SIX NEW HETEROPTERA (HEMIPTERA) SPECIES FOR THE FAUNA OF TURKEY WITH A NEW SYNONYMY

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ABSTRACT: In this study six Heteroptera species are reported for the first time from Turkey; *Dicyphus (Mesodiyphus) martinoi* Josifov, 1958; *Campylomma simillimum* Jakovlev, 1882; *Orthotylus (Melanotrichus) rubidus* (Puton 1874); *Orthotylus (Litocoris) ericetorum arboreae* Wagner, 1969; *Heegeria tangirica* (Saunders, 1877) and *Brachysteles parvicornis* (Costa, 1847). Additionally a new synonymy is proposed; *Orius (Heterorius) laticollis laticollis* (Reuter, 1884) = *Orius (Heterorius) laticollis discolor* (Reuter, 1884) syn. n. and a remarkable color form of *C. simillimum* is mentioned.

KEY WORDS: Heteroptera, new records, new synonymy, fauna, Turkey

Heteroptera Latreille, 1810 is a suborder of Hemiptera Linnaeus, 1758 which contains, according to the latest review of Henry (2009), 42,347 described species. This estimation is mainly based on the regional catalogs for North America (Henry & Froeschner; 1988), Australia (Cassis & Gross, 1995; 2002) and the Palearctic (Aukema & Rieger, 1995; 1996; 1999; 2001; 2006). Most of the true bugs are strictly herbivorous, carnivorous or hematophagous. Some of them also adapted to different types of habitats such as spider webs (as a part of commensal life), water surface, interior of water and intertidal zones (Schuh & Slater, 1995).

The family Miridae or plant bugs, represent the largest family in the Heteroptera, with more than 1300 genera and 10,040 species, or about 25% of the true bugs (Henry, 2009). They are currently separated into eight subfamilies (Schuh, 1995; Cassis & Gross, 1995; Cassis et al. 2006). The subfamily Bryocorinae are a mixed group comprising three tribes, with about 200 genera (Schuh & Slater, 1995). The tribe Dicyphini is represented by 5 genera and 21 species in Turkey (Önder et al. 2006). Many members of this tribe live on glandular-hairy plants where they prey on insects entrapped on the viscid surfaces of stems, leaves and flower clusters (Henry, 2009).

The family Alydidae was represented in Turkey by 7 species namely *Alydus calcaratus* (Linnaeus, 1753); *Camptopus bifasciatus* Fieber, 1864; *Camptopus illustris* Horvath, 1899; *Camptopus lateralis* (Germar, 1817); *Camptopus tragacanthae* Kolenati, 1845 (Önder et al. 2006); *Megalotomus ornaticeps* (Stål, 1858) and *Namausus sordidatus* (Stål, 1858) (Dursun et al. 2010). With this new record of *Heegeria tangirica* (Saunders, 1877), the number of Alydidae species recorded from Turkey increased to 8.

MATERIAL AND METHODS

The material examined in this study was collected between 2015 and 2016 from Istanbul and Karaman. The specimens of *D. martinoi* and *O. rubidus* were collected by the second author by using UV light trap. The specimens of *O. laticollis* were collected by sweeping the branches of a *Salix sp*. tree with a

sweeping net and the specimens of *C. simillimum* were collected by a light trap. The specimen of *H. tangirica* was collected while it was sitting on a rock in Izmir. The specimen of *B. parvicornis* and *O. ericetorum arboreae* were collected from a pitfall trap. The identifications of the specimens were mainly based on Pericart (1972), Wagner (1974-78), Konstantinov et al. (2016) and Falamarzi et al. (2009). *D. martinoi* was identified by Prof. Attilio Carapezza.

RESULTS

Family ALYDIDAE Amyot & Serville 1843
Subfamily ALYDINAE Amyot & Serville, 1843
Heegeria tangirica (Saunders, 1877) (Fig. 1A)

Material examined: **İzmir:** Çeşme, Ildırı (Erythrai), 24. VIII. 2016, 1 ♂, B. Çerçi leg. & det. **Muğla:** Bodrum, Gümüşlük, 29. VII. 2012, 1 (nymph), B. Çerçi leg. & det.

