Three Anthocorid Species (Heteroptera: Anthocoridae), Predators of *Thrips palmi* (Thysanoptera) in Eggplant Gardens of Thailand

Tomohide YASUNAGA and Syôiti MIYAMOTO¹

*Biological Laboratory, College of General Education, Kyushu
University, Ropponmatsu, Fukuoka 810, Japan*

¹ *Iikura 3–34–4, Sawara-ku, Fukuoka 814–01, Japan*

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Three species of the Anthocoridae associated with *Thrips palmi* KARNY in eggplant gardens of Thailand are reported. *Wollastoniella rotunda* is described as new to Science, and *Orius minutus* (LINNAEUS) and *O. tantillus* (MOTSCHULSKY) are recorded from this region for the first time. A new subgenus, *Paraorius*, is proposed for *Orius tantillus*.

Key words: Anthocoridae, Thailand, new species, new subgenus, *Thrips palmi*

INTRODUCTION

During exploration under Dr. Y. HIROSE for natural enemies of *Thrips palmi* KARNY in Thailand from 1987 to 1988, 26 specimens of anthocorid bugs were collected in eggplant gardens. Some of these specimens were reported as *Orius* sp. A and *Bilia* sp. (HIROSE, 1990), based on the identification by YASUNAGA. Recently, we had an opportunity to examine all 26 specimens more closely, and three species were recognized. One of them is an undescribed species belonging to the genus *Wollastoniella*, which was previously recorded as *Bilia* sp. (HIROSE, 1990). The other two species are *Orius minutus* (LINNAEUS, 1758) and *O. tantillus* (MOTSCHULSKY, 1863).

In the present paper *Wollastoniella rotunda* sp. nov. is described and illustrated, and *Orius minutus* and *O. tantillus* are reported from Thailand for the first time. A new subgenus, *Paraorius*, is proposed for *O. tantillus*. All three species are known to be predators of *T. palmi*, a serious pest of fresh vegetables.

All measurements in the text are given in mm. Type specimens of new species will be deposited in authors' collection, U.S. National Museum of Natural History and The University of Florida.

Wollastoniella rotunda YASUNAGA and MIYAMOTO, new species
(Figs. 1; 2 A & B)

Body fuscous, rounded; dorsal surface shining, punctate, uniformly covered with silky suberect pubescence (Fig. 1A).

Head chestnut brown to fuscous, shining, declivous, somewhat pointed in front, sparsely covered with silky erect pubescence; vertex weakly carinate basally; tylus reddish apically, slightly projected. Antennae yellowish brown, short, thickened in ♂,

with pale suberect hairs; 1st segment short, about half as long as an eye; 2nd segment about as long as width of vertex; 3rd and 4th segments usually reddish brown; length of segments I–IV as 0.08:0.22:0.16:0.20 in ♂, 0.07:0.22:0.16:0.20 in ♀. Rostrum yellow, except 1st segment tinged with red, extending slightly beyond anterior coxae.

Pronotum shiny fuscous, coarsely and rather densely punctate, carinate laterally, uniformly covered with silky suberect pubescence; anterolateral margin flattened and somewhat rounded; callus flat, weak, partially minutely punctate (Fig. 1 B). Scutellum shining, sparsely and finely punctate, with silky suberect pubescence; median part somewhat depressed; posterior half weakly and transversely rugose. Scent gland opening distinct, somewhat rounded posteriorly (Fig. 1 C). Hemelytra shiny fuscous, rounded laterally, shallowly and finely punctate, uniformly covered with silky suberect pubescence (Fig. 1 D); cuneus short, about half as long as width; membrane pale grayish brown. Legs yellow, rather short; length of hind femur: tibia: tarsus as 0.36:0.43:0.14 in ♂, 0.38:0.49:0.18 in ♀.

Fig. 1. *Wollastoniella rotunda* sp. nov.—A, Female in dorsal view; B, head and pronotum of male in dorsal view; C, scent gland opening in left lateral view; D, left forewing. Scales: 0.5 mm for A and D, 0.2 mm for B and C.

Fig. 2. Left parameres of *Wollastoniella rotunda* (A and B), *Orius minutus* (C) and *O. tantillus* (D)—A, Ventral view; B–D, dorsal view. Scale: 0.1 mm.

Abdomen dark chestnut brown to fuscous, shining, almost concolorous, densely with silky hairs. Left paramere distinctly twisted in general shape; cone with a dorsal thin projection at middle and with a dorsal reflexed flap at base of flagellum; flagellum thickened at basal 1/3, tapering toward slender and recurved apex (Fig. 2 A & B).

Body length 1.13–1.27 (♂), 1.34–1.39 (♀); head width including compound eyes 0.34–0.36 (♂), 0.36–0.38 (♀); width between ocelli 0.17 (♂), 0.17–0.18 (♀); rostral length 0.43–0.44 (♂), 0.44–0.46 (♀); basal width of pronotum 0.65–0.66 (♂), 0.67–0.73 (♀); width across hemelytra 0.71–0.73 (♂), 0.79–0.88 (♀).

