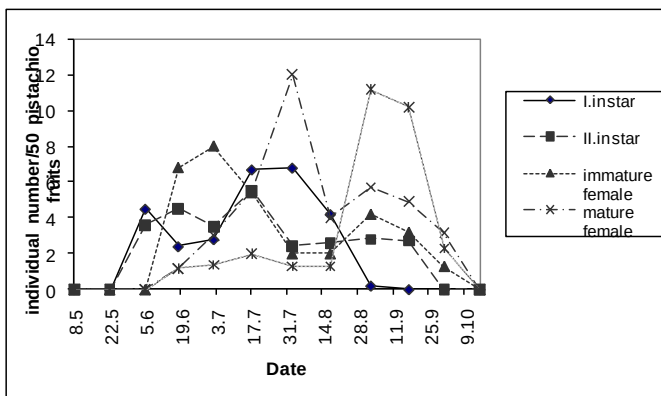


Figure 5. The population Fluctuation of *Lepidosaphes pistaciae* on the fruits in 2003 at the Merkez (=Central) Orchard of Siirt province.

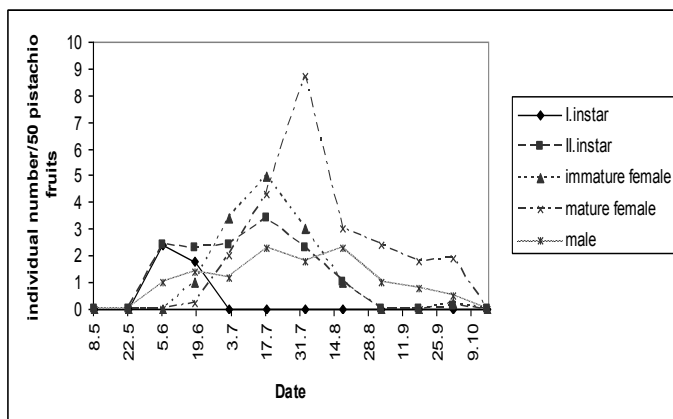


Figure 6. The population Fluctuation of *Lepidosaphes pistachiae* on the fruits in 2003 at the Aydınlar Orchard of Siirt province.

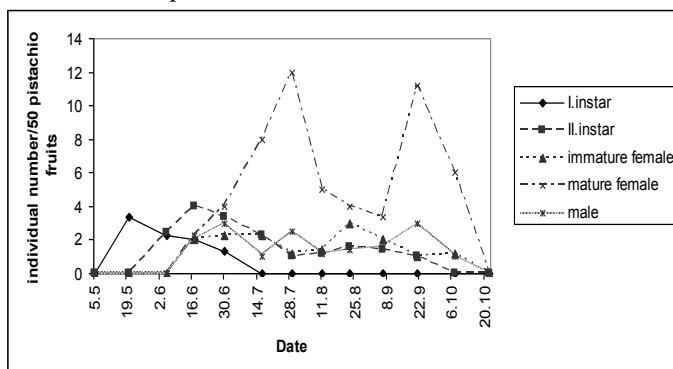


Figure 7. The population Fluctuation of *Lepidosaphes pistachiae* on the fruits in 2004 at the Merkez (=Central) Orchard of Siirt province.

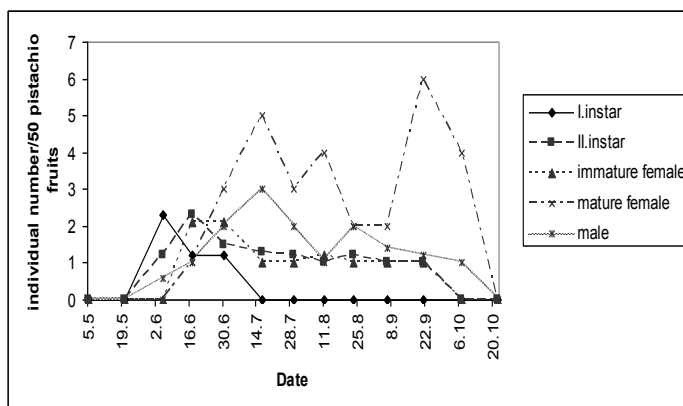


Figure 8. The population Fluctuation of *Lepidosaphes pistachiae* on the fruits in 2004 at the Aydınlar Orchard of Siirt province.

HOST PLANT PREFERENCES OF *RICANIA HEDENBORGI* STAL, 1868 (HEMIPTERA: RICANIIDAE)

İnanç Özgen*, Celalettin Gözüaçık** and Murat Karavin***

* Dicle University Agricultural Faculty, Plant Protection Department, Diyarbakır, TURKEY.
E-mail: inancoz@hotmail.com

** Plant Protection Research Institute, Diyarbakır, TURKEY.

*** Ondokuz Mayıs University Art and Science Faculty Biology Department, Samsun, TURKEY.

[Özgen, İ., Gözüaçık, C. & Karavin, M. 2011. Host Plant Preferences of *Ricania hedenborgi* Stal, 1868 (Hemiptera: Ricaniidae). Munis Entomology & Zoology, 6 (2): 983-986]

ABSTRACT: This study was conducted to determine the host plant preferences and the vertical distribution of the *Ricania hedenborgii* Stal, 1868 (Hemiptera: Ricaniidae). Totally 151 individuals which of 103 ♂ and 48 ♀ was obtained. *R. hedenborgii* was survived on the *Crataegus azarrolus* L., *Acacia* sp., *Prunus amygdalus* L., *Juglans regia* L., *Malus comminis* Poir, *Morus* sp., *Elaeagnus* sp., *Capparis ovata*, *Rosa canina* L., *Quercus* sp. (Meşe), *Punica granatum* L., *Glycyrrhiza glabra*, *Eleagnus agnustifolia*, *Vitis vinifera* L., *Triticum* sp., *Hordeum* sp., L., *Poa annua* L., *Bromus inermis* Leysser, *Poa bulbosa* L., *Lolium rigidum* Gaudin, *Bromus tectorum* L., *Hordeum murinum* L., *Aegilops cylindrica* Host., *Avena sterilis* L., *Secale montanum* L., *Bromus inermis* Leysser, *Hordeum geniculatum* All., *Phalaris brachysathys* L., *Alopecurus myosuroides* Hudson in nature. As a result, The increase the population of *R. hedenborgii* were determined in parallel to air temperature and humidity values.

KEY WORDS: *Ricania hedenborgi*, host plant preferences, temperature, humidity, ecology.

Ricaniidae family species are generally widespread over the tropical zones. *Ricania hedenborgii* Stal, 1865, located within this family is disseminated at Armenia, tropical zones of Africa, Sicily, Greece, Aegean Islands, Middle East countries, North Africa and Turkey (Nast, 1987). This species has been identified in our country at the cities of Diyarbakır (Ergani), Elazığ, İzmir (Selçuk), Mardin (Nusaybin), Muğla (Marmaris), Manisa (Muradiye) (Lodos and Kalkandelen, 1981; Tezcan and Zeybekoğlu, 2001; Demir, 2009). It has been reported that this species is present in nature from mid-June to mid-August and that it is located within *Vitex agnus-castus*, *Punica granatum* (Pomegranate), *Prunus avium* (Cherry) and weed host plants (Lodos & Kalkandelen, 1981; Tezcan & Zeybekoğlu, 2001).

This study has been conducted in 2007-2008 in order to determine the host plants of *R. hedenborgii* in the cities of Diyarbakır and Mardin, and especially the vertical distribution therefore in the Pınarkaya and Yolköprü sampling areas bound to Ergani district of Diyarbakır province. The data of this study pose a significance in terms of the ecological and biological studies to be conducted in the future years for *R. hedenborgii*, and this study shall provide the basic data for the studies aimed at determining the behavior of this species within the habitat, its feeding relations and the relations with natural enemies.

MATERIALS AND METHODS

The material of the study is comprised of *R. hedenborgii*, host plants and sampling tools. This study has been conducted in 2007-2008 in the cities of Diyarbakır and Mardin. Surveys have been performed with sweep net and knock

down methods on the plants that may be the host of *R. hedenborgii* and agricultural and non-agricultural areas with non-periodical outings.

Sweep net method: Nets were thrown over the weeds at locations covering single-year culture plants and perennial plants and *R. hedenborgii* individuals were obtained.

Knock down method: By hitting on perennial fruit trees, shrubs and other perennial trees on four edges with pulse tool, the *R. hedenborgii* individuals were caused to fall on the Japan umbrella.

The individuals obtained with sweep net and knock down methods were classified as ♂ and ♀, and prepared for diagnosis.

RESULT AND DISCUSSION

R. hedenborgii was collected over many plants in nature. These plants are perennials and single, presence imposition, the number of host plants and sex ratio are given below.

1. Host Plant: *Acasia* sp.

Material examined: Diyarbakır (Ergani, Pınarkaya, 14.VII.2007- 2 ♀, 12 ♂). **Totally:** 14 specimens.

2. Host Plant: *Crataegus azarrolus* L.

Material examined: Diyarbakır (Ergani, Pınarkaya, 14.VII.2007- 2 ♀, 8 ♂). **Totally:** 10 specimens.

3. Host Plant: *Prunus amygdalus* L.

Material examined: Mardin (Mazıdağı, 06.VII.2007- 2 ♀, 2 ♂). **Totally:** 4 örnek.

4. Host Plant: *Triticum* sp.,

Material examined: Diyarbakır (Ergani, Pınarkaya, 26.VII.2007- 1 ♂, 09.VIII.2007- 8 ♂). **Totally:** 9 specimens.

5. Host Plant: *Junglans regia* L.

Material examined: Mardin (Mazıdağı, 06.VII.07-6 ♂). **Totally:** 6 specimens.

6. Host Plant: *Morus* sp.

Material examined: Diyarbakır (Ergani, Pınarkaya, 26.VII.2007-10 ♂). **Totally:** 10 örnek.

7. Host Plant: *Malus comminis* Poir

Material examined: Diyarbakır (Ergani, Pınarkaya, 26.VII.2007-6 ♂, 09.VIII.2007-6 ♂). **Totally:** 12 specimens.

8. Host Plant: *Eleagnus agnustifolia*

Material examined: Diyarbakır (Ergani, 26.VII.2007-6 ♂, 30.06.2008-1 ♀). **Totally:** 7 specimens.

9. Host Plant: *Capparis ovata*

Material examined: Mardin (Derik, 06.VII.2007-4 ♂). **Totally:** 4 specimens.

10. Host Plant: *Rosa canina* L.

Material examined: Diyarbakır (Ergani, Pınarkaya, 22.VIII.2007-2 ♂, 26.VII.2007-6 ♀). **Totally:** 8 specimens.

11. Host Plant: *Quercus* sp.

Material examined: Diyarbakır (Ergani, Kayapınar-6 ♀). **Totally:** 6 specimens.

12. Host Plant: *Glycyrrhiza glabra*

Material examined: Diyarbakır (Ergani, Yashica, 09.VIII.2007- 2 ♂). **Totally:** 2 specimens.

13. Host Plant: *Punica granatum*

Material examined: Diyarbakır (Ergani, Pınarkaya, 14.VII.2007-6 ♂, 23.VI.2008-1 ♂, Mardin (Derik, 06.VII.2007-1 ♂, 6 ♀). **Totally:** 14 specimens.

14. Host Plant: *Triticum* sp., *Hordeum* sp., *L.*, *Poa annua* L., *Bromus inermis* Leysser, *Poa bulbosa* L., *Lolium rigidum* Gaudin, *Bromus tectorum* L., *Hordeum murinum* L., *Aegilops cylindrica* Host., *Avena sterilis* L., *Secale montanum* L., *Bromus inermis* Leysser, *Hordeum geniculatum* All., *Phalaris brachysachys* L., *Alopecurus myosuroides* Hudson.

Material examined: Diyarbakır (Ergani, Pınarkaya, 14.VII.2007-13 ♂, 26.VII.2007-3 ♂, 2 ♂, 12.VII.2008, 4♂, 23♀). **Totally:** 45 specimens.

As a result of this study, it was determined that *R. hedenborgi* was present in the nature from the end of June until the end of August. It has been determined that in nature, *R. hedenborgi* can be found on, *Crataegus azarrolus* L. (Hawthorn), *Acasia* sp. (acacia), *Prunus amygdalus* L. (Almond), *Junglans regia* L. (Walnut), *Malus comminis* Poir (Apple), *Morus* sp. (Mulberry), *Elaeagnus* sp. (Oleaster), *Capparis ovata* (Capers), *Rosa canina* L. (Rosehip), *Quercus* sp. (Oak), *Punica granatum* L. (Pomegranate), Licorice, *Vitis vinifera* L. (Vine), *Triticum* sp., *Hordeum* sp., L., *Poa annua* L., *Bromus inermis* Leysser, *Poa bulbosa* L., *Lolium rigidum* Gaudin, *Bromus tectorum* L., *Hordeum murinum* L., *Aegilops cylindrica* Host., *Avena sterilis* L., *Secale montanum* L., *Bromus inermis* Leysser, *Hordeum geniculatum* All., *Phalaris brachysachys* L., *Alopecurus myosuroides* Hudson. It has been determined that *R. hedenborgii* was especially creating an epidemic at Pınarkaya location of Ergani district and had a distribution on several plants.

When the dates that the species abound in the nature are analyzed, an increase was observed near the middle of the July months in 2007 when the average humidity and temperature demonstrated an increase (Figure 2). Likewise, an increase was observed in the species population when the temperature increased towards the middle of July in 2008 (Figure 3).

151 individuals (103 ♂ and 48 ♀) were collected from the nature from *R. hedenborgii* from totally fourteen host plants. The insect has been seen to fly in the period of end of June until the start of August. The insect demonstrated flight most intensely during the July month, and it has been observed especially that the species flew during the arid period of the region towards Pınarkaya and Yolköprü areas where the plant vegetation is varied and abundant, and that the species abounded more in the areas near water accumulations.