Comment: This species is very similar to *Alydus calcaratus* (Linnaeus, 1758) in the coloration and the patterns of the hemelytra but can be easily distinguished from it by the strongly thickened posterior femurs. *H. tangirica* distributes in Europe in Greece, Italy and Spain; in Africa in Egypt, Morocco, tropical Africa and in Asia in Israel, Oman, Yemen, Iran and Pakistan (Dolling, 2006). The first author has collected a male specimen on a rock in a path in Ildırı, Izmir. Its discovery in Turkey, particularly in Izmir is not surprising since it is already known from the neighbor country Greece (Dolling, 2006). Vivas & Burgers (2015) illustrated its nymphal stages.

Distribution in Turkey: İzmir, Muğla (This work).

Family ANTHOCORIDAE Fieber, 1836
Subfamily ANTHOCORINAE Van Duzee, 1916
Tribe ORIINI Carayon, 1958
Orius (Heterorius) laticollis laticollis (Reuter, 1884) (Fig. 1B-F)

Triphleps laticollis Reuter, 1884
Triphleps brevicollis Rey, 1888
Triphleps bernarddi Ribaut, 1937
Heterorius ossiannilssonii Wagner, 1952
Orius (Heterorius) laticollis discolor (Reuter, 1884) **syn. n.**
Orius (Heterorius) laticollis laticollis f. discolor (Reuter, 1884) **stat. n.**

Material examined: **Istanbul:** Esenyurt, 29. VI. 2015, 2♀♀ (*f. discolor*); 06. VIII. 2015, 1♀ (*f. discolor*); 04. VI. 2016; 2♂♂ 7♀♀ (*f. typica*); 18. VI. 2016, 1♀ (*f. discolor*); 27. VI. 2016, 3♂♂ 7♀♀ (*f. discolor*); 28. VI. 2016, 7♂♂ 9♀♀ (*f. discolor*); 28. VI. 2016, 3♂♂ (*f. typica*) 05. VII. 2016, 1♂ 1♀ (*f. discolor*); 05. VII. 2016, 2♀♀ (*f. typica*), B. Çerçi leg. and det.

This species can be easily distinguished from other species of the genus *Orius* by the strong sexual dimorphism of the pronotum and the very long flagellum of the paramere. It contains 2 subspecies, the nominative subspecies and the subspecies *discolor*. The latter subspecies does not show any differences from the nominative subspecies in the form of the paramere but it has uniformly pale orange coloration (sometimes the head and the pronotum is darker) in contrast to the nominative subspecies which is mostly dark colored in the head, pronotum and cuneus. The nominative subspecies distributes in Europe in all countries except Albania, Belarus, Latvia, Ukraine and Spain; in Middle East in Turkey (both European and Anatolian parts) and Syria; in east palearctic region in Siberia and Mongolia. The subspecies *discolor* distributes in Europe in Romania, Spain and Ukraine; in Crimea; in North Africa in Algeria, Morocco and Tunisia; in Caucasian region in Azerbaijan and Armenia; in Middle East in Israel and Iran; in east palaearctic region in Tajikistan, Turkmenistan and Uzbekistan. (Pericart,

1972; Aukema & Rieger, 1996; Ghahari et al. 2009). The distributions of these subspecies do not overlap in any place so it is logical to consider them as two different subspecies. But recently we have collected a series of *O. laticollis* specimens from a *Salix sp.* tree in Istanbul. It is interesting that some of the specimens collected are representing the nominative subspecies and at the other hand some of the specimens collected from the same tree in the same time are representing the subspecies *discolor*. It is easy to distinguish them from the nominative subspecies because they have a very pale coloration in contrast to the nominative subspecies. As it was mentioned before, the species ranges from Spain to Mongolia and we cannot be sure if both subspecies can also occur together in other places of their distribution but we can confirm that both subspecies can also be found together in Ankara based on the specimens in the collections of Museum of Natural History Prague. Because of the fact that both subspecies were collected from the same colony on the same tree, we conclude that the subspecies *discolor* is a junior synonym of the nominative subspecies and must be only considered as a color variation.

