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Research Article

Morphological diagnosis information about some rare Heteroptera (Hemiptera) species in Türkiye

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ABSTRACT: This study is based on specimens of species that were collected by light trap in Diyarbakır Province, located in the Eastern Anatolia Region of Turkey, and which are rarely known in Anatolia.

7 species (*Acrosternum breviceps* (Jakovlev, 1889), *Mecidea lindbergi* Wagner, 1954, *Lethaeus nitidus* (Douglas & Scott, 1868), *Megalonotus maximus* (Puton, 1895), *Peritrechus flavicornis* Jakovlev, 1877, *Ectomocoris caucasicus* Linnavuori, 1972 and *Reduvius ciliatus* Jakovlev, 1879) specimens were examined and diagnostic photographs of their general morphology and male genitalia were presented.

KEY WORDS: Heteroptera, rare species, morphology, Türkiye.

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INTRODUCTION

Türkiye, especially Anatolia (the Asian part of Türkiye), is very rich in terms of living diversity and Heteroptera species diversity. With the latest studies conducted in Türkiye, it is estimated that there are 1645 species belonging to Heteroptera (Çerçi & Koçak, 2023). Of these, the type localities of 237 species are in Anatolia and 107 species and 4 subspecies are endemic to Türkiye (Dursun & Fent, 2017).

In various studies conducted on the Heteroptera fauna in Türkiye some species that are rarely distributed both in the Palearctic Region and the country were also obtained. In the study conducted with a light trap in Diyarbakır Province, located in the east of Türkiye, some species with rare distribution were detected (Fent et al., 2022). In this study are given general morphological and male genitalia photographs and descriptions of these little-known species detected by Fent et al. (2022) and it is aimed to assist the researchers who will work on this subject in identification.

MATERIALS AND METHODS

In this study, samples of a total of 7 species from the Pentatomidae, Reduviidae and Rhyparochoromidae families were studied. General morphologies of the species and paramers obtained from male specimens were photographed. Distinctive features of the species were defined and their distribution in Türkiye and Palaearctic were given.

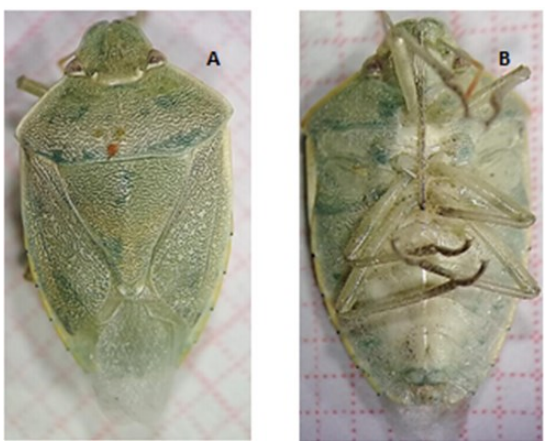

Figure 1. *Acrosternum breviceps* (Jakovlev, 1889); **A.** Dorsal view, **B.** Ventral view.

RESULTS AND DISCUSSION

Family Pentatomidae Leach, 1815

Acrosternum breviceps (Jakovlev, 1889) (Figure 1)

Distribution in Türkiye: Asian Türkiye: Adıyaman, Şanlıurfa (Gözüaçık et al., 2011); Diyarbakır (Önder et al., 1995; Gözüaçık et al., 2011; Matocq et al., 2014; Fent et al., 2022); Mersin (Yazıcı et al., 2014).

Distribution in Palaearctic: Asia: Afghanistan, Armenia, Asian Türkiye, Azerbaijan, Georgia, Iran, Iraq, Kirgizia, Kuwait, Saudi Arabia, Tadzhikistan, Turkmenistan, Uzbekistan (Aukema, 2020).

