

RESEARCH PAPER

Two new species and ten new records of Heteroptera from Turkey, including the first record of the potential alien *Campylomma miyamotoi* in the Western Palaearctic

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Abstract. In this paper, two new Miridae species are described from Turkey, *Adelphophylus oenderi* sp. nov. from Silifke (Mersin province) and *Phytocoris (Exophytocoris) carapezzai* sp. nov. from Merkez (Karaman province). Habitus of males and females and male genitalia of both species and female genitalia of *A. oenderi* sp. nov. are illustrated. Additionally, 10 Heteroptera species are recorded from Turkey for the first time: *Campylomma miyamotoi* Yasunaga, 2001, *Compsidolon (Compsidolon) elegantulum* Reuter, 1899, *Hallodapus concolor* (Reuter, 1890), *Mauroidactylus kukuensis* V. G. Putshkov, 1978, *Pinalitus viscidola* (Puton, 1888), *Platycranus alkestis* Linnavuori, 1999, *Zanchius breviceps* (Wagner, 1951), *Montandoniola moraguesi* (Puton, 1896), *Temnostethus (Temnostethus) gracilis* Horváth, 1907, and *Plinthisus (Isioscytus) minutissimus* Fieber, 1864. *Campylomma miyamotoi* Yasunaga, 2001, an Eastern Palaearctic species bound to the ornamental *Albizia julibrissin*, is a new potentially alien species in the Western Palaearctic. The species status of *Compsidolon (Compsidolon) parietariae* V. G. Putshkov, 1984 is discussed.

Key words. Hemiptera, Heteroptera, Anthocoridae, Miridae, Rhyparochromidae, *Albizia julibrissin*, alien species, new records, new species, Turkey, Palaearctic Region

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Introduction

Heteroptera is a suborder of Hemiptera which two years ago was considered to contain approximately 45,254 described species (HENRY 2017). Most true bugs are phytophagous, zoophagous, or zoophytophagous, though there is a minority of mycophagous and ectoparasitic, hematophagous species. Some of them are also adapted to unusual habitat types such as spider webs, ant and termite nests, caves, aquatic and semiaquatic habitats as well as intertidal zones (SCHUH & SLATER 1995). The Heteroptera fauna of Turkey was investigated by several researchers in recent years and these studies resulted in records of 54 new species previously unknown from Turkey (MATOCQ et al. 2014; ÇERÇİ & KOÇAK 2016, 2017a,b; FENT & DURSUN 2016; YAZICI & YILDIRIM 2017; YILDIRIM & YAZICI 2018; ÖZGEN & ÇERÇİ 2018; ÖZGEN & DIOLI

2018; DIOLI & ÖZGEN 2018; ARSLANGÜNDOĞDU et al. 2018; CARAPEZZA & KMENT 2018; BOLU et al. 2019). In this study, 10 Heteroptera species are new records for Turkey. Some of them were already known from the neighbouring countries, which suggests that they have already been present in Turkey for a long time and have been found only now thanks to a more intense research. Besides the newly recorded species, in the past 40 years 28 new species have been originally described from Turkey (MATOCQ 2000; MATOCQ & PLUOT-SIGWALT 2001, 2011; DOĞANLAR et al. 2007; MEMON & AHMAD 2008; MORKEL & WYNIGER 2009; ÇERÇİ & DURSUN 2017; DURSUN & FENT 2017; GÜNTHER & STRAUSS 2018; CARAPEZZA & KMENT 2018; MATOCQ 2019). In this paper, a new species of the genus *Adelphophylus* Wagner, 1959 and a new species of the genus *Phytocoris* Fallén, 1814 are described. The finding of a new species



of *Adelphophylus* from the South of Turkey is noteworthy considering that all known species of this genus are distributed in mountainous regions of the Balkans (PROTIĆ 2003, MATOCQ & MAGNIEN 2009). The finding of a new *Phytocoris* species from Anatolia is not surprising since 10 out of 40 *Phytocoris* species known from Turkey were originally described from Anatolia (KERZHNER & JOSIFOV 1999, LODOS et al. 2003, ÖNDER et al. 2006, DURSUN & FENT 2017, ÇERÇİ & KOÇAK 2017).

Material and methods

Methods of specimen collection are mentioned as “collection circumstances” under each species if known. Habitus photos were taken with a Nikon D3200 DSLR camera combined with a macro bellow and a Lomo 3.7X 0.11 Microscope lens. Identification of the Miridae species was based on the following publications: YASUNAGA et al. (2015); WAGNER (1974); LINNAVUORI (1984), and KNYSHOV & KONSTANTINOV (2013). Identification of the Rhyparochromidae species was based on PÉRICART (1998). Identification of the Anthocoridae species was based on PÉRICART (1972) and PLUOT-SIGWALT et al. (2009). The specimens examined are deposited in the following institutions and collections:

AZMM Alaşehir Zoological Museum, Manisa, Turkey;
LEMT Lodos Entomological Museum, İzmir, Turkey;
BCIT Barış Çerçi collection, İzmir, Turkey.

Description of new species

Adelphophylus oenderi sp. nov.

(Fig. 1)

Type locality. Turkey, Mersin, Silifke, 36°22'39.1"N 33°56'10.7"E.

Material examined. HOLOTYPE: 1 ♂ (LEMT), TURKEY: MERSIN: Silifke, 36°22'39.1"N 33°56'10.7"E, 25.07.1984; glued on a pointed cardboard with male genitalia inside a tube filled with glycerol, labels as follows: ‘Turkey, Mersin prov. / Silifke, on *Verbascum* sp. / F. Önder coll. [white printed label] // Holotypus / *Adelphophylus oenderi* sp. n. / B. Çerçi det. 2019 / [red printed label]’. PARATYPES: TURKEY: MERSIN: 2 ♂♂ 8 ♀♀, Silifke, 25.vii.1984, F. Önder leg., B. Çerçi det. (LEMT); 2 ♀♀, Mut, 27.vii.1984, on *Verbascum* sp., F. Önder leg., B. Çerçi det. (LEMT).

Diagnosis. The new species is recognized by the combination of the following characters: shape oval, general coloration reddish brown to black, head always more or less brownish, antennae, legs, coxae and labium pale yellow, hemelytra unicolorous, slightly translucent and enlarged towards apical half, vesica (Fig. 1C) with one short and two long processes, short process without any neighbouring teeth, one of long processes thin and unarmed, other one thick and armed with small teeth, sclerotized rings of bursa copulatrix large and broad, sclerotized recesses above sclerotized rings small.

Description (♂♀). **Coloration.** Reddish brown to black (Figs 1A–B). Head reddish brown to dark brown, in pale specimens tylus even reddish, antennae uniformly pale yellow; pronotum, scutellum and hemelytra uniformly reddish brown to black. Hemelytra slightly translucent. Membrane dark brown. Legs, coxae and rostrum pale yellow except for apex of last tarsomeres and claws which are slightly darkened. Body black.

Surface and vestiture. Smooth and slightly shiny. Setae covering head, pronotum, scutellum and hemelytra unicolorous brown, mostly erected on head and adpressed on pronotum, scutellum and hemelytra, setae covering antennae short, adpressed and hyaline. Tibiae with thin hyaline spines.

Structure. Body 3.2–3.7 mm long, oval, 2.8–3.2 times as long as width of posterior edge of pronotum. Head vertical, 5 times as wide as its length in dorsal view and 1.2 times as wide as width of anterior edge of pronotum, strongly sloped downwards, 1.4 times as wide as high in frontal view. Vertex with more or less obvious carina along posterior edge, ocular index 1.9–2.1. Antennae half the length of body, first two antennal segments slightly but conspicuously thicker than last two segments, second segment 0.5–0.7 as long as width of pronotum and as long as or slightly shorter than width of head, ratio of antennal segments 6:24:15:14 in male and 8:30:21:16 in female. Pronotum trapezoid, posterior margin 1.4–1.6 times as wide as anterior margin, and twice as wide as length of pronotum, lateral margins straight. Basis of scutellum large. Hemelytra enlarged towards apex, more conspicuously in females than in males, considerably surpassing abdomen. Legs very gracile, hyaline spines of tibia as long as tibia width. Rostrum widely surpassing posterior coxae but not reaching apex of abdomen.

Vesica (Fig. 1C) large and gracile, U-shaped, with one short and two long apical sclerotized processes, finger-like short process smooth, without any teeth, one of long processes thicker and armed with small denticles, other one thin and unarmed. Both parameres very similar to that of congeners. Dorsal view of bursa copulatrix as in Fig. 1D. Sclerotized rings large, slightly different from each other in shape. Sclerotized recess (SR) above rings small.

