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ANTHOCORID BUGS OF THE TRIBE ORIINI (HETEROPTERA: ANTHOCORIDAE) OF THE OGASAWARA (BONIN) ISLANDS, JAPAN

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Abstract.—Three anthocorid bugs of the tribe Oriini that are endemic to the Ogasawara (Bonin) Islands are reported. Two **new species**, ***Bilia pilosa*** and ***Kitocoris hahajima,*** are described, and the male of *K. omura* Herring is described for the first time. A note on *Orius strigicollis* (Poppius) is given, which is considered to have been accidentally introduced to Hahajima Island with vegetable nursery stock.

Key Words: Heteroptera, Anthocoridae, Oriini, new species, Ogasawara Islands

The anthocorid tribe Oriini includes well-known predators of aphids, mites, thrips and other tiny arthropods, and some members are effective candidates for biological control (e.g., *Orius* spp., *Bilia* spp., *Wollastoniella* spp.). The species of the tribe occurring in the Japan proper and the Ryukyu Islands were treated by Carayon and Miyamoto (1972), Yasunaga (1993, 1997a, b, c) and Yasunaga et al. (1993), whereas only two species, *Orius strigicollis* (Poppius) and *Kitocoris omura* Herring (Herring 1967, Yasunaga 1992, 1996, 1997b), have been reported from the Ogasawara (Bonin) Islands. In my recent surveys to clarify the oriine fauna of these islands, I have found four species. Three of them are considered endemic to the islands.

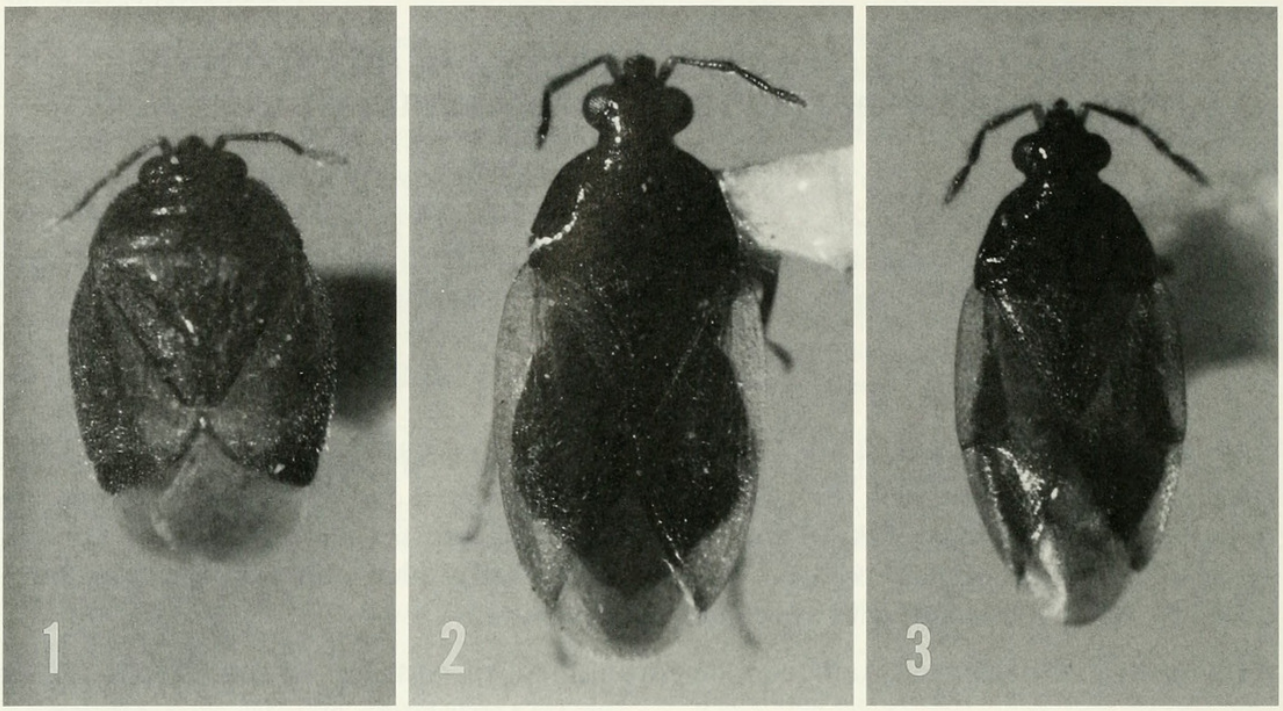
In the present paper, two new species of the genera *Bilia* and *Kitocoris* are described; the undescribed species of *Kitocoris* was erroneously reported from Hahajima Island as *K. omura* Herring by Yasunaga (1992). The male of true *Kitocoris omura* Herring, now confirmed to be restricted to Chichijima and Mukojima Islands, is described for the first time. A note on the Hahajima population of *Orius strigicollis* (Poppius) is given, which is considered to have been accidentally introduced to the island.