Diagnosis: (Fig. 1) The body completely green and with black and the same color as the ground punctures. Thylus surrounded the front of the gena. The first two segments of the antennas green, III. segment proximally green, distally reddish, IV and V. segments brownish. The distal part of the lateral edge of the pronotum straight, and the proximal edge rounded. Corium and clavus green, the base of exocorium yellowish green. Connexivum green, lateral distal edge with small black spots. Membranes translucent, whitish. The rostrum extends to the middle of the hind coxae. Legs green, distal of tibiae and tarsi darkened. Length: 12-13 mm.

The most important feature that distinguishes *Acrosternum brevicep* from other *Acrosternum* species is that the thylus cover the front of the gena, in other species the distal part of the thylus is free.

Mecidea lindbergi Wagner, 1954

Distribution in Türkiye: Asian Türkiye: Siirt (central province) (Özgen

& Çerçi, 2018); Diyarbakır (Fent et al., 2022).

Distribution in Palaearctic: Europe: Belgium, Crete, France, Great Britain (migrant), Greece, Italy, Portugal, Romania, Spain. **North Africa:** Algeria, Canary Islands, Egypt? Morocco, Tunisia. **Asia:** Afghanistan, Asian Türkiye, Iran, Iraq, Israel, Jordan, Saudi Arabia, Sinai, Syria, Turkmenistan, Yemen.

Extralimital: Burkina Fasso, Cape Verde Island (Aukema, 2020).

Diagnosis: (Fig. 2) Very slim and long body. Body pale yellow color pale yellow color, with large punctures same as ground. Head equilateral triangle shaped, slightly diverging distally. Antennae reddish green, the second segment 1.6 times (male) and 2.8 times (female) longer than the third (Fig. 2C, D). The lateral edge of the pronotum is straight distally and curved in the middle. The middle of the pronotum and scutellum flattened along a line.

Membranes translucent, whitish. Rostrum pale yellow, distally darkened, extending beyond the middle coxa (Fig. 2A). Legs are pale yellow, sometimes the distal femurs and tibias and the first tarsal segment are reddish. Length: 11,3 -12,2 mm.

Mecidea lindbergi differs from *Mecidia pallidissima* in that its body is larger (*M. lindbergi* size: 11.5-12 mm, *M. pallidissiama* size: 7-10.7 mm); The ratio of the second and third segments of the antenna to each other (in *M. lindbergi*, the second segment is 1.6 times (male) and 2.8 times (female) longer than the third, in *M. pallidissima*, the second segment is 0.4-0.7 (male) and 1.38-2.0 (female) times the length longer than the third.

Family Rhyparochromidae Amyot & Serville, 1843

***Lethaeus nitidus* (Douglas & Scott, 1868)**

Distribution in Türkiye: Asian Türkiye: Hatay (Akbez) (Puton & Noualhier, 1895); Hatay (Antakya), Adana, Kahraman-maraş (Pazarcık) (Péricart, 1999b); Diyarbakır (Fent et al., 2022).

Distribution in Palaearctic: Europe: Bulgaria, Crete, Greece. Asia: Asian Türkiye, Cyprus, Israel, Jordan, Lebanon, Syria (Aukema, 2020).