Differential diagnosis. The genus *Adelphophylus* consists of the following four species occurring in the mountainous areas of the Balkans: *A. balcanicus* Kormilev, 1939 from south Macedonia, south Bulgaria and Albania, *A. kormilevi* Protić, 2003 from south Macedonia, *A. serbicus* Protić, 2003 from central Serbia and *A. pericarti* Matocq & Magnien, 2009 from south Bulgaria and the north of Greece (MATOCQ & MAGNIEN 2009). *Adelphophylus oenderi* sp. nov. was discovered in Toros mountains in South Anatolia. Its remote distribution readily suggests that this separate population might belong to a separate species. As noted by MATOCQ & MAGNIEN (2009), the species of *Adelphophylus* are almost undistinguishable from each other in appearance, and examination of male genitalia is necessary for a reliable identification. *Adelphophylus oenderi* is not an exception, being almost identical to the other species of the genus in general shape and coloration. With its length of 3.2–3.7 mm, *A. oenderi* is slightly smaller than the four Balkan species of the genus (among them the smallest one is *A. balcanicus*, with females 3.8 mm long) (WAGNER 1959, PROTIĆ 2003). In addition to its small size, the new species might be distinguished from *A. pericarti* by the reddish brown to dark brown colored head (black in *A. pericarti*) and by the conspicuously

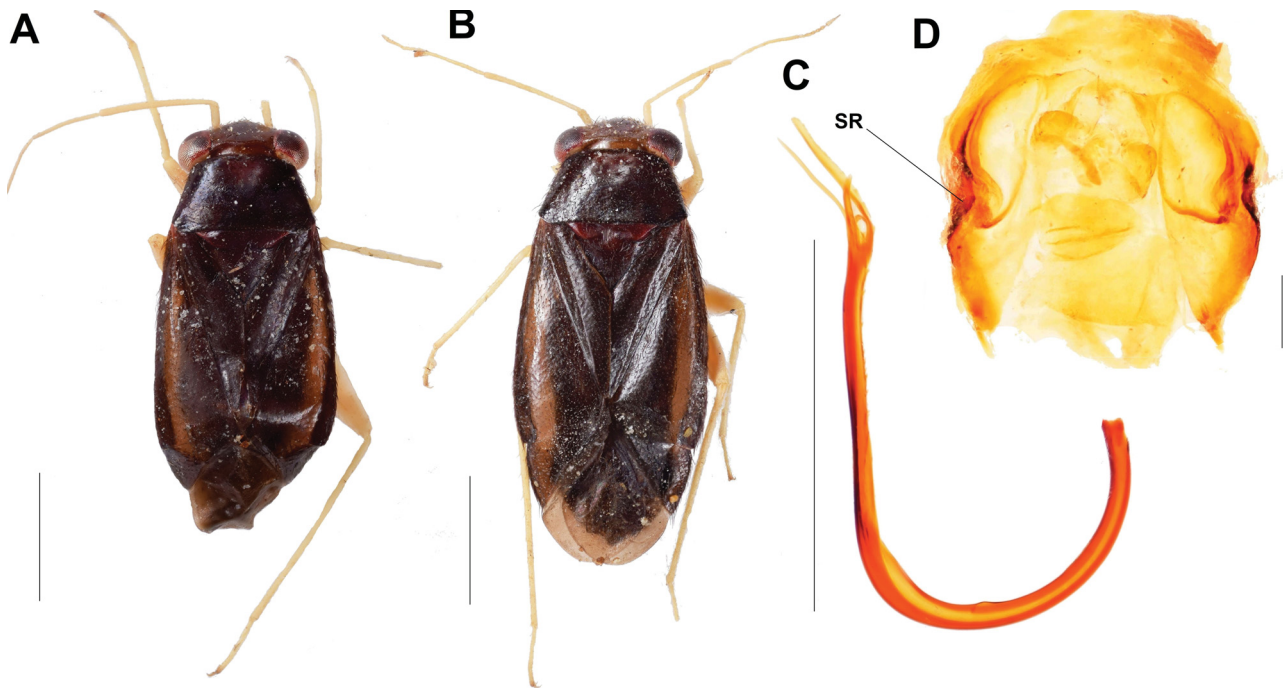


Fig. 1. *Adelpophylus oenderi* sp. nov.: A – male; B – female; C – vesica; D – bursa copulatrix. Abbreviation: SR – sclerotized recess. Scale bars: A, B – 1 mm; C – 0.5 mm; D – 0.1 mm.

enlarged hemelytra (parallel-sided in the other three species of the genus). However, these characters are not fully reliable and may vary substantially when a large number of specimens are examined. Consequently, the only reliable distinguishing feature is the structure of the vesica. As mentioned by MATOČQ & MAGNIEN (2009), the four Balkan species can be divided into two groups with respect to the shape of their vesica which is short, thick and robust in *A. balcanicus*, *A. kormilevi*, and *A. serbicus*, and long, thin and U-shaped in *A. pericarti*. In this respect, *A. oenderi* belongs to the second group but is unique in the genus due to the presence of a third apical process of vesica. Additionally, the short apical process of the vesica is finger-shaped and mutic. In contrast, the short apical processes of *A. balcanicus*, *A. serbicus*, and *A. pericarti* are armed with numerous teeth which form a characteristic hand-like structure; *A. kormilevi* lacks the short process altogether (PROTIĆ 2003). The new species can also be distinguished from *A. pericarti* by the structure of bursa copulatrix. Sclerotized rings of *A. oenderi* are larger and broader than those of *A. pericarti*, and the sclerotized recesses above sclerotized rings (SR in Fig. 1D) are smaller.

Biology. The species of this genus are known to feed on *Verbascum* sp. (Scrophulariaceae) (MATOČQ & MAGNIEN 2009). Specimens of *A. oenderi* were also found on *Verbascum* sp.

Etymology. The new species is dedicated to Prof. Dr. Feyzi Önder who was the finest Turkish entomologist that ever lived, contributed to the knowledge of the Heteroptera fauna of Turkey throughout his life and was the collector of this new species.

Phytocoris (Exophytocoris) carapezzai sp. nov.

(Figs 2, 5A)

Type locality. Turkey, Karaman, Merkez, 37°13'18.3"N 33°13'14.2"E. **Material examined.** HOLOTYPE: 1 ♂ (AZMM), TURKEY: KARAMAN: Merkez, 37°13'18.3"N 33°13'14.2"E, 8.ix.2015; glued on a pointed cardboard with male genitalia on the same cardboard, labelled as follows: 'Turkey, Karaman prov./ Merkez, with UV light trap / Ö. Koçak coll. [white printed label] // Holotypus / *Phytocoris (Exophytocoris) carapezzai* sp. n./ B. Çerçi det. 2019 [red printed label]'. PARATYPES: TURKEY: KARAMAN: 2 ♂♂, Merkez, 8.ix.2015, light trap, Ö. Koçak leg., B. Çerçi det. (BCIT).

Diagnosis. The new species is recognized by the combination of the following characters: general coloration yellowish brown, pronotum darker than hemelytra and scutellum. First antennal segment white with dense red patterns, eyes very big, ocular index 0.6–0.8 in male. Posterior margin of pronotum with narrow white marginal band and wavy and uninterrupted brown submarginal band. Hemelytra with scattered reddish pattern, tip of clavus darkened, outer margin of corium and inner margin of cuneus with red dots interrupted by white coloration along their whole length, inner upper corner of cuneus with isolated red dot. Membrane brownish and translucent with dense small pale patches. Femora (Fig. 2B) dark brown with dense white dots. Left paramere edentate (Fig. 2E), hypophysis strongly enlarged before apex, vesica with marginally dentate lamellae apically (Fig. 2D), sclerotized process of vesica (Fig. 2C) stick-like, long and thick, edentate and slightly bent towards apex.

Description. Male. Coloration. General coloration yellowish brown (Fig. 2A). Head yellowish brown with reddish patterns. First antennal segment whitish, maculated in red, second antennal segment yellow except

