

Contribution to the knowledge of the Cydnidae (Hemiptera, Heteroptera, Pentatomodea) fauna of Turkey

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Abstract: This study is based upon material of the family Cydnidae collected from different localities in Turkey between 1980 and 2012. A total of 13 species of 7 genera belonging to 2 subfamilies, Cydninae and Sehrinae, of the family Cydnidae were recorded from Turkey. Among them, *Cydnus aterrimus* (Forster, 1771), *Macroscytus brunneus* (Fabricius, 1803), *Canthophorus dubius* (Scopoli, 1763), and *Tritomegas sexmaculatus* (Rambur, 1839) have been found to be the most abundant and widespread species. Separately, *Legnotus picipes* (Fallén, 1807) is a new record for the Turkish fauna. In addition, new localities are added for some species previously reported for Turkey.

Key words: Hemiptera, Heteroptera, Cydnidae, fauna, new record, Turkey

1. Introduction

Cydnidae or burrower bugs are mostly ground-living Pentatomomorpha (Lis, 2006). The group includes 89 genera and almost 700 known species in all regions of the world, but the majority can be found in warm to tropical areas of the Old World (Lis, 2013). All are phytophagous species, feeding on roots of plants, or are mycetophagous (Lis, 2006). Most of the Cydnidae are rather shiny, not dull; only Garsauriinae and some Sehirinae can be regarded as having a dorsally flat body, with rather strong legs bearing stout spines (particularly the front one, used to dig in soil). Male genitalia are symmetrical, and the female ovipositor is of the plate-like type. In the Palearctic region, there are 5 subfamilies and more than 37 genera (Lis, 1994, 1999, 2006; Pluot-Sigwalt and Lis, 2008). World revision of the group is due to Signoret (1881–1884); the American fauna was monographed by Froeschner (1960); the African fauna was studied by Linnavuori (1993); the Oriental fauna was studied by Lis (1994); and the Australian fauna was also studied by Lis (1996). The Palearctic catalogue was compiled by Lis (2006) and supplemented by Aukema et al. (2013).

Some faunistic studies on this family in Turkey have been made by Horváth (1901), Seidenstücker (1957), Sienkiewicz (1964), Linnavuori (1971), Protic (1988), Lis (1997), Kment and Jindra (2005), Magnien (1998, 2006), Hoberlandt (1956), Önder and Adigüzel (1979), Lodos and Önder (1980), Karsavuran (1988), Önder et al. (1992),

Lodos et al. (1998), Yıldırım et al. (1999), Gençer et al. (2004), Kıyak et al. (2004), Fent and Aktaç (2007, 2009), Öncül Abacıgil et al. (2010), Kıyak and Akar (2010), Matocq and Özgen (2010), and Fent (2010). Up to the present, 37 species and 15 genera belonging to Cydnidae have been recorded from Turkey (Lis, 2006; Önder et al., 2006).

The aim of this paper is to present new collection and biological data on Cydnidae in Turkey.

2. Materials and methods

The Cydnidae material was collected from different localities in Turkey between 1980 and 2012. The insect samples for this study were collected by sweeping plants with an insect net. Provinces where the specimens were collected are given in alphabetical order in the following list. The material is deposited in the Entomology Museum of Erzurum, Turkey (EMET). The male and female genitalia of *L. picipes* were dissected under a microscope, and their important morphological characters were examined.

3. Results

In this study, 13 species of 7 genera belonging to 2 subfamilies, Cydninae and Sehrinae, from the family Cydnidae were recorded from Turkey.

Superfamily Pentatomodea Leach, 1815

Family Cydnidae Billberg, 1820

Subfamily Cydninae Billberg, 1820

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Tribe Cydnini Billberg, 1820

Genus *Cydnus* Fabricius, 1803

Cydnus aterrimus (Forster, 1771)

Material examined: **Adana:** Tufanbeyli, 23.VII.2011, ♀; **Bursa:** Karacabey, 75 m, 18.VIII.2009, ♂; **Erzurum:** Köprüköy, Karataşlar, 1848 m, 16.VII.2011, ♀; **Iğdır:** Tuzluca, Menderes, 1100 m, 23.VI.2010, ♀; **Manisa:** Bağyurdu, 45 m, 4.VII.2011, ♂; **Mersin:** Anamur, 29.VIII.1994, ♂; **Osmaniye:** Kadirli, Kabayar, 14.VII.1997, ♂.