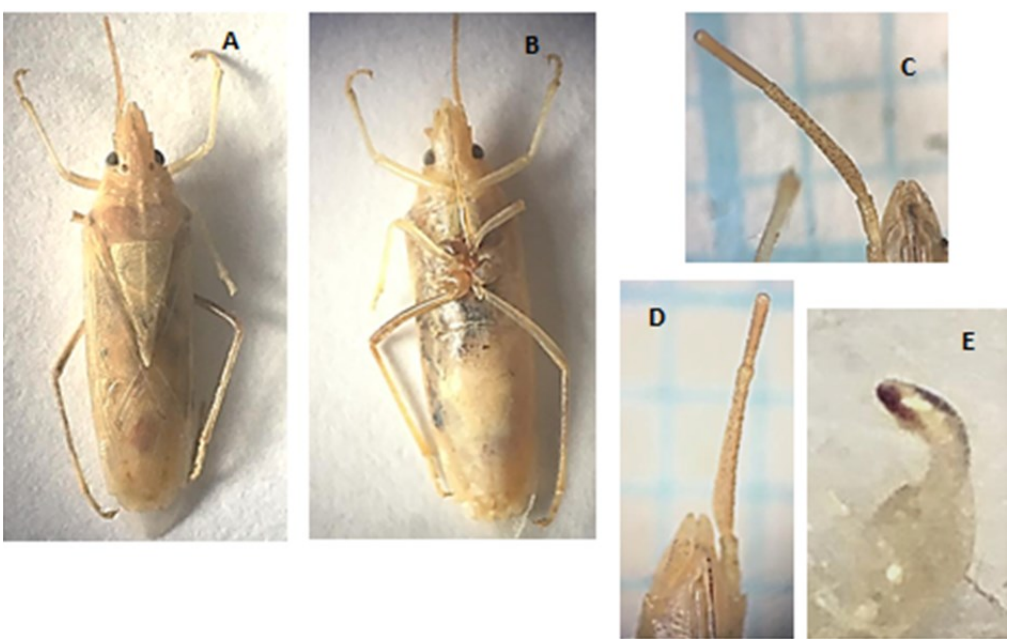

Figure 2. *Mecidea lindbergi* Wagner, 1954; **A.** Dorsal view, **B.** Ventral view, **C.** Antennae (male), **D.** Antennae (female), **E.** Paramere.

Diagnosis: (Fig. 3) Only macropter forms are known. Oblong oval, shiny, subglabrous, covered above with a rather coarse and tight puncture, finer on the head and the front of the pronotum; head and thorax mostly black-brown to black. Hemelytra and abdomen reddish brown or dark mahogany, antennae and legs yellowish. Head densely punctuated, black except the clypeus which is mahogany behind and yellowish in front; eyes almost touching the anterior edge of the prothorax; forehead 3.8-4.8 times as wide as the eyes seen from above; Antenniferous tubercles slightly visible from above. Antennae 0.5 times as long as the body, article I exceeding the clypeus by half its length, article II quite slender, 0.9 times as long as diatone and 1.25-1.35 times as long as III; IV equal to III. Rostrum reaching the anterior edge of the metacoxae. Pronotum 1.4-1.68 times as wide as long, weakly trapeziform often dark mahogany on the posterior field; lateral edges arched, especially in the anterior half, lateral keels yellow-brown, integument almost smooth in the middle of the anterior field. Hemelytra, reaching or almost the apex of the abdomen; costal blades yellow-brown; clavus bearing 4 rows of points, the 2 posterior ones separated by a small side; membranes translucent, whitish. Legs light brownish yellow; slightly swollen profemurs, armed in front with 2 spiniform setae and one or two denticles in the anterior part; tibias bearing rows of pale spines generally longer than their diameter. Length: 5,5 mm (Péricart, 1999a).

Lethaeus nitidus can only be confused with *Lethaeus lethierryi* because both species are similar in size and smaller than other species in the genus.

However, *L. nitidus* is shiny black-brown and roughly punctuated, whereas *L. lethierryi* is a mat and the punctuation is thin (Péricart, 1999a).

Distribution in Türkiye: Asian Türkiye: Hatay (Akbez), **(**Puton & Noualhier,1895), Ankara (central province), Konya (central province) (Lodos *et al.*,1999); Bingöl, Kahramanmaraş (Pazarcık), Şanlıurfa (Çaylarbaşı) (Péricart, 1999b); Siirt (central province) (Matocq & Özgen, 2010); Diyarbakır (Fent et al., 2022).

Distribution in Palaearctic: Asia: Asian Türkiye, Armenia, Cyprus, Iraq, Israel, Jordan, Syria (Aukema, 2020).

Diagnosis. (Fig. 4) Elongated oval, mat, black, the antennae and legs entirely yellow-brown or yellow.