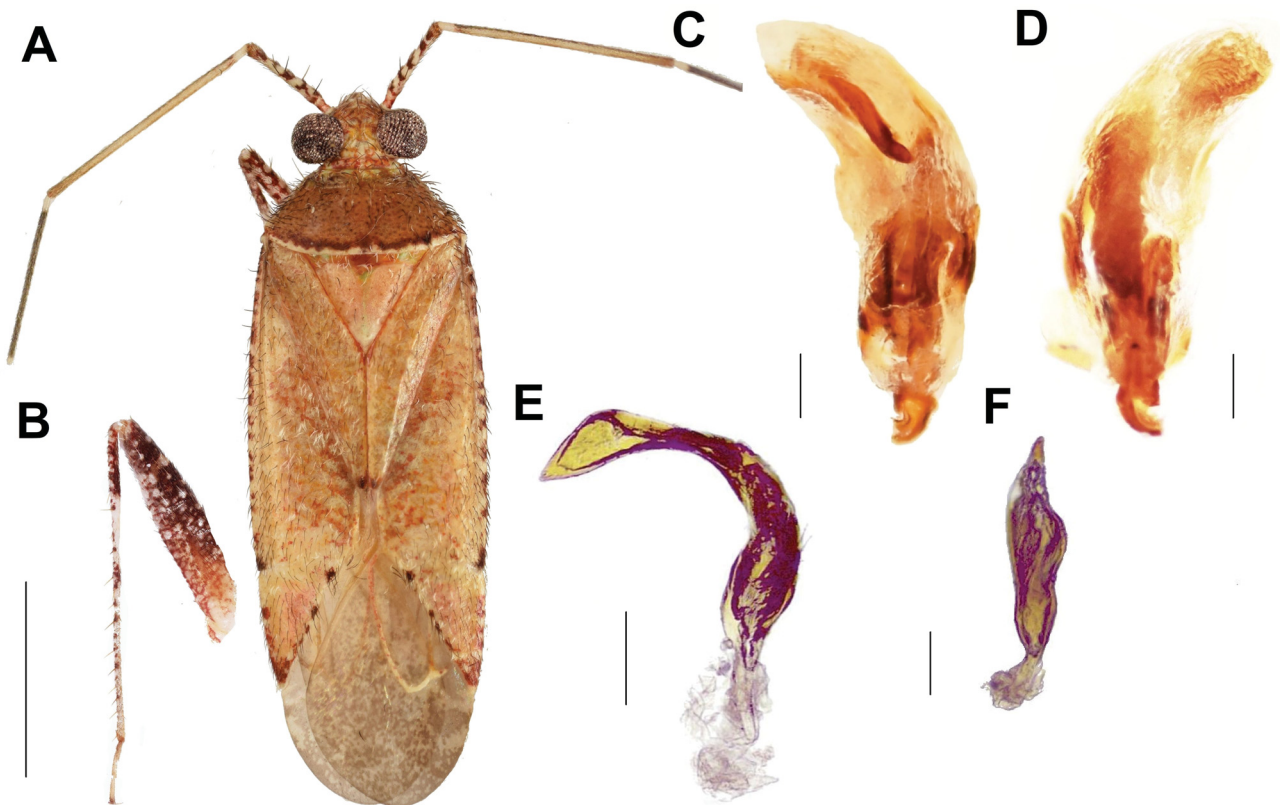


Fig. 2. *Phytocoris (Exophytocoris) carapezzai* sp. nov.: A – male; B – posterior leg; C–D – vesica in two different views; E – left paramere; F – right paramere. Scale bars: A, B – 1 mm; C, D – 0.1 mm; E, F – 0.1 mm.

for white basal ring, third antennal segment black with white ring both basally and apically, apical ring sometimes absent, last segment unicolorous black. Pronotum pale brown, pronotal collar red maculated, posterior margin with narrow white marginal band and wavy and uninterrupted brown submarginal band. Scutellum unicolorous yellowish brown. Hemelytra yellowish brown with scattered reddish pattern, outer margin of corium with red dots interrupted by white coloration along its whole length, very tip of clavus darkened. Outer and inner margins of cuneus with reddish dots interrupted by white coloration, upper inner corner of cuneus with isolated prominent red dot. Membrane brownish with dense pale maculation. Femora reddish brown with numerous white dots of different sizes, tibiae white with broad reddish ring basally and small and irregular reddish spots towards apex, tarsi and claws pale.

Vestiture. Upper surface with mostly suberect and rarely erect thick brown setae and adpressed silvery scale-like setae. First antennal segment with several long erect black spines in addition to adpressed brown setae, rest of antennal segments covered only with dense adpressed hyaline setae. Tibial spines pale, femora with long adpressed black setae, vestiture of tibiae as in last three antennal segments.

Structure. Body 4.00–4.60 mm long, macropterous, elongate, parallel-sided, 3.5 times as long as basal width of pronotum, head transverse in dorsal view, twice as wide as long, 0.7 times as wide as posterior margin of pronotum and 1.7 times as wide as anterior margin of

pronotum, in lateral view as high as long with shallow notch between frons and base of tylus, eyes very large, ocular index 0.6–0.8. Antennae as long as total length of body. First antennal segment 0.8 times as long as diatone, second antennal segment 1.3 time as long as basal width of pronotum. Ratio of antennal segments 12:30:21:12. Pronotum strongly trapezoid, posterior margin 2.4 times as wide as anterior margin, lateral margins straight. Rostrum reaching posterior coxae.

Vesica (Figs 2C–D) with stick-like long and thick sclerotized process bending slightly in apical third (Fig. 4A), primary membranous sac with weakly sclerotized wrinkles and marginally dentate lamellae (Fig. 2D), several strongly sclerotized structures present near secondary gonopore. Left paramere (Fig. 2E) with sensory lobe slightly produced, hypophysis strongly enlarged before apex. Right paramere elongate, with preapical bulge on right side, apex straight (Fig. 2F).

Female. Living specimen, see Fig. 5A. Unfortunately, this specimen was not available for description.

Differential diagnosis. The new species is placed in the subgenus *Exophytocoris* Wagner, 1961 of the genus *Phytocoris* Fallén, 1814 because of the combination of the following features: the first antennal segment ornamented, the third antennal segment brownish with a pale basal ring, head in lateral view as long as high with a shallow notch between frons and base of tylus, and left paramere edentate. The subgenus *Exophytocoris* includes 25 species (KERZHNER & JOSIFOV 1999, PAGOLA-CARTE 2010, CARAPEZ-

ZA 2016, PAGOLA-CARTE & RIEGER 2017). Some of these species were subdivided into three groups in relation to the structure of vesica by LINNAVUORI (1994a). This new species can be placed into the group in which the spiculum is formed of several marginally dentate lamellae (the other two groups have blade-like marginally dentate spiculum or trough-shaped spiculum with both margins dentate). This group of species includes *P. koronis* Linnavuori, 1992, *P. pinihalepensis* Lindberg, 1948, *P. parvuloides* Wagner, 1961, *P. scituloides* Lindberg, 1948, and *P. zenobia* Linnavuori, 1994 (LINNAVUORI 1994a). The new species differs from all species of this group in the presence of an additional strongly sclerotized basal process. There are two species which have such a sclerotized process though they are not members of this group: *Phytocoris* (*Exophytocoris*) *parrotiae* Putshkov, 1978, a species endemic to Azerbaijan, which only has a single tooth-like sclerotized process in its vesica according to the original description (PUTSHKOV 1978b), and *Phytocoris* (*Exophytocoris*) *raunolinnavuorii* Carapezza, 2016 which has a small sclerotized process in addition to a lobal sclerite that is unique to this species (CARAPEZZA 2016). *Phytocoris carapezzai* sp. nov. can be distinguished from *P. raunolinnavuorii* by much longer sclerotized basal process, presence of dentate lamellae apically, a different left paramere, and dissimilar coloration and patterns of dorsum. *Phytocoris carapezzai* sp. nov. can also be distinguished from *P. parrotiae* by different shape of the sclerotized process of vesica which is short, sharp and tooth-like in *P. parrotiae* and long, thick and stick-like in the new species, by the presence of additional sclerotized structures near secondary gonopore, different shape of the left paramere, and by some other morphological characters such as ocular index, length of the first antennal segment, coloration patterns of pronotum and hemelytra. With respect to its general appearance, the new species might be confused with *P. pinihalepensis* and *P. minor* but it can be easily distinguished from them by the dissimilar sclerotized basal process of vesica which is formed of about 10 weakly sclerotized marginally dentate lamellae in the former and is comb-like and marginally dentate in the latter but edentate and stick-like in *P. carapezzai* sp. nov. The new species is also distinguished from many species of the subgenus *Exophytocoris* by the very small ocular index of male which is 0.6–0.8, although there are at least two more species, *P. pinihalepensis* and *P. parvuloides*, in which the ocular index of male is smaller than 1.0 (WAGNER 1974).

Etymology. The name of this new species is dedicated to Attilio Carapezza who is an outstanding specialist and has published lots of precious scientific data on the Heteroptera of the Mediterranean and the Near East. The first author is very grateful to him for his endless help in his first years of work on Heteroptera.

Habitat. The UV-light trap that attracted this new species was located in a urban area. There were *Populus* sp. (Salicaceae), *Rosa* sp. (Rosaceae), *Malus* sp. (Rosaceae), *Thuja* sp. (Cupressaceae), *Cedrus* sp. (Pinaceae), *Juniperus* sp. (Cupressaceae), *Aesculus* sp. (Sapindaceae) trees in the area.

New records

Family Miridae Subfamily Phylinae

Campylomma miyamotoi Yasunaga, 2001

(Figs 3A–B, 5B–C)

Material examined. TURKEY: İZMİR: Urla, 38°18'33.9"N 26°43'47.8"E: 16.vii.2018, 1 ♂; 6.viii.2018, 1 ♂; 13.viii.2018, 1 ♂; 14.viii.2018, 1 ♂; 15.viii.2018, 1 ♀; 31.viii.2018, 1 ♂; 7.ix.2018, 1 ♂; 15.ix.2018, 1 ♀, B. Çerçi det. (BCIT).

Collection circumstances. Light trap.

Comment. *Campylomma* Reuter, 1878 is a diverse genus with plenty of similar species (KONSTANTINOV et al. 2016). In most cases, species of this genus can only be distinguished by the shape of their vesica. In recent years, four *Campylomma* species were recorded from Turkey for the first time (KONSTANTINOV et al. 2016; ÇERÇİ & KOÇAK 2017a,b). Recently, the first author collected a series of a remarkably small *Campylomma* species by light traps. Examination of vesica showed that this species did not correspond to any *Campylomma* species known from the West Palaearctic Region. After considering the East Palaearctic species of *Campylomma*, we reached the conclusion that our specimens belong to *Campylomma miyamotoi* Yasunaga, 2001, a species known from Japan and Korea (DUWAL et al. 2013, YASUNAGA et al. 2015). The host plant of *C. miyamotoi* is *Albizia julibrissin* D., a tree whose original range extended from China and Korea to Azerbaijan and Iran (KARAER et al. 2015). *Albizia julibrissin* has been planted as an ornamental tree in Turkey since the 18th century. It grows on the whole coastline of Turkey as well as in regions with temperate climate (KARAER et al. 2015). Our light traps were located next to an *A. julibrissin* tree. The finding of *C. miyamotoi* in Izmir, Turkey is quite interesting. It is highly possible that this species was introduced to Turkey by man but there is also the possibility that the species, even if known only from East Asia, is present throughout the whole distribution range of the host plant, from Japan to Turkey. Living adults, male (Fig. 5B) and female (Fig. 5C), a mounted male (Fig. 3A) and vesica (Fig. 3B) are illustrated. An identification key to distinguish *Campylomma* species known from Turkey is provided below.