Furthermore, it has been determined that the species is present in high quantities during the times when the average humidity and temperature increases. Of the 27 host plants determined with this study, 26 has been determined for the first time. This finding shows that *R. hedenborgii* creates an epidemic at a certain time frame and distributes over a wide area.

LITERATURE CITED

- Demir, E.** 2009. *Ricania* Germar 1818 Species of Western Palearctic Region (Hemiptera: Fulgoromorpha: Ricaniidae). Mun. Ent. Zool., 4 (1): 271-275.
- Lodos, N. & Kalkandelen, A.** 1981. Preliminary list of Auchenorrhyncha with notes on distribution and importance of species in Turkey V. Families Flatidae, Ricaniidae and Cicadidae. Türk Bit. Kor. Derg., 5 (2): 67-82.
- Nast, J.** 1972. Palearctic Auchenorrhyncha (Homoptera). An annotated check list Polish Scientific Publishers, Warszawa. 550 pp.
- Tezcan, S. & Zeybekoğlu, Ü.** 2001. Faunistical studies in ecological cherry orchards in İzmir and Manisa provinces of Turkey. An evaluation on the species of Fulgoroidea and Cercopoidea (Homoptera). Türk entomol derg., 25 (4): 287-298.



Figure 1. The Adult of *Ricania hedenborgii* (Stal, 1895).

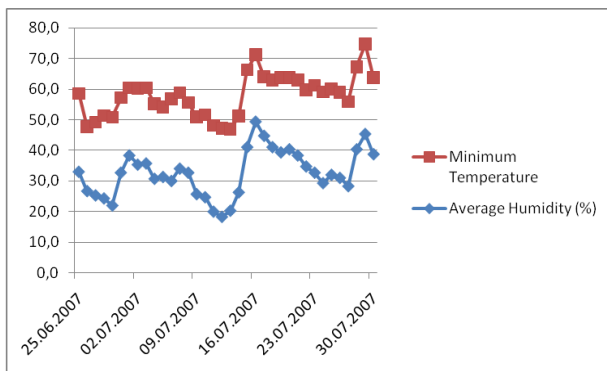


Figure 2. The temperature and humidity degrees of Ergani (Pınarkaya) location in 2007.

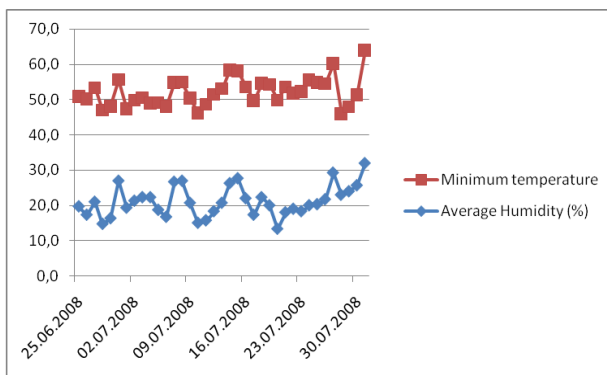


Figure 3. The temperature and humidity degrees of Ergani (Pınarkaya) location in 2008.

BIONOMICS OF INDIAN OAK TASAR SILKMOTH, *ANTHARAEA ROYLEI* MOORE AND ITS POTENTIAL FOR BREEDING IN NORTH EAST INDIA

N. Ibotombi Singh* and Yumnam Debaraj**

*Central Muga Eri Research and Training Institute, Lahdoigarh, JORHAT-785700, INDIA.
E-mail: ibotombisingh@yahoo.co.in

**Regional Sericultural Research Station, JORHAT-785005, INDIA.

[Singh, N. I. & Debaraj, Y. 2011. Bionomics of Indian Oak Tasar SilkmOTH, *Antheraea roylei* Moore and its Potential for Breeding in North East India. Munis Entomology & Zoology, 6 (2): 987-994]

ABSTRACT: During the survey of oak fed silkmOTH fauna in the forest of North-Eastern part of India, the Indian oak fed silkmOTH, *Antheraea roylei* Moore was recorded from oak growing areas of this region and it constitutes a part of the wild silk moth genetic resources of this region. It is distributed in the Indian Sub-Himalayan range and South East Asian countries. It feeds on about 12 varieties of oak tasar food plants. The bionomics and potential of the silkmOTH was studied in the laboratory condition and the results are presented in this paper. *A. roylei* behaves as bivoltine in nature. The female moth lays 185-230 eggs. The average hatching percent, larval period, cocoon yield, effective rate of rearing (ERR %), cocoon weight, cocoon shell weight, cocoon shell ratio % and average single filament length in the laboratory condition were 61.40 %, 38 days, 30 cocoons/disease free laying (dff), 20.36 %, 7.94 g, 0.85 g, 10.71 % and 250 m respectively. *A. roylei* shows high genetic compatibility with *A. pernyi* and *A. proylei* in interspecific hybridization which shows the genetic potential of this species. The F₁ hybrids of *A. roylei* with *A. pernyi* and *A. proylei* showed high vigour in all the yield contributing characters. The present study will be very helpful for future breeding programs in oak tasar culture.

KEY WORDS: *Antheraea roylei*, bionomics, characterization, genetic resource, conservation.

The oak tasar silk is produced in large scale by the countries like China, India and Japan. The commercially exploited oak tasar silkmOTHS are *Antheraea pernyi* of China, *Antheraea proylei* of India and *Antheraea yamamai* of Japan. Many species reared for production oak tasar silk are univoltine or bivoltine in nature. The wild silk moths play an important role in the conservation and utilization of biodiversity (Frankel, 1982; Peigler, 1993). The conservation links genetic diversity to utilization, protecting diverse gene pool, habitat or ecosystem for human socio-economic needs (Metzler & Zebold, 1995). The ecorace conservation is must for utilizing their valuable genes in enhancing productivity and to build variation in new population through hybridization (Kumaresan et al., 2004; Mirhoseini et al., 2004). The intercross between *A. pernyi* and *A. yamamai* was made but hybrids were sterile (Shimada & Kobayashi, 1992). The different interspecific crosses were also made in *Antheraea* but majority of them were sterile except *A. roylei* × *A. pernyi*, *A. mylitta* × *A. pernyi* and their reciprocals [Jolly et al., 1969; Jolly et al., 1973]. The Indian Sub-Himalayan belt extending from Jammu & Kashmir in the North West and Manipur in the North East is the natural abode of many oak fed *Antheraea* species which feeds on nature grown oak plants available in this region. Out of the thirty five species of *Antheraea* recorded so far, thirty one species have been belonging to Indo-Australian biographic region (Seitz, 1933; Crotch, 1956). A few workers have studied some aspects of wild silkmOTHS in general and *Antheraea* species in particular in North east India during last some decades (Jolly et al., 1976; Thangavelu, 1991; Singh &

Singh, 1998; Baruah et al., 2000; Singh et al., 2000; Singh & Maheswari, 2003). Many important genetic resources of sericigenous insects may become extinct due to large scale deforestation, threat from various pests and predators, soil & air pollution by chemical insecticides and adverse climatic condition. Hence, proper conservation and utilization of the wild silk moths are the need of the hour to boost the silk production thereby helping in the conservation and utilization of biodiversity. The Indian oak fed wild silk moth, *Antheraea roylei* is one of such wild silkmoth found in the oak forest of North-Eastern India, which can be exploited for production of oak tasar silk. The successful performance of rearing and grainage of this wild silkmoth in the laboratory and its characteristic features reveal its genetic potential and need for conservation as a good genetic resource. Therefore, the present study was undertaken to know the bionomics of *A. roylei* and its genetic potential in Manipur, North East India and the results are presented in this paper showing the potential of the silkmoth for future breeding programmes.

MATERIALS AND METHODS

The survey and collection of *Antheraea roylei* were conducted in Manipur and its adjoining states in North East India and the seed cocoons were collected and consigned for conducting grainage in the laboratory of Regional Tasar Research Station, Imphal. The characteristics of the cocoons were recorded and compared with other races maintained in the station. The behavior of moth emergence, coupling and oviposition were recorded. The moths were allowed to couple for 10-12 hours inside wire mesh cages (6' × 6' × 6.5') and after decoupling moths were kept individually for egg laying inside nylon net netted bags (15 × 20 cm) for 72 hr. The prepared disease free layings (dfl) were disinfected in 3% formalin for 10 minutes followed by washing in plain water prior to incubation. The dfls were incubated at 22±2°C and 70-80 % R.H. with slight modifications of the method in *A. pernyi* [Jiang et al., 1992]. Eggs were spread in a thin layer prior to hatching and exposed to light in the morning hour. A few twigs of *Lithocarpus dealbata* were placed on the hatched larvae. The worms crawl over the leaves within half an hour and then the twigs were directly shifted in outdoor on *L. dealbata* foliages. The rearing field was well cleaned and disinfected before 10-15 days of rearing. The nylon bags containing eggs may be directly shifted on branches when the hatching starts so that the worms can crawl over the leaves. The rearing was conducted on raised plantations of *L. dealbata* following RBD with four replications successively for six generations in outdoor condition under nylon net cover in two seasons i.e., April-May and July-August for three years in Imphal, India (785 m above MSL; 93.94°E longitude and 24.83°N latitude). While transferring of the worms, the branches with the worms are cut with the help of a secateur and shifted to another bush having quality foliages. Worms are not touched by hand as far as practicable. Transfer of worms is always carried out in the morning and evening hours only. Harvesting of the cocoons is done after 6-7 days of spinning. The newly hatched worms of the F₁ hybrids of the different crosses were reared cellularly and recorded the different rearing parameters. The grainage and rearing performance along with salient features of different life stages of the silk moth were recorded and analyzed. The conservation in the *ex-situ* condition of the moth was continued for six generations to acclimatize in the semi-domesticated condition and to explore the possibility of future programs. This species was crossed with *A. proylei* and *A. pernyi* and rearing performances were analyzed. The important yield contributing characters viz., fecundity,

hatching percentage, number of cocoons per dfl, effective rate of rearing (ERR %), average cocoon weight, single cocoon shell weight, cocoon shell ratio (SR %), single cocoon filament length were recorded.

RESULTS AND DISCUSSION

Regular field survey revealed that *Antheraea roylei* is distributed in the undisturbed oak growing forest of North-East India at the altitude of 780-2000 m AMSL. It was particularly more abundant in Senapati district (1500 m AMSL) of Manipur and West Kameng of Arunachal Pradesh while sparsely at other parts. The cocoons and larvae are found mostly on *Lithocarpus dealbata* and less on *Quercus serrata* and *Quercus griffithii* showing more preference on foliages of *L. dealbata*.

Voltinism: Voltinism is one of the important self regulating character in the life cycle of *Antheraea roylei*. *A. roylei* is purely bivoltine in nature and it undergoes diapause at the pupal stage after second crop. Normally first crop and second crop were reared during April-May and August-September seasons from the natural emergence. The natural emergence of moths starts from the third week of March during first crop and rearing is completed during April-May. During second crop, moth emergence starts from the second week of July and conducted grainage in the captive condition. The *A. roylei* moths do not undergo self coupling under captive condition in the early generations. However, it undergoes self coupling (60 %) in captive condition in the later generations. The second crop rearing is completed during August -September. The life cycle (egg to adult) of *A. roylei* under fluctuating environment varies from 70-80 days. The pupal diapause of this wild silk moth may be a physiological mechanism to withstand the cold climate of the winter.

Moth emergence and coupling: The emergence of moth occurs in the night from 18.00 to 22.00 hr. Self coupling of moths just after emergence is not allowed by keeping male and female moths separately in the cages for about 2-3 hr so as to allow the sperms and ova to mature. Coupling starts in the night time mostly from 19.00 hr and continued up to 23.00 hr. Coupling (45-60 %) takes place in the captive condition inside cages and the coupling of the remaining moths was induced mechanically. The optimum temperature and relative humidity for moth emergence and coupling are 22-24°C and 75-85 %. On reaching the female moth, the male moth starts courtship behavior with raised antennae, fluttering wings around the female followed by mating. Mating lasts for 10-12 hr but it continues up to 24 hr of the next day if not disturbed. Similar finding of mating on *A. pernyi* was reported by some workers (Kuang-Ming & Ta-Yuan, 1958). Copulation by one male moth is enough for complete fertility of the female moth. Male moths are utilized for second time mating when there is shortage. In the natural condition the male moth flies long distances in search of females and the female moth also flies particularly after mating to lay the eggs on the leaves and branches of the food plants. However, they usually do not fly at day time. The moths do not lay all eggs at one place only but in a scattered way. The coupled moths detach at the slight mechanical disturbance. The life span of the adult moths is 7-10 days.

Oviposition: After decoupling, the individual female moths are kept for egg laying in nylon net bags (15 × 20 cm) in dark condition at 22±2°C and 75±5 % R.H. Eggs are collected after 72 hr of oviposition but egg laying continues up to 4-

5 days. The average fecundity ranges from 185-230 eggs in both the cropping seasons.

Incubation and Hatching: After proper disinfection the eggs are incubated at $22 \pm 2^{\circ}\text{C}$ and 70-80 % R.H. Hatching takes place after 9-10 days of incubation. Profuse hatching does not occur initially and it continues up to late hours of the day. The average hatching varies from 60-75 %.

Larval Development: The larva spins the cocoon after about 35 days of active feeding through five larval instars but it is prolonged up to 40 days depending upon the climatic condition. The brushing and rearing of *A. roylei* need special care. The duration of development of first, second, third, and fourth instars took 6 days, 5 days, 7 days and 8 days respectively while the fifth instar took prolong time (12 days) where the temperature and relative humidity ranges from $23-31^{\circ}\text{C}$ and 64-78 % R.H.

Laboratory studies have shown that the optimum favourable temperature and relative humidity for larval development is 28°C and 80 % for first and second instars, 27°C and 75 % for third instar and 25°C and 70 % for fourth and fifth instars respectively. The optimum environmental conditions are more or less similar to that of *A. proylei* (Singh & Singh, 1998).