Figure 3. *Lethaeus nitidus* (Douglas & Scott, 1868); **A.** Dorsal view, **B.** Ventral view.

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Head as long as it is broad, clypeus yellow-brown, (Fig. 4D) eyes touching or almost the pronotum. Antennae 0.5 times as long as the body; article I exceeds the clypeus by half its length; article II, 0.95-1.05 times as long as the diatone and 1.15-1.2 times as long as Ill; article IV as long as II. Rostrum extending to mesocoxae, (Fig. 4C). Pronotum 1.3 times as wide as long, trapeziform. The anterior part of the pronotum black, the posterior part brownish, space punctuation barely larger than that of the anterior field. Very light, clear, applied dorsal pubescence. Laterally barely sinuous behind the middle, clearly bordered by a narrow brownish border. The anterior part of the scutellum black, posterior part brownish. Hemelytra yellow, anal edge brownish, membrane whitish.

Armament of the ventral face of the profemurs comprises a row of 8-12 spinules then a big sharp spine, then 3-5 spinules in the most distal part; the large spine is located slightly out of alignment which thus appears sinuous (Fig. 4F); in addition, a second row of 2-3 spinules near the distal end. Non-arched protibia; meso- and metatibias furnished with rows of dark spiniform bristles, as long as their diameter. Length: 8,1 mm (Péricart, 1999b).

The most distinctive feature that distinguishes *Megolonotus maximus* from other *Megalonotus* species is its size (8 mm and above). Apart from this, the proximal half of the pronotum and scutellum are brownish (completely black in other species), the antennae and legs are completely yellow, the spines on the