Distribution in Turkey. İzmir (this work).

Key to the species of *Campylomma* from Turkey

(adapted from KONSTANTINOV et al. 2016)

- 1 Vesica with a single apical blade (cf. KONSTANTINOV et al. 2016: Figs 5–6). On *Pistacia vera*.
..... *C. lindbergi* Hoberlandt, 1953
- Vesica with two apical blades. 2
- 2 Second antennal segment in male entirely dark brown or black. 3
- Second antennal segment in male pale with a dark ring basally or entirely pale. 7
- 3 Anterior blade only slightly shorter than posterior one (cf. KONSTANTINOV et al. 2016: Figs 5–6). On *Salix* spp. *C. simillimum* Jakovlev, 1882
- Anterior blade considerably shorter than posterior one. 4

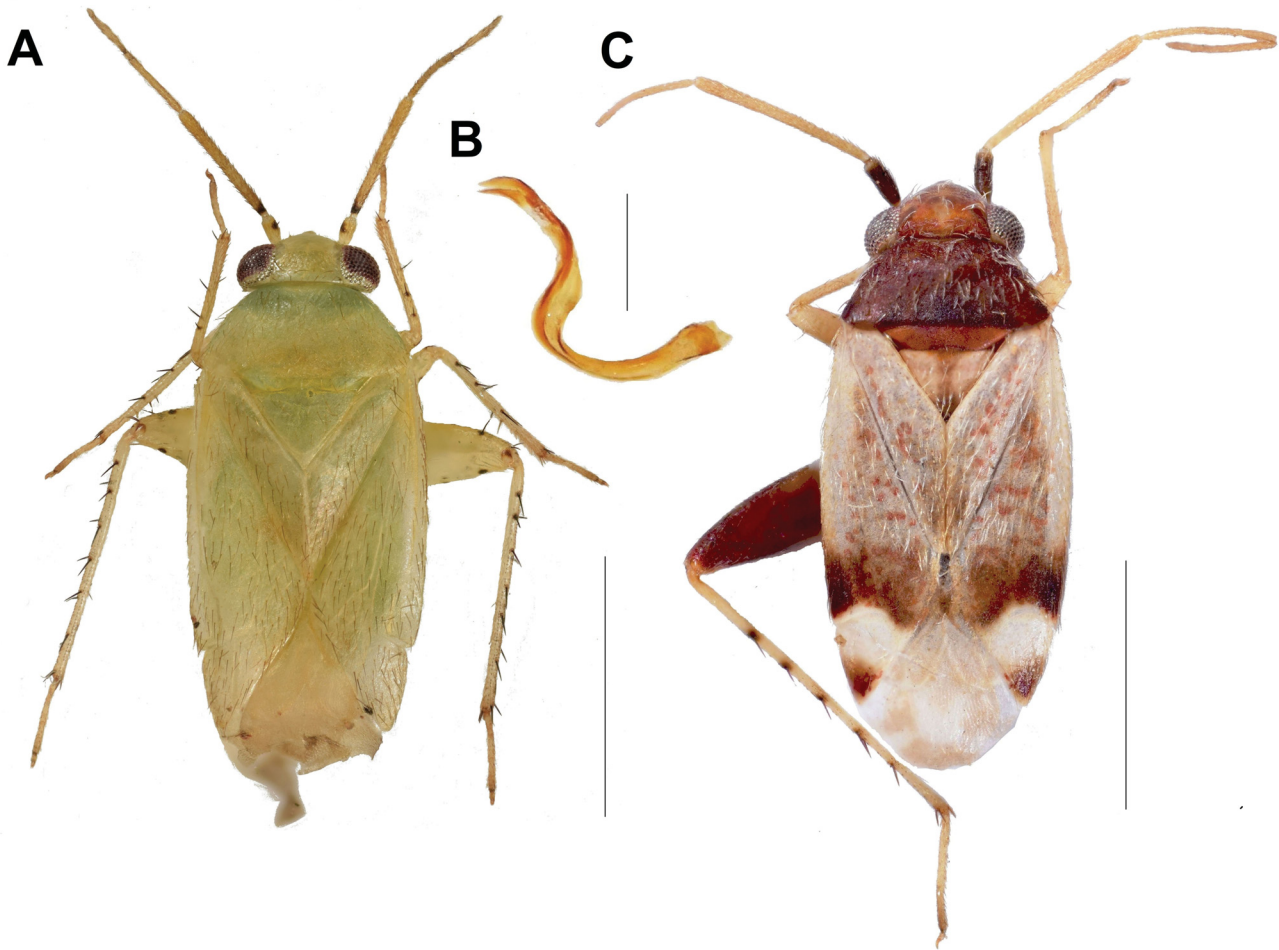


Fig. 3. A–B – *Campylomma miyamotoi* Yasunaga, 2001: A – male, B – vesica. C – *Compsidolon (Compsidolon) elegantulum* Reuter, 1899, male. Scale bars: A, C – 1 mm; B – 0.1 mm.

- 4 Posterior blade short, anterior blade small and thick (cf. KONSTANTINOV et al. 2016: Figs 5–6). On *Vitex agnus-castus*. *C. oertzenii* Reuter, 1888
- Posterior blade distinctly elongated, anterior blade long and thin (cf. KONSTANTINOV et al. 2016: Figs 5–6; ÇERÇİ & KOÇAK 2017b: Fig. 2C). 5
- 5 Pronotum dark brown to black. On *Juniperus* sp.
..... *C. vendicarium* Carapezza, 1991
- Pronotum pale. 6
- 6 Second antennal segment in female entirely black. Anterior blade of vesica almost straight, not curved at midpoint. *C. diversicorne* Reuter, 1878
- Second antennal segment in female pale with a narrow black ring basally. Anterior blade of vesica bent at midpoint, on *Salix* spp. ... *C. annulicorne* (Signoret, 1865)
- 7 Lateral strap of vesica apically spine-shaped, giving impression of third apical blade in lateral view. 8
- Lateral strap of vesica not spine-shaped. 9
- 8 Spine-shaped lateral strap of vesica prior to anterior blade (cf. KONSTANTINOV et al. 2016: Figs 5–6), on *Vitex agnus-castus*. *C. viticis* Lindberg, 1948
- Spine-shaped lateral strap of vesica reaching apex of posterior blade (Fig. 3B), on *Albizia julibrissin*.
..... *C. miyamotoi* Yasunaga, 2001

- 9 Second antennal segment entirely pale colored. 10
- Second antennal segment pale with a dark ring basally. *C. verbasci* (Meyer-Dür, 1843)
- 10 Entire clypeus contrastingly dark brown. On *Populus* spp. *C. nigronasutum* Reuter, 1878
- Clypeus pale and immaculate.
..... *C. unicolor* Poppius, 1914

***Compsidolon (Compsidolon) elegantulum*
Reuter, 1899**

(Fig. 3C)

Material examined. TURKEY: MERSİN: Silifke, Kırabaşı, 24.iv.1985, 3 ♂♂, F. Önder leg., B. Çerçi det. (LEMT); Silifke, Kırabaşı, 24.iv.1985, 7 ♀♀, F. Önder leg., B. Çerçi det. (LEMT).

Comment. The genus *Compsidolon* Reuter, 1899 consists of small species with mostly dotted hemelytra (WAGNER 1965). The subgenus *Compsidolon* consists of the following four species: *C. bicolor* (Reuter, 1883), *C. elegantulum* Reuter, 1899, *C. nebulosum* Reuter, 1878, and *C. parietariae* V. G. Putshkov, 1984. *Compsidolon elegantulum* is known to feed on *Parietaria* sp. (Urticaceae) and *Podonosma orientalis* (Boraginaceae) (WAGNER 1975; LINNAVUORI 1993). It has a Syrio-Anatolian distribution and is known from Iran, Iraq, Israel, Jordan, and Syria

(KERZHNER & JOSIFOV 1999, LINNAVUORI & MODARRES 1999). *Compsidolon elegantulum* and *C. parietariae* are two very similar species, and the latter was distinguished from the former by V. G. PUTSHKOV (1984) by the following characters: apex of second antennal segment obscured, black scutellum and large size (2.5–2.7 mm). Among the typical specimens of *C. elegantulum* that we examined, there was a male which had a second antennal segment with obscured apex and dark scutellum. Furthermore, LINNAVUORI (1951) described a female specimen of *C. elegantulum* [as a new species, *Psallus badius* Linnavuori, 1951 which he later synonymized with *C. elegantulum* (LINNAVUORI 1953)] that measured 2.7 mm. LINNAVUORI (1992) differentiated *C. parietariae* from *C. elegantulum* in his key to the species of the subgenus *Compsidolon* by the following additional characters: pale basal half of hemelytra immaculate, head 0.83 (♀) as broad as basal width of pronotum and ocular index 2.21 (♀). But in the original description V. G. PUTSHKOV (1984) mentioned the presence of indistinct brownish dots on pale basal half of the hemelytra. Also the ratios that are used to distinguish *C. parietariae* from *C. elegantulum* by LINNAVUORI (1992) are very close to those of *C. elegantulum* so they may vary when a large number of specimens are examined. Also both authors did not indicate any difference between the male genitalia of the two species. Considering all these remarks, *C. parietariae* can very well be a junior synonym of *C. elegantulum*. Since we were not able to examine the types of *C. parietariae* we cannot suggest a definite synonymy between these two species. However, we want to encourage the experts who have an easy access to the types of *C. parietariae* to re-examine these specimens and evaluate the status of *C. parietariae* with our remarks in mind.