Feeding behavior: The larvae prefer tender leaves to mature and hard leaves irrespective of the instars. Just after hatching the larvae crawl in search of food and are in the habit of eating bits of egg shell when hatched. It is observed that the worms crawl up to the tip of the branches and start eating tender leaves. It is desirable to provide tender leaves to the chawki worms (1st-3rd instars) while semi-mature and mature leaves should be provided to the 4th and 5th instars respectively for healthy growth of the larvae. The larvae feed on the entire leaves including midrib. It stops feeding at the slight disturbance. A larva consumes about 75-80 g of leave during the entire larval development.

Pupation and Adult development: The mature larva completes the pupation inside the cocoon within 5-7 days. The pupa develops into adult moth after about 20-35 days. After second crop the pupa undergoes diapause for 5-6 months. However, a few stray emergence of moths is also observed during late autumn.

Cocoon yield and survivability: The data of the *ex-situ* rearing in three consecutive years (2 crops/year) reveal that the average cocoon yield varies from 30-35 cocoons/df. The survivability is recorded as 25-30 % during both the cropping season. The low cocoon yield is mainly attributed due to the variations in climatic condition and quality of leaves fed to the silkworms. The low survivability may be due to non-acclimatization of the silkmoth under captive condition.

Morphological characteristics

Egg: Egg shell is brown and oval in shape. The size of the egg varies from 2.8-3.0 mm in length and 2.2-2.4 mm in breadth. The weight of the egg ranges from 0.8-0.9 mg.

Larva: The newly hatched larva is dark green in colour. The size varies from 5-6 mm in length and 1.0-1.5 mm in breadth and it is 5-6 mg in weight. There is colour polymorphism in the late instar larvae. The larval colour varies from light green to dark green (Fig. 1 a & b). The weight of mature larvae varies from 12.40-

16.64 g in male and 15.86-25.75 g in female. There are 462 numbers of elongated tubercular setae are present in the mature larva arranged in irregular fashion. The mature larva forms cocoon on the tree itself by making a hammock. The peduncle supports the cocoon in hanging from the branch.

Cocoon: Cocoons are oval in shape, length and breadth varies from 4.4-5.4 cm and 3.2-4.3 cm respectively, white in colour, double layered of which the outer layer is unreelable and the inner layer is reelable (Fig. 2 a & b). The cocoon weight ranges from 4.0-5.9 g in male and 6.1-9.9 g in female. The shell weight ranges from 0.5-0.7 g in male and that of female ranged from 0.7-1.0 g. The shell ratio ranges from 12-13 % in male while in female it ranges from 10-11%. The length of the peduncle ranges from 3.2-5.4 cm and it has a ring at the terminal for hanging on the twigs. The raw silk content varies from 06-09 % and the filament length varies from 180-204 m. The denier ranges from 5.7-6.3 and the reelability varies from 16-25 %. The boil-off loss is 17-20 %.

Pupa: The pupa is light metallic in colour. The length of the pupa varies from 2.8-3.6 cm in male and 3.4-4.2 cm in female. The breadth varies from 1.5-1.9 cm in male and 1.7-2.8 cm in female. The pupal weight varies from 3.5-5.3 g in male and 7.0-9.3 g in female respectively.

Moth: There are variations in the colour of both male and female moths. Males are greenish gray while the females are reddish brown in colour (Fig. 3 a & b). The body length of the moth varies from 2.9-3.6 cm. The wing span varies from 11.5-13.4 cm in male and 11.8-14.5 cm in female. The eye spot in both forewings and hind wings of both the sexes is very distinct and is round to oval with a large transparent round to elliptical fenestra. The eye spot of the hind wing is smaller than that of the forewing. The ground colour of the moth is grayish brown. The colour of ante median line, oblique line and post-median line are reddish, black with yellow and reddish white respectively.

Genetic potential: *A. roylei* can be utilized in interspecific hybridization for heterosis breeding and creation of genetic variability in oak tasar silkworms. The interspecific hybrids and reciprocal crosses of *A. roylei* (n=31) with *A. pernyi* (n=49) and *A. proylei* (n=49) showed high hetero-beltiosis (improvement of the F₁ hybrid over better parent in percentage) in the yield contributing characters in spite of wide differences in chromosome numbers (Table 1). The rearing performance of the F₁ hybrids of *A. roylei* with *A. pernyi* and *A. proylei* revealed that the fecundity, cocoon shell weight and cocoon shell ratio (%) were highest in *A. pernyi* × *A. proylei* whereas the hatching (%) and cocoon weight were recorded highest in *A. roylei* × *A. proylei*. However, cocoon per dfl and ERR (%) was found maximum in *A. roylei* × *A. pernyi*. The resulting fertile and vigorous F₁ offspring may be due to the high degree of homology between the chromosomal complements of these three species (Singh et al., 1984; Nagaraju & Jolly, 1986). The studies carried out in the silkworm have shown that the characters could be pooled to suit the breeder's choice since selection for one trait has a correlation with genetic changes for other traits (Gamo, 1976; Tazima, 1984).

Biodiversity conservation is increasingly recognized as a fundamental component of sustainable development of natural resources by protecting and using biological resources in the ways that do not diminish the world's variety of genes and species or destroy important habitat or ecosystem. *Antheraea roylei* constitutes a significant component of wild silk moth genetic diversity that cannot be ignored in the assessment of quantitative and qualitative characters, conservation and utilization of silk moth biodiversity. The present study reveals that *A. roylei* can be utilized in heterosis breeding and for enhancing genetic variability in oak tasar culture.

LITERATURE CITED

- Baruah, B., Duarah, D. & Chakraborty, D.** 2000. Performance of wild silkmoths. *International Journal of Wild Silkmoths & Silk*, 5: 376-378.
- Crotch, W. J. B.** 1956. A silkmoth rearers handbook. *Amat. Entomol. Soc.*, 12: 165 pp.
- Frankel, O. H.** 1982. Can genetic diversity survive? *Advances in Cytogenetics and Plant improvement*. Kalyani publication, New Delhi.
- Gamo, T.** 1976. Recent concepts and trends in Silkworm breeding. *Farming Japan*, 10: 11-12.
- Jiang, Z., Changle, C., Yongquing, C., Yuqing, Z. & Yujin, D.** 1992. Identification and purification of vitellin from the Chinese oak silkworm, *Antheraea pernyi* and its changes during oogenesis and embryogenesis. *Wild Silkmoth*, pp: 125-133.
- Jolly, M. S., Narasimhana, M. N., Sinha, S. S. & Sen, S. K.** 1969. Interspecific hybridization in *Antheraea*. *Indian Journal of Heredity*, 1: 45-48.
- Jolly, M. S., Sinha, B. R. R. Pd. & Sinha, S. S.** 1973. Interspecific hybridization in *Antheraea* with special reference to *Antheraea roylei* and *Antheraea pernyi*. Document, 12th International Silk Congress, Barcelona, p. 6.
- Jolly, M. S., Sonwalkar, T., Sen, S. K. & Prasad, G. K.** 1976. Non-mulberry silks. *Sericultural Manual*, FAO, United Nations, Rome.
- Kuang-Ming, C. C. & Ta-Yuan, C.** 1958. The tasar silkworm. *Journal of Silkworm*, XI: 111-125.
- Kumaresan, P., Sinha, R. K., Mohan, B. & Thangavelu, K.** 2004. Conservation of multivoltine silkworm (*Bombyx mori* L.) Germplasm in India – an overview. *International Journal of Industrial Entomology*, 9 (1): 1-13.
- Metzler, E. H. & Zebold, R. A.** 1995. Twenty eight species of moths new to Ohio from Huffman prairie, Green County (Lepidoptera). *Ohio Journal of Sci.*, 95: 240-242.
- Mirhoseini, S. Z., Seydavi, A. R., Ghanipoor, M. & Etebari, K.** 2004. General and special combining ability estimation and heterosis in new varieties of silkworm *Bombyx mori*. *Journal of Biological Sci.*, 4: 725-730.
- Nagaraju, J. & Jolly, M. S.** 1986. Interspecific hybrids of *Antheraea roylei* and *A. pernyi*- a cytogenetic reassessment. *Theor. Appl. Genet.*, 72: 269-273.
- Peigler, R. S.** 1993. Wild silkmoths of the World. *American Entomologist*, 39: 51-160.
- Seitz, Z. A.** 1933. The Macrolepidoptera of the world. Palearctic fauna. Stuttgart Alfred Kernen. 10: 509-516.
- Shimada, T. & Kobayashi, M.** 1992. Fertility of F₁ hybrids between *Antheraea yamamai* (Guerin-Meneville) and *Antheraea pernyi* (Guerin-Meneville). *Wild Silkmoth*, pp: 186-195.
- Singh, K. C. & Singh, N. I.** 1998. Biology and ecology of temperate tasar silkmoths, *Antheraea proylei* Jolly and *Antheraea pernyi* Guerin-Meneville (Saturniidae) – A review. *Indian Journal of Sericulture*, 37 (2): 89-100.
- Singh, N. I., Singh, Y. R. & Noamani, M. K. R.** 1994. Chromosome pairing in the cross between *Antheraea roylei* M and *Antheraea proylei* J. *Chromosome. Proc. Conf. Cytol. Genet.*, 10: 157-159.
- Singh, N. I., Singh, N. I., Keisa, T. J., Singh, Y. R. & Singh, K. C.** 2000. Conservation and utilization of Indian oak fed *Antheraea* fauna. *International Journal of Wild Silkmoths & Silk*, 5: 330-331.
- Singh, R. N. & Maheswari, M.** 2003. Conservation and utilization of sericigenous insects in North East Region of India. *Sericologia*, 43: 1-15.
- Tazima, Y.** 1984. Silkworm moths; In *Evolution of domesticated Animals*. Mason, I.L. (eds), Longman, London and New York, pp: 416-424.
- Thangavelu, K.** 1991. Recent studies in tasar and other wild silkmoths. *Wild Silkmoth*, pp: 20-29.

Table 1. Average rearing performance of *Antheraea roylei* with other oak tasar silkworm species and their hybrids.

Name of the spp. / breeds	Fecundity (no.)	H %	Cocoon Per dfl (no.)	ERR (%)	Cocoon Weight (g)	Shell Weight (g)	SR %	Filament Length (m)
<i>A. roylei</i>	198	61.4	30	20.36	7.94	0.85	10.71	250
<i>A. pernyi</i>	133	69.92	45	48.38	5.94	0.61	10.27	626
<i>A. proylei</i>	121	70.24	42	49.41	5.91	0.69	11.67	628
<i>A. roylei</i> × <i>A. pernyi</i>	174 (30.83)	81.03 (15.89)	91 (102.22)	64.53 (33.38)	7.94 (33.67)	0.84 (37.70)	10.57 (2.92)	810 (29.39)
<i>A. pernyi</i> × <i>A. roylei</i>	142 (6.76)	74.65 (6.76)	79 (43.04)	74.53 (54.05)	7.84 (31.98)	0.99 (62.29)	12.92 (25.80)	925 (47.76)
<i>A. roylei</i> × <i>A. proylei</i>	187 (54.54)	75.94 (8.12)	74 (76.19)	52.12 (5.48)	8.80 (48.90)	1.08 (65.00)	12.27 (51.41)	990 (57.64)
<i>A. proylei</i> × <i>A. roylei</i>	132 (9.09)	66.66 (-5.09)	64 (52.38)	72.72 (47.17)	8.61 (45.68)	0.91 (31.88)	10.69 (-8.40)	905 (44.10)

*Figure within parentheses indicates hetero-beltiosis in percentage of the F1 hybrid



(a)

(b)

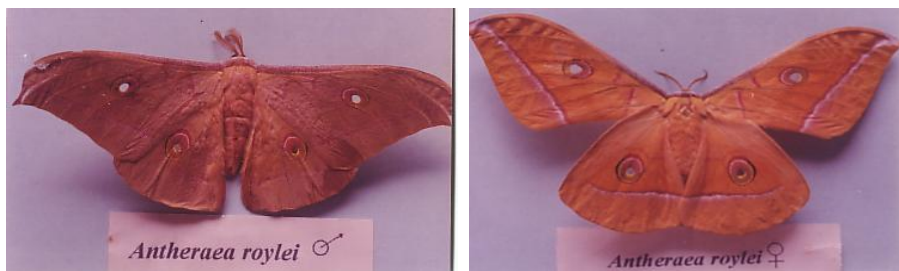
Figure 1 (a & b). Colour variations of *Antheraea roylei* larvae feeding on *Lithocarpus dealbata*.



(a)

(b)

Figure 2. *Antheraea roylei* cocoon (a) garlands for grainage, (b) male & female cocoon.



(a)

(b)

Figure 3 (a & b). Moths of *Antheraea roylei* (Male and Female).

DEVELOPMENT OF A POLYVOLTINE BREED OF THE MULBERRY SILKWORM, *BOMBYX MORI* L. BY MEANS OF DISPERMIC ANDROGENESIS

Ravindra Singh*, R. Nirupama** and Yumnam Debaraj*

*Regional Sericultural Research Station, Jorhat - 785 005, INDIA. E-mail: ravin_sin@yahoo.com

**Central Sericultural Research and Training Institute, Mysore - 570 008, INDIA.

[Singh, R., Nirupama, R. & Debaraj, Y. 2011. Development of a polyvoltine breed of the Mulberry Silkworm, *Bombyx Mori* L. by means of dispermic androgenesis. Munis Entomology & Zoology, 6 (2): 995-1002]

ABSTRACT: A polyvoltine silkworm breed "AGL₃" was evolved by using dispermic androgenesis. The breed was developed by crossing F₂ males derived from a polyvoltine hybrid BL₆₈ × BL₆₉ with another polyvoltine race "Nistari" and exposing the eggs at 38 °C for 200 minutes. Androgenetic larvae expressed paternal characters. Repeated backcrosses were adopted with androgenetic males for several generations. The line was evaluated utilizing five productive bivoltine silkworm breeds. Laboratory evaluation showed superiority of the hybrid AGL₃ × CSR₂ in terms of higher fecundity, pupation rate, yield/10,000 larvae by weight, cocoon shell weight, cocoon shell percentage, filament length and neatness. The hybrid exhibited maximum average evaluation index value and manifested high hybrid vigour for several characters. The possibility of application of androgenesis as a breeding tool in silkworm breeding for the evolution of superior silkworm breeds and hybrids has been discussed.