Distribution in Turkey: Black Sea region; Marmara region; Mediterranean region; western, central, and southeastern Anatolia regions (Önder et al., 2006).

Tribe Geotomini Wagner, 1963

Genus *Macrocytus* Fieber, 1860

Macrocytus brunneus (Fabricius, 1803)

Material examined: **Adana:** Kozan, 29.VII.1984, ♀; **Adıyaman:** Kâhta, Elbeyi, 650 m, 28.VI.2011, ♂, 4.IX.2011, ♂; **Antalya:** 24.VII.1984, ♀, Kepez, 112 m, 21.VI.2012, 2 ♀♀, 23.VI.2012, ♀, Odabaşı, 305 m, 9.IX.2012, ♂, Serik, 4.VI.1993, ♂, 11.VIII.1993, 2 ♀♀, 15.VIII.1995, ♂, 16.VIII.1993, ♀, 17.VIII.1995, ♀, 2 ♂♂, 22.VIII.1995, ♂; **Isparta:** Sütçüler, 4.VII.1990, ♂; **Gaziantep:** 20.VIII.1993, 2 ♀♀, 10.IX.1993, ♀, 3 ♂♂; **Hatay:** Erzin, 11.VIII.1995, ♂.

Distribution in Turkey: Adana, Antalya, Denizli, Diyarbakır, Gaziantep, and Hatay (Önder et al., 2006).

Subfamily *Sehrinae* Amyot and Serville, 1843

Tribe *Sehirini* Amyot and Serville, 1843

Genus *Canthophorus* Mulsant and Rey, 1866

Canthophorus dubius (Scopoli, 1763)

Material examined: **Antalya:** Serik, 11.VIII.1993, ♀; **Artvin:** Şavşat, 400 m, 16.VI.2010, ♀; **Bayburt:** Çalidere, 1700 m, 17.VI.2010, ♀; **Bursa:** 8.VIII.1984, ♀; **Erzincan:** Mercan, 1381 m, 10.VI.2010, ♀; **Erzurum:** Çiftlik, 1850 m, 15.VII.2009, ♀, Dutçu, 2000 m, 24.VII.2010, ♀, Palandöken, 2400 m, 23.VII.1996, ♂, Söğütlü, 1853 m, 25.VI.2010, 2 ♀♀, university field, 1850 m, 13.V.2009, ♂, 30.V.2007, ♀, 3.VII.2007, ♀, 22.VII.2009, ♀, 24.VII.2007, ♀, ♂, 27.VII.2010, ♀, 29.VII.2009, ♀, ♂, 3.VIII.2008, 3 ♀♀, 4 ♂♂, 4.VIII.2008, 2 ♀♀, 7.VIII.2008, ♀, 8.VIII.2008, 5 ♀♀, 5 ♂♂, 9.VIII.2008, ♀, 11.VIII.2008, ♂, Yarımca, 13.VI.2010, ♀, Aşkale, Adaçay, 11.VII.1990, ♀, Çat, Aşağı Çat, 1950 m, 6.VIII.2010, ♂, Çirişli, 1876 m, 23.VII.2011, ♀, ♂, Hıms, 1742 m, 2.VII.2010, ♂, İspir, Duruköy, 1419 m, 15.VII.2012, 2 ♀♀, Karayazı, Çatalören, 2365 m, 16.VII.2011, ♀, 2 ♂♂, Narman, Göllü, 1803 m, 30.VII.2011, ♂, Şehitler, 1884 m, 16.VII.2012, ♂, Pasinler, Büyüktuy, 1819 m, 17.VII.2011, ♂, Pazaryolu, 1639 m, 15.VII.2012, ♀, 3 ♂♂, Şenkaya, Timurkışla, 1314 m, 14.VII.2012, 2 ♀♀, Tortum, Aksukapı, 1648 m, 13.VII.2011, ♂; **Iğdır:** Tuzluca, 900 m, 16.VI.2009, ♀; **Kars:** Kağızman, 1.V.1989, ♂, 1750 m, 22.VI.2010, ♂, ♀, Sarıkamış, 1900 m, 13.VIII.2009, ♀; **Manisa:** Kırkağaç, Öveçli, 190 m, 30.IX.2011, ♀.

