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A new species of *Anthocoris* from Iran (Hemiptera: Heteroptera: Anthocoridae)

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Abstract. *Anthocoris kmenti* sp. nov. (Hemiptera: Heteroptera: Anthocoridae) is described from Mazandaran province (northern Iran). The species was collected on *Rubus idaeus* (Linnaeus) (Rosaceae), and confirmed as the predator of *Pealius setosus* Danzig, 1964 (Hemiptera: Aleyrodidae).

Key words. Heteroptera, Anthocoridae, *Anthocoris kmenti*, new species, host association, Iran, Palaearctic Region

Introduction

Anthocoris Fallén, 1814 (Hemiptera: Heteroptera: Anthocoridae), with more than 70 species worldwide, is the second largest genus in the family Anthocoridae (Péricart 1972, 2007; Ke & Bu 2007; Yamada et al. 2010; Lewis & Horston 2012). Most species of *Anthocoris* are primarily predators of Auchenorrhyncha, Sternorrhyncha, thrips and mites, and some species play an important role in the biological control of agricultural pests (Péricart 1972, Lattin 2000, Horton 2008). The Iranian fauna of *Anthocoris* is currently represented by 15 described species (Péricart 2007, Ghahari et al. 2009, Ostovan et al. 2017). This paper describes and illustrates a recently discovered new species uniquely associated with European raspberry (*Rubus idaeus*).

Material and methods

All specimens were obtained by beating the host plant, collected by aspirator, killed and preserved in 75% ethyl alcohol. They were then dried and mounted for examination of various structures. Examination and illustration of the genitalia and other external structures such as

the ostiolar peritreme and evaporatorium were made from specimens macerated in hot 10% KOH solution for 10 minutes. Specimens were dissected with micro-pins in glycerin on a glass slide using a binocular microscope (Leica MZ 12-5). Illustrations were made with the use of a binocular microscope and the aid of an eyepiece grid.

Taxonomy

Anthocoris kmenti sp. nov.

(Figs 1–7)

Type locality. Iran, Mazandaran, Behshahr, 36°41′N 53°44′E, 57 m a.s.l.

Type material. Holotype: ♂, 'Holotype, *Anthocoris kmenti* Moulet, Ghahari & Ostovan n. sp., P. Moulet det. 2017 [printed, red label] / Behshahr, 36°41′N 53°44′E (Mazandaran province), 6.viii.2014, leg. H. Ghahari, on *Rubus idaeus* (Linnaeus) (Rosaceae) [printed, white label]'. The abdomen, pygophore and paramere are attached to the label with the specimen. Paratype: ♂, same labels as holotype, except 'Paratype'. Both types are deposited in the Museum Requien, Avignon, France.