KEY WORDS: Androgenesis, *Bombyx mori* L., Development, Polyvoltine breed.

Induction of androgenetic development in the silkworm, *Bombyx mori* L. has been carried out by means of several agents such as ultraviolet light (Strunnikov, 1983), gamma rays (Xu et al., 1988; 1997), CO₂ and dry ice (Tazima & Onuma, 1967; Li et al., 1988), low temperature (Sugai et al., 1987) and high temperature (Ravindra Singh et al., 1991). Ravindra Singh et al. (2009a) have devised an improved method of androgenetic development in the eggs of the silkworm. Attempts have been made to explore the possibility of developing silkworm breeds through application of androgenesis (Strunnikov et al., 1982; Malinova et al., 1996, Xu et al., 1997; Nacheva et al., 1999). Recently, Ravindra Singh et al. (2009b; 2010) have developed some polyvoltine breeds of the mulberry silkworm, *Bombyx mori* L. utilizing androgenesis as a breeding tool. Hybrid vigour has been reported to a greater extent due to the homozygous nature of the breed involved (Strunnikov, 1986; Nacheva et al., 1999). In the present study, an attempt was made to explore the possibility of application of androgenesis in the evolution of superior silkworm breed to raise hybrids of high viability, vigour, cocoon yield and better silk quality.

MATERIALS AND METHODS

Androgenetic development in the eggs of the silkworm was induced as per Strunnikov (1983). Nistari, an indigenous polyvoltine race of West Bengal which gives marked larvae and golden yellow spindle shaped cocoons and two evolved polyvoltine silkworm breeds BL₆₈ and BL₆₉ which give plain larvae and greenish yellow cocoons, were utilized in this study. F₂ males obtained from the polyvoltine hybrid BL₆₈ × BL₆₉ were crossed with Nistari females. Moths were allowed to mate

for 3 h at 25 °C and after depairing, females were kept at 5 °C for 48 h to synchronize the age of the egg. Oviposition was carried out in dark condition for 50 – 60 minutes. Then the eggs were exposed to hot air at 38 °C for 200 minutes and transferred to 15 °C for 72 h. Eggs were incubated at 25 °C and 75 % relative humidity till hatching. Androgenetic development of eggs was identified with the appearance of reddish-brown dark pigmentation in the serosa cells. The polyvoltine silkworm line “AGL₃” was developed by a series of backcrosses with androgenetic males. The breeding plan of AGL₃ has been depicted in Fig. 1. The breed was evaluated utilizing five productive bivoltine silkworm breeds *viz.*, CSR₂, CSR₃, CSR₄, CSR₁₂ and NB₄D₂. The promising polyvoltine × bivoltine hybrid AGL₃ × CSR₂ was evaluated along with the control PM × CSR₂ in the laboratory as well as in Technology Validation and Demonstration Centre (TVDC) of CSRTI, Mysore. Evaluation of the developed hybrids has been carried out through multiple traits evaluation index method of Mano *et al.* (1993). Evaluation Index (E. I.) for different characters was calculated using the following formula

$$E. I. = A - B / C \times 10 + 50$$

Where,

A = value obtained for a particular hybrid combination.

B = mean value of particular trait of all the hybrid combinations.

C = standard deviation of particular trait of all the hybrid combinations.

10 = standard unit.

50 = fixed value.

Heterosis over mid parent (MPH) and better parent (BPH) was calculated by using the following formulae

$$MPH = 100 \times (F_1 - MPV) / MPV$$

$$BPH = 100 \times (F_1 - BPV) / BPV$$

Where, MPV = mid parent value

BPV = better parent value

RESULTS AND DISCUSSION

Performance of AGL₃ during breeding process: Generation-wise performance of AGL₃ for thirteen characters namely, fecundity, hatching, total larval span, pupation rate, yield / 10,000 larvae by weight, cocoon weight, cocoon shell weight, cocoon shell percentage, filament length, filament size, reelability, raw silk percentage and neatness has been presented in Table I. Fecundity ranged from 474 (F₉) to F₂ (521). Maximum pupation rate was observed at F₄ (95.20 %). Cocoon yield / 10,000 larvae by weight ranged from 1.511 (F₈) to 12.634 kg (F₂). Higher cocoon weight was observed at F₄ (1.438 g) whereas it was minimum at F₈ (1.142 g). Cocoon shell weight ranged from 0.193 (F₈) to 0.262 g (F₄). Cocoon shell percentage (18.46 %) was recorded maximum at F₁. Filament length ranged from 525 (F₈) to 785 m (F₄). Maximum reelability was observed at F₂ (83.0 %). Raw silk percentage ranged from 11.6 (F₂) to 13.9 % (F₉). Maximum neatness of 90 p was observed from F₈ onwards. To know stability of the breeding line, data pertaining to different economic characters at later generations from F₁₀ – F₁₂

were statistically analysed and CV % was calculated. The line was stabilized as the CV % ranged below the level of 10 % for all the characters.

Performance of polyvoltine breed “AGL₃” with bivoltine breeds in the laboratory: The performance of AGL₃ × bivoltine hybrids along with evaluation index values is given in Table II. Two hybrids *viz.*, AGL₃ × CSR₄ and AGL₃ × CSR₁₂ have recorded a fecundity of 505 and 513, respectively. The survival rate was observed maximum in PM × CSR₂ (97.60%) followed by AGL₃ × CSR₃ and AGL₃ × CSR₁₂ (97.47 %). The cocoon yield/ 10,000 larvae by weight was recorded maximum (18.322 kg) in AGL₃ × CSR₂ followed by PM × CSR₂ (16.917 kg). Maximum cocoon weight (1.928 g), cocoon shell weight (0.412 g), cocoon shell percentage (21.38 %) filament length (870 m), reelability percentage (82 %), raw silk percentage (16.2 %) and neatness (91 p) were recorded in AGL₃ × CSR₂.

The hybrid AGL₃ × CSR₂ exhibited higher evaluation index values of above 50 for nine characters namely, hatching (75.00), cocoon yield / 10,000 larvae by weight (68.48), cocoon weight (60.50), cocoon shell weight (69.33), cocoon shell percentage (61.27), filament length (69.13), reelability (61.62), raw silk percentage (64.57) and neatness (66.90). The hybrid ranked first on the basis of highest average evaluation index value of 63.85 followed by AGL₃ × CSR₃ (52.90) which recorded higher index value for ten characters.

Manifestation of hybrid vigour over mid and better parent values was estimated in six polyvoltine × bivoltine hybrids along with the control PM × CSR₂ (Table III). Positive and significant heterosis over mid parent value for survival was observed in all the six hybrids except AGL₃ × CSR₄. All the six hybrids have manifested positive and significant hybrid vigour over mid parent values for six characters namely, yield/10,000 larvae by weight, cocoon weight, cocoon shell weight cocoon shell percentage, filament length and raw silk percentage. AGL₃ × CSR₂ exhibited maximum hybrid vigour over better parent value for four characters *viz.*, yield/10,000 larvae by weight (26.53), cocoon weight (16.19), cocoon shell weight (15.72) and filament length (7.94).

The hybrid AGL₃ × CSR₂ was evaluated on large scale in TVDC of CSRTI, Mysore along with the control PM × CSR₂. The average performance of 3 trials is given in Table IV. The new hybrid recorded maximum per cent gain over for cocoon rate/kg (20.81 %) followed by filament length (16.70 %) and cocoon shell weight (14.46 %). The hybrid was also evaluated with few farmers in a limited scale. The performance of the hybrid along with the control PM × CSR₂ is given in Table V. The new hybrid recorded maximum per cent gain over for cocoon rate/kg (25.68) followed by cocoon shell weight (15.53) and cocoon yield/ 100 dfls (10.34).

Androgenesis has been used for the development of homozygous silkworm breeds (Strunnikov et al., 1982; Malinova et al., 1996). Recently, Ravindra Singh et al. (2009b) have developed some bisexual polyvoltine silkworm breeds through application of androgenesis. Self bred silkworm lines have been isolated through irradiation of female pupae with 80 KR gamma rays, crossing the female moths with normal males and exposing the eggs at 38 °C for 200 minutes (Xu et al., 1997). Nacheva et al. (1999) have developed bisexual silkworm lines by crossing F₂ hybrid males to Ps race used as marker and exposing the eggs at 42 °C for 200 minutes.

In the present study, an attempt has been made to develop promising polyvoltine silkworm breed with better silk quality. The hybrid AGL₃ × CSR₂ is characterized by high survival (>95 %), high cocoon weight (1.9 g), high cocoon shell weight (>0.35 g), high cocoon shell percentage (>20.0 %), longer filament

length (> 800 m) and high neatness (90 p). Dandin et al. (2007) have isolated one promising polyvoltine breed "ND₇" with better silk quality without sacrificing other quantitative characters.

Manifestation of hybrid vigour was observed relatively high for some characters viz., yield/10,000 larvae by weight (46.63), cocoon weight (37.67) and cocoon shell weight (50.12) in AGL₃ × CSR₂. Efforts have been made on manifestation of hybrid vigour in hybrids involving polyvoltine and bivoltine silkworm breeds (Ravindra Singh et al., 1998; 2001; Datta et al., 2001; Gangopadhyay & Ravindra Singh, 2006, Dandin et al., 2007).

Laboratory evaluation of AGL₃ × CSR₂ has demonstrated the superiority of the new hybrid over the control PM × CSR₂. The cocoons fetch more price which is more than 20 rupees as compared to the control. Presently, the hybrid is being tested on farm trials through the nested units of CSRTI, Mysore. Large scale trials at TVDC have recorded an average cocoon yield of 71.945 kg/100 dfls as against 68.643 kg in the control. The hybrid recorded cocoon yield of 70.139 kg/100dfls as against 63.561 kg in the control when evaluated with few farmers in a limited scale (Table VI). The striking features of the new hybrid are that it produces cocoons with high cocoon shell weight, cocoon shell percentage, filament length and neatness.

The findings of this study can be useful to the silkworm breeders to assess the practical significance of androgenesis in the development of outstanding homozygous genotypes with uniform populations, high viability and hybrid vigour. Androgenesis can be successfully utilized in the transmission of homozygosity into existing pure lines to develop promising silkworm breeds. Recently, level of homozygosity using random amplified polymorphic DNA (RAPD) has been assessed in some silkworm breeds developed through application of androgenesis and parthenogenesis (Ravindra Singh et al., 2009 c). The main advantages of utilization of androgenesis in silkworm are that it provides an opportunity to shorten the breeding cycle and to develop bisexual homozygous silkworm lines which are of utmost importance in silkworm breeding in order to obtain high hybrid vigour.

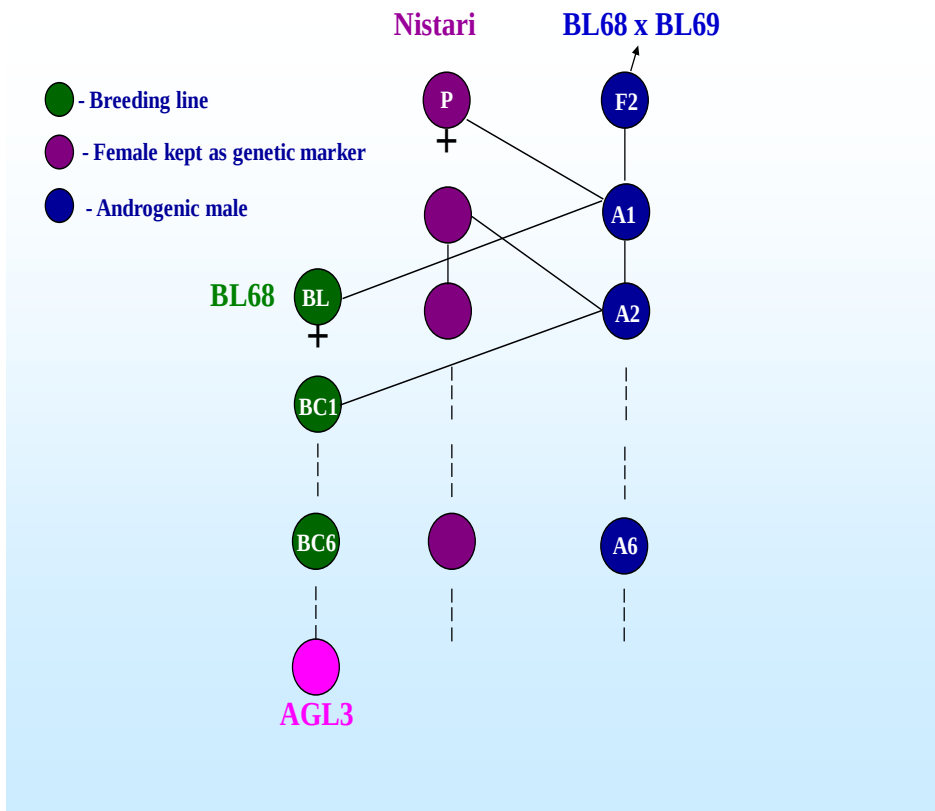
ACKNOWLEDGEMENTS

The authors wish to thank the Department of Science and Technology, New Delhi for financial assistance.