Redescription: Size: male: 2,2 mm female: 2,2-2,4 mm.

f. typica Reuter: Color, black. Head black, in intermediate specimens brownish orange or orange, 1,3x as wide as long. Antennae show sexual dimorphism, thin in female and thick in male, first, third and fourth antennal segments a little bit obscured, second antennal segment light yellow. Pronotum brown to black, covered with semi-erected white setae, 3x as wide as long, posterior margin strongly concave, with a strong sexual dimorphism, lateral margins very slightly concave in the middle (more clear in male and very bare in female), extensions of the lateral margins of female cross in the middle of the rostrum when the rostrum is straight between the antennae, those of male cross just in the apex of the head. Scutellum brown to black. Hemelytra smooth, immaculate and yellow, bearing dense white setae, parallel sided, cuneus yellow to black. Membran smooth and grayish. Legs totally pale, only the apex of the tarsi obscured a little bit. Abdomen dark brown to black.

f. discolor Reuter **stat. n.**: Color, orange. Head orange, sometimes a little bit darker. Antennae yellow, obscured a little bit in the first, second and fourth segments, sexual dimorphic as in *f. typica*. Pronotum totally orange, in some specimens middle of the posterior margin with a broad black pattern, sexual dimorphism strong as in *f. typica*, lateral margin very slightly concave in the middle in male. Scutellum totally orange or in some specimens with two little black patterns through the apex. Hemelytra orange to yellow, smooth and immaculate, unicolor or obscured to brown in the cuneus or totally clear with two black spots on the middle of the membrane margin of the cuneus, bearing dense clear setae. Membran smooth and brownish. Legs as in *f. typica*. Abdomen orange to brown.

Distribution in Turkey: Western, central and eastern Anatolian regions (Önder et al., 2006).

Subfamily LYCTOCORINAE Reuter, 1884
Tribe DUFOURIELLINI Van Duzee, 1916
Brachysteles parvicornis (Costa, 1847) (Fig. 2A)

Material examined: **Istanbul:** Esenyurt, 01. X. 2016, 1 male, B. Çerçi leg. & det.

This species was originally described from Italy. It is very similar to the rare *Cardiastethus nazarenus* but the head of the latter species is longer than wide while it is shorter in the first one. *B. parvicornis* distributes in Europe in Belgium, Croatia, Czechia, Denmark, France, Great Britain, Germany, Greece, Italy,

Luxembourg, Malta, Netherland, Poland, Spain, Switzerland, Ukraine and Serbia, in Africa in Algeria, Libya, Morocco and Tunisia, in Asia only in Syria where it needs a confirmation (Pericart, 1996). As it can be seen from the known distribution of this species, it is a common and widespread species. It is new for the fauna of Turkey.

Distribution in Turkey: Istanbul (This work).

Family MIRIDAE Hahn, 1833
Subfamily BRYOCORINAE Carvalho, 1957
Tribe DICYPHINI Carvalho, 1958
***Dicyphus (Mesodicyphus) martinoi* Josifov, 1958 (Fig. 2B)**

Material examined: **Karaman:** Merkez, 24. VI. 2015, 1 male, Ö. Koçak leg., A. Carapezza det.

This species was firstly described from Bulgaria based upon a single female and put in the subgenus *Brachyceraea* by the author of the original publication (Josifov, 1958). But later it was transferred to the subgenus *Mesodicyphus* by Wagner (1974-78) because of the fact that the vesica of the male lacks of spiculi. The biology of the species was unknown till now since it could not be found in the daylight by any researchers (Josifov & Simon, 2006). Unfortunately we also cannot add any new information to the biology of this species because we collected the only specimen with a UV light trap. It was already mentioned by Josifov & Simon (2006) that this species could only be collected by using UV light. They also mentioned that it is highly probable that this species also live in Asia Minor. Now we can confirm the suggestion of these authors and report this species from Anatolia for the first time.

Distribution in Turkey: Karaman (this work).

Subfamily PHYLINAE Douglas and Scott, 1865
Tribe PHYLINI Carvalho, 1958
***Campylomma simillimum* Jakovlev, 1882 (Fig. 2C)**

Material examined: **Izmir:** Urla, 11. VII. 2015, 1 male 2 females, B. Çerçi leg., B. Çerçi and F. Konstantinov det.