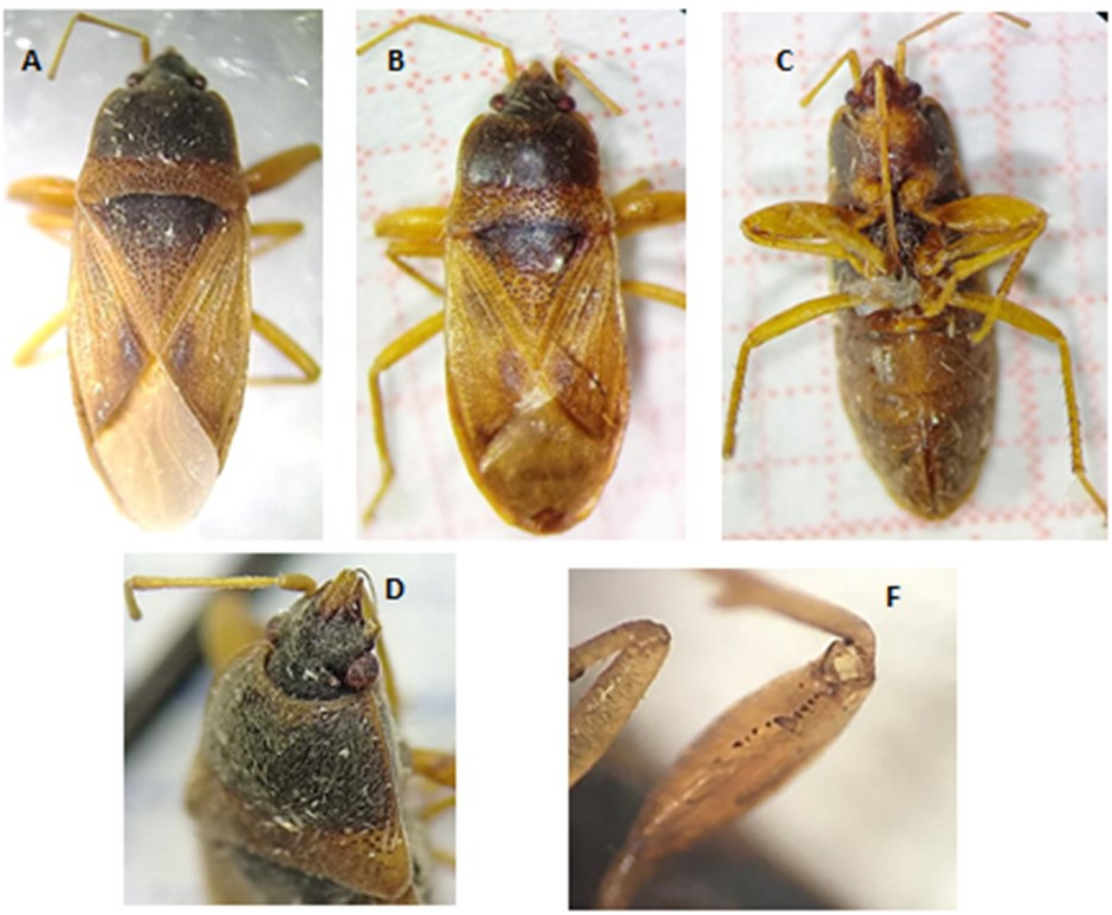

Figure 4. *Megalonotus maximus* (Puton, 1895); **A-B.** Dorsal view, **C.** Ventral view, **D.** Head (clypeus), **E.** Profemur.

profemur and the paramer (could not be evaluated because we do not have a male sample).

***Peritrechus flavicornis* Jakovlev, 1877**

Distribution in Türkiye: Asian Türkiye: Adana (Karataş) (Hoberlandt, 1956); Hatay (Altınözü) (Lodos et al., 1999); Siirt (central province) (Matocq & Özgen, 2010); Diyarbakır (Fent et al., 2022).

Distribution in Palaearctic: Europe: Russia (South European Territory). **Asia:** Asian Türkiye, Caucasus, Iran, Saudi Arabia, Uzbekistan (Aukema, 2020).

Diagnosis. (Fig. 5) Head dark brown, brilliant, finely punctuated, with light silvery-white pubcsence, proximal margin and apex of the clypeus reddish. Rostrum and legs yellow, antennae light, very light brown to dirty yellow, first segment brownish with lightened apex, or yellowish browned in the middle, and last segment brownish or yellowish. Pronotum and hernelytra bearing fine grayish reclining pubescence. Pronotum trapeziform, 1.7-1.75 times as wide at the top as it is long along its median, anterior part brown, posterior part and anterior margin (back of the head) yellow, posterior angles brownish, finely punctuated with brownish except lateral edges. Lateral edges slightly arched in front of the posterior angles; lateral margins narrow, and lateral keels dark in front, and yellowish behind. Hemelytra with parallel external edges: grey, pale yellowish or whitish yellow and with a brownish pattern in the anal edge and a brownish spot in the distal edge. Clavus often a fairly whitish plaque contrasting near its anterior edge and another near its posterior region. Membranes clear, and semi-transparent with some brownish spots or bands between the veins. The abdomen and connexivum completely black. Length: 4-4.9 mm (Péricart, 1999b).

The species most similar to *Peritrechus flavicornis* is *Peritrechus meridionalis*. However, in *P. flavicornis*, the legs are completely yellow, whereas in *P. meridionalis*, the femurs are light brown.

