

ADDITIONS TO THE RARE SPECIES OF BRACONIDAE FAUNA (HYMENOPTERA: BRACONIDAE) FROM TURKEY

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ABSTRACT: 7 subfamilies of the Braconidae family were identified, and 5 of these, Adeliinae, Charmontinae, Exothecinae, Ichneutinae and Rhysalinae are new records for the Turkish fauna. In addition, 7 genera: *Adelius* Haliday, 1833; *Charmon* Haliday, 1833; *Ichneutes* Nees, 1816; *Proterops* Wesmael, 1835; *Pseudichneutes* Belokobylskij, 1996; *Dolopsidea* Hincks, 1944; *Colastes* Haliday, 1833 and 12 species: *Adelius* (*Adelius*) *erythronotus* (Förster, 1851); *A.(A.) subfasciatus* Haliday, 1833; *Charmon extensor* (Linnaeus, 1758); *Homolobus* (*Chartolobus*) *infumator* (Lyle, 1914); *H. (Phylacter) annulicornis* (Nees, 1834); *Hormius moniliatus* (Nees, 1811); *Ichneutes reunitor* Nees, 1816; *Proterops nigripennis* Wesmael, 1835; *Pseudichneutes levis* (Wesmael, 1835); *Dolopsidea tataniae* (Telenga, 1941); *D. indagator* (Haliday, 1836) and *Colastes* (*Xenarcha*) *lustrator* (Haliday, 1836) are recorded for the first time from Turkey. Comments are presented on some insufficiently known taxa, and zoogeographic interest is the record of the each species for considered to be Turkey's fauna.

KEY WORDS: Braconidae, Hymenoptera, new records, zoogeographic, Turkey.

Braconidae is a family of parasitoid wasps and one of the richest families of insects. Between 17963 species exist worldwide. The species are grouped into about 47 subfamilies, 97 tribes and 1032 genera. This work reports on the rare braconids fauna, and in particular new records for Turkey. Although there has been a significant increase in our knowledge of rare braconid taxonomy, in this paper only Homolobinae and Hormiinae subfamilies had been previously recorded from Turkey (Yu et al., 2006).

Members in this family have long and thin body, long antenna and some with very long ovipositor. They have narrow waist like most other wasps. They are from small to medium in size. The two families Braconidae and Ichneumonidae are very close related and some species look similar. They can be distinguished by the forewing venation. In the Ichneumons there is an extra vein creating a cell which can not be found on Braconids (Matthews, 1974).

Braconidae wasps are attack of wide range of host species (Coleoptera, Diptera, Hemiptera, Hymenoptera, Lepidoptera, Neuroptera, Orthoptera, Psocoptera) (Yu et al., 2006). Some species attack spiders, while some are hyperparasitic. There are both solitary and gregarious species in the family (Shaw, 1995; Wharton, 1993). Braconids represent two biological groups substantially differing in mode of life and morphology of larvae. All ectoparasites have been combined in the subfamilies Braconinae, Doryctinae and Microgastrinae, and the endoparasites in the remaining subfamilies. Since Braconidae with few exceptions are all primary parasites, this family in particular has attracted increasing interest as emphasis in pest control has shifted toward biotic agents (Sharkey, 1993; Tobias, 1986).

Although many studies were carried out about different habitats, altitude, and season on braconid wasps in different regions of Turkey, in Turkey such studies

are the first time. Here, we add a few more species and discuss the distribution of others.

MATERIAL AND METHODS

Sample collection

Adult braconid wasps from Turkey were collected from various habitats and altitudes between years 1986-2009. Sweeping nets and light traps were used to obtain samples on grass-type plants. The specimens were then pinned and labeled according to taxonomic rules and regulations.

Species identification

Morphological terminology and characters used in this description follow: Achterberg, 1993; Belokobylskij, 1988, 1998; Chen et al., 2004 and Tobias, 1986. The specimens were deposited in the collection of the Zoological Museum at Trakya University.

Study area

Turkey, at the centre of Asia, Europe and Africa continents, is located between 26° and 45° east meridians according to Greenwich, between 36° and 42° North parallel according to Ecvator. Some parts of the country belongs to Asia continent (Anatolian Peninsula), and the other belongs to Europe continent (Thrace includes the westernmost part of Turkey). Also the country is related to Africa continent. According to these features, Turkey has three different biogeographical regions, namely Europe-Siberian, Mediterranean and Iran-Turan. So, the country is a small continent according to its biodiversity (Lodos, 1995).