This species was firstly described by Jakovlev (1882) from Caucasian region of Russia (Dagestan, Petrovsk). Its host plant was indicated as *Populus sp*. by Jakovlev. Later it has been recorded from Bulgaria, Hungary, Iraq, Iran, Slovenia, Turkmenistan, Ukraine (Kerzhner & Josifov, 1999; Linnavuori & Modarres, 1999) and very recently from Crete (Heckmann, 2015). It is distinguished from other *Campylomma* species by the unique coloration of the second antennal segment. It is totally black in male and only the first half is black in female. This feature is enough to separate it from the closest two species *C. annulicorne* and *C. oertzenii* since the second antennal segment of *C. annulicorne* is largely clear and only in the very base black in female and that of *C. oertzenii* is totally black in female. Vesica of these three species also show some distinct differences; in *C. simillimum* the anterior blade of the vesica is only slightly shorter than the posterior blade, in *C. annulicorne* the anterior blade is obviously shorter than the posterior blade and in *C. oertzenii* the anterior blade is very short in contrast to the posterior blade (Konstantinov, 2016). After the examination of the male genitalia we are sure that the examined specimens are referring to *C. simillimum*. But the female specimens we collected from Izmir do not show the characteristic feature of this species. There are specimens which have largely clear second antennal segment (cf. Konstantinov, 2016 Fig. 4) but one of our specimen has a totally black second antennal segment while the other one has a black second antennal segment

bearing a yellow narrow ring at the very apex which represent a remarkable color form that should be mentioned. This color form can be easily confused with other species of the genus which have totally black second antennal segment in both sexes (C. *oertzenii*, *C. diversicorne* and *C. obscura*). It can be distinguished from *C. diversicorne* by the dark color of the abdomen (*C. diversicorne* has a pale abdomen), from *C. obscura* by the ocular index which is 1,8 in male and 2,1 in female (1,1 (male)- 2,1 (female) in *C. obscura*) and from *C. oertzenii* by the thick first two antennal segments of male (first two antennal segments of male are thin in *C. oertzenii*). This is the first record of this species from Turkey.
Distribution in Turkey: İzmir (this work).

Subfamily ORTHOTYLINAE Van Duzee, 1916
Tribe ORTHOTYLINI Van Duzee, 1916
***Orthotylus (Melanotrichus) rubidus* (Puton 1874) (Fig. 2D)**

Material examined: **Istanbul:** Beykoz, 26. VIII. 2016, 1 male, Ö. Koçak leg., B. Çerçi det.

This distinctive species is easy to recognize by its pink color. The combination of the pink color and white stiff hairs spread in groups on the hemelytra makes it easy to distinguish from all other *Orthotylus* species. It distributes in Europe in Austria, Bulgaria, France, Great Britain, Germany, Greece, Moldavia, Netherlands, Romania, Russia, Slovakia, Ukraine and in Asia in Azerbaijan, Iran, Kazakhstan, China, Mongolia, Turkmenistan and Uzbekistan (Kerzhner & Josifov, 1999; Linnavuori, 2007). It leaves on Chenopodiaceae (Linnavuori, 2007). It is known from the neighbor countries of Turkey so its discovery in Istanbul is not surprising.

***Orthotylus (Litocoris) ericetorum arboreae* Wagner, 1969 (Fig. 2E)**

Material examined: **Istanbul:** Esenyurt, 22. X. 2016, 1 female, B. Çerçi leg. & det.

The species belongs to the subgenus *Litocoris* Fieber, 1860 because of the combination of these characters: wings bearing only black dressed hairs, rostrum reaching or even passing the posterior coxae. This species is divided into 3 subspecies; *O. ericetorum ericetorum* (Fallen, 1807) , *O. e. corsicensis* Wagner, 1956 and *O. e. arboreae* Wagner, 1969. The nominative subspecies distributes from North and Central Europe to Portugal, Spain and Italy and Czech Republich in the south, subspecies *corsicensis* only in Corsica and Sardinia, subspecies *arboreae* in Algeria, Morocco and Greece (Linnavuori, 1992). The subspecies *arboreae* can be easily distinguished from the nominative subspecies by the lack of the orange coloration of the membrane-vein. It is orange-yellow in the nominative subspecies and gray-green in the subspecies *arboreae*. It is strictly associated with *Erica arborea*. This new record from Istanbul proves that this species besides its distribution in the West Mediterranean costs also widely distributes in the East Mediterranean costs.
Distribution in Turkey: Istanbul (this work).