Distribution in Turkey: Erzurum (Yıldırım et al., 1999); Ağrı, Ankara, Bursa, Edirne, and Kırklareli (Önder et al., 2006); Ağrı, Ankara, Bursa, Edirne, and Kırklareli (Önder et al., 2006); İstanbul and Kırklareli (Fent and Aktaç, 2009).

Canthophorus melanopterus (Herrich-Schäffer, 1835)

Material examined: **Erzurum:** 3.VIII.2012, ♀, 8.VIII.1985, ♂, Çiftlik, 1850 m, 15.VII.2009, ♀, university field, 1850 m, 17.VII.1996, ♂, Aziziye, Dallıkavak Pass, 2243 m, 24.VII.2011, ♂, Karayazı, Çatalören, 2365 m, 16.VII.2011, ♀, Narman, Şehitler, 1884 m, 16.VII.2012, ♂, Pasinler, Rabat, 2400 m, 11.VII.1996, ♂, Pazaryolu, 1639 m, 15.VII.2012, 2 ♀♀.

Distribution in Turkey: Aegean region; Black Sea region; Marmara region; Mediterranean region; central, eastern, and southeastern Anatolia regions (Önder et al., 2006).

Canthophorus maculipes (Mulsant and Rey, 1852)

Material examined: **Artvin:** Yusufeli, Darıca, 500 m, 16.VI.2010, ♀, 2 ♂♂, Sebzeçiler, 2 ♀♀, 3 ♂♂; **Erzurum:** 30.V.1982, ♀, Aşkale, Gökçebük, 1699 m, ♂, Oltu, Aksuyayla, 2250 m, 14.VII.1996, ♂, Tortum, Aksukapı, 1648 m, 13.VII.2011, ♀, 2 ♂♂, Uzundere, Çağlayanlı, 985 m, 7.VI.2012, 4 ♀♀, ♂, Şelale, 1000 m, 9.VI.1996, ♀; **Kars:** Kağızman, 1.V.1969, 2 ♂♂, Sarıkamış, Akkurt, 1650 m, 13.VIII.2009, 2 ♂♂, Karakurt, 1500 m, 22.VI.2010, 4 ♀♀.

Distribution in Turkey: Konya (Önder et al., 2006).

Genus *Legnotus* Schiödte, 1848

Legnotus picipes (Fallén, 1807)

Material examined: **Erzurum:** Aşkale, Çayköy, 1691 m, 1.VIII.2010, ♂, Küçükgeçit, 1709 m, 23.VII.2011, 4 ♀♀, 11 ♂♂, Pasinler, Ügümü, 1724 m, 17.VII.2011, ♂, Sansaderesi, 1877 m, 17.VII.2011, ♂, Yiğitpinarı, 1839 m, 22.VII.2012, 2 ♀♀ (Figure 1).

This species is a new record for the Turkish fauna.

Distribution in Palearctic region: EUROPE: Albania, Austria, Belgium, Bosnia Herzegovina, Bulgaria?, Belarus, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Kazakhstan (European part), Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Moldavia, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia (Central European Territory, South European Territory), Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine; NORTH AFRICA: Morocco; ASIA: Azerbaijan, China (Northern Territory, Northwestern Territory), Iran, Kazakhstan (Asian part), Kyrgyzstan, Mongolia, Russia (East Siberia, West Siberia), Tajikistan, Uzbekistan (Halaszfy, 1953; Lis, 1999, 2006; Protić, 2001; Coulianos, 2005; Spungis, 2005; Rieger, 2007; Smith, 2007; Ghahari et al., 2009; Aukema et al., 2013).