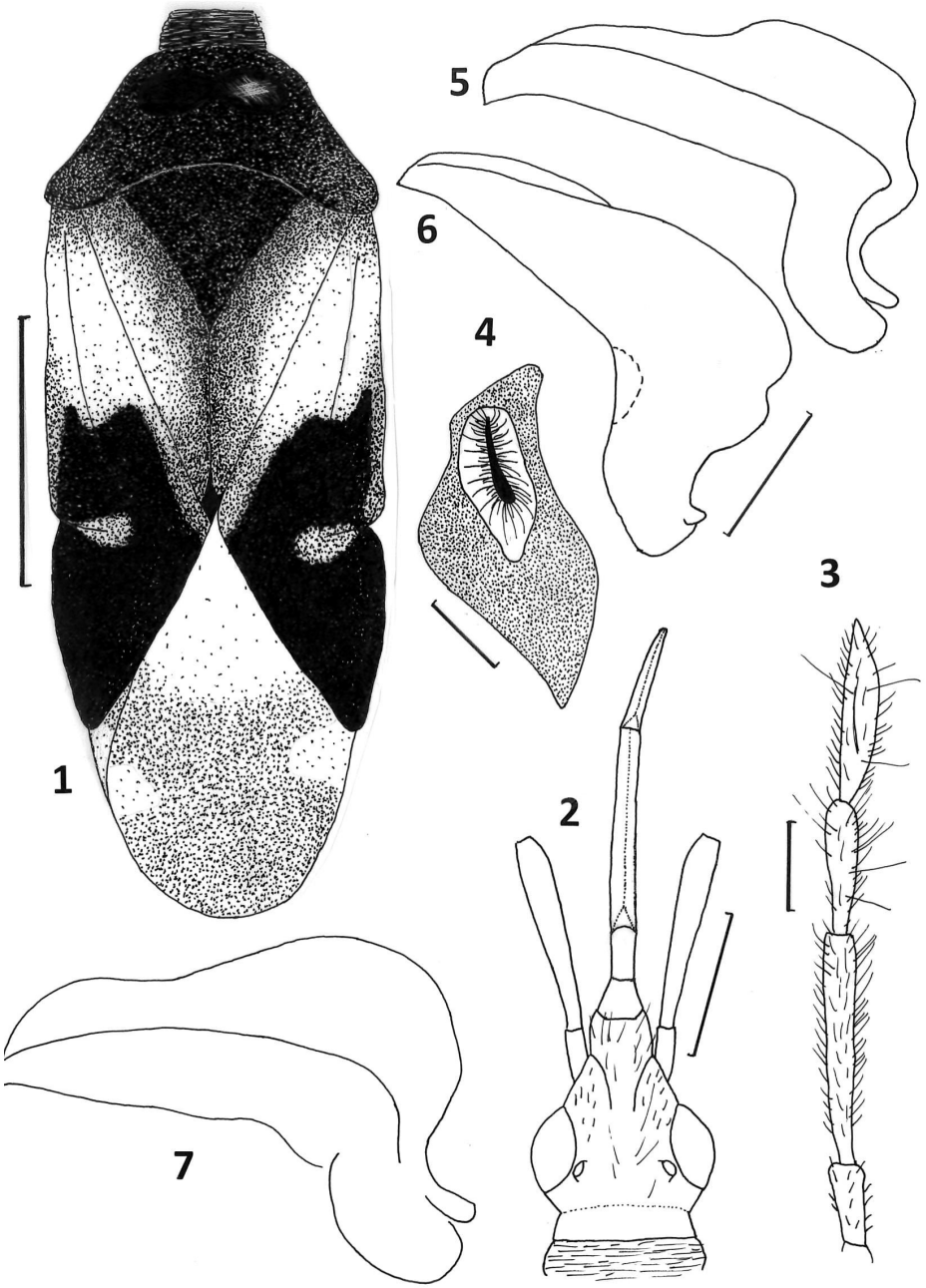
Description. *General morphology.* Body elongate, sides sub-parallel (Fig. 1). Head black (Fig. 2); apex of clypeus slightly paler (reddish brown); white, transparent, fine, stiff, long erect setae on clypeus, shorter elsewhere. Median line from posterior third of clypeus until "neck" glabrous. Eyes with some scarce stiff and very short setae. Ocelli red and very close to eyes. Antennae (Fig. 3) with white semi-erect setae, the longest as long as the diameter of the 2nd antennal segment at base; third and fourth antennal segments with numerous setae much longer and nearly perpendicular to the axis of the segment; first segment cylindrical, dark brown; second and third segments mostly yellowish, regularly widened from base to apex, second segment with base and apical quarter brown; third segment darkened on the apical half; fourth segment fusiform, uniformly more or less dark brown, very slightly paler at apex.

Pronotum black; collar broad, transversally striate; lateral margins slightly concave in posterior half; posterior margin deeply and broadly concave. Humeral angles pale brown to beige, broadly rounded. Disc not punctate, shagreened with very low gloss. Anterior rim smooth with few transverse striations, slightly raised relative to disc surface, and indistinguishable laterally, a very faint medial longitudinal furrow. Posterior part of pronotum (behind the rim) very slightly depressed in the middle; white or light yellow setae, semi-erect, separated from each other by a distance of 0.75–1.0 times the length of a seta.

Scutellum triangular, black, very finely punctured with fine, white, soft, erect or slightly curved setae, and apical part (from the middle to the apex) inclined relative to the basal part and weakly striate transversally.

Corium translucent, moderately shiny (incl. cuneus). Clavus light brown, slightly darker at ends; a pale lenticular spot along its external suture. Corium very slightly concave in its apical third; whitish on the apical half, light brown on the posterior half; exocorium brown with a discolored spot on the apical half. Cuneus dark brown, cuneal fracture yellowish. Scattered, stiff, semi-erect yellow or white setae, on cuneus and exocorium, even fewer and finer on corium. Membrane smoky brown except its base, which is whitish.

Dorsum and connexivum blackish-brown. Evaporatorium (Fig. 4) auriculate; margins sinuous, convergent and forming an acute tip both externally and internally; surface of evaporatorium shagreened; ostiole short and narrow.