Distribution in Turkey. Mersin (this work).

Hallodapus concolor (Reuter, 1890)

(Fig. 5D)

Material examined. TURKEY: İZMİR: Urla, 38°18'33.9"N 26°43'47.8"E: 17.vii.2018, 2 ♂♂; 22.vii.2018, 1 ♂; 2.viii.2018, 1 ♂, B. Çerçi leg. and det. (BCIT).

Collecting circumstances. Light trap.

Comment. The genus *Hallodapus* Fieber, 1858 is represented by two species in Turkey: *H. suturalis* (Herrich-Schäffer, 1839) and *H. pseudoconcolor* (Linnavuori, 1984). While the former is widely distributed in the West Palaearctic Region, the latter is only known from Iraq and the South East of Turkey (MATOCQ et al. 2014). *Hallodapus concolor* Reuter, 1890 is distributed in tropical Africa from Cameroon to Sudan and in Asia from Saudi Arabia and Azerbaijan all the way to Kirghizia and in Europe only in Crete (Greece) (KERZHNER & JOSIFOV 1999). This species was observed to live on low grass vegetation in dry sandy areas (LINNAVUORI 1996). *Hallodapus concolor* (Figs 8A, B) is most similar to *H. pseudoconcolor* but differs from it in the shape of the left paramere and theca (see LINNAVUORI 1984).

Distribution in Turkey. İzmir (this work).

Maurodactylus kukuensis

V. G. Putshkov, 1978

(Fig. 4A–B)

Material examined. TURKEY: BITLIS: 2 ♂♂ 4 ♀♀, 12.vi.1976, on *Umbellifera* sp., F. Önder leg., B. Çerçi det. (LEMT).

Comment. *Maurodactylus* Reuter, 1878 is a small genus with six species described so far (KERZHNER & JOSIFOV 1999). Among them *Maurodactylus kukuensis* V. G. Putshkov, 1978 and *Maurodactylus acanthophylli* V. G. Putshkov, 1980 are the only two species with dark dorsal vestiture (V. G. PUTSHKOV 1978a, 1980). These two species can be easily distinguished from each other by the coloration of antennae which is uniformly black in both sexes of *M. kukuensis* and uniformly pale in both sexes of *M. acanthophylli*. The specimens we examined perfectly fit the description and illustrations of *M. kukuensis* morphologically but there is an important point to be noted about the male genitalia of our specimens. The apex of vesica of the specimens we examined is bifid unlike the illustration of the vesica of *M. kukuensis* in the original publication which has a long and sharp single tip (V. G. PUTSHKOV 1978a). This difference in the vesica either indicates that the apical part of the vesica is variable in different populations or that the illustrations of V. G. Putshkov are incorrect. *Maurodactylus kukuensis* was originally described to be associated with the plant *Grammosciadium platycarpum* (Apiaceae) (V. G. PUTSHKOV 1978a). Specimens we examined were collected from an undetermined plant species belonging to the family Apiaceae. *Maurodactylus kukuensis* was described from Shakhbuz District of Nakhchivan Republic, Azerbaijan, and was only known from its type locality until now.

Distribution in Turkey. Bitlis (this work).

Subfamily Mirinae

Pinalitus visicicola

(Puton, 1888)

(Fig. 4C)

Material examined. TURKEY: NEVŞEHİR: Hacıbektaş, 17.viii.1979, 4 ♂♂ 4 ♀♀, F. Önder leg., B. Çerçi det. (LEMT).

Comment. The genus *Pinalitus* Kelton, 1955 is represented by three species in Turkish fauna: *P. atomarius* Meyer-Dür, 1843, *P. cervinus* Herrich-Schäffer, 1841, and *P. conspurcatus* Reuter, 1875 (ÖNDER et al. 2006). *Pinalitus visicicola* is widely distributed in most European countries and is also known from Morocco and doubtfully from Tunisia in North Africa (KERZHNER & JOSIFOV 1999). However, the species was never recorded from any Asian country and its new record from Central Anatolia is the first record for the Asian continent. This species is known to be associated with *Viscum album*, and also the specimens we examined were collected from the same host plant. *Pinalitus visicicola* can be distinguished from its congeners known from Turkey by the presence of two broad transverse reddish brown bands, one on the posterior and one on the anterior third of corium.

Distribution in Turkey. Nevşehir (this work).

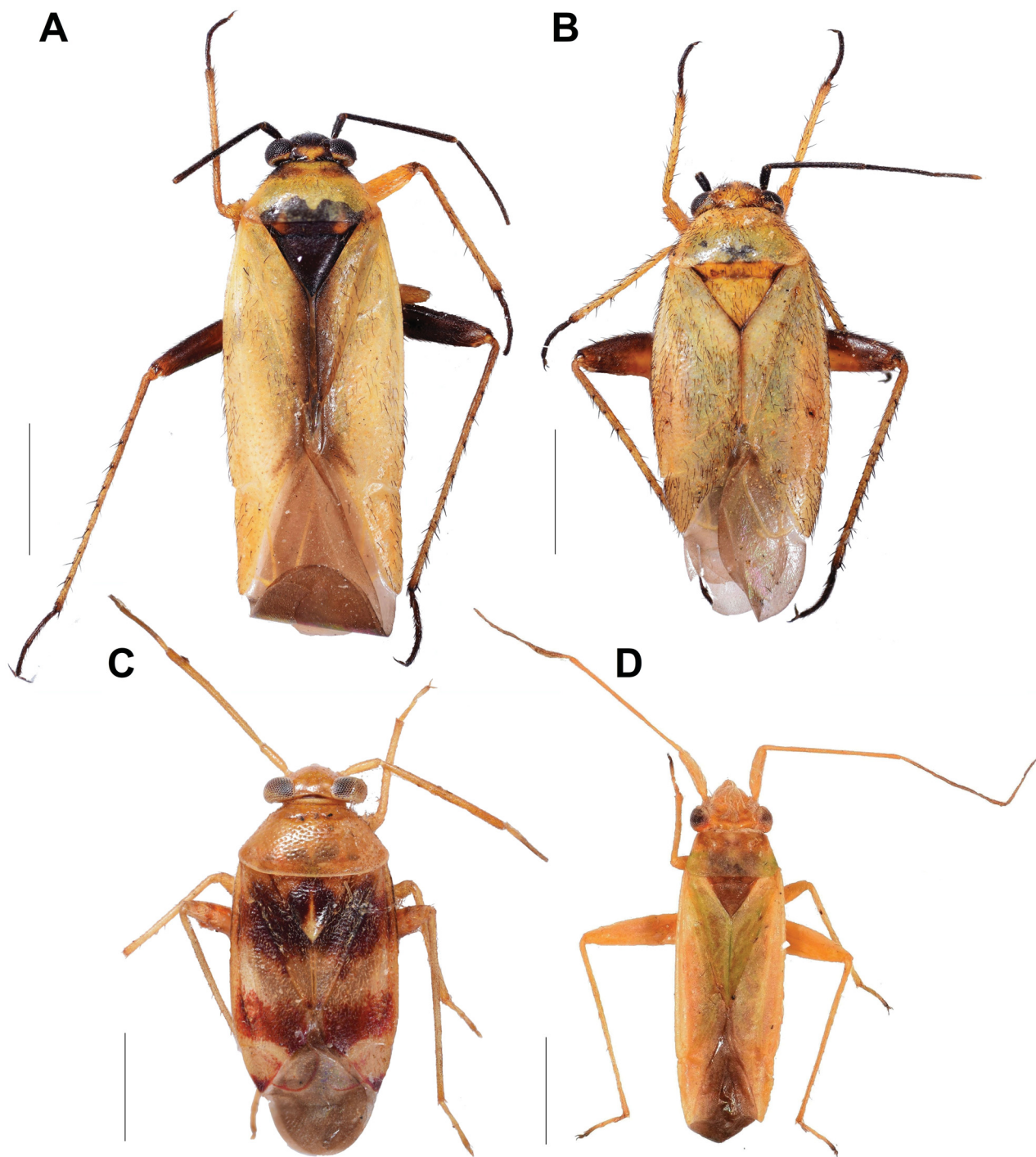


Fig. 4. A–B – *Maurodactylus kukuensis* V. G. Putshkov, 1978: A – male; B – female. C – *Pinalitus viscicola* (Puton, 1888), male. D – *Platycranus* (*Genistocapsus*) *alkestis* Linnavuori, 1999, male. Scale bars: 1 mm.

Subfamily Orthotylinae

Platycranus (*Genistocapsus*) *alkestis*
Linnavuori, 1999
(Fig. 4D)

Material examined. TURKEY: ANTALYA: Merkez, 17.v.1986, 3♂4♀♀, on *Genista* sp., F. Önder leg., B. Çerçi det. (LEMT).