Description of the studied specimens: Body small, elliptical, shiny black; head subquadrate; anterior to the



Figure 1. Map of distribution of *Legnotus picipes* (Fallén, 1807) in Turkey (new records in yellow).

middle portion of the head slightly hollow; eyes prominent; the clypeus extends up to the end of the portion of the head at the level of the anterior upper part of the eyes; antenna brown, 5-segmented, length 3 mm, the first and second segments of equal length, third segment 2/3 as long as the fourth; corium at the base edged narrowly with a pale color that extends only halfway down the edges of the wings, clypeus not or barely shorter than *paraclypei* (Figure 2A); coxa, femora, and tarsi segments pale brown; pygophore with dorsal margin a broad median ridge passing down on each side round the base of the proctiger, ventral margin gently concave with an inferior ridge and corners with 2 strong setae (Figure 2B); paramere sickle-shaped, small, stem long and numerous thin hairs on apical margin (Figure 2C); in female eighth paratergites continuous above the anus; the dorsal representing the median section of the eighth paratergites (Figure 2D); length of females 3 mm, males 4 mm.

Distinguished from the very similar *L. limbosus* by the lesser extent of the white edging on the wing cases, the smaller size, and the fact that the clypeus is planar with respect to the rest of the head at the front (Magnien, 1998; Smith, 2007).

Genus *Ochetostethus* Fieber, 1860

Ochetostethus opacus (Scholtz, 1847)

Material examined: **Erzurum:** Aşkale, Küçükgeçit, 1709 m, 23.VII.2011, 2 ♀♀, 5 ♂♂, Horasan, Dalbaşı, 1577 m, 22.VI.2012, 3 ♀♀, İspir, Akseki, 2190 m, 20.VII.2011, ♀, Kirazlı, 1207 m, 24.VII.2011, ♀, 4 ♂♂, Narman, İncedere, 1987 m, 21.VII.2010, 4 ♀♀, 4 ♂♂, Oltu, 1750 m, 3.VIII.2009, 2 ♀♀, Olur, Köprübaşı, 973 m, 30.VII.2011,

♂, Pazaryolu, Kümbettepe, 1427 m, 24.VII.2011, ♀, Şenkaya, Penek, 1145 m, 31.VII.2011, ♀, Uzundere, 1147 m, 7.VIII.2011, ♀.

Distribution in Turkey: Önder et al. (2006) and Fent and Aktaş (2009) recorded this species from Adana, Antalya, Çorum, Edirne, Gaziantep, İzmir, Kahramanmaraş, Karaman, Kayseri, Konya, Manisa, Mersin, Osmaniye, and Tekirdağ as *Ochetostethus nanus* (Herrich-Schäffer, 1834). However, *O. nanus* does not occur in Turkey; it is distributed only in the southwestern parts of the Mediterranean area, i.e. in Belgium, France, Portugal, Spain (Lis, 2006). Thus, old records of *O. nanus* from Turkey represent mostly *O. opacus*.

Genus *Sehirus* Amyot and Serville, 1843

Sehirus dissimilis Horváth, 1919

Material examined: **Ardahan:** 20.V.1992, ♂; **Erzurum:** university field, 1850 m, 15.V.2010, ♀, 17.V.1980, ♂, Tekman, Körsu, 1987 m, 17.VI.2012, ♀; **İstanbul:** Bayrampaşa, 77 m, 10.VIII.2012, ♂.

Distribution in Turkey: Kahramanmaraş and Sinop (Önder et al., 2006; Fent, 2010).

Sehirus luctuosus Mulsant and Rey, 1866

Material examined: **Erzurum:** university field, 1850 m, 8.VIII.2008, ♂, Aşkale, Atlıkönak, 1760 m, 5.VII.2012, ♀, ♂; **Kars:** Sarıkamış, 1900 m, 13.VIII.2009, ♂.

Distribution in Turkey: Bursa, Kars, and Kayseri (Önder et al., 2006).