All measurements in the text are given in mm. Terminology for descriptions mainly follows Yasunaga (1997a). In the synonymic lists, only selected references are cited for known taxa; see Péricart (1996) for detailed lists. The specimens examined are deposited in Hokkaido University of Education, Sapporo, Japan (HUES), and National Museum of Natural History, Smithsonian Institution, Washington, D. C., USA (USNM).

Bilia Distant

Bilia Distant 1904: 480 (in Isometopinae of Miridae), type species: *B. fracta* Distant 1904, monotypic (transferred to tribe Oriini of Anthocoridae by Carayon 1958: 149); Carayon and Miyamoto 1960: 20–26; Péricart 1996: 121.

Diagnosis.—This is a small genus currently composed of five members in the Oriental and eastern Palearctic regions, and is recognized by the rounded body; shiny fuscous dorsal surface uniformly provided with sericeous, reclining pubescence; short and widened head; C-shaped, apically ta-



Figs. 1–3. Dorsal habitus of female. 1, *Bilia pilosa.* 2, *Kitocoris omura,* holotype. 3, *K. hahajima.*

pered male paramere accompanied by a mesial slender hook; and a fragile, membranous female copulatory tube. The nymph has a fuscous, rounded body. Detailed generic characters were provided by Carayon and Miyamoto (1960), including descriptions of three Japanese species, *B. japonica, B. esakii,* and *B. ophthalmica.*

Remarks.—All members of the genus are predaceous. Carayon and Miyamoto (1960) documented that *B. japonica* preyed on the eggs and nymphs of iassid leafhoppers. According to Mr. M. Takai (personal communication), *B. japonica* is often found preying on thrips in flowers of loquat (*Eriobotrya japonica* Lindley, Rosaceae).

Bilia pilosa Yasunaga, new species
(Figs. 1, 9)

Bilia sp.: Herring 1967: 395; Yasunaga et al. 1993: 168, pl. 27 (dorsal habitus photo).

Description.—Body almost unicolorously dark chestnut brown, rounded, rather flat; dorsal surface not strongly shining due to dense, silky pubescence. Head much wider than long in dorsal view, bearing sericeous pubescence. Antenna dark brown, short, generally thickened in ♂; setae on segments II–IV long, about twice as long as diameter of every segment; basal ⅓–½ of segment II sometimes yellowish brown; lengths of segments I–IV (♂/♀): 0.08–0.09/0.07–0.09, 0.33–0.38/0.22–0.27, 0.22–0.25/0.18–0.22, 0.21–0.25/0.18–0.22. Rostrum shiny chocolate brown; segment II and III usually pale. Pronotum rounded at humeri, with densely distributed, silky, suberect pubescence; callus narrow, with pubescent and minutely punctate mesal part; scutellum somewhat arched; pleura widely dark brown. Hemelytra weakly shining, with densely distributed, silky, suberect pubescence; cuneus narrow; membrane pale grayish brown. Coxae dark brown; legs yellowish brown, short; metafemur sometimes weakly darkened; lengths of metafemur, tibia and tarsus (♂/♀): 0.45–0.49/0.43–0.51, 0.58–0.62/0.56–0.62, 0.14–0.16/0.12–0.16.