LITERATURE CITED

- Dandin, S. B., Singh R., Rao, D. R., Basavaraja, H. K. & Kariappa, B. K. 2007. Studies on the isolation of a promising polyvoltine breed ND7 and its F1 hybrid performance with productive bivoltine races. Indian J. Seric., 46: 52 -58.
- Datta, R. K., Rao, D. R., Jayaswal, K. P., Premalatha, V. & Singh, R. 2001. Heterosis in relation to combining ability in multivoltine x bivoltine strains of silkworm, *Bombyx mori* L. Indian J. Seric., 40: 1 - 6.
- Gangopadhyay, D. & Singh, R. 2006. Line x tester analysis in hybrids between polyvoltine and bivoltine breeds of the silkworm, *Bombyx mori* L. Indian J. Seric., 45: 116 -122.
- Li, W. Q., Abe, S. & Sakaguchi, B. 1988. Induction of androgenesis, gynogenesis and mosaic by treatment with CO₂ gas derived from dry ice. J. Seric. Sci. Japan, 57: 43 - 48.
- Malinova, K., Nacheva, J. & Petkov, N. 1996. Application of androgenesis in silkworm (*Bombyx mori*) breeding. Selskostopanska-Nouka (Bulgaria) Agric. Sci., 34: 34 - 36.

- Mano, Y., Nirmalkumar, S., Basavaraja, H. K., MalReddy, N. & Datta, R. K.** 1993. A new method to select promising silkworm breeds/ combination. *Indian Silk*, 31: 53.
- Nacheva, Y., Petkov, N., Tzenov, P., Malinova, K. & Gen, S. C.** 1999. Breeding of bisexual lines of the silkworm, *Bombyx mori* L. with androgenetic origin. *Bull. Indian Acad. Seric.*, 3: 36 - 41.
- Ravindra Singh, Vijayaraghavan, K., Rao, P. R. M., Sengupta, K. & Premalatha, V.** 1991. Androgenic development in the eggs of the mulberry silkworm, *Bombyx mori* L. *Indian J. Seric.*, 30: 93 - 96.
- Ravindra Singh, Rao, P. S., Kalpana, G. V., Basavaraja, H. K., Ahsan, M. M. & Datta, R. K.** 1998. Studies on hybrid vigour in different crosses of the silkworm, *Bombyx mori*. *Sericologia*, 38: 155 - 158.
- Ravindra Singh, Goel, R., Rao, D. R., Rekha, M., Premalatha, V., Ahsan, M. M. & Datta, R. K.** 2001. Evaluation of multivoltine $\times$ bivoltine F_1 hybrids of the mulberry silkworm, *Bombyx mori* L. in two different seasons. *Sericologia*, 41: 231 - 238.
- Ravindra Singh, Nirupama, R., Gangopadhyay, D. & Kamble C. K.** 2009a. An improved method of androgenetic development in the silkworm, *Bombyx mori* L. *Sericologia*, 49: 255 - 258.
- Ravindra Singh, Nirupama, R., Gangopadhyay, D. & Kamble C. K.** 2009b. Development of polyvoltine breeds of the mulberry silkworm, *Bombyx mori* L. with androgenic origin. *Sericologia*, 49: 21 - 28.
- Ravindra Singh, Sreekumar, S., Gangopadhyay, D., Nirupama, R. & Ashwath, S. K.** 2009c. Assessment of homozygosity using RAPD markers in silkworm breeds developed through application of androgenesis and parthenogenesis. *Sericologia*, 49: 261 - 266.
- Ravindra Singh, Nirupama, R., Gangopadhyay, D. & Qadri, S. M. H.** 2010 Androgenesis – A new approach in Silkworm Breeding. *Indian Silk*, 1: 10 - 11.
- Strunnikov, V. A.** 1983. Control of silkworm reproduction, development and sex. Pp. 1 -280, Mir Publishers, Moscow.
- Strunnikov, V. A.** 1986. Nature of heterosis and combining ability in the silkworm. *Theor. Appl. Genet.*, 75: 503 - 512.
- Strunnikov, V. A., Lezhenko, S. S. & Stepanova, N. L.** 1982. Genetically identical copies of the mulberry silkworm. *Theor. Appl. Genet.*, 63: 307 - 315.
- Sugai, E., Yokoyama, T. & Mino, T.** 1987. Death of haploid androgenetic eggs in the silkworm, *Bombyx mori*. *J. Seric Sci. Japan*, 56: 385 - 389.
- Tazima, Y. & Onuma, A.** 1967. Experimental induction of androgenesis, gynogenesis and polyploidy in *Bombyx mori* by treatment with CO_2 gas. *J. Seric Sci. Japan*, 36: 286 - 292.
- Xu, A., Fang, A. & Hun, J. T.** 1988. Studies on chromosome engineering and its application in *Bombyx mori*. III. Induction of androgenetic silkworm. *Acta Sericologica Sinica*, 14: 93 - 96.
- Xu, A., Li, M. W., Fang, A., Fei, M. H. & Huang, J. T.** 1997. Isolation of a self bred line of *Bombyx mori* L. by means of dispermic androgenesis. *Sericologia*, 37: 199 - 204.

Figure 1. Breeding plan for AGL₃.Table 1. Performance of selected polyvoltine line AGL₃ during the process of breeding.

Generation	Fecundity (no.)	Hatching (%)	Total larval span (h)	Pupation rate (%)	Yield/10000 larvae by wt. (kg)	Cocoon wt. (g)	Cocoon shell wt. (g)	Cocoon shell (%)	Filament length (m)	Filament size (d)	Reel ability (%)	Raw silk (%)	Neatness (p)
F ₁	505	92.91	486	92.74	10.884	1.160	0.208	18.46	551	2.66	82	13.8	89
F ₂	521	94.60	504	92.33	12.634	1.372	0.214	15.62	625	2.70	83	11.6	89
F ₃	502	92.17	504	94.50	12.268	1.306	0.218	16.69	645	2.40	77	12.4	89
F ₄	481	94.54	504	95.20	13.687	1.438	0.262	18.19	785	2.41	79	13.2	89
F ₅	490	91.65	504	92.39	11.545	1.257	0.223	17.76	575	2.30	77	12.5	89
F ₆	491	98.13	504	94.99	13.533	1.424	0.246	17.27	593	2.38	74	12.0	89
F ₇	483	97.17	504	94.33	13.027	1.394	0.242	17.36	543	2.46	72	12.6	89
F ₈	495	94.85	504	91.18	10.511	1.142	0.193	16.91	526	2.31	82	12.8	90
F ₉	474	97.14	506	91.55	12.411	1.381	0.243	17.62	625	2.77	72	13.9	90
F ₁₀	511	94.98	504	90.66	11.000	1.196	0.213	17.81	609	2.49	75	12.7	90
F ₁₁	500	96.00	468	93.33	11.666	1.302	0.221	16.97	630	2.50	78	13.0	90
F ₁₂	506	95.48	480	92.33	11.466	1.213	0.216	17.82	629	2.43	79	12.7	90
Mean	497	94.93	498	92.92	12.056	1.299	0.225	17.37	611	2.49	77	12.8	89
SD	13.59	2.01	12.50	1.57	1.04	0.10	0.02	0.76	67.00	0.15	3.68	0.68	0.55
CV %	2.74	2.12	2.51	1.69	8.59	8.04	8.60	4.40	10.96	6.10	4.75	5.14	0.62
(F10-F12)													
Mean	506	95.49	484	92.11	11.377	1.237	0.217	17.53	623	2.47	77	12.8	90
SD	5.51	0.51	18.33	1.35	0.34	0.06	0.00	0.49	11.85	0.04	2.08	0.17	0.00
CV %	1.09	0.53	3.79	1.46	3.00	4.60	1.87	2.78	1.90	1.53	2.69	1.35	0.00

Table 2. Performance of polyvoltine $\times$ bivoltine hybrids along with evaluation index values.

Hybrids	Fecundity (no)	Hatchling (%)	Pupation rate (%)	Yield/10,000 wt. (kg)	Cocoon wt (g)	Cocoon shell wt (g)	Cocoon shell (%)	Filament length (m)	Reel- ability (%)	Raw silk (%)	Neat- ness (p)
AGL ₃ $\times$ CSR ₂	493 (53.32)	96.21 (75.00)	96.60 (52.26)	18.322 (68.48)	1.928 (60.50)	0.412 (96.33)	21.38 (61.27)	870 (69.13)	82 (61.62)	16.2 (64.57)	91 (66.90)
AGL ₃ $\times$ CSR ₃	490 (52.41)	95.44 (53.61)	97.47 (57.44)	16.862 (51.11)	1.764 (50.25)	0.364 (53.33)	20.62 (55.93)	766 (47.73)	79 (51.66)	15.4 (56.06)	88 (52.41)
AGL ₃ $\times$ CSR ₄	505 (56.95)	95.58 (57.50)	94.33 (38.75)	16.605 (48.41)	1.751 (49.43)	0.356 (50.66)	20.34 (52.67)	739 (42.18)	74 (35.04)	15.1 (52.87)	86 (42.75)
AGL ₃ $\times$ CSR ₁₂	513 (59.37)	94.62 (30.83)	97.47 (57.44)	16.472 (47.01)	1.703 (46.43)	0.340 (45.33)	19.99 (48.60)	737 (41.76)	76 (41.69)	14.7 (48.61)	85 (37.92)
AGL ₃ $\times$ NB ₄ D ₂	468 (45.75)	95.50 (55.27)	93.87 (36.01)	15.363 (35.33)	1.655 (43.43)	0.319 (38.33)	19.28 (40.34)	772 (48.97)	79 (51.66)	13.9 (45.57)	88 (52.41)
PM $\times$ CSR ₂	422 (31.85)	94.53 (28.33)	97.60 (58.21)	16.917 (51.69)	1.762 (50.12)	0.336 (44.00)	19.05 (37.67)	778 (50.20)	81 (58.30)	13.7 (37.97)	87 (47.58)
Mean	482	95.31	96.22	16.756	1.760	0.354	20.11	777	78.5	14.83	87.5
SD	33.07	0.36	1.68	0.95	0.16	0.03	0.86	48.66	3.01	0.94	2.00

Values in parentheses indicate evaluation index values

Table 3. Heterosis over mid and better parent values.

Hybrids	Fecundity	Hatchling g	Total Larval span	Pupatio n Rate	Yield/10,000 wt.	Cocoon wt	Cocoon shell wt	Cocoon shell (%)	Filamen t length	Filamen t size	Reel- ability	Raw silk	Neat- ness
Heterosis over mid parent values													
AGL ₃ $\times$ CSR ₂	-7.56	1.02	0.00	3.22*	46.63**	37.67**	50.12**	11.43**	30.68**	8.42	-0.20	9.60**	-0.18
AGL ₃ $\times$ CSR ₃	-0.57	0.44	-1.73	4.51**	28.56**	27.24**	36.29**	9.14**	21.56**	17.42	-2.46	6.08**	-2.21
AGL ₃ $\times$ CSR ₄	7.41**	0.51	-4.55*	2.25	29.98**	25.62**	33.50**	8.20**	9.65*	14.34	-10.34	5.48**	-4.78
AGL ₃ $\times$ CSR ₁₂	6.65**	-0.40	-3.41	4.89**	31.05**	29.10**	33.99**	5.43**	11.59**	1.49	-6.17	4.00**	-5.20
AGL ₃ $\times$ NB ₄ D ₂	-0.92	1.01	-3.41	3.54*	25.63**	22.93**	29.41**	6.35**	18.49**	2.44	-1.24	1.46**	-1.68
PM $\times$ CSR ₂	-17.75	0.02	-4.35*	6.60**	44.92**	31.56**	32.41**	5.10**	31.38**	23.59	8.52**	0.61	-1.69
Heterosis over better parent values													
AGL ₃ $\times$ CSR ₂	-13.76	0.62	0.00	0.62	26.53**	16.19**	15.72**	-0.42	7.94*	0.87	-1.20	-3.39	-1.45
AGL ₃ $\times$ CSR ₃	-0.94	0.26	-4.49*	2.24	7.26**	8.13**	6.75**	-1.25	4.26	7.72	-2.86	-5.33	-2.93
AGL ₃ $\times$ CSR ₄	2.02	0.25	-8.70**	1.07	10.41**	6.38**	4.60**	-1.68	-10.10	4.55	-10.89	-4.64	-5.82
AGL ₃ $\times$ CSR ₁₂	3.70**	-0.55	-7.61**	2.96	12.61**	13.81**	8.04**	-5.05	-7.30	-0.42**	-6.94	-5.35	-5.20
AGL ₃ $\times$ NB ₄ D ₂	-5.45	0.69	-7.61**	2.95	10.15**	6.73**	6.33**	-0.38	-0.73	-3.69**	-2.86	-4.81	-1.86
PM $\times$ CSR ₂	-26.12	-1.13	-12.00**	1.67	16.83**	6.37**	-5.80	-11.26	-3.51	7.84	-3.20	-17.93	-5.43

*and ** denote significantly different at 5 and 1% level, respectively

Table 4. Evaluation of promising polyvoltine $\times$ bivoltine hybrids in Technology Validation and Demonstration Centre of CSR&TI, Mysore (Average of 3 trials).

Hybrids	Yield/100 dfls (kg)	Cocoon wt (g)	Cocoon shell wt (g)	Cocoon shell (%)	Filament Length (m)	Raw silk (%)	Neatness (p)	Cocoon rate / kg (Rs.)
AGL ₃ $\times$ CSR ₂	71.945 (4.81)	1.806 (5.92)	0.364 (14.46)	20.15 (8.04)	922 (16.70)	13.82 (9.07)	91.3 (2.23)	137=76
PM $\times$ CSR ₂ (Control)	68.643	1.705	0.318	18.65	790	12.67	89.3	114=03

Values in parentheses indicate per cent improvement over control.

Table 5. Field trial of promising polyvoltine $\times$ bivoltine hybrids of the silkworm, *Bombyx mori* L.