Type-series. Holotype: ♂, Muangkaew, Mae Rim, Chiang Mai, N. Thailand, 9. ii. 1988, Y. HIROSE (U.S. National Museum of Natural History). Paratypes: 2 ♀, Nong Kong, Mae Taeng, Chiang Mai, 28. ix. 1987, Y. HIROSE; 2 ♂ 8 ♀, same data as the holotype; 3 ♀, Khee Lek, Mae Taeng, Chiang Mai, 9. ii. 1988, Y. HIROSE; 1 ♂ 1 ♀, Tambol Bang Gung, Suphan Buri, 20 ii. 1988, Y. HIROSE; 5 ♂ 15 ♀*, Thoen Tak: Bam Mae Wa, with *T. palmi*, 28. i. 1992, F. D. BENNETT and R. M. BARANOWSKI.

Distribution. Northern Thailand.

This new species is allied to *Wollastoniella yunnanensis* BU and ZHENG, 1990, from which it can be distinguished by the much rounded body, reddish 3rd and 4th antennal segments and different structure of the left paramere.

This species actually fed on *T. palmi* (Dr. HIROSE, pers. commun.). The additional specimens indicated by an asterisk were subsequently offered by Dr. F. D. BENNETT.

Fig. 3. Heads pronota and scent gland openings of *Orius* spp.—A and B, *O. minutus*; C and D, *O. tantillus*—A and C, Heads and pronota in dorsal view; B and D, scent gland openings in left lateral view. Each scale graduated in steps of 0.1 mm.

Orius (Heterorius) minutus (LINNAEUS, 1758)
(Figs. 2 C; 3 A & B)

Cimex minutus LINNAEUS, 1758, Syst. nat., 1: 446.

Orius minutus: CHINA, 1943, Gen. Names Brit. Ins., 8: 253.

Orius (Heterorius) minutus: WAGNER, 1952, Notul. ent., 32: 43.

Specimens examined. 1 ♂, Khee Lek, Maetaeng, Chiang Mai, 8. i. 1988, Y. HIROSE; 1 ♂ 5 ♀, Muangkaew, Mae Rim, Chiang Mai, 9. ii. 1988, Y. HIROSE.

Distribution. N. Thailand (new record), Holarctic Region (WAGNER, 1967), N. Africa (PÉRICART, 1972).

This species is recognized by the dense silky pubescence on dorsum, distinct pronotal callus, dark basal part of the hind femur, long and slender flagellum of the left paramere and large indentation which is contiguous to the base of flagellum.

It has the widest distribution among the congeneric species, and is well known as an effective predator of tiny arthropods, thrips, aphids, mites, etc. HIROSE (1990) reported it as *Orius* sp. A from Thailand, and it actually preyed on *T. palmi* (Dr. HIROSE, pers. commun.).

Paraorius YASUNAGA and MIYAMOTO, new subgenus

Type species: *Anthocoris tantillus* MOTSCHULSKY, 1863, by monotypy.

Body suboval, rather small; dorsal surface punctate, clothed with very short hairs.

Head relatively long, punctate; basal margin of vertex weakly and transversely carinate; tylus rather elongate, about as long as an eye.

Pronotum narrow, coarsely and distinctly punctate, with very short hairs, lacking noticeable setae at each angle; lateral margin not rounded; callus flat, partially but distinctly punctate. Scutellum sparsely set with very short hairs. Hemelytra shallowly and irregularly punctate, with pale very short hairs.

Left paramere with 3-branched flagellum; cone tapered toward apex, lacking dorsal indentation (Fig. 2 D).

As pointed out by GHURI (1972) and WOODWARD and POSTLE (1986), the subgeneric position of *O. tantillus* has not been determined, although the genus *Orius* itself is subdivided into four subgenera: *Orius* s. str., *Heterorius* WAGNER, *Dimorphella* REUTER and *Microtrachelia* BLÖTE. Since *O. tantillus* cannot be included in any of the above mentioned subgenera due to the structural differences, a new subgenus is proposed for it.

This new subgenus is characterized by the very short hairs on dorsum, long head, distinctly punctate pronotum that lacks the noticeable setae at each angle, flat and punctate pronotal callus, branched flagellum and cone that lacks the dorsal indentation.

Orius (Paraorius) tantillus (MOTSCHULSKY, 1863)
(Figs. 2 D; 3 C & D)

Anthocoris tantillus MOTSCHULSKY, 1863, Bull. Soc. nat. Mosc., 36(3): 89; KERZHNER & JANSSON, 1985, Annl. ent. fenn., 51: 38 (note on type specimens).

Orius tantillus: GHURI, 1972, J. nat. Hist., 6: 411 (= *Orius niobe*); MANLEY, 1976, Ent. News., 87: 103; WOODWARD & POSTLE, 1986, J. Aust. ent. Soc., 25: 247 (= *Triphleps australis*); ZHENG, 1982, Acta ent. sin., 25: 193, fig. 10; CHANG & LIM 1985, in Econ. Ins. Faun. China, Fasc. 31, Hem. (1), p. 195; ZHENG & BU, 1990, Contr. Tianjin nat. Hist. Mus., 7: 26.