Comment. The genus *Platycranus* Fieber, 1870 consists of green and broad headed species which are strictly associated with *Genista* spp. In Turkish fauna, *Platycranus* is represented by five species: *P. erberi* Fieber, 1870, *P.*

putoni Reuter, 1879, *P. remanei* Wagner, 1955, *P. genistae* Lindberg, 1948, and *P. bicolor* (Douglas & Scott, 1868) (ÖNDER et al. 2006). While the first two species belong to the subgenus *Platycranus* s. str., the other three species belong to the subgenus *Genistocapsus* Wagner, 1956 which is identified by the long labium reaching at least the middle coxae (KNYSHOV & KONSTANTINOV 2013). *Platycranus alkestis* Linnavuori, 1999 was originally described from the island of Rhodes and was known only from its type locality up to now. This species can be distinguished from other species of its subgenus by relatively long first antennal

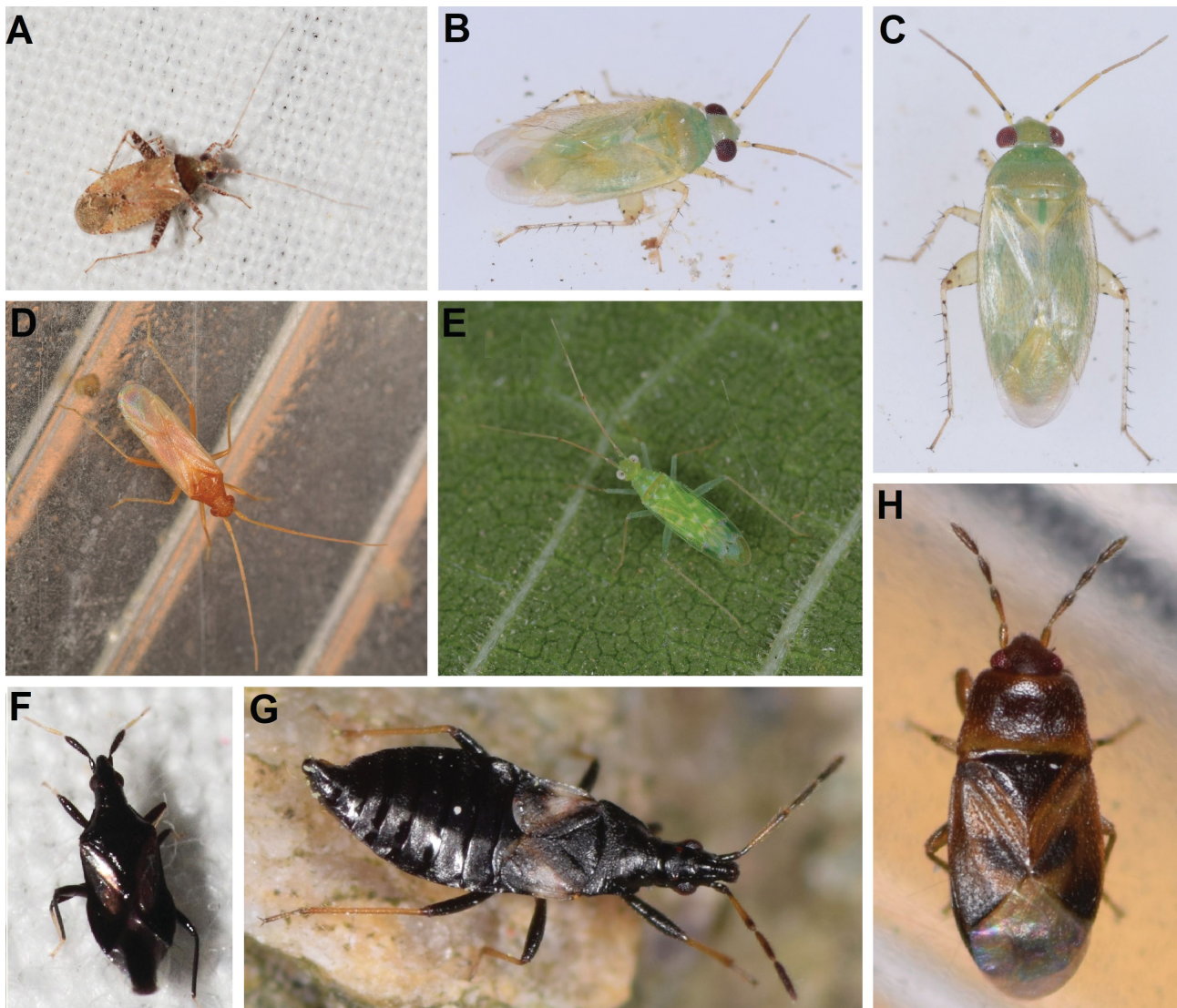


Fig. 5. A – *Phytocoris* (*Exophytocoris*) *carapezzai* sp. nov., alive female attracted to UV light; B–C – *Campylomma miyamotoi* Yasunaga, 2001 (B – male; C – female). D – *Hallodapus concolor* (Reuter, 1890), male; E – *Zanchius breviceps* (Wagner, 1951), alive male on *Ficus* sp.; F – *Montandoniola moraguesi* (Puton, 1896), alive male attracted to UV light; G – *Temnostethus* (*Temnostethus*) *gracilis* Horváth, 1907, male; H – *Plinthisus* (*Isioscytus*) *minutissimus* Fieber, 1864, female.

segment (0.7× as long as width of head) and brown colored pronotum and scutellum (K_{NYSHOV} & K_{ONSTANTINOV} 2013). The specimens we examined have paler coloration with scutellum being pale brown and pronotum being yellowish to green (Fig. 4D).

Distribution in Turkey. Antalya (this work).

***Zanchius breviceps* (Wagner, 1951)**

(Fig. 11A)

Material examined. **TURKEY:** **MUĞLA:** Bodrum, 37°03'59.1"N 27°15'02.3"E, 31.vii.2012, 1 ♂, B. Çerçi det. and leg. (BCIT); Fethiye, 36°54'36.2"N 28°45'21.2"E, 30.viii.2015, 1 ♂, B. Çerçi det. and leg. (BCIT); **İZMİR:** Urla, 38°18'33.9"N 26°43'47.8"E: 22.viii.2018, 1 ♂, B. Çerçi det. and leg. (BCIT).

Collection circumstances. On *Ficus* sp., attracted to light trap as well.

Comment. *Zanchius* is a very diverse genus with most species distributed in tropical Africa and the East Palearctic Region (L_{INNAVUORI} 1994b, K_{ERZHNER} & J_{OSIFOV}

1999). *Zanchius alatanus* Hoberlandt, 1956, described from Turkey (Mersin: Alata), was considered the single representative of this genus in Turkey. *Zanchius breviceps* was originally described from Egypt (W_{AGNER} 1951). Later it was discovered to occur in tropical Africa from Nigeria to Eritrea, in most parts of the Middle East, in Cyprus and Crete (K_{ERZHNER} & J_{OSIFOV} 1999). It was reported to be associated with *Trichilia emetica* (Meliaceae) (L_{INNAVUORI} 1975), *Abutilon* sp., *Gossypium* sp. (both Malvaceae) (L_{INNAVUORI} 1994b), and *Calotropis procera* (Apocynaceae) (L_{INNAVUORI} 2009). Recently, this species was discovered in Malta associated with a new plant, *Ficus* sp. (M_{IFSUD} et al. 2012). The first author too observed this species on *Ficus* sp. in İzmir and Muğla (Figure 5E). They were abundant on every *Ficus* sp. tree checked in İzmir. This species can be easily distinguished from *Z. alatanus* by the lack of middle red rings on the second antennal segment.

Distribution in Turkey. İzmir, Muğla (this work).

Family Anthocoridae

Montandoniola moraguesi (Puton, 1896)

(Fig. 5F)

Material examined. TURKEY: MERSİN: Anamur, 36°02'08.3"N 32°48'31.7"E, 17.vii.2018, 1 ♂, Ö. Koçak leg., B. Çerçi det. The specimen was only photographed but not collected.

Comment. *Montandoniola moraguesi* is an important biological control agent used to fight thrips invasions on economically important crops. It is unique among the Anthocoridae species known from Turkey because of its thrips-like appearance (Fig. 11B). It lives inside the galls or gall-like deformations caused by the thrips on which it feeds (PLUOT-SIGWALT et al. 2009). *Montandoniola moraguesi* is known from the following countries: the Balearic Islands, France, Italy, Spain, the Canary Islands, Israel, Morocco, Algeria, Tunisia, Egypt, Chad, Sudan, Burkina Faso, and South Africa (PLUOT-SIGWALT et al. 2009). Considering its wide distribution along the Mediterranean coasts, it is possible that this species has a stable population in Mersin, Turkey and was not introduced here by farmers.

Distribution in Turkey. Mersin (this work).

Temnostethus (Temnostethus) gracilis

Horváth, 1907

(Fig. 5G)

Material examined. TURKEY: İSTANBUL: Esenyurt, 41°03'01.7"N 28°40'34.2"E, 16.v.2018, 1 ♂, B. Çerçi leg. and det. (BCIT).

Collection circumstances. It was collected while it was wandering on a rock under a *Pyrus* sp. (Rosaceae).