DISCUSSION

In this study four new Miridae species, a new Alydidae species and a new Anthocoridae species for the fauna of Turkey are reported for the first time; *Dicyphus (Mesodiyphus) martinoi* Josifov, 1958; *Campylomma simillimum* Jakovlev, 1882; *Orthotylus (Melanotrichus) rubidus* (Puton 1874); *Orthotylus (Litocoris) ericetorum arboreae* Wagner, 1969; *Heegeria tangirica* (Saunders, 1877) and *Brachysteles parvicornis* (Costa, 1847). The phenology of the *D. martinoi* was formed under the conditions of the Middle Asian climate and its

occurrence in the middle of Anatolia was considered highly probable by Josifov & Simon (2006) because of the similarity of the climate of Middle Anatolia with Middle Asia. We just confirmed their thoughts with this record. *C. simillimum* and *O. rubidus* were already known from the neighbor countries of Turkey [e.g. Bulgaria, Iran and Greece] and these records from Izmir and Istanbul are not surprising. But the remarkable color form of *C. simillimum* is interesting and worth to be mentioned. Additionally a new synonymy is proposed. This synonym is based on the specimens examined from Ankara and Istanbul in Turkey. In the future more specimens must be examined from other localities in other countries to make the synonymy stronger because for now we do not have any idea if both subspecies can also be found together in other countries or not.

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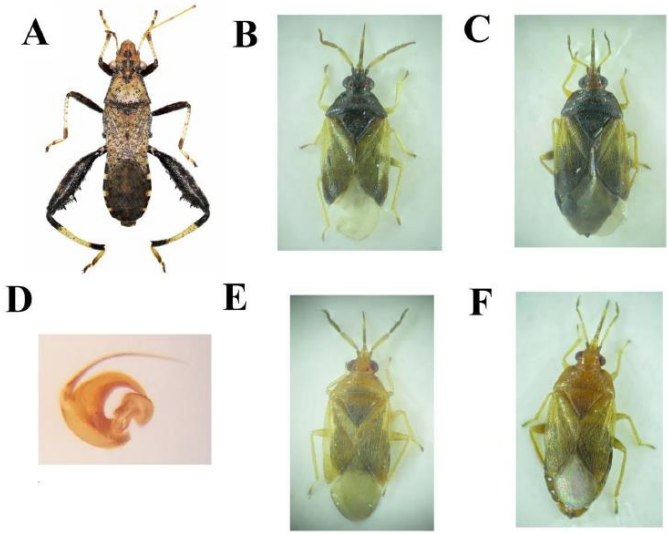

Figure 1A-F. **A,** *Heegeria tangirica* (Saunders, 1877), Izmir, male; **B**, *Orius (Heterorius) laticollis f. typica* (Reuter, 1884), Istanbul, male; **C**, *id.*, Istanbul, female; **D,** *id.* paramere; **E,** *Orius (Heterorius) laticollis f. discolor* (Reuter, 1884) **stat. n.**, Istanbul, male; **F**, *id.*, Istanbul.

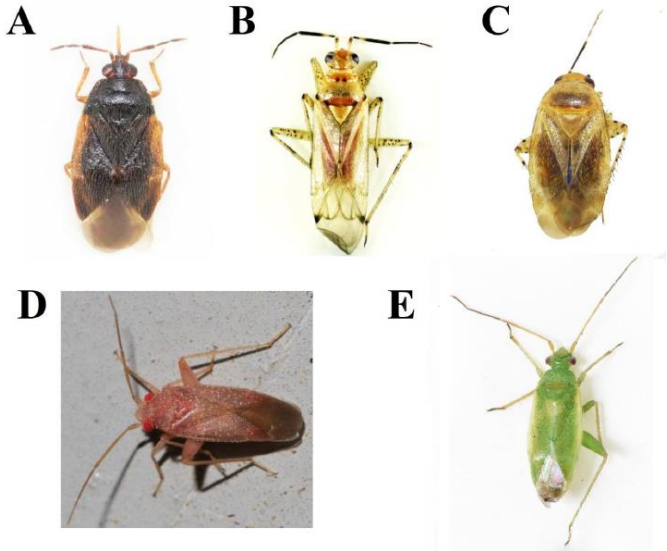

Figure 2A-E. **A,** *Brachysteles parvicornis* (Costa, 1847), Istanbul, male; **B**, *Dicyphus (Mesodicyphus) martinoi* Josifov, 1958, Karaman, male; **C,** *Campylomma simillimum* Jakovlev, 1882, Izmir, female; **D,** *Orthotylus (Melanotrichus) rubidus* (Puton, 1874), Istanbul, male; **E,** *Orthotylus (Litocoris) ericetorum arboreae* Wagner, 1969, Istanbul, female.