Triphleps tantilus [sic]: DISTANT, 1906, Faun. Brit. India, Rhync. Vol. 3, p. 8; POPPIUS, 1909, Acta Soc. Sci. fenn., 37(9): 43.

Orius tantilus [sic]: GHURI, 1964, Ann. Mag. nat. Hist., (13)7: 687; MURALEEDHARAN & ANANTHAKRISHNAN, 1974, Orient. Ins., 8: 38.

Triphleps australis CHINA, 1926, Bull. ent. Res., 16: 361.

Orius niobe HERRING, 1967, Ins. Micronesia, 7: 399, fig. 4.

Specimen examined. 1 ♂, Muangkaew, Mae Rim, Chiang Mai, 9. ii. 1988, Y. HIROSE.

Distribution. N. Thailand (new record), Malaysia (MANLEY, 1976), Sri Lanka (DISTANT, 1906), India (DISTANT, 1906; MURALEEDHARAN and ANANTHAKRISHNAN, 1974), S. China (ZHENG, 1982), Australia (CHINA, 1926; WOODWARD and POSTLE, 1986), Micronesia (HERRING, 1967).

This species is easily recognized by the smaller size, fuscous punctulate head and pronotum, and almost entirely pale hemelytra and legs.

Orius tantillus is a southern species, widely distributed in the Indo-Pacific. BERNARDO (1991) reported that *O. tantillus* is a predator of *T. palmi* in the Philippines. It is also known as a predator of agricultural pests in India (MURALEEDHARAN and ANANTHAKRISHNAN, 1974) and as an effective predator of thrips and lepidopteran eggs in rice fields of southern China (CHANG and LIM, 1985). CHINA (1926) mentioned that

this species preys on eggs of *Heliothis obsoleta* (Lepidoptera) in Australia. A detailed report on its biology in Malaysia was provided by MANLEY (1976).

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REFERENCES

- BERNARDO, E. N. (1991) Thrips on vegetable crops in the Philippines. In *Thrips in Southeast Asia* (N. S. TALEKAR, ed.), AVRDC, Taipei, pp. 5–11.
- BU, W.-j. and L.-y. ZHENG (1990) Genus *Wollastoniella* Rr. and genus *Bilia* Dist. (Hemiptera: Anthocoridae) from China. *Entomotaxonomia* **12**: 79–84.
- CHANG, W.-q. and S.-j. LIM (1985) Anthocoridae. In *Economic Insect Fauna of China*, Fasc. 31, Hemiptera 1 (S.-m. ZHANG, ed.), Science Press, Beijing, China, pp. 191–196.
- CHINA, W. E. (1926) A new species of *Triphleps* (Heteroptera, Anthocoridae) preying on the eggs *Heliothis obsoleta* H.S., in Queensland. *Bull. entomol. Res.* **16**: 361–362.
- DISTANT, W. L. (1906) *The fauna of British India, including Ceylon and Burma*. Rhynchota Vol. III (Heteroptera-Homoptera). Taylor and Francis, London, xiv+503 pp.
- GHAURI, M. S. K. (1972) The identify of *Orius tantillus* (MOTSCHULSKY) and notes on other Oriental Anthocoridae (Hemiptera, Heteroptera). *J. nat. Hist.* **6**: 409–421.
- HERRING, J. L. (1967) Heteroptera: Anthocoridae. *Ins. Micronesia* **7**: 391–414.
- HIROSE, Y. (1990) Prospective use of natural enemies to control *Thrips palmi* (Thysanop., Thripidae). In *The Use of Natural Enemies to Control Agricultural Pests* (J. BAY-Petersen, ed.), FFTC, Taipei, pp. 135–141.
- MANLEY, G. V. (1976) Immature stages and biology of *Orius tantillus* (MOTSCHULSKY), (Hemiptera: Anthocoridae), inhabiting rice fields in West Malaysia. *Entomol. News.* **87**: 103–110.
- MURALEEDHARAN, N. and T. N. ANANTHAKRISHNAN (1974) New and little known species of *Orius* WOLFF from India (Hemiptera: Anthocoridae). *Orient. Ins.* **8**: 37–41.
- PÉRICART, J. (1972) Hémiptères. Anthocoridae, Cimicidae et Microphysidae de L'Ouest-Paléarctique. *Faune de l'Europe et du Bassin Méditerranéen* **7**: 1–402, 204 figs.
- WAGNER, E. (1967) Wanzen oder Heteropteren. II. Cimicomorpha. *Tierw. Dtl.* **55**: 1–179.
- WOODWARD, T. E. and C. POSTLE (1986) The Australian species of *Orius* WOLFF (Heteroptera: Anthocoridae). *J. Aust. entomol. Soc.* **25**: 245–254.
- ZHENG, L.-y. (1982) Two new species of *Orius* WOLFF from China. *Acta entomol. sin.* **25**: 191–194.