Male genitalia (Fig. 9): Genital segment rather pointed apically; paramere C-shaped, tapered toward apex, with long median branch.

Dimensions (♂/♀): Body length 1.6–1.8/

1.7–1.9; head width, including compound eyes 0.41–0.45/0.40–0.45; vertex width 0.19–0.20/0.22–0.24; width between ocelli 0.16–0.19/0.19–0.20; rostral length 0.41–0.45/0.43–0.48; mesal pronotal length 0.28–0.33/0.29–0.35; basal pronotal width 0.81–0.88/0.85–0.92; embolium length 0.69–0.76/0.75–0.78; cuneal length 0.26–0.29/0.24–0.29; width across hemelytra 0.94–1.02/1.03–1.12.

Holotype.—♂, Ogasawara Island, Hahajima Is., Mt. Chibusa, 15. iv. 1993, T. Yasunaga (HUES).

Paratypes.—Chichijima Is.: 6 ♂, 1 ♀, Hase, 15. iv. 1997, T. Matsumoto (HUES); 1 ♀, Tatsumi-dani, 31. vii. 1996, T. Matsumoto (HUES); 1 ♀, Nakayama-toge, 16. iv. 1997, T. Matsumoto (HUES). Hahajima Is.: 3 ♂, 2 ♀, same data as for holotype (HUES); 1 ♂, 2 ♀, same locality, 20. iv. 1993, K. Yoshizawa (USNM); 1 ♂, 4 ♀, Kuwanokiyama, 14. iv. 1993, T. Yasunaga (HUES); 2 ♂, 10 ♀, Kita Vil., 18. iv. 1993, T. Yasunaga et al. (HUES); 12 ♀, Funakiyama, 20. iv. 1993, T. Yasunaga (HUES).

Distribution.—Chichijima and Hahajima islands.

Remarks.—This new species is distinguished from other congeners by the dense pubescence on dorsum, narrow pronotal callus, and shape of the male paramere.

I collected *B. pilosa* from flowers of *Boehmeria boninensis* Nakai (Urticaceae) and *Celtis boninensis* Koidz. (Ulmaceae), together with unidentified thrips that are considered as prey.

Kitocoris Herring

Kitocoris Herring 1967: 396, type species: *K. omura* Herring 1967, monotypic; Yasunaga 1992: 1; Péricart 1996: 122.