Hybrids	No. of Dfls.	No. of farmers	Yield/100 dfls (kg)	Cocoon wt (g)	Cocoon shell wt (g)	Cocoon shell (%)	Cocoon rate / kg (Rs.)
AGL ₃ $\times$ CSR ₂	300	3	70.139 (10.34)	1.829 (7.27)	0.357 (15.53)	19.52 (7.72)	137=00 (25.68)
PM $\times$ CSR ₂ (Control)	300	3	63.561	1.705	0.309	18.12	109=00

Values in parentheses indicate per cent improvement over control.

LABORATORY EVALUATION OF WEST AFRICAN BLACK PEPPER (*PIPER GUINEENSE*) SEED POWDER AGAINST MAIZE WEEVIL (*SITOPHILUS ZEAMAI* MOTS.)

I. O. Udo*, M. S. Ekanem** and E. U. Inyang*

* Department of Crop Science, Faculty of Agriculture, University of Uyo, PMB 1017, Uyo, NIGERIA. E-mail: imeudo@yahoo.com

** Department of Zoology, Faculty of Science, University of Uyo, Uyo, NIGERIA.

[Udo, I. O., Ekanem, M. S. & Inyang, E. U. 2011. Laboratory evaluation of West African black pepper (*Piper guineense*) seed powder against maize weevil (*Sitophilus zeamais* Mots.). Munis Entomology & Zoology, 6 (2): 1003-1007]

ABSTRACT: The seed powder of West African black pepper (*Piper guineense*) was evaluated in the laboratory against the maize weevil (*Sitophilus zeamais* Mots.) to assess for repellency, progeny development and adult mortality. The powder was applied as direct admixture at 0, 5, 10 and 20 g per 40g of maize grains. Results obtained showed significant ($P<0.05$) of 49.50% to 100% compared with the control. Adult mortality significantly ($P<0.05$) increased with increase in concentration and 100% mortality was achieved after 96 hours of exposure of insects to treatment. Progeny development was also significantly inhibited as fewer adults emerged from treated grains compared with the control. The potential of using the seed powder of *P. guineense* as grain protectant against infestation of stored maize by *S. zeamais* is discussed.

KEY WORDS: Black pepper, weevil, progeny, repellency, stored maize.

The overall goal of storage is to ensure food security and ensure that agricultural commodities are preserved for the attainment of price stabilization, national and domestic food security, provision of raw materials for industry and international trade, provision for a country's strategic stock, enhancement of a nation's international status and provision of seeds for planting (Lale, 2002).

The economic situation in a developing country like Nigeria has been adversely affected mostly by post harvest losses of agricultural products which are usually encountered especially during storage and could be caused by pests and other spoilage agents (Arannilewa et al., 2002). Severe attack by insects is one of the major constraints in profitable production and efficient storage of cereal grains.

The maize weevil (*Sitophilus zeamais* Mots.) is one of the most destructive pests of stored maize in the world (Bekele, 2002). This insect has a wide host range with a high capacity to penetrate grain mass and can infest grains in field as well as in storage and accounts for about 50% of loss in stored maize.

Control of storage pests is imperative in the successful production and storage of cereal grains. In an attempt to control this insect pest, farmers in Akwa Ibom State of Nigeria commonly hang harvested maize cobs over cooking fire to prevent damage by this insect. However, this method is not very effective as losses encountered are still high. Presently, farmers rely heavily on the use of synthetic insecticides to control *S. zeamais* and other insect pests of stored products.

The negative environmental impacts of the use of synthetic insecticides including harm on non-target species, development of resistance in insect species, high and prohibitive cost of application, high mammalian toxicity, health hazards to grain handlers and erratic supply in developing countries due to foreign exchange constraints have necessitated research interest on the use of alternative

control measures and attention has been turned to botanical insecticides because they are eco-friendly, safe and biodegradable.

Plants are known to produce secondary metabolites many of which act as natural defense against insects, herbivores and disease causing micro-organisms (Potenza et al., 2004). More than 100,000 secondary metabolites from about 200,000 plant species which may possess insecticidal properties have been identified and include alkaloids, terpenoids, flavonoids, etc. (Vendramim & Castiglioni, 2000; Schmutterer, 1990; Potenza et al., 2004). Some plants in the Piperaceae family such as black pepper (*Piper nigrum*), West African black pepper (*Piper guineense*) and Betel pepper (*Piper betel*) produce alkaloids like piperine, piperidine and chavicine as secondary metabolites that help plants defend themselves against phytophagous insects, fungi and other pests (Tsao et al., 2002). The present study evaluated the bioactivity of *Piper guineense* seed powder for insecticidal properties against *S. zeamais* on stored maize.

MATERIALS AND METHODS

Culturing of insects

Adult *S. zeamais* were obtained from infested stock of maize at Uyo main market, Akwa Ibom State, Nigeria. The insects were reared on whole maize and were transferred to a glass jar containing 300g of grains which were sterilized in a freezer for 14 days. After one week of oviposition, all insects were removed and discarded by freezing to enable the emergence of same age progeny that were used to establish the main culture.

Preparation of seed powder

P. guineense seeds were purchased from Uyo main market, Akwa Ibom State, Nigeria and 600 g of the dry seeds were ground into fine powder using manual hand grinder. The powder was stored in polyethylene bags prior to application.

Repellency bioassay

The repellent action of *P. guineense* seed powder against *S. zeamais* was assessed using food preference method as described by Inyang (2004). Five maize grains were coated in slurry of the seed powder at different concentrations of 1, 5 and 10 g, respectively and left to dry while the control was treated with distilled water only. The treated and untreated grains were placed adjacent to each other with a space between them on a filter paper in a Petri-dish (11 cm diameter). Ten adult *S. zeamais* were introduced into the middle of the Petri-dish (Udo, 2000). Each treatment was replicated four times and the number of insects present on control (N_c) and treated (N_t) grains were recorded after 1, 6, 24 and 48 hours of exposure. Percent repellency (PR) was computed using the formula according to Inyang (2004):

$$PR = \frac{N_c - N_t}{N_c + N_t} \times \frac{100}{1}$$

Weevil mortality

Mortality test was carried out by placing 40g of maize in 9cm white plastic cups and the seed powder of *P. guineense* was added as direct admixture at concentration level of 5, 10 and 20 g while the control had no seed powder added. Twenty adult *S. zeamais* of mixed sex were introduced into each cup and replicated four times. The cups were covered with white muslin cloth held in place with rubber bands. The number of dead insects in each treatment was counted after 24 hours and up to 96 hours. Insects were considered dead on failure to respond to three probing with a blunt probe.

Progeny development

One hundred adult *S. zeamais* were introduced into 600g of uninfested maize in a glass jar and left for seven days to allow for oviposition. One day after adult removal, *P. guineense* seed powder was applied at 5, 10 and 20g to 40g of grains and the treatments were repeated after 7 days, 14 and 21 days after adult removal. Each treatment was replicated four times while the control had no seed powder added.

Data analysis

The data obtained were subjected to analysis of variance (ANOVA) for complete randomized design (CRD) while means were separated using least significant difference (LSD).

RESULTS

Repellency

Result of the repellent effect of *P. guineense* against *S. zeamais* is shown in Table 1. There was a significant repellency of 80 – 100% being observed at all treatment levels. The 1 g treatment level was able to evoke about 50% repellent effect on the beetles one hour after treatment and within 48 hours after treatment recorded a repellent effect of 99%. This is noteworthy as the insects could be repelled from stored grains even at such low treatment concentration.

Insect mortality

The effect of *P. guineense* seed powder on mortality of *S. zeamais* is presented in Table 2. Adult mortality significantly ($P < 0.05$) increased with increase in concentration and hours exposure. One hundred percent mortality was observed in the 10 g treatment level after 96 hours of exposure.

Progeny development

The effect of *P. guineense* seed powder treatment on the progeny of *S. zeamais* is summarized in Table 3. The number of adults that emerged decreased with increase in treatment level. There was no significant difference amongst the treatments over the control after 21 days of adult removal. However, the powder significantly affected progeny development within 1 day to 14 days after adult removal.

DISCUSSION

The repellent properties exhibited by *P. guineense* against *S. zeamais* explains the fact that *P. guineense* has broad spectrum of activity as it is reputed to contain alkaloids like *piperine*, *chavicine* and *piperidine* (Lale & Alaga, 2000). The alkaloids therefore may be involved in offering protection against attack of maize grains by the weevil. The seed powder evoked a strong repellent action of 80 – 100% against adult weevils and this agrees with the result from other researchers (Udo, 2000; Pessu and Williams, 1998). This suggests its incorporation into traditional storage systems with periodic applications as repellent against the weevils from attacking stored maize. The seed powder caused significant insect mortality which could be attributed to the presence of highly pungent alkaloidic secondary metabolites. The extremely pepperish nature of *P. guineense* may have exerted toxic effect on the weevils thereby resulting in death. Dead insects were observed to have their metathoracic wings unfolded which suggest that death was as a result of the toxic action of the West African black pepper (Adedire & Ajayi, 1996). *Piperidine* being one of the secondary metabolites present in *P. guineense* is known to be an axonic poison and this may be another reason for the toxic action of the powder against the adult weevil (Ivbijare & Agbaje, 1986; Udo,

2005). The significant inhibition of the progeny of *S. zeamais* by the seed powder of *P. guineense* could probably be attributed to the fact that some edible spices possesses appreciable vapour pressure so that toxic quantities could be picked up by insects via the vapour phase (Lale, 2002). The pungent vapour of *P. guineense* seed powder could had been absorbed by the larval stages of *S. zeamais* developing within the grains thus leading to reduced progeny emergence. It has also been observed that *P. guineense* seed powder caused adult, larval and egg mortality as well as impaired oviposition and reduced adult emergence in *C. maculatus*, *S. zeamais* and *T. castaneum* (Lale, 2002). The present study has confirmed that *P. guineense* seed powder possess insecticidal properties that can be exploited for successful storage of maize grains. The use of plant products in the form of powders in the management of stored product insect pests is perhaps the most convenient among resource-poor farmers because the powders are easy to apply and commodities remain clean compared to those treated with fixed plant oils. Because of *P. guineense* abundance in the study area and also relatively are cheaper to procure, resource poor farmers could incorporate them into traditional storage systems.

LITERATURE CITED

- Adedire, C. O. & Ajayi, T. S.** 1996. Assessment of insecticidal properties of some plants as grain protectants against the maize weevil, *Sitophilus zeamais* (Mots). Nigerian Journal of Entomology, 13: 93–151.
- Arannilewa, S. T., Odeyemi, O. O. & Adedire, C. O.** 2002. Effects of medicinal plants extract and powder on the maize weevil *Sitophilus zeamais* Mots. (Coleoptera: Curculionidae). Annals. Agric. Science, 3: 1–10.
- Bekele, J.** 2002. Evaluation of the toxicity potential of *Milletia ferruginea* (Hochest) Baker against *Sitophilus zeamais* Mots. International Journal of Pest Management, 42 (1): 29–32.
- Inyang, U. E.** 2004. The potential threshold level, relative abundance, life cycle and control of the Banana weevil, *Cosmopolites sordidus* Germar (Coleoptera: Curculionidae) on plantain in Uyo, Akwa Ibom State, Nigeria. Ph.D Thesis, Michael Opara University of Agriculture, Umudike, Nigeria. 295 pp.
- Ivbijaro, M. F. & Agbaje, M.** 1986. Insecticidal activities of *Piper guineense* Schum and Thonn and *Capsicum* species on the cowpea bruchid, *Callosobruchus maculatus*. Insect Science and its Application, 7 (4): 521–524.
- Lale, N. E. S. & Alaga, K. A.** 2000. Exploring the insecticidal, larvicidal and repellent properties of *Piper guineense* Schum and Thonn seed oil for the control of rust-red flour beetle *Tribolium castaneum* (Herbst) in stored pearl millet *Pennisetum glaucum* (L.) R. Br. Journal of plant diseases and protection, 108 (3): 305–313.
- Lale, N. E. S.** 2002. Stored product entomology and acarology in Tropical Africa. Mole publications (Nig) Ltd, Maiduguri, Nigeria. Pp. 4–5.
- Pessu, P. O. & Williams, J. O.** 1998. Mode of action and activity period of *Dennetia tripetala* (G. Baker) and *Piper guineense* (Thonn) as protectant against stored products pests. Book of Abstracts, Entomological Society of Nigeria. 29th Annual Conference, Awka, Nigeria. Pp 27.
- Potenza, M. R., Aurther, V., Felicio, J. D., Rossi, M. H., Sakita, M. N., Silvestre, D. F. & Gomes, D. H. P.** 2004. Efeito de produtos naturais irradiados sobre *Sitophilus zeamais* Mots. (Coleoptera: Curculionidae). Arquivos do Instituto Biologico, 71: 477–484.
- Schmutterer, H.** 1990.. Properties and potential of natural pesticides from the neem tree, *Azadirachta indica*. Review of Entomology, 35: 271–297.
- Tsao, R., Peterson, C. J. & Coats, J. R.** 2002. Glucosinolate breakdown productas insect fumigants and their effect on carbon dioxide emission of insects. BMC Ecology 2. URL: <http://www.biomedcentral.com/content/pdf/1472-6785-2-5.pdf>. Retrieved July, 2006.

Udo, I. O. 2000. Efficacy of candle wood, *Zanthoxylum xanthoxyloides* Lam for the control of three stored product pests. M.Phil Thesis, University of Ghana, Legon, Accra. 81 pp.

Udo, I. O. 2005. Evaluation of the potential of some local spices as stored grain protectants against the maize weevil *Sitophilus zeamais* Mots (Coleoptera: Curculionidae). Journal of Applied Science and Environmental Management 9 (1): 165–168.

Vendramim, J. D. & Castiglioni, E. 2000. Aleloqui Micos, resistencia de plantas e plantas insecticidas. In: Quedes, J. C., Costa, I. D., Castiglioni, E. (eds). Bases e tecnicas do manejo de insetos. Santa Maria Pp 113–128.

Table 1. Percent repellency of *Piper guineense* to *S. zeamais* adults at different hours after treatment.