For each species, a listing of the materials examined, species distribution (Yu et al., 2006) and proposed chorotypes (items of classification based on distribution patterns as inferred from the comparative analysis of the geographical ranges of species, Vigna Taglianti et al., 1999). Vigna Taglianti et al. (1999) classification results from the comparison of over 3,000 geographical ranges of terrestrial and freshwater animal species. Chorotypes are useful for interspecific faunistic and biogeographic comparisons. The present zoogeographical characterization is based on the chorotype classification of Anatolian fauna, recently proposed by Vigna Taglianti et al. (1999).

RESULTS

13 species belonging to 7 subfamilies within family Braconidae were identified, and 5 subfamilies, 7 genera and 12 species new records for fauna of Turkey. The taxa are presented alphabetically.

Subfamily Adeliinae Viereck, 1918

***Adelius* Haliday, 1833**

***Adelius (Adelius) erythronotus* (Förster, 1851)**

Material examined: Kastamonu-Ilgaz Mountain-Çatören, mixed forest, 1280 m, 30.08.2002, 1♀, 2♂♂.

Distribution: Palearctic (Azerbaijan, Bosnia Hercegovina, former Czechoslovakia, France, Georgia, Germany, Hungary, Ireland, Korea, Moldova, Poland, Russia, Switzerland, Turkmenistan, Ukraine, United Kingdom, former Yugoslavia).

Chorotype: Asiatic-European.

New record for Turkey.

***Adelius (Adelius) subfasciatus* Haliday, 1833**

Material examined: Bolu-Gerede-Güney, pasture, 1200 m, 13.06.2002, 1♂; **Karabük-Safranbolu-İnceçay-Sarıçekdağı**, *Pinus* sp., oak and pasture, 1567 m, 29.06.2001, 1♀; **Trabzon-Maçka-Şolma Yaylası**, fir forest, 1677 m, 05.08.2005, 3♀♀; -Maçka-Sümela, pasture, 1073 m, 03.07.2004, 1♀; **Sivas-Hafik-Durulmuş**, clover field and pasture, 1275 m, 31.5.2007, 1♀.

Distribution: Palearctic: Belgium, Bulgaria, Croatia, Czech Republic, former Czechoslovakia, Finland, France, Georgia, Germany, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Netherlands, Poland, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, former Yugoslavia.

Chorotype: Asiatic-European.

New record for Turkey.

Subfamily Charmontinae van Achterberg, 1979***Charmon* Haliday, 1833*****Charmon extensor* (Linnaeus, 1758)**

Material examined: Samsun-Salıpazarı-Astepe mevkii, chestnut and pasture, 600 m, 03.07.2003, 1♀.

Distribution: Ethiopian, Nearctic, Neotropical, Oriental, Palearctic: Austria, Azerbaijan, Belgium, Bulgaria, China, former Czechoslovakia, Czech Republic, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Mongolia, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, United Kingdom.

Chorotype: Holarctic.

New record for Turkey.

Subfamily Homolobinae van Achterberg, 1979***Homolobus Förster*, 1862*****Homolobus (Apatia) truncator* (Say, 1829)**