Comment. *Temnostethus gracilis* is a widespread species known from most of Europe, including the Balkans. It is a predacious species known to feed on Sternorrhyncha species. It was observed to live on numerous deciduous tree species such as *Malus*, *Pyrus*, *Prunus*, *Crataegus* (Rosaceae), *Fraxinus* (Oleaceae), *Quercus*, *Fagus* (Fagaceae), *Betula*, *Corylus* (Betulaceae), *Acer* (Sapindaceae), *Salix*, *Populus* (Salicaceae) (PÉRICART 1972). *Temnostethus gracilis* differs from *T. winkelmanni* WAGNER, 1961 and *T. longirostris* (Horváth, 1907) in shorter clypeus and the existence of brachypterous form, from *T. pusillus* (Herich-Schäffer, 1835) by pale second antennal segment, and from *T. tibialis* Reuter, 1888 by much shorter and sparser setae on hemelytra which are almost invisible (Fig. 5G) (PÉRICART 1972).

Distribution in Turkey. İstanbul (this work).

Family Rhyparochromidae

Plinthisus (Isioscytus) minutissimus Fieber, 1864

(Fig. 5H)

Material examined. TURKEY: İZMİR: Urla, 38°18'33.9"N 26°43'47.8"E, 22.vii.2018, 1 ♀, B. Çerçi det. and coll. (BCIT).

Collection circumstances. Light trap.

Comment. *Plinthisus minutissimus* is a very small species which was observed to live inside nests of *Formica rufa* Linnaeus, 1758 and *F. lugubris* Zetterstedt, 1838 (= *F. congerens* Nylander, 1846) (PUTON 1878). However, PÉRICART (1998) mentions that he always collected this

species from mosses. The examined specimen belongs to the rare macropterous form. This species has a wide distribution range in southern Europe (Austria, Bosnia and Herzegovina, Croatia, France, Germany, Greece (Corfu and Crete as well), Italy, Macedonia, Portugal, Romania, Spain, and Switzerland) and North Africa (Algeria, Morocco, and Tunisia) (PÉRICART 1998). It is distinguished from other species of its subgenus by its relatively small size, shiny dorsum and castaneous coloration (Fig. 5H) (PÉRICART 1998).

Distribution in Turkey. İzmir (this work).

Discussion

In this paper, a total of 10 species of Heteroptera are recorded from Turkey for the first time. Among them, the finding of *Campylomma miyamotoi* from İzmir is particularly interesting since it was previously known only from Japan and Korea. We believe that its remote distribution in Turkey is due to the plant trades between Turkey and Japan or Korea but it is also possible that it is naturally present in whole distribution area of its host plant, *A. jubibrissin*, which spans from Japan to Azerbaijan. Other newly recorded species in this paper were already known from the neighboring regions of Turkey. The finding of a new *Adelphophylus* species from South Anatolia is very interesting considering the fact that this genus was known to occur only in the Balkans. Lack of records of any *Adelphophylus* species from any place between the Balkans and South Anatolia can suggest that this new species was isolated from the Balkanian populations a long time ago compared to other species of this genus. Finding of *Phytocoris (Exophytocoris) carapezzai* sp. nov. from Turkey is not surprising since the diversity and endemism of *Phytocoris* species of Turkey is very high and it is highly probable that there are still plenty of undescribed *Phytocoris* in Turkish fauna. Consequently, these new records and new species highlight the fact that the Heteroptera fauna of Turkey still has not been illustrated well and is in need of further research.

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References

- ARSLANGÜNDOĞDU Z., HIZAL E. & ACER S. 2018: First record of *Oxycarenus lavaterae* (Fabricius, 1787) (Heteroptera, Lygaeidae) in Turkey. *Applied Ecology and Environmental Research* **16**(2): 1305–1311.
- BOLU H., ÇELİK H. & KUŞTOĞAN N. 2019: The “Adasi” Lace Bug *Urentius euonymus* Distant, 1909 (Hemiptera: Heteroptera: Tingidae) a new pest on *Althea* spp. (Malvaceae) in Southeastern Anatolian region of Turkey. *Munis Entomology and Zoology* **14**(1): 265–269.
- CARAPEZZA A. 2016: Heteroptera of Lebanon. II. *Phytocoris (Exophytocoris) raunolinnavuorii* sp. nov. from the Horsh Ehden Nature