Sehirus morio (Linnaeus, 1761)

Material examined: **Erzurum:** Aşkale, Çayköy, 1876 m, 23.VII.2011, ♂, İspir, Akseki, 2190 m, 20.VII.2011, ♂, Kirazlı, 1207 m, 24.VII.2011, ♀, Narman, İncedere, Kireçli

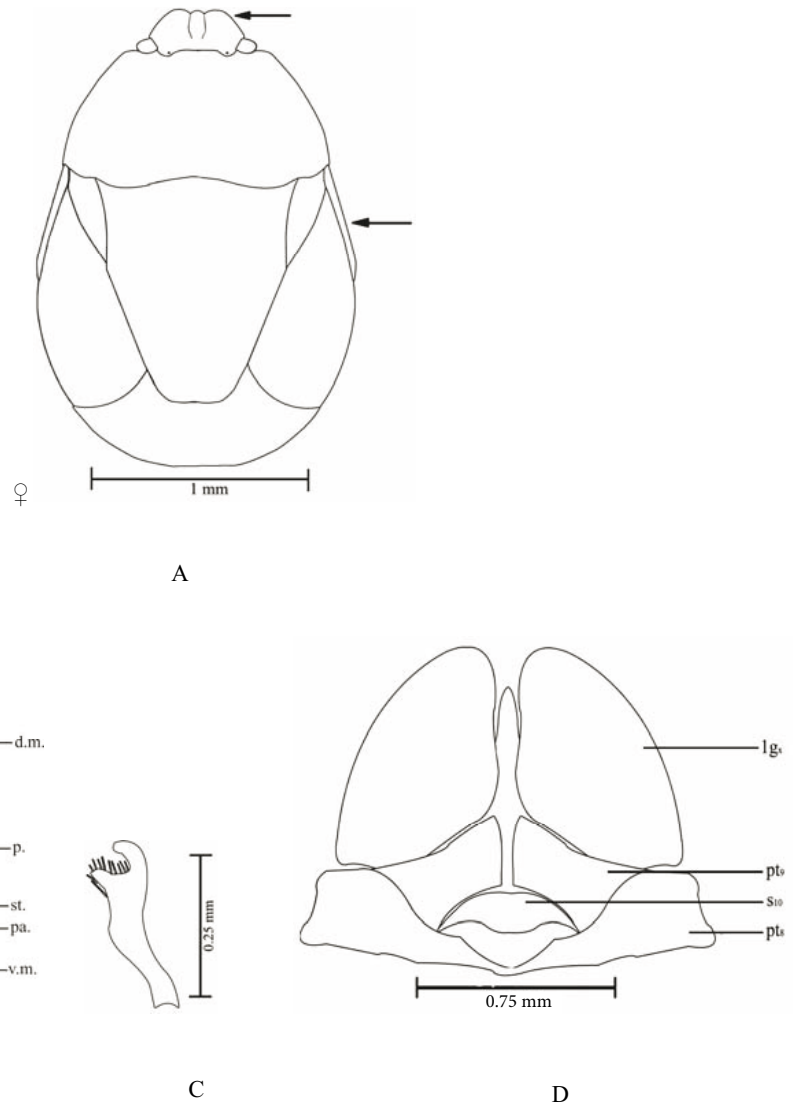


Figure 2. *Legnotus picipes* (Fallén, 1807): **A-** dorsal view, **B-** pygophore (dorsal view), **C-** paramere (lateral view), **D-** female genitalia (d.m. [dorsal margin], p. [proctiger], v.m. [ventral margin], st. [setae], pa [paramere], lg_x [first gonocoxa], pt₉ [paratergite 9], pt₈ [paratergite 8], s₁₀ [sternum 10]).

Pass, Demirdağ, 1987 m, 21.VII.2010, ♀, Pazaryolu, 1495 m, 24.VII.2011, ♀, Kümbettepe, 1427 m, 2 ♀♀, ♂, Tortum, Çağlayanlı, 985 m, 27.V.2011, ♀.

Distribution in Turkey: Afyonkarahisar, Ankara, Bolu, Kastamonu, and Mersin (Önder et al., 2006).

Sehirus robustus Horváth, 1895

Material examined: **Erzurum:** Güngörmez, Dumlubaba, 2000 m, 19.VIII.2009, ♀, Pasinler, 1600 m, 8.VII.2009, ♂, Pazaryolu, 1510 m, 22.VI.2011, ♂, Tortum, 1653 m, 15.VI.2010, ♀.