Material examined: Adana-Kadirli, pasture, 89 m, 18.12.1997, 1♀; **Afyon-Emirdağ-Kırkpınar**, poplar woodland and pasture, 911 m, 07.07.2006, 1♂; **Amasya-Suluova**, poplar woodland and pasture, 470 m, 03.09.2003, 1♂; **Ankara-Temelli-Elagöz**, poplar woodland and pasture, 803 m, 10.07.2007, 1♂, 3♀♀; -Tuz Gölü 22.04.2001, pasture, 920 m, 1♀; **Aydın-Kocarlı**, orchard and pasture, 51 m, 18.09.1996, 1♂; **Batman-Ünlüce**, pasture, 1506 m, 15.08.1991, 1♂; **Bayburt**, vegetable garden, 1562 m, 07.08.2005, 1♂; -Konursu, clover field, 1522 m, 30.08.2004, 1♀, 2♂♂; **Bursa-Süleymaniye**, orchard, 380 m, 19.09.1992, 1♀; **Çanakkale-Yenice-Sameteli**, pasture, 120 m, 12.09.2002, 1♂; **Elazığ-Cip Barajı**, poplar woodland and pasture, 1006 m, 04.06.2007, 2♂♂; **Çorum-Alacahöyük**, pasture, 867 m, 07.06.2003, 1♀; -İskilip-Karlık, orchard and pasture, 546 m, 26.08.2004, 1♂; Denizli-Tavas-Tekkeköy, vegetable garden, 419 m, 30.07.1997, 1♂; **Edirne-Lalapaşa-Sinanköy**, clover field, 350 m, 02.08.2000, 1♀; **Erzurum**, pasture, 1939 m, 10.06.1999, 3♂♂; **Giresun-Alucra**, oak and clover field, 1300 m, 02.07.2004, 1♂; **Gümüüşhane-Kelkit**, pasture, 1259 m, 29.07.1991, 1♀; -Şiran-Karaşeyh, poplar woodland and pasture, 1435 m, 29.08.2004, 1♂; **Isparta-Güneykent**, pasture, 1032m, 12.05.2004, 1♂; **Kastamonu-Alamaşışlı**, orchard and clover field, 620 m, 06.09.2001, 1♂; -Daday-İnceğiz-Çiftlik, pine forest, 860 m, 29.08.2002, 1♀; **Kayseri-Bağpınar**, clover field, 1097 m, 14.09.2006, 2♂♂; -Erciyes, pasture, 2056 m, 25.6.2009, 1♀; **Kırklareli-İnce-Paşayeri**, clover field, 150 m, 02.08.2000, 1♀; -Lüleburgaz-Türkgeldi, orchard and pasture, 60 m, 13.08.1992, 1♂; **Kırıkkale-Karakeçili**, poplar woodland and clover field, 839 m, 11.07.2007, 5♀♀, 4♂♂; **Kırşehir-Kaman**, crop field and pasture, 1020 m, 10.07.2007, 1♀, 1♂; -Kaman-Darıözü, beetroot field, 902 m, 16.09.2006, 1♂; -Özbağ, clover field and poplar woodland, 1036 m, 16.09.2006, 1♀, 1♂; **Konya-Beyşehir**, clover field, 1256 m, 22.04.2001, 1♀; -Seydişehir, vegetable garden, 1130 m, 09.09.2006, 1♂; **Mardin-Ömerli**, pasture, 1088 m, 19.6.2009, 1♀; **Muğla-Milas-Çamiçi** 24.06.1999, clover field, 100 m, 1♀; **Neveşehir-Avanos-Saruhan**, poplar woodland and pasture, 958 m, 06.06.2007, 1♀; -Gülşehir-Gümüüşkent, crop field and pasture, 1286 m, 07.06.2007, 1♀; **Niğde-Ava**, pasture, 1467 m, 02.06.2005, 1♀; -Bor-Çukurkuyu, vegetable garden and clover field, 1078 m, 19.07.2007, 5♀♀, 2♂♂; **Siirt**,

pasture, 986 m, 30.7.2009, 3♀♀; **Sivas**-Taşhidere, pasture, 956 m, 23.05.2001, 1♂; **Tekirdağ**-Işıklar, pasture, 400 m, 09.09.1999, 2♀♀; (light trap), 09.09.1999, 3♀♀; -Saray-Küçüksinekli, orchard, 170 m, 25.08.1992, 1♂; **Tokat**-Almus-Çilhane, clover field and pasture, 830 m, 02.09.2003, 1♀; **Uşak**-Banaz, orchard and crop field, 820 m, 22.07.1997, 1♀; **Yozgat**-Sorgun-Mahmatlı, crop field and pasture, 1083 m, 21.08.2008, 1♀.

Distribution: Ethiopian, Nearctic, Neotropical, Palearctic (Afghanistan, Austria, Belgium, Bosnia Hercegovina, Bulgaria, China, Cyprus, Czech Republic, former Czechoslovakia, Denmark, Finland, Egypt, France, Georgia, Germany, Greece, Hungary, Israel, Italy, Japan, Kazakhstan, Lithuania, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkmenistan, Turkey, United Kingdom, former Yugoslavia).

Chorotype: Holarctic.

Homolobus (Chartolobus) infumator (Lyle, 1914)

Material examined: **Aydın**-Germencik-Kızılcapınar, clover field, 70 m, 17.09.1996, 1♀; Edirne-Trakya Üniversitesi, Biyoloji Bölümü, Balkan Yerleşkesi, (light trap), crop field and pasture, 09.07.2001 1♀; **Sinop**-Ünlüce, pasture, 150 m, 17.07.1993, 1♀.

Distribution: Nearctic, Neotropical, Oriental, Palearctic (Armenia, Austria, Azerbaijan, Belgium, Bulgaria, China, Czech Republic, former Czechoslovakia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom).

Chorotype: Holarctic.

New record for Turkey.

Homolobus (Phylacter) annulicornis (Nees, 1834)

Material examined: **Gümüşhane**-Kelkit-Köycük, pasture, 1223 m 08.08.2005 2♀♀; 2♂♂; -Şiran-Artaş, poplar woodland, oak and pasture, 1300 m, 08.08.2005, 1♀; **Ordu**-Akkuş-Yukarıdüğencili, pasture, 1340 m, 05.07.2003, 1♀.