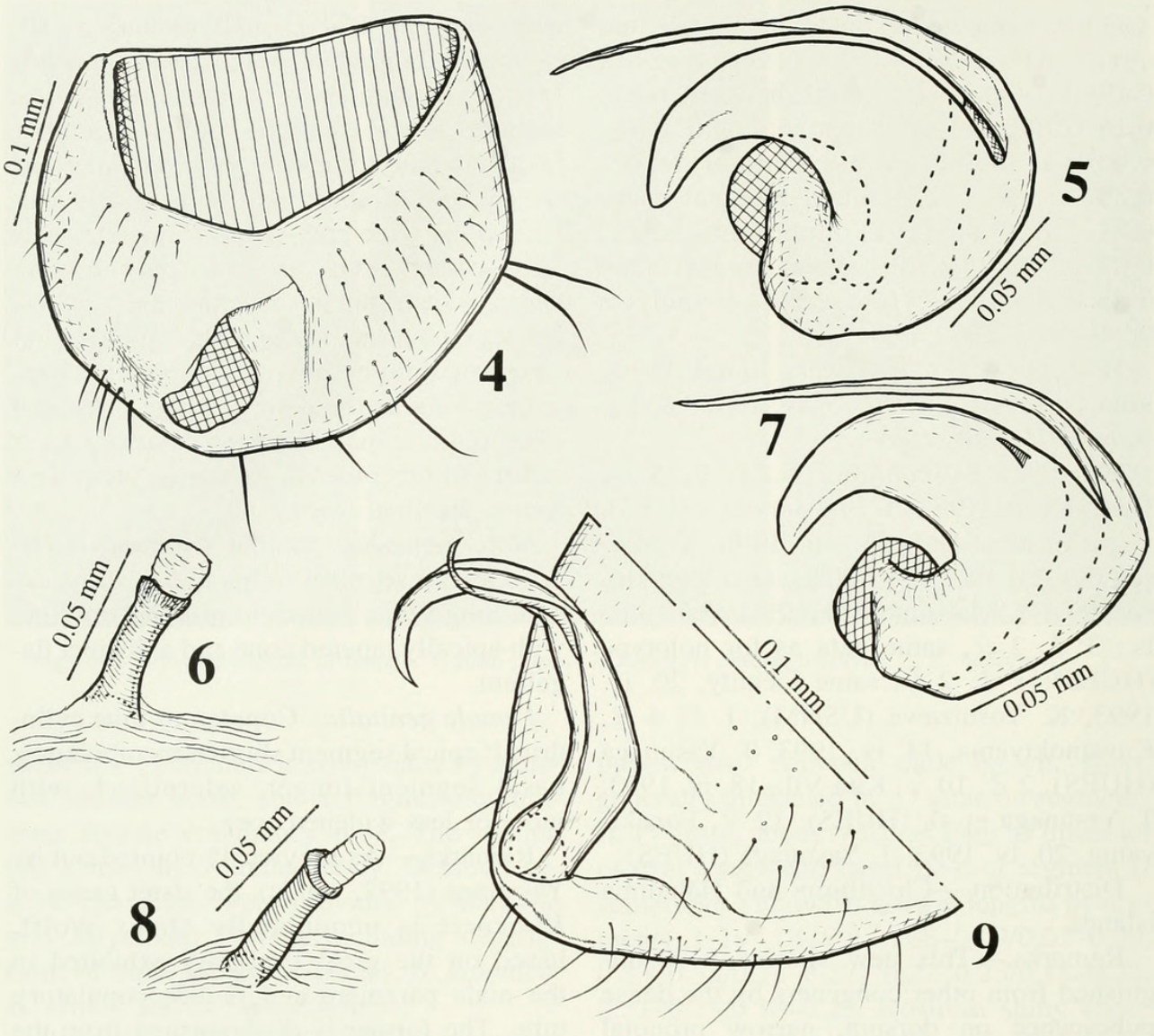
Diagnosis.—Body oval, relatively flat; dorsal surface shiny, densely pubescent. Head fuscous, apparently shorter than width including compound eyes, constricted anteriorly; vertex with a weak, basal transverse carina. Antennae short, not thickened in ♂; each segment almost equal in thickness; segment I about half as long as III; segment II gradually incrassate towards apex. Pronotum dark, shining, rounded at humeri; lateral margin strongly carinate, flattened and somewhat reflexed laterally, with a row of short, stiff setae along margin; callus wide and tumid. Hemelytra pale yellowish brown, semitransparent, with densely distributed, pale suberect pubescence; embolium wide, with somewhat reflexed margin; corium and embolium short; cuneus long and wide, more than ¾ as long as embolium; membrane very narrow. Legs rather short; protibia with distinct, dark brown protibial teeth.

Male genitalia: Similar to those of *Orius*. Genital segment rather short, with several, long setae; paramere rounded and flat, with apically tapered cone and a distinct flagellum.

Female genitalia: Copulatory tube cylindrical; apical segment shorter, membranous; basal segment longer, sclerotized, with more or less widened apex.

Remarks.—As previously pointed out by Yasunaga (1992, 1997a), the sister genus of *Kitocoris* is undoubtedly *Orius* Wolff, based on the great similarity exhibited in the male paramere and female copulatory tube. The former is distinguished from the latter by the strongly and widely carinate lateral margin and rounded humeri of the pronotum, tumid callus, short, rounded embolium, wide cuneus, and narrow forewing membrane; these characters are regarded as autapomorphies for *Kitocoris*. Presumably, the common ancestor of the genus invaded Bonin Island was isolated by the Pacific Ocean, and speciated.