Distribution in Turkey: Kars and Kayseri (Önder et al., 2006).

Genus ***Tritomegas*** Amyot and Serville, 1843

Tritomegas bicolor (Linnaeus, 1758)

Material examined: **Erzincan:** Mercan, 1381 m, 10.VI.2010, ♂; **Erzurum:** İspir, Madenköprübaşı, 1256 m, 22.VI.2011, ♀.

Distribution in Turkey: Ankara and Antalya (Önder et al., 2006); Edirne and İstanbul (Fent and Aktaş, 2009); Ankara (Kiyak and Akar, 2010).

Tritomegas sexmaculatus (Rambur, 1839)

Material examined: **Ardahan:** Çetinsu, 1853 m, 19.VIII.2012, ♀, Çıldır, Kaşlıkaya, 1800 m, 2.IX.2012, ♀, Kotanlı, 1960 m, 2.IX.2012, 2 ♀♀, ♂, Meryem, 1980 m, 2.IX.2012, 3 ♀♀, 2 ♂♂, Posof, Akballı, 1766 m, 25.VIII.2012, ♀, Aşık Zülali, 1714 m, 25.VIII.2012, ♀; **Erzurum:** Pazaryolu, Kumaşkaya, 1800 m, 20.VII.2011, ♀, Tortum, Aksukapı, 1648 m, 13.VII.2011, ♀, Uzundere,

Altınçanak, 1048 m, 7.VIII.2011, ♂; **İstanbul:** Bakırköy, 90 m, 15.VII.2009, ♂; **Mersin:** Anamur, 18.X.1990, ♀; **Samsun:** Havza, Kamlık, 500 m, 14.IX.2011, ♂.

Distribution in Turkey: Bursa (Gençer et al., 2004); western, central, and southeastern Anatolia regions (Önder et al., 2006); Edirne, İstanbul, Kırklareli, and Tekirdağ (Fent and Aktaç, 2009).

4. Discussion

As a result of the present study, 13 species of 7 genera of Cydnidae were recorded from Turkey. *Legnotus picipes* (Fallen, 1807) is new for the Turkish fauna, and some new localities were added to its known distribution area. All the recorded species are phytophagous. With the recent investigation of the geographical distribution of the species mentioned above, they can now be divided into the following groups: *Cydnus aterrimus* (Forster, 1771) is distributed in the Palearctic region, Indo-Australian region, Ethiopian region (introduced), and Nearctic region (introduced); *Macroscytus brunneus* (Fabricius, 1803) is distributed in the Palearctic region and Ethiopian region; and *Canthophorus melanopterus* (Herrich-Schäffer, 1835), *C. dubius* (Scopoli, 1763), *C. maculipes* (Mulsant and Rey, 1852), *Legnotus picipes* (Fallén, 1807), *Ochetostethus opacus* (Scholtz, 1847), *Sehirus dissimilis* Horváth, 1919, *S. luctuosus* Mulsant and Rey,

1866, *S. morio* (Linnaeus, 1761), *S. robustus* Horváth, 1895, *Tritomegas bicolor* (Linnaeus, 1758), and *T. sexmaculatus* (Rambur, 1839) are distributed in the Palearctic region. Separately, the type localities of *S. dissimilis* are located in Turkey, and this species is distributed in Turkey and Iran. Among them, *C. aterrimus*, *M. brunneus*, *C. dubius*, and *T. sexmaculatus* have been found to be the most abundant and widespread species. Our collections also give information on the regional distribution of these species (many new localities are mentioned); we particularly focused our attention on the region of Erzurum, where we found 9 species not mentioned previously (Önder et al., 2006).

As a result of the current study, the total number of species recorded from Turkey is raised to 38, belonging to 15 genera from Cydnidae, and our knowledge of the distribution of previously known species has broadened. However, supplementary studies are necessary to better know the composition of the Turkish fauna of Cydnidae and monitor the expansion of these potential predators of agriculture.

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