Distribution: Oriental, Palearctic (Austria, Azerbaijan, Belgium, China, Czech Republic, former Czechoslovakia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Moldova, Netherlands, Poland, Romania, Russia, Sweden, Switzerland, United Kingdom, former Yugoslavia).

Chorotype: Asiatic-European.

New record for Turkey.

Subfamily Hormiinae Förster, 1862

Hormius Nees, 1819

Hormius moniliatus (Nees, 1811)

Material examined: **Ankara**-Kızılcahamam-Pazar, poplar woodland, oak and pasture, 959 m, 17.9.2006, 1♀; -Kızılcahamam-Özbekler, orchard, poplar woodland and pasture, 970 m, 17.9.2006, 2♀♀; **Eskişehir**-Bilecik yolu 26. km, pasture, 789 m, 01.09.2006, 1♂; -Alpu-Sündiken mountain, pine forest, 1573 m, 05.09.2006, 1♂.

Distribution: Nearctic, Oceanic, Oriental, Palearctic (Afghanistan, Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Canary islands, China, Czech Republic, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Latvia, Lithuania, Moldova, Mongolia, Morocco, Netherlands, Norway, Poland, Russia, Slovakia, Spain, Sweden, Switzerland, Tajikistan, Turkmenistan, Ukraine, United Kingdom, Uzbekistan).

Chorotype: Holarctic.

New record for Turkey.

Subfamily Ichneutinae Förster, 1862

Ichneutes Nees, 1816

Ichneutes reunitor Nees, 1816

Material examined: **Sivas**-Yıldızeli, crop field, 1152 m, 30.05.2007, 1♂.

Distribution: Nearctic, Palearctic (Azerbaijan, Belgium, Finland, France, former Czechoslovakia, Georgia, Germany, Hungary, Ireland, Italy, Japan, Kazakhstan, Lithuania,

Mongolia, Netherlands, Norway, Poland, Romania, Russia, Sweden, Switzerland, Ukraine, United Kingdom, former Yugoslavia).

Chorotype: Holarctic.

New record for Turkey.

Proterops Wesmael, 1835

Proterops nigripennis Wesmael, 1835

Material examined: Trabzon-Maçka-Sümela, pasture, 1073 m, 03.07.2004, 1♂.

Distribution: Palearctic (Austria, Azerbaijan, Belgium, China, Czech Republic, former Czechoslovakia, Denmark, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Mongolia, Netherlands, Norway, Poland, Russia, Sweden, Switzerland, United Kingdom).

Chorotype: Asiatic-European.

New record for Turkey.

Pseudichneutes Belokobylskij, 1996

Pseudichneutes levis (Wesmael, 1835)

Material examined: Sivas-Cumhuriyet Üniversitesi, pasture, 1278 m, 13.06.2001, 1♀;

Tekirdağ-Ganos mountain, pine forest, 554 m, 17.05.1986, 1♂.

Distribution: Palearctic (Belgium, Finland, France, Germany, Hungary, Italy, Kazakhstan, Netherlands, Poland, Russia, Sweden, United Kingdom, Ukraine).

Chorotype: Asiatic-European.

New record for Turkey.

Subfamily Rhyssalinae Förster, 1862

Dolopsidea Hincks, 1944

Dolopsidea indagator (Haliday, 1836)

Material examined: Amasya-Çakallar, orchard, 780 m, 28.05.2002, 1♀.

Distribution: Palearctic (Armenia, Austria, Azarbaijan, Belgium, Bulgaria, former Czechoslovakia, Finland, France, Germany, Hungary, Ireland, Italy, Korea, Lithuania, Russia, Sweden, Switzerland, Ukraine, United Kingdom).

Chorotype: Asiatic-European.

New record for Turkey.

Dolopsidea tatianae (Telenga, 1941)

Material examined: Zonguldak-İlksu, mixed forest, 25 m, 08.06.2002, 1♀.

Distribution: Palearctic (Lithuania, Moldova, Russia).

Chorotype: Sibero-European.

New record for Turkey.

Subfamily Exothecinae Förster, 1862

Colastes Haliday, 1833

Colastes (Xenarcha) lustrator (Haliday, 1836)

Material examined: Kastamonu-Hanönü, pasture, 450 m, 06.09.2001, 1♂; -İlgaz Dağı, pasture, 2100 m, 30.08.2002, 1♀; **Ordu-Korgan-Belalan**, vegetable garden, 1040 m, 31.08.2003, 2♀♀.

Distribution: Palearctic (Austria, Belarus, Belgium, Bulgaria, former Czechoslovakia, Denmark, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Lithuania, Moldova, Netherlands, Poland, Russia, Spain, Sweden, Switzerland, United Kingdom).

Chorotype: Asiatic-European.

New record for Turkey.

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