Family Reduviidae Latreille, 1807

***Ectomocoris caucasicus* Linnavuori, 1972**

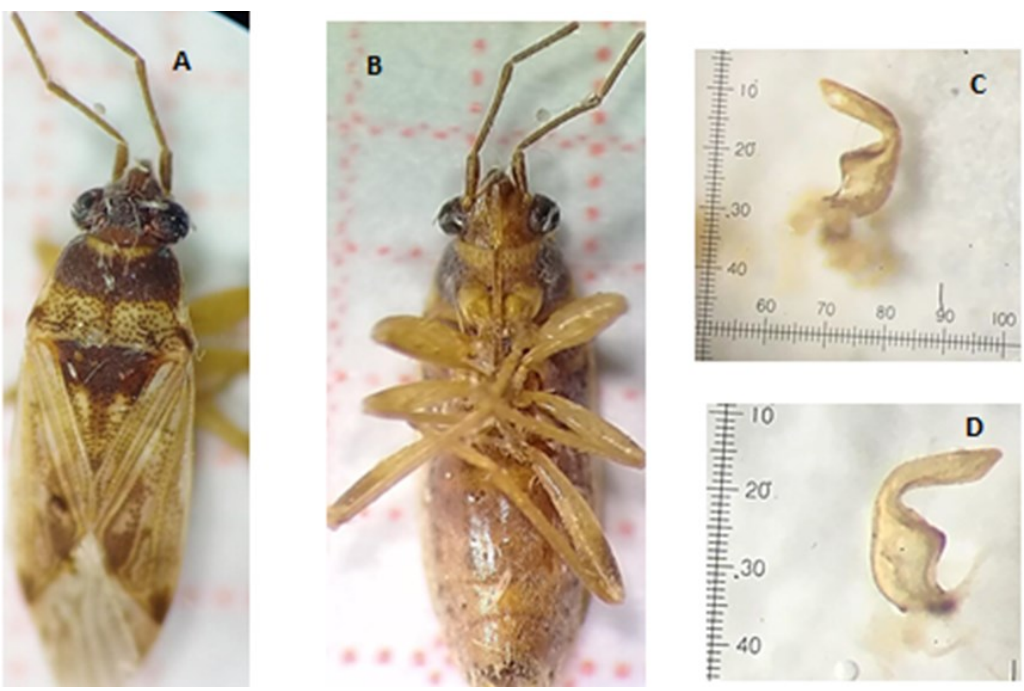

Figure 5. *Peritrechus flavicornis* Jakovlev, 1877; **A.** Dorsal view, **B.** Ventral view, **C-D.** Paramere.

Distribution in Türkiye: Asian Türkiye: Adıyaman (Kahta, Elbeyi), (Yıldırım et al., 2013); Şanlıurfa (Tülmen) (Dursun & Fent, 2015); Diyarbakır (Fent et al., 2022).

Distribution in Palaearctic: Europe: Russia (South European Territory). **Asia:** Asian Türkiye, Armenia, Azerbaijan, Georgia, Iran, Iraq (Aukema, 2020).

Diagnosis: (Fig. 6) The general coloring dark brown to blackish. Head with a deep transverse furrow behind the eyes, convex behind; a short, less deep median furrow between the eyes; anterior lobe (eyes included) triangular, posterior lobe short no higher than the anterior, ending in a collar ring posteriorly; eyes prominent, acute ventrally; strong eyespots. Head, pronotum and scutellum covered with short white hairs and much longer golden brown hairs. The first segment of the antenna dark brown, and the other segments lighter brown. Black pronotum with very deep transverse furrow; anterior lobe with a medial furrow in a medio-posterior depression; anterior margin markedly concave, anterior angles obtuse, lateral margins with long brown setae; posterior lobe 0.4-0.5 times as long as the anterior, decorated behind with 3 mouse nipples; posterior margin regularly convex. Scutellum black, posterior half of lateral edges with a soft keel; these lateral keels united medially; globose apex. Legs of the ground clue, of the same structure as the other species of the genus; black profemurs; fossula spongiosa occupying 54-60% of the length of the protibia and 34-44% of the mesotibia, the latter decorated with a range of golden setae densely implanted at the apex of their upper surface. Chocolate brown cories decorated with a yellowish-white spot against the clavus which is slightly darkened. Membrane of the same color as the coria (sometimes slightly lighter or darker); inner apical cell decorated with a yellowish-white spot extending beyond the vein Cu; outer apical cell decorated with a velvety black spot but sometimes (dark examples) the entire membrane black. Hemelytra reaching or very slightly exceeding the apex of the abdomen. Back of the abdomen and connexivum of the ground color.