Treatment level (g)	Mean percent repellency Hours after treatment			
	1	6	24	48
0	0.00	0.00	0.00	0.00
1	49.50	55.00	84.50	99.25
5	80.00	89.25	98.25	100.00
10	83.00	98.25	100.00	100.00
LSD (P<0.05)	10.10	5.72	6.14	ns

Table 2. Effect of *Piper guineense* seed powder on adult mortality of *S. zeamais*.

Treatment level (g)	Mean percent mortality Hours after treatment			
	24	48	72	96
0	0.00	0.00	0.00	0.00
5	15.00	52.50	85.00	95.00
10	35.00	75.50	97.50	100.00
20	75.00	90.00	100.00	100.00
LSD (P<0.05)	0.80	1.53	0.93	0.49

Table 3. Effect of *P. guineense* seed powder on progeny development of *S. zeamais*.

Treatment level (g)	Mean percent F ₁ emergence Days after adult removal			
	1	7	14	21
0	145.00	146.00	74.00	73.00
5	63.75	85.75	118.50	61.75
10	37.75	52.70	79.00	48.75
20	24.00	29.50	52.75	28.25
LSD (P<0.05)	73.49	73.49	66.58	ns

SCIENTIFIC NOTES

**NEW REPORT OF APHIDS ON MUGA FOOD PLANTS
IN UPPER ASSAM (INDIA)****S. G. Eswara Reddy***

* Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles, Govt. of India, Lahdoigarh, Jorhat -785 700 Assam, INDIA. E-mail: ereddy2001@yahoo.com

[**Eswara Reddy, S. G.** 2011. New report of aphids on Muga food plants in Upper Assam (India). Munis Entomology & Zoology, 6 (2): 1008-1009]

Muga silkworm, *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae), yields golden yellow silk and is unique to Brahmaputra river valley of Assam. It is polyphagous insect, multivoltine. It producing 117 million tonnes of raw silk, accounting to 0.65% of raw silk produced in the country, while rest of the production contributed by other North-Eastern states. The silkworm has 5-6 generations in a year viz., *Jethua* (April-May), *Aherua* (June-July), *Bhodia* (Aug-Sept.), *Kotia* (Oct.-Nov.), *Jarua* (Dec.-Jan.) and *Chatua* (March-April). The *Jethua* and *Kotia* rearings are considered as commercial crops, *Chotua* and *Bhodia* as seed and *Jarua* and *Aherua* are pre-seed crops. Muga silkworm is reared on two primary host plants, Som, *Persea bombycina* Kost and Soalu, *Litsaea monopetala* Roxb under outdoor conditions; there fore quality and nutritional value of food plants play a significant role in larval growth and silk productivity. These perennial trees are attacked by the number of insect pests and diseases their by affecting the quality and reduction in the leaf yield which indirectly influences the production of muga silk. During visits to the institute farms, the new species of aphid, *Schizoneuraphis himalayensis* (Ghosh & Raychaudhuri) on Som and *Toxoptera aurantii* (Boyer de Fonscolombe) (Hemiptera:Aphididae) on Soalu is reported first time at Farm No.2, Lahdoigarh, Jorhat (Assam) during May-October 2010. The nature of damage caused by these aphids and its management is discussed below.

***Schizoneuraphis himalayensis* (Ghosh & Raychaudhuri, 1973)
(Hemiptera: Aphididae)**

This aphid (Fig. 1) is reported on som plants, it is greenish; infest the som plants after pruning particularly during new flush. Both nymphs and adults found in the colonies on tender buds, shoots, lower surface of leaves and suck the sap which results in curling and reduction in the size of the leaves. In severe incidence, aphids secrete honeydew on tender parts of the plant and develop black sooty mold which reduces the photosynthesis activity and vigour of the plant. Sooty mould affected leaves are unfit for rearing of muga silkworm. Presence of honeydew and ants on the plants indicate the incidence of aphids.

***Toxoptera aurantii* (Boyer de Fonscolombe, 1841)
(Hemiptera: Aphididae)**

This **black citrus aphid** (Fig. 2) is reported on soalu plants, it is dark brown to black and infest tender parts of the soalu plants. Both nymphs and adults found in the colonies on tender buds, leaves, shoots and suck the sap their by reducing the vigour of the leaves.

Management: Collection and destruction of affected parts of plants as soon as noticed both in som and soalu, encouraging predatory coccinellids viz., *Coleophora bowringi* Crotch, *Coleophora saucia* Mulsant, *Harmonia dimidiata* (Fabricius), *Phrynocaria unicolor* (Fabricius) reported on som to reduce the infestation and spraying of any commercial Neem based formulations containing Azadirachtin 50000 ppm (1ml/L)/ Azadirachtin 10000 ppm (3ml/L) or any systemic insecticides like Imidacloprid (0.2 ml/L) on both som and soalu plants at 25-30 days before brushing of worms is recommended to control the aphids.

ACKNOWLEDGEMENT

Authors thankful to Dr. Sunil Joshi, Senior Scientist, National Bureau of Agriculturally Important Insects, Indian Council of Agricultural Research, Govt. of India, Bengaluru for identification of aphids.



Figure 1. *Schizoneuraphis himalayensis* sucking sap on som leaf.



Figure 2. *Toxoptera aurantii* sucking sap on soalu leaf.

SCIENTIFIC NOTES

**NEW REPORT OF COLEOPTERAN BEETLES ON MUGA
FOOD PLANTS IN ASSAM (INDIA)****S. G. Eswara Reddy***

* Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles, Govt. of India, Lahdoigarh, Jorhat -785 700 Assam, INDIA. E-mail: ereddy2001@yahoo.com

[**Eswara Reddy, S. G.** 2011. New report of Coleopteran beetles on Muga food plants in Assam (India). Munis Entomology & Zoology, 6 (2): 1010-1011]

Muga silkworm is reared on two primary host plants, Som, *Persea bombycina* Kost and Soalu, *Litsaea monopetala* Roxb in the field under natural conditions. These host plants are infested by number of insect their by affecting the quality and reduction in the leaf yield which indirectly influences the production of muga silk. During routine visits to the institute farms, the coleopteran beetle, *Xylotrupes gideon* (Linnaeus), *Adoretus* sp, Chrysomelid beetle, *Aspidolopha* sp., *Clytra* sp on som and *Apogonia* sp on Soalu is reported during July 2010 in Farm No.2, Lahdoigarh, Jorhat (Assam). The nature of damage caused by these beetles and its management is discussed below.

***Xylotrupes gideon* (Linnaeus, 1767)
(Coleoptera: Scarabaeidae) Rhinoceros beetle**

Adult beetle (Fig. 1A) is reddish brown to black and having long horn projecting dorsally from the head in male and in female, the horn is short. Incidence of rhinoceros beetles was observed during May-October. Adult beetle responsible for causing damage to som plants and seen at the base of the stem and tree trunks. These beetles mainly bore at the base of the stem and also on tree trunks and feed internal tissues/contents by making big hole from outside without entering inside the stem. During boring, fibrous woody material will comes out from the bored hole. Repeated attack of beetles affects the growth of the plant. Gummy exudation was observed from bored holes of the stem, which in turn attracts flies.

***Adoretus* sp. and *Apogonia* sp.
(Coleoptera: Scarabaeidae) Chafer beetles**

Adult beetle of *Adoretus* sp. (Fig. 1B) is brown coloured, reported in som and where as *Apogonia* sp. (Fig. 1C) is brownish black reported in soalu. These beetles emerge from the soil with the on set of monsoon showers (May-June) after dusk. They feed on leaves after pruning by making small holes/perforations on the leaves. Beetles lay eggs in the soil, after hatching the grubs feed on roots. Severe infestation results in the wilting of the younger plants.

***Aspidolopha* sp. and *Clytra* sp.
(Coleoptera: Chrysomelidae) Leaf beetles**

These beetles reported on som, they found on the leaves and feed by making small holes and irregular cuts. This beetle does not cause much damage to the plants.

Management of Coleopteran beetles:

- Maintain field hygiene to prevent the spread of beetles
- Collect the beetles and destroy to avoid further infestation.
- Beetles should be trapped with attractive breeding material mixed with insecticide.
- Set up sex pheromone traps to attract female beetles.
- Soil application of Neem based granules (Avana @ 50-100 grams/plant) to control the grubs breeding in the soil.
- Treat the manure/compost pits by spraying/dusting of Carbaryl 75 WP (2g/l) at least 3-4 times in a year or drenching the soil with Chlorpyrifos 30 EC (4ml/L) to kill the grubs.
- Spraying of any commercial Neem based formulations containing Azadirachtin 50000 ppm (1ml/L)/ Azadirachtin 10000 ppm (3ml/L) on plants at 25-30 days before brushing of worms is recommended.

ACKNOWLEDGEMENT

Authors thankful to Dr. C.A. Viraktamath, Emeritus Professor and Principal Investigator, *Network Project on Biosystematics*, Department of Agricultural Entomology, University of Agricultural Sciences, GKVK, Bengaluru, Karnataka (India) for identification of insect specimens.

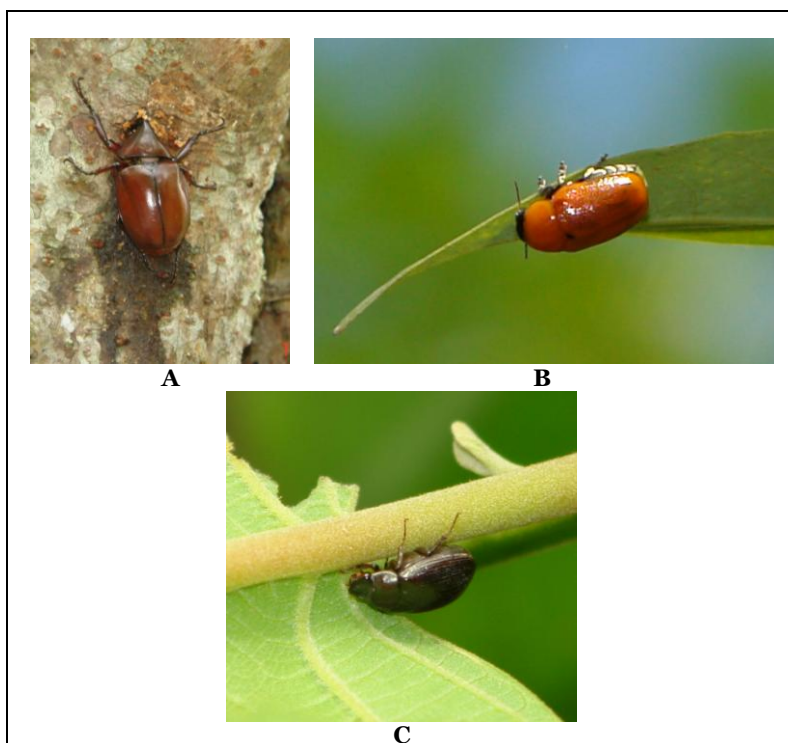


Figure 1. A. *Xylotrupes gideon* feeding on som stem, B. *Adoretus* sp. feeding on som leaf, C. *Apogonia* sp. feeding on soalu leaf.

SCIENTIFIC NOTES

**INTEGRATED MANAGEMENT OF UZI FLY,
EXORISTA BOMBYCIS (LOUIS) (DIP.: TACHINIDAE) IN
MUGA SILKWORM, *ANTHERAEA ASSAMENSIS* HELFER
(LEP.: SATURNIIDAE) UNDER OUT DOOR REARING
CONDITIONS OF ASSAM (INDIA)**

S. G. Eswara Reddy*

* Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles, Govt. of India, Lahdoigarh, Jorhat -785 700 Assam, INDIA. E-mail: ereddy2001@yahoo.com

[Eswara Reddy, S. G. 2011. Integrated management of Uzi fly, *Exorista bombycis* (Louis) (Dip.: Tachinidae) in Muga Silkworm, *Antheraea assamensis* Helfer (Lep.: Saturniidae) under out door rearing conditions of Assam (India). Munis Entomology & Zoology, 6 (2): 1012-1013]

Muga silkworm, *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae) is semi domesticated, polyphagous, multivoltine and endemic to Assam, yields golden yellow silk. The present production of raw silk in Assam is 117 million tonnes accounting to 0.65% of raw silk produced in the country, while rest of the production contributed by other North-Eastern states (Anon, 2009). The muga silkworm is reared in 5-6 seasons in the year. The *Jethua* (April-May) & *Kotia* (Oct.-Nov.) rearings are commercial crops, *Chotua* (Feb.-Mar.) & *Bhodia* (Aug.-Sept.) as seed and *Jarua* (Dec.-Jan.) & *Aherua* (June-July) as pre-seed crops.

Muga silkworm is attacked by a number of parasitoids (*Apanteles* sp., *Exorista bombycis*) and predators (ants, wasps, birds etc.). Among these *E. bombycis* is one of the serious endo-parasitoid particularly during *Jarua* (Dec.-Jan.) and *Chotua* (Feb.-Mar.) crop seasons and reported 20-90% loss in winter & post winter (Dec.-Mar.) (Anon, 2007) and 50-70% cocoon rejection during Feb.-March (Anon, 1996). Single female *E. bombycis* prefers to lay eggs directly at inter segmental region of the larval body. After hatching, the maggots penetrates into the larval body and starts feeding on inner tissues/fat bodies then maggots comes out from the body and pupates in the soil. The silkworm parasitized by Uzi fly in early instars are killed before attaining spinning stage, while those parasitized in the late 4th & 5th instars spin cocoons of weak built and from such cocoons Uzi maggots emerge by piercing, thus rendering cocoons unfit for reeling and reduces the market value of the cocoons. Presence of egg(s) or black scar on the body of the silkworm larvae and maggot emergence hole in the cocoons indicates uzi infestation. This parasitoid was also reported on 95 species of insects belonging to 20 families of Lepidoptera and one family of Hymenoptera worldwide in the absence of silkworm (Narayanaswamy & Devaiah, 1998).