Figs 1–7. *Anthocoris kmenti* sp. nov. 1 – body in dorsal view (excluding head) (scale 1 mm); 2 – head in dorsal view (scale 0.5 mm); 3 – antenna (scale 0.2 mm); 4 – ostiole, peritreme and evaporatorium (scale 0.1 mm); 5–7 – paramere in different positions (scale 0.05 mm).

Fig. 8. The collecting site of *Anthocoris kmenti* sp. nov. in Behshahr (northern Iran) with growth of *Rubus idaeus* in front.

Femora brown, very slightly paler near the junction with tibia. Tibiae orange yellow to light brown; metatibiae slightly darkened (paratype). Tarsi 3-segmented, brownish; claws hooked.

Ventral surface of abdomen completely black; coxae and trochanters yellowish; fore trochanters widely brown at the apex. First rostral joint dark brown; second cylindrical, becoming slightly paler from base to apex; third segment light brown.

Paramere (Figs 5–7) yellow, lamellate, basal part finely striate. Apical part (above the furrow) wider than the basal part; superior margin sinuous; the tip in the form of a short, hooked beak.

Measurements (holotype/paratype, in mm)**.** Body length: 3.43/3.52; head length: 0.48/0.48; head width across eyes: 0.49/0.49; length of antennal segments: I – 0.15/0.16, II – 0.49/0.51, III – 0.28/missing, IV – 0.39/missing; pronotal length: 0.57/0.60; pronotal width at the level of the anterior angles: 0.45/0.48; pronotal width at the level of the humeral angles: 1.09/1.12; scutellum length: 0.6/0.75, hind tibia length: 0.9/1.03.

Differential diagnosis. *Anthocoris kmenti* sp. nov. belongs to the *A. nemorum* species-group which consists of nine Palaearctic species: *A. alpinus* Zheng, 1984 (China), *A. expansus* Bu, 1995 (China), *A. kerzhneri* Bu & Zheng, 2001 (China), *A. limbatus* Fieber, 1836 (Palaearctic),

A. montanus Zheng, 1984 (China), *A. nemorum* (Linnaeus, 1761) (Palaearctic), *A. pericarti* Bu & Zheng, 2001 (China), *A. qinlingensis* Bu & Zheng, 1990 (China) and *A. zoui* Bu & Zheng, 2001 (China) (Bu & Zheng 2001).

Anthocoris kmenti is similar to other species of Palaearctic distribution, *A. nemorum* (Linnaeus, 1761) and *A. limbatus* Fieber, 1836 and the Chinese species, *A. pericarti* Bu & Zheng, 2001. With respect to the general colouration, *A. kmenti* is close to *A. limbatus* and *A. nemorum*: corium pale, darker basally, clavus brown with lenticular pale spot; but the posterior part of the pronotum of *A. limbatus* is pale (unlike *A. nemorum* and *A. kmenti*). The colour of the second antennal segment of *A. limbatus* (pale basal half, dark apical half) is different from that of *A. kmenti* which is dark only at base (narrowly) and apex (more broadly); in *A. nemorum* the segment II is pale except at the extreme apex. The paramere of *A. kmenti* is quite different from that of the other species of the group. In *A. pericarti*, the apical part is very broad, shorter than the basal part and does not reach the tip; the latter is differentiated into a strong and long hooked process. In *A. limbatus* and *A. nemorum*, the apical part of the paramere is broad and overlaps the basal part toward the tip; the tip is regularly tapered and not differentiated into a beak; the superior margin is regularly convex in *A. limbatus* and *A. nemorum* and sinuous in *A. kmenti*.

Etymology. The new species is kindly dedicated to Petr Kment (National Museum, Prague, Czech Republic) for helping the authors on multiple occasions.

Plant association. *Rubus idaeus* (Linnaeus) (Rosaceae) (Fig. 8).

Biology. Based upon observations of the second author, *A. kmenti* was an active predator of the whitefly *Pealius setosus* Danzig, 1964 (Hemiptera: Aleyrodidae). These observations, however, do not necessarily indicate that *A. kmenti* is a specialized predator, as no other species of insects could be found on *R. idaeus* at the type locality. *Pealius setosus* was listed from Iran by Evans (2007) and its main host plants are *Juniperus* spp. (Cupressaceae), *Fragaria vesca* (Linnaeus) and *Rubus* spp. (Rosaceae) (Evans 2007).

Distribution. *Anthocoris kmenti* is so far known only from Mazandaran province, north Iran.

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