Recently, inferred phylogenetic relationships for some *Orius* species were proposed by Honda et al. (1998), with *Wollastoniella rotunda* Yasunaga et Miyamoto as the outgroup taxon. Their conclusion, as declared, is tentative, because only 10 species were analyzed. Judging from the genital structures, *Kitocoris* is even closer to *Orius* than *Wollastoniella,* and would seem to be a better outgroup for hypothesizing phylogeny



Figs. 4–9. Genitalia of *Kitocoris omura* (4–6), *K. hahajima* (7, 8) and *Bilia pilosa* (9). 4, Male genital segment. 5, 7, Paramere. 6, 8, Female copulatory tube. 9, Male genital segment with paramere.

of *Orius,* the largest genus among the Anthocoridae. Of course, *Orius* is a world genus, and it would be desirable to include all species, or, at least, representatives of all the subgenera.

Kitocoris omura Herring
(Figs. 2, 4–6)

Kitocoris omura Herring 1967: 397, fig. 3; Péricart 1996: 122.

Redescription.—Body oval; dorsal surface uniformly clothed with suberect, sericeous pubescence. Head shiny chestnut brown, with sparse, silky pubescence. Antennae dark brown; apical part of segment I and sometimes segment II pale brown; lengths of segments I–IV (♂/♀): 0.10–0.12/0.09–0.13, 0.25–0.26/0.24–0.25, 0.19–0.21/0.18–0.20, 0.21–0.22/0.16–0.21. Rostrum shiny dark brown. Pronotum shiny dark chestnut brown, weakly rugose behind callus; scutellum chestnut brown; pleura unicolorously fuscous. Coxae chestnut brown or reddish brown; legs yellowish brown; basal half of profemur fuscous; metafemur slightly darkened basally; lengths of metafemur, tibia and tarsus (♂/♀): 0.50–0.58/0.57–0.60, 0.60–0.65/0.60–0.62, 0.18–0.20/0.17–0.20. Abdomen dark brown.

Male genitalia (Figs. 4–5) : Paramere

lacking denticule; basal half of flagellum broadened.

Female genitalia (Fig. 6): Copulatory tube with short apical segment.

Dimensions (♂/♀): Body length 1.9–2.2/2.1–2.3; head width, including compound eyes 0.40–0.44/0.38–0.44; vertex width 0.19–0.20/0.19–0.21; width between ocelli 0.14–0.16/0.15–0.18; rostral length 0.41–0.53/0.44–0.52; mesal pronotal length 0.31–0.38/0.35–0.40; basal pronotal width 0.71–0.84/0.75–0.85; embolium length 0.74–0.76/0.74–0.81; cuneal length 0.55–0.57/0.57–0.58; width across hemelytra 0.92–1.12/0.99–1.10.

Material examined.—Chichijima Is.: 1 ♀, Omura, 19. vi. 1949, A. R. Mead (holotype, USNM); 1 ♂, 2 ♀, Mt. Tsutsuji, 17. iv. 1997, T. Matsumoto (HUES); 1 ♀, same locality, 10. vii. 1997, T. Kishimoto (HUES); 3 ♀, Mt. Mikazuki, 28. vii. 1996, T. Kishimoto (HUES); 1 ♀, Nakayamatoge, 16. iv. 1997, T. Matsumoto (HUES); 1 ♂, 1 ♀, Tatsumi R'd-Mt. Tsutsuji, 30. vi. 1997, T. Matsumoto (HUES); 1 ♂, 1 ♀, Tatsumidani, 28. iv. 1996, K. Morimoto (HUES). Mukojima Is. (new record): 2 ♀, Mt. Zoutouzan, 25. iv. 1997, T. Matsumoto (HUES).

Distribution.—Chichijima and Mukojima islands.

Remarks.—The male of this species is here reported and described for the first time.

Kitocoris hahajima Yasunaga, new species

(Figs. 3, 7–8)

Kitocoris omura (nec Herring 1967): Yasunaga 1992: 2, fig. 1; Yasunaga et al. 1993: 168, pl. 27 (dorsal habitus photo).