As per the recent survey results indicates that, maximum infestation of uzi fly was recorded in 5th instar larvae (43.0%) and at harvesting of cocoons (35.0%) during *Chotua* crop (Mar.-Apr.2010) followed by *Jarua* crop, Dec. 2009-Jan. 2010 (19.0% infestation at larval stage & 27.50% at harvesting stage of cocoons) reported in Upper Assam (Eswara Reddy, 2010). To reduce the infestation level of uzi fly, the following integrated management practices to be recommended.

Integrated management practices to be followed for *Exorista bombycis*:

1. Cultural methods:

- Plough or dig the soil in rearing plots to expose the maggots/pupa for predators/strong sun light to reduce the infestation.
- Avoid rearing of muga silkworms continuously (monocropping) from Dec.-April to minimize the uzi fly infestation.

2. Mechanical methods:

- Rear muga silkworms under nylon net to minimize the infestation.
- Collect and destroy uzi maggots which come out at three days after spinning in the Jali (mountage).
- Dried leaves should be used for Jali (mountage) to facilitate quick spinning of cocoons to minimize the time for emergence of uzi maggots to emerge out.
- Reeling cocoons should be stifled properly within 2-3 days after spinning which helps to kill uzi maggots and pupae noticed sometimes inside the cocoon.
- Install electrically operated stifling chambers for cocoons to check the emergence of uzi maggots from infested cocoons at 3-5 days after spinning.

3. Quarantine method:

- Restrict the transport of seed cocoons from one location/state to other to reduce the infestation (Ex: private cocoon markets/grainage/reeling units should be kept under regular vigilance).

4. Biological control:

- Inundative release of pupal parasitoid, *Nesolynx thymus* Girault (Hymenoptera:Eulophidae) to reduce the infestation of uzi fly in muga culture.
- Release the parasitoids once in 2nd, 3rd, 4th & 5th instar and once in spinning and grainage @ 10000/release for six releases in the centre of the rearing field.

Note: The number of pupal parasitoids can be increased/decreased depending upon the infestation of uzi fly.

LITERATURE CITED

Anonymous. 1996. Annual report, Regional Muga Research Station, Boko, Assam (India). p. 17.

Anonymous. 2007. A diagnostic manual for disease and pests of muga silk worm and their host plants. Central Muga Eri Research & Training Institute, Central Silk Board, Ministry of Textiles: Govt. of India, Lahdoigarh, Jorhat, Assam (India). p. 1-47.

Anonymous. 2009. Annual report, Central Silk Board, Bangalore. pp.113.

Eswara Reddy, S. G. 2010. Present Status of Uzi fly, *Exorista bombycis* (Louis) (Diptera:Tachinidae) Incidence in Muga Silkworm, *Antheraea assamensis* Helfer (Lepidoptera:Saturniidae) in Upper Assam. Paper presented in National seminar on Seri-Bio diversity of North East India and its Conservation & Prospects held on 28-29 Jan. 2011.pp.69. Organized by Department of Zoology, Dhing College, Nagaon, Assam (India).

Narayanaswamy, K. C. & Devaiah, M. C. 1998. Silkworm Uzi fly. p232. Zen publishers, No. 1489, 40th Cross, 4th T Block, Jayanagar, Bangalore, Karnataka (India).

SCIENTIFIC NOTES

**NEPOMORPHAN FAUNA OF ÇORUM PROVINCE
(HEMIPTERA: HETEROPTERA)****Ali Salur* and Seda Mesci****

* Hitit University, Faculty of Science and Arts, Department of Biology, 19030 Çorum, TURKEY.

** Gazi University, Institute of Science and Technology, Department of Biology, 06500 Ankara, TURKEY.

[Salur, A. & Mesci, S. 2011. Nepomorphan fauna of Çorum province (Hemiptera: Heteroptera). Munis Entomology & Zoology, 6 (2): 1014-1016]

Çorum province is located in the Black Sea Region of Turkey. The aquatic Heteropteran fauna of this province is scarcely known. Nepomorphans in the families Nepidae, Pleidae, Notonectidae, Corixidae, Naucoridae were sampled at the Çorum province in Black Sea Region from 2006 through 2009 and 2010. Result of the research, 15 species of nepomorphans were recorded in Çorum province. Two species of nepomorphans have been recorded from the studied region previously, shown in the Table 1. 13 species appeared to be new for Çorum. Of these nepomorphans 12 species are here recorded for the first time from the Black Sea region. The known ranges of these species are expanded by the new findings.

MATERYAL AND METHOD

The studies were carried out in different periods between June and November 2006-2008 and 2010 in Çorum. Samples were collected from nineteen different localities with aquatic nets. Specimens were put into jars, preserved in % 70 alcohols and then softened and pinned. All the specimens were deposited in Hitit University Zoology Museum.

Localities: (Loc.1): Beydili village (marsh), 40° 37' N 34° 53' E; (Loc.2): Boğazönü village (bridge), 40° 19' N 34° 18' E; (Loc.3): Cemilbey village (stream) 40° 20' N 35° 03' E (Loc.4): Çatak (public park), 40° 41' N 34° 18' E; (Loc.5): Göcenovacı village (small lake), 40° 20' N 34° 50' E; (Loc.6): Gökçepınar village (small lake), 40° 22' N 35° 08' E; (Loc.7): Gölünyazı Lake, 40° 41' N 34° 54' E; (Loc.8): Hatap (stream), 40° 23' N 34° 48' E; (Loc.9): İskilip (18. km road iskilip); 40° 46' N 34° 47' E; (Loc.10): Kayı village (stream) 40° 24' N 35° 00' E; (Loc.11): Kızılırmak (25. km road dodurga), 40° 34' N 34° 45' E; (Loc.12): Obruk dam, 40° 46' N 34° 47' E; (Loc.13): Sarılık bridge , 40° 23' N 35° 04' E; (Loc.14): Seydim (Seydim Lake), 40° 33' N 34° 44' E; (Loc.15): Sıklık pass, 40° 34' N 35° 01' E; (Loc.16): Türkler village (stream), 40° 38' N 34° 52' E; (Loc.17): Küçük Keşlik village (small stream), 40° 15' 34° 39'; (Loc.18): Karapınar village (small stream and pool), 40° 28' 34° 56'; (Loc.19): Büyükgülücek village (small stream), 40° 20' 34° 43'.

According to Jannson (1986), only two species as *Corixa affinis* and *Hesperocorixa parallela* have been recorded from Çorum province.

RESULTS

Family Nepidae

Nepa cinerea Linnaeus, 1758

Material Examined: 1♀, (Loc.16), 03.06.2006; 2♂♂, 1♀, (Loc.16), 29.07.2006; 2♂♂, (Loc.16), 19.08.2006; 1 nymph, (Loc.15), 28.07.2006; 7 nymph, (Loc.16), 29.07.2006; 7 nymph, (Loc.16), 05.08.2006; 1 nymph, (Loc.2), 05.08.2006; 2 nymph, (Loc.16), 19.08.2006; 3 nymph, (Loc.2), 07.07.2007; 1 nymph, (Loc.2), 18.08.2007; 1 nymph, (Loc.8), 03.07.2008. **Remarks:** New for Çorum.

Family Pleidae

Plea minutissima minutissima Leach, 1817

Material Examined: 7 samples, (Loc.1), 03.06.2006; 284 samples, (Loc.6), 12.08.2007; 60 samples, (Loc.6), 25.08.2007. **Remarks:** New for Çorum.

Family Notonectidae

Notonecta glauca Linnaeus, 1758

Material Examined: 1♂, (Loc.14), 30.06.2006; 1♂, 1♀, (Loc.14), 10.07.2006; 1♂, (Loc.4), 29.07.2006; 1♂, (Loc.8), 09.09.2007; 3♂♂, 5♀♀, (Loc.19), 07.11.2010. **Remarks:** New for Çorum.

Notonecta viridis Delcourt, 1909

Material Examined: 1♂, (Loc.14), 10.07.2006; 3♂♂, (Loc.14), 29.07.2006; 2♂♂, 3♀♀, (Loc.4), 05.08.2006; 1♀, (Loc.14), 05.08.2006; 5♂♂, 6♀♀, (Loc.4), 19.08.2006; 2♂♂, (Loc.5), 23.06.2007; 1♂, (Loc.5), 07.07.2007; 3♂♂, (Loc.2), 21.07.2007; 2♂♂, (Loc.2), 05.08.2007; 1♂, (Loc.13), 12.08.2007; 1♀, (Loc.2), 18.08.2007; 1♂, (Loc.13), 25.08.2007; 1♂, (Loc.8), 09.09.2007; 3♂♂, 1♀, (Loc.2), 09.09.2007; 2♂♂, (Loc.9), 21.05.2008; 7♂♂, 12♀, (Loc.17), 20.09.2010. **Remarks:** New for Çorum.

Notonecta maculata Fabricius, 1794

Material Examined: 1♂, (Loc.4), 05.08.2006; 1♀, (Loc.5), 23.06.2007; 1♀, (Loc.8), 07.07.2007; 1♂, (Loc.5), 07.07.2007; 1♂, (Loc.2), 21.07.2007; 6♂♂, 2♀♀, (Loc.2), 05.08.2007; 2♂♂, 5♀♀, (Loc.2), 18.08.2007; 4♂♂, 2♀♀, (Loc.8), 09.09.2007; 1♂, (Loc.2), 09.09.2007; 5♂♂, 6♀♀, (Loc.18), 07.11.2010. **Remarks:** New for Çorum.

Family Corixidae

Sigara lateralis (Leach, 1817)

Material Examined: 1♂, 4♀♀, (Loc.1), 03.06.2006; 2♂♂, (Loc.3), 16.06.2007; 3♂♂, 3♀♀, (Loc.5), 07.07.2007; 17♂♂, 6♀♀, (Loc.10), 15.07.2007; 6♀♀, (Loc.6), 28.07.2007; 6♂♂, 13♀♀, (Loc.10), 28.07.2007; 79♂♂, 254♀♀, (Loc.10), 12.08.2007; 1♂, (Loc.10), 25.08.2007; 2♂♂, (Loc.6), 28.08.2007; 3♀♀, (Loc.1), 15.05.2008; 4♂♂, 4♀♀, (Loc.7), 04.08.2008; 2♀♀, (Loc.11), 04.08.2008. **Remarks:** New for Çorum.

Sigara striata (Linnaeus, 1758)

Material Examined: 4♂♂, 10♀♀, (Loc.1), 03.06.2006; 3♂♂, (Loc.7), 03.06.2006; 8♀♀, (Loc.7), 09.07.2006; 1♂, 1♀, (Loc.6), 25.08.2007. **Remarks:** New for Çorum.

Sigara nigrolineata nigrolineata (Fieber, 1848)

Material Examined: 1♂, (Loc.3), 30.06.2007; 1♂, (Loc.8), 07.07.2007; 1♂, (Loc.2), 21.07.2007; 6♂♂, 9♀♀, (Loc.2), 05.08.2007; 1♂, (Loc.13), 12.08.2007; 3♂♂, 18♀♀, (Loc.2), 18.08.2007; 5♂♂, 6♀♀, (Loc.2), 09.09.2007; 2♂♂, 1♀, (Loc.9), 21.05.2008. **Remarks:** New for Çorum.

Sigara iactans Jansson, 1983

Material Examined: 5♂♂, 16♀♀, (Loc.7), 04.08.2008; 1♀, (Loc.12), 04.08.2008. **Remarks:** New for Çorum.

***Corixa punctata* (Illiger, 1807)**

Material Examined: 1♀, (Loc.4), 03.06.2006; 1♀, (Loc.1), 03.06.2006; 1♂, 1♀, (Loc.2), 18.08.2007; 2♀♀, (Loc.10), 25.08.2007. **Remarks:** New for Çorum.

***Corixa affinis* Leach, 1817**

Material Examined: 1♂, 5♀♀, (Loc.2), 18.08.2007; 1♀, (Loc.5), 18.08.2007; 1♀, (Loc.10), 25.08.2007; 1♂, (Loc.2), 09.09.2007.

***Hesperocorixa paralella* (Fieber, 1860)**

Material Examined: 1♂, 20♀♀, (Loc.13), 12.08.2007.

***Micronecta griseola* Horvath, 1899**

Material Examined: 5 samples, (Loc.1), 03.06.2006; 3 samples, (Loc.8), 04.08.2008. **Remarks:** New for Çorum.

***Micronecta pusilla* (Horvath, 1895)**

Material Examined: 37 samples, (Loc.5), 05.08.2007; 8 samples, (Loc.7), 04.08.2008; 137 samples, (Loc.5), 18.08.2008. **Remarks:** New for Çorum.

Family Naucoridae***Ilyocoris cimicoides cimicoides* (Linnaeus, 1758)**

Material Examined: 1 nymph, (Loc.1), 03.06.2006; 3♂♂, 3♀♀, (Loc.14), 10.06.2006; 1♂, (Loc.14), 30.06.2006; 8♂♂, 1♀, (Loc.14), 10.07.2006; 1♂, 2♀♀, (Loc.6), 25.08.2007. **Remarks:** New for Çorum.

In nineteen different habitats of Çorum province, 15 species belonging to 5 families were recorded. Of these, *Nepa cinerea*, *Plea minutissima minutissima*, *Notonecta glauca glauca*, *Notonecta viridis*, *Notonecta maculata*, *Sigara striata*, *Sigara nigrolineata nigrolineata*, *Sigara iactans*, *Corixa punctata*, *Micronecta griseola*, *Micronecta pusilla*, *Ilyocoris cimicoides cimicoides* are new records for the nepomorphan fauna of Black Sea Region. Furthermore, 13 species are new record only for Çorum. Although the nepomorphan fauna of Turkey is now better known, more studies are required to better understand the overall distribution.

LITERATURE CITED

Jansson, A. 1986. The Corixidae (Heteroptera) of Europe and some adjacent region. *Annales Entomologici Fennici*, 52: 1-93.