Rostrum brown to blackish, articles I and II of diameter II much finer. Ventral side of the general color. Length: 17.5 mm (Putshkov & Moulet, 2009).

The characteristic that distinguishes *E. caucasicus* from other species is the membranal light spot surpassing the Cu vein (Indicated by arrow in Fig. 2A)

***Reduvius ciliatus* Jakovlev, 1879**

Distribution in Türkiye: Asian Türkiye: Hatay (Akbez) (Puton & Noualhier, 1895); Ağrı (Ağrı Mountain) (Kiritshenko, 1918); Gaziantep (central province) (Hoberlandt, 1956); Mardin (Ömerli) (Matocq & Özgen,

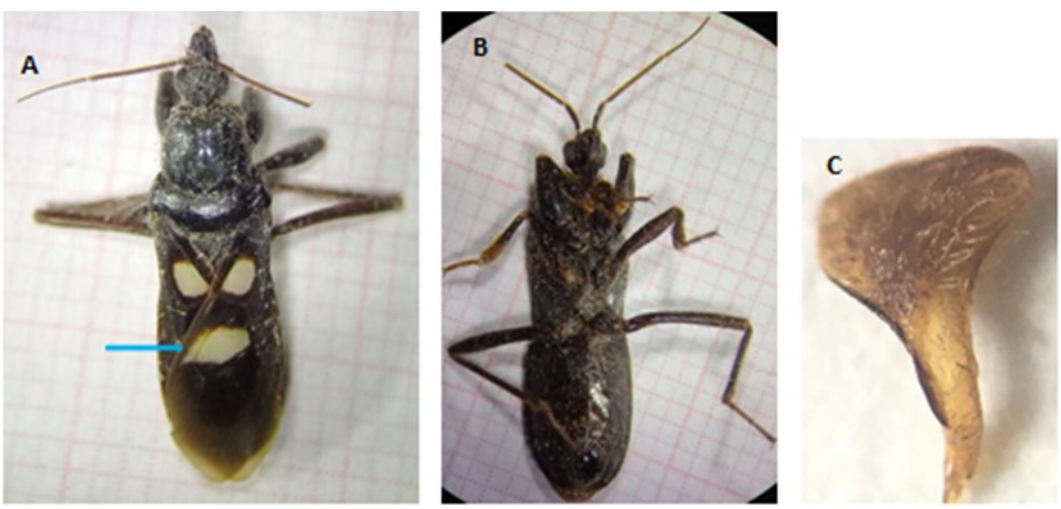

Figure 6. *Ectomocoris caucasicus* Linnavuori, 1972; **A.** Dorsal view, **B.** Ventral view, **C.** Paramere.

2010); Iğdır (Center-Suveren) (Çerçi et al., 2022); Diyarbakır (Fent et al., 2022); Karaman (Çerçi & Koçak, 2023).

Distribution in Palaearctic: Europe: Russia (South European Territory). **Asia:** Asian Türkiye, Armenia, Azerbaijan, Iran, Iraq, Israel, Syria (Aukema, 2020).

Diagnosis. (Fig. 7) The head, pronotum and scutellum blackish brown, with long brownish hairs. Antennae yellowish brown, with long golden hairs. Sometimes the first segment is light yellow, the other segments are darker. Pronotum broadly trapezoidal at base, blackish brown; the anterior lobe bilobed, separated in the middle by a deep line and decorated with a raised pattern on both sides (Fig. 7D), the posterior lobe decorated with two submedian keels strongly divergent behind and delimiting a hollow and striated mid-longitudinal dimple. Scutellum black-brown except for the apex which is tapered and often thinned (Fig. 7E); when viewed from the top, the carinated lateral edges meet at the apical end to form a long apical extension and appear as a "Y" shape. The part between the arms of the "Y" forms regular wrinkles. Clavus brown, proximal part brownish-yellow or pale yellow. Corium bicolor; corium pale yellow, postmedially with black-brown band, distal angle black-brown. Connexivum pale yellow, 6th paratergites black-brown. Legs pale yellow, apical of profemurs and mesofemurs dark brown, apical of metafemurs blackish brown. Sometimes the proximal part of the tibia is darkened and the tarsi are pale yellow. Fossula spongiosa on 1/7 of the length of the protibia (Fig. 7F). Venter dark brown or black brown. Process of the pygophorus cylindrical (Fig. 7G). Length: 10.2-11.5 mm.