Description.—Head dark brown, shining, with sparse, silky, suberect pubescence. Antennae dark brown, except entirely yellow segment I; lengths of segments I–IV (♂/♀): 0.08–0.10/0.08–0.10, 0.22–0.24/0.20–0.24, 0.15–0.18/0.13–0.16, 0.15–0.16/0.15–0.17. Rostrum shiny dark brown. Pronotum shiny dark chestnut brown; basal margin less arched; scutellum dark chestnut brown, shining; pleura almost entirely dark chestnut brown, with somewhat paler ostiolar peritreme. Hemelytra pale yellowish brown, semitransparent; apex of embolium with a brown spot; membrane pale smoky brown. Coxae pale brown or brown; legs yellow; basal ⅓–½ of all femora dark brown; basal parts of meso- and metatibiae usually widely darkened; tarsi brown; lengths of metafemur, tibia and tarsus (♂/♀): 0.47–0.49/0.48–0.52, 0.53–0.55/0.52–0.55, 0.13–0.15/0.13–0.16. Abdomen almost unicolorously shiny chestnut brown.

Male genitalia (Fig. 7): Paramere with a small but distinct denticule on cone; flagellum long, gradually tapered toward apex.

Female genitalia (Fig. 8): Very similar to *K. omura*; copulatory tube rather slender; apex of basal segment forming tubercle; apical segment longer.

Dimensions (♂/♀): Body length 1.7–1.8/1.7–1.9; head width including compound eyes 0.34–0.38/0.32–0.37; vertex width 0.18–0.19/0.19–0.20; width between ocelli 0.13–0.17/0.14–0.16; rostral length 0.37–0.40/0.41–0.43; mesal pronotal length 0.27–0.33/0.28–0.34; basal pronotal width 0.61–0.67/0.58–0.69; embolium length 0.56–0.61/0.57–0.59; cuneal length 0.47–0.49/0.47–0.50; width across hemelytra 0.81–0.84/0.86–0.88.

Holotype.—♂, Ogasawara Islands, Hahajima Is., Kuwanokiyama, 14. iv. 1993, T. Yasunaga (USNM).

Paratypes.—Hahajima Is.: 2 ♂, 8 ♀, same data as for holotype (HUES); 1 ♀, Mt. Chibusa-yama, Hahajima Is., 17. vii. 1991, T. Yasunaga (HUES); 2 ♂, 1 ♀, same locality, 19. vii. 1991, T. Ueno (HUES); 1 ♀, same locality, 4. viii. 1996, T. Kishimoto (HUES); 1 ♂, same locality, 7. vii. 1997, T. Matsumoto (HUES); 1 ♀, Tamagawa Reservoir, 5. vii. 1997, T. Matsumoto (HUES).

Distribution.—Endemic to Hahajima Island.

Remarks.—In my previous paper (Ya-

sunaga 1992), this species was regarded conspecific with *K. omura*. But the present examination of the holotype of *K. omura* indicates that the population occurring in Hahajima Island is not conspecific. These two species are now confirmed to be allopatric. The present new species is readily distinguished from it by the smaller size, dark apex of the embolium, fuscous base of the metafemur, widely infuscated meso- and metatibiae, and distinct denticule on the paramere.

Kitocoris hahajima was found on flowers of *Boehmeria boninensis* Nakai and other herbaceous plants, together with undetermined thrips that appear to be prey.

Orius (Heterorius) strigicollis (Poppius)

Triphleps strigicollis Poppius 1915: 9.
Orius (Heterorius) strigicollis: Yasunaga 1997b: 382.

A single distributional record of this species in Ogasawara Islands is associated with Hahajima Island (Yasunaga 1997b). My observations in the island suggest that *O. strigicollis* is restricted to cultivated lands and environs of two (Oki and Kita) villages where numerous specimens were collected from herbaceous plants and vegetables. But not an individual was to be found in montane or forest areas with natural vegetation. *Orius* bugs are frequently observed depositing their eggs into leaf veins, and young leaves and stems of eggplant, cucumber, etc. Therefore, the Hahajima population of *O. strigicollis* appears to have been introduced with shipment of vegetable nursery stock.

A synonymic list, redescription, habit, habitat and distributional records for *O. strigicollis* were provided by Yasunaga (1997b).

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