- Reserve and adjacent areas (Hemiptera: Heteroptera: Miridae: Mirinae). *Entomologica Americana* **122**(1): 110–114.
- CARAPEZZA A. & KMENT P. 2018: *Psallus thomashenryi* sp. n. and *Psallus lucanicus* from Turkey (Hemiptera, Heteroptera, Miridae). Pp. 253–265. In: WHEELER A. G. JR. (ed.): A festschrift recognizing Thomas J. Henry for a lifetime of contributions to Heteropteran systematics. *ZooKeys* **796**: 253–265.
- ÇERÇİ B. & DURSUN A. 2017: *Isometopus anlasi* sp. nov. (Heteroptera: Miridae) from Turkey. *Zootaxa* **4353**: 378–384.
- ÇERÇİ B. & KOÇAK Ö. 2016: Contribution to the knowledge of Heteroptera (Hemiptera) fauna of Turkey. *Journal of Insect Biodiversity* **4**: 1–18.
- ÇERÇİ B. & KOÇAK Ö. 2017a: Six new Heteroptera (Hemiptera) species for the fauna of Turkey with a new synonymy. *Munis Entomology and Zoology* **12**: 532–538.
- ÇERÇİ B. & KOÇAK Ö. 2017b: Further contribution to the Heteroptera (Hemiptera) fauna of Turkey with a new synonymy. *Acta Biologica Turcica* **30**: 121–127.
- DIOLIP. & ÖZGEN I. 2018: *Rhyparochromus tisifone* Linnavuori 1990, first record for Turkey (Heteroptera, Rhyparochromidae). *Journal of Entomology and Zoology Studies* **6**: 1153–1155.
- DOĞANLAR M., KARSAVURAN Y. & DEMIREL N. 2007: Taxonomic studies on *Coptosoma* (Laporte, 1832) (Heteroptera: Plataspidae) from Turkey. *Journal of Entomology* **4**(6): 404–424.
- DURSUN A. & FENT M. 2017: Type localities of Heteroptera (Insecta: Hemiptera) from Turkey. *Zootaxa* **4227**: 451–494.
- DUWAL R. K., JUNG S. H. & LEE S. H. 2013: Taxonomic revision of the genus *Campylomma* Reuter (Hemiptera: Miridae: Phylinae: Phylini) from Korea. *Journal of Asia-Pacific Entomology* **16**: 389–394.
- FENT M. & DURSUN A. 2016: Neue Funde und Beiträge zur Saldiden-Fauna (Hemiptera: Heteroptera) der Türkei. *Heteropteron* **47**: 27–29.
- GÜNTHER H. & STRAUSS G. 2018: *Reuteria winkelmanni* sp. nov., eine neue Weichwanze aus der Türkei (Heteroptera: Miridae). *Entomologische Zeitschrift* (Schwanfeld) **128**: 153–155.
- HENRY T. J. 2017: Biodiversity of Heteroptera. In: FOOTIT R. G. & ADLER P. H. (eds): *Insect Biodiversity. Science and Society. Vol. I. Second edition*. Wiley-Blackwell, Oxford, 904 pp.
- KARAER F., KUTBAY H. G. & TERZIOĞLU S. 2015: *Albizia julibrissin*. Pp. 156–164. In: HUSEYİN O. (ed.): *Türkiye İstilacı Bitkiler Kataloğu*. [Catalogue of Invasive Plants of Turkey]. T.C. Gıda, Tar. Ve Hay. Bakanlığı. Tagem, Bit. Sağ. Araş. Daire Başk., Ankara, 533 pp.
- KERZHNER I. M. & JOSIFOV M. 1999: Miridae Hahn, 1833. Pp. 1–576. In: AUKEMA B. & RIEGER C. (eds.): *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 1, Enicocephalomorpha, Dipsochoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha*. The Netherlands Entomological Society, Amsterdam, xiv + 577 pp.
- KNYSHOV A. & KONSTANTINOV F. V. 2013: A taxonomic revision of the genus *Platycranus* Fieber, 1870 (Hemiptera: Heteroptera: Miridae: Orthotylinae). *Zootaxa* **3637**(3): 201–253.
- KONSTANTINOV F. V., NEIMOROVETS V. V. & KORZEEV A. I. 2016: Review of *Campylomma* from Russia, Caucasus, and Central Asia with description of two new species (Hemiptera: Heteroptera: Miridae: Phylinae). *Entomologica Americana* **122**(1): 115–155.
- LINNAVUORI R. E. 1951: On some new or lesser known Heteroptera. *Annales Entomologici Fennici* **17**: 104–107.
- LINNAVUORI R. E. 1953: Hemipterological studies. *Annales Entomologici Fennici* **19**: 109–118.
- LINNAVUORI R. E. 1984: New species of Hemiptera Heteroptera from Iraq and the adjacent countries. *Acta Entomologica Fennica* **44**: 1–59.
- LINNAVUORI R. E. 1992: Studies on the Miridae fauna of Greece and the Middle East. *Biologica Gallo-Hellenica* **19**: 3–27.
- LINNAVUORI R. E. 1993: Hemiptera of Iraq. III. Heteroptera, Miridae (Phylinae). *Entomologica Fennica* **4**: 253–271.
- LINNAVUORI R. E. 1994a: On the Miridae fauna of Greece. *Biologica Gallo-Hellenica* **21**: 41–48.
- LINNAVUORI R. E. 1994b: Orthotylinae of West, Central and North-East Africa (Heteroptera, Miridae). *Acta Zoologica Fennica* **193**: 1–84.
- LINNAVUORI R. E. 1996: Miridae of West and Central Africa (Hemiptera, Heteroptera). *Acta Zoologica Fennica* **202**: 1–84.
- LINNAVUORI R. E. 2009: Studies of the Nepomorpha, Gerromorpha, Leptopodomorpha, and Miridae excluding Phylini (Hemiptera: Heteroptera) of Khuzestan and the adjacent provinces of Iran. *Acta Entomologica Musei Nationalis Pragae* **49**: 1–32.
- LINNAVUORI R. E. & MODARRES M. 1999: Studies on the Heteroptera of the Khorasan province in N.E. Iran. II. Cimicomorpha: Miridae. *Entomologica Fennica* **10**: 215–231.
- LODOS N., ÖNDER F., PEHLIVAN E., ATALAY R., ERKİN E., KARASAVURAN Y., TEZCAN S. & AKSOY S. 2003: *Faunistic Studies On Miridae (Heteroptera) of Western Bleack Sea, Central Anatolia and Mediterranean Regions of Turkey*. Ege Üniversitesi Ziraat Fakültesi, İzmir, X+85 pp.
- MATOCQ A. 2000: Une nouvelle espèce de *Cymus* de Turquie (Heteroptera, Lygaeidae, Cyminae). *Revue française d'Entomologie (Nouvelle Série)* **22**: 73–75.
- MATOCQ A. 2019: Un nouveau *Psallus* Fieber, 1858 de Turquie et de Jordanie (Hemiptera, Heteroptera, Miridae). *Revue de l'Association Roussillonnaise d'Entomologie* **28**(2): 92–96.
- MATOCQ A. & MAGNIEN P. 2009: Un nouvel *Adelphophylus* Wagner, 1959 des Balkans (Heteroptera, Miridae, Phylinae). *Nouvelle Revue d'Entomologie (Nouvelle Série)* **25**: 241–245.
- MATOCQ A. & PLUOT-SIGWALT D. 2001: Une nouvelle et remarquable espèce d'*Orthonotus* Stephens de Turquie et notes sur le genre (Heteroptera, Miridae, Phylinae). *Revue Française d'Entomologique (Nouvelle Série)* **23**: 71–78.
- MATOCQ A. & PLUOT-SIGWALT D. 2011: Une nouvelle espèce de *Psallus* de Turquie associée à *Fraxinus* sp. (Oleaceae) (Hemiptera, Heteroptera, Miridae, Phylinae). *Nouvelle Revue d'Entomologie* **27**(2): 163–172.
- MATOCQ A., PLUOT-SIGWALT D. & ÖZGEN I. 2014: Terrestrial Hemiptera (Heteroptera) collected in South-East Anatolia (Diyarbakır, Mardin and Elazığ provinces) (Turkey): second list. *Munis Entomology and Zoology* **9**: 884–930.
- MEMON N. & AHMAD I. 2008: Description of *Mustha izmirensis*, new species (Heteroptera: Pentatomidae: Halyini) from Bornova, Izmir, Turkey with key to its world species. *Pakistan Journal of Zoology* **40**(6): 435–439.
- MIFSUD D., FALZON A., MALUMPHY C., LILLO E., VOVLAS N. & PORCELLI F. 2012: On some arthropods associated with *Ficus* species (Moraceae) in the Maltese Islands. *Bulletin of the Entomological Society of Malta* **5**: 5–34.
- MORKEL C. & WYNIGER D. 2009: *Orthotylus attali* sp. nov. – a new plant bug from Turkey (Heteroptera: Miridae: Orthotylinae: Orthotylini). *Mitteilungen der Münchner Entomologischen Gesellschaft* **99**: 105–199.
- ÖNDER F., KARSAVURAN Y., TEZCAN S. & FENT M. 2006: *Heteroptera (Insecta) Catalogue of Turkey*. Ege Üniversitesi Ziraat Fakültesi, İzmir, vi+164.
- ÖZGEN I. & ÇERÇİ B. 2018: First record of the narrow stink bug *Mecidea lindbergi* Wagner, 1954 (Hemiptera: Heteroptera: Pentatomidae: Mecedini) from Turkey. *Ecologia Balkanica* **10**: 53–56.
- ÖZGEN I. & DIOLIP. 2018: A new and interesting record on Miridae (Hemiptera) fauna of Turkey: *Megacoelum quercicola* Linnavuori, 1965. *International Journal of Fauna and Biological Studies* **5**: 104–105.
- PAGOLA-CARTE S. 2010: A Revision of the genus *Brachynotocoris* Reuter, 1880 and other miridological contributions (Hemiptera: Heteroptera: Miridae) from the Basque Country (Northern Iberian Peninsula). *Heteropterus Revista de Entomología* **10**(2): 107–129.
- PAGOLA-CARTE S. & RIEGER C. 2017: *Phytocoris* (Exophytocoris) *diversitatis* n. sp. from Calabria, Southern Italian Peninsula (Hemiptera: Heteroptera: Miridae). *Heteropterus Revista de Entomología* **17**: 1–7.
- PÉRICART J. 1972: *Hémiptères Anthocoridae, Cimicidae et Microphysidae de l'Ouest-Paléarctique*. Faune de l'Europe et du Bassin Méditerranéen. Vol. 7. Masson et Cie Éditeurs, Paris, 404 pp.
- PÉRICART J. 1998: *Hémiptères Lygaeidae euro-méditerranéens, volume 2*. Faune de France. Vol. 84B. Fédération Française des Sociétés de Sciences Naturelles, Paris, 453 pp.
- PLUOT-SIGWALT D., STREITO J. & MATOCQ A. 2009: Is *Montandoniola moraguesi* (Puton, 1896) a mixture of different species? (Hemiptera: Heteroptera: Anthocoridae). *Zootaxa* **2208**: 25–43.

- PROTIĆ L. 2003: Species of the genus *Adelphophylus* Wagner (Heteroptera: Miridae) on the Balkan Peninsula. *Acta Entomologica Serbica* **8**: 79–84.
- PUTON A. 1878: *Synopsis des Hémiptères-Hétéroptères de France. Ire Partie. Lygaeidae*. Paris, Deyrolle, 82 pp.
- PUTSHKOV V. G. 1978a: New species of Miridae (Heteroptera) from Zangezur Ridge and Talysh Mountains of Transcaucasia. *Doklady Akademii Nauk Ukrainskoi SSR, Seriya B* **1978 (7)**: 645–649 (in Russian).
- PUTSHKOV V. G. 1978b: The species of the genus *Phytocoris* Fieb. (Heteroptera, Miridae) of the Caucasus fauna. *Vestnik Zoologii* **1978 (5)**: 50–57 (In Russian).
- PUTSHKOV V. G. 1980: New species of Miridae (Heteroptera) in the fauna of the Transcaucasus. *Doklady Akademii Nauk Ukrainskoi SSR Ser. B* **1980 (1)**: 82–85. [In Russian]
- PUTSHKOV V. G. 1984: *New species of Miridae (Heteroptera) in the fauna of the south of the USSR*. Pp. 28–32 In: SAVCHENKO E. N. (ed.): *Taksonomiya i zoogeografiya nasekomykh* (Taxonomy and Zoogeography of Insects). Akademii Nauk Ukrainskoi SSR, Kiev. (in Russian).
- SCHUH R. T. & SLATER J. A. 1995: *True Bugs of the World (Hemiptera: Heteroptera). Classification and Natural History*. Cornell University Press, Ithaca, New York: xii + 338 pp.
- WAGNER E. 1951: Einige neue Miridenarten aus Ägypten. *Bulletin de la Societe Fouad Ier d'Entomologie* **35**: 153–161.
- WAGNER E. 1959: Über einige Mediterrane Miridae (Hem. Het.). *Acta Entomologica Musei Nationalis Pragae* **33**: 339–358.
- WAGNER E. 1965: Die Gattung *Compsidolon* Reuter, 1899 (Het. Miridae). *Notulae Entomologicae* **45**: 113–137.
- WAGNER E. 1974: Die Miridae Hahn, 1831, des Mittelmeerraumes und der Makaronesischen Inseln (Hemiptera, Heteroptera). Teil 1. *Entomologische Abhandlungen Museum für Tierkunde Dresden* **39 (Supplement)**: 1–483.
- YASUNAGA T., SCHUH R. T. & DUWAL K. 2015: Taxonomic review of the plant bug genus *Campylomma* Reuter from Japan (Heteroptera: Miridae: Phylinae: Nasocorini), with descriptions of two new species. *Tijdschrift voor Entomologie* **158**: 49–69.
- YAZICI G. & YILDIRIM E. 2017: New and interesting records of Orthops Fieber 1858 (Hemiptera: Heteroptera: Miridae) in Turkey. *Acta Entomologica Serbica* **22**: 1–14.
- YILDIRIM E. & YAZICI G. 2018: Three new records from Phylinae (Hemiptera: Heteroptera: Miridae) for the Turkish fauna. *Turkish Journal of Zoology* **42**: 508–512.