Reduvius ciliatus distinguished from *Reduvius pallipes* and *Reduvius tabidus* with posterior tarsus segment I longer than segment II (segment I is shorter than segment II in *R. pallipes* and *R. tabidus).* Additionally, the body length of *R. ciliatus* is 10-11.5 mm, *R. pallipes* is 15 mm and *R. tabidus* is 18.5 mm.

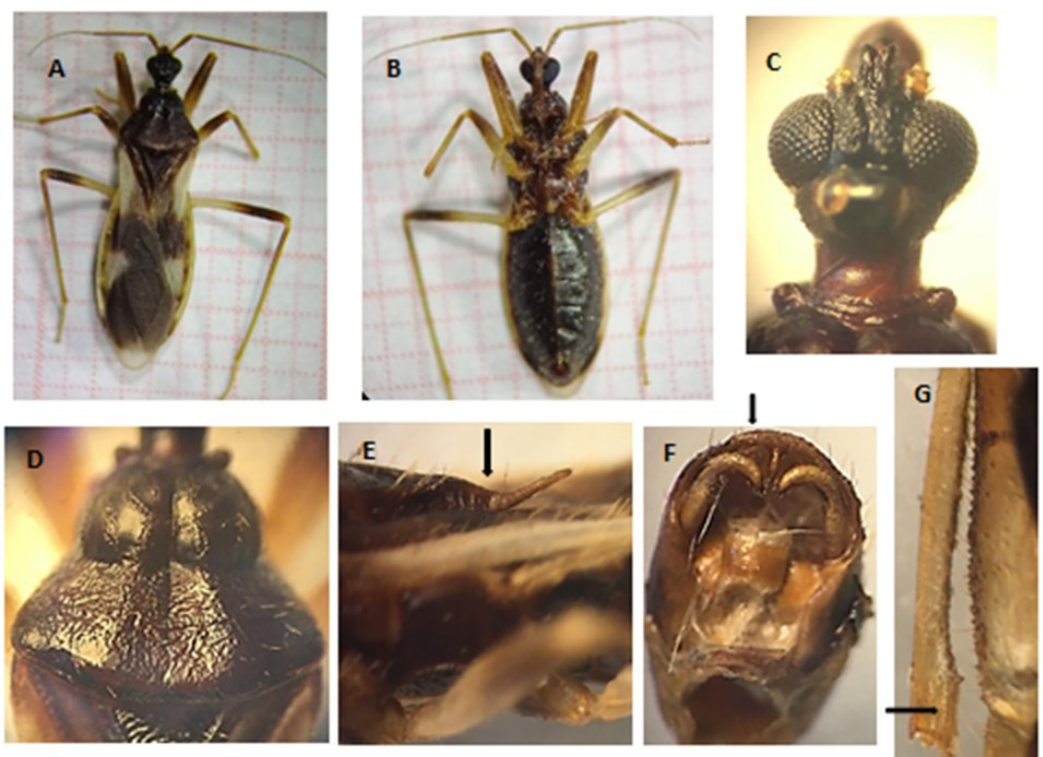

Figure 7. *Reduvius ciliatus* Jakovlev, 1879; **A.** Dorsal view, **B.** Ventral view, **C.** Head, **D.** Pronotum, **E.** Scutellum (lateral view), **F.** Pygophore, **G.** Protibia.

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