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A New Species of The Lace Bug Genus *Perissonemia* (Hemiptera: Heteroptera: Tingidae) from Taiwan

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Abstract. A new species of the lace bug genus *Perissonemia* Drake & Poor, 1937 (Hemiptera: Heteroptera: Tingidae), from Taiwan, is described under the name of *P. miyamotoi* **sp. nov.** This new species differs from other species of *Perissonemia*, mainly due to the shape of lateral carina of pronotum, and the arrangement of areolae of hemelytron. A key to Taiwanese species of the genus is presented to facilitate identification.

Key words: biodiversity, East Asia, identification key, taxonomy.

Introduction

The lace bug genus *Perissonemia* Drake & Poor, 1937 (Hemiptera: Heteroptera: Tingidae) comprises 18 species worldwide (cf. Drake & Poor 1937; Takeya 1962; Drake & Ruhoff 1965; Péricart 1985, 1986; Guilbert 2002), with five known species, namely: *P. bimaculata* (Distant, 1909), *P. borneensis* (Distant, 1909), *P. gressitti* Drake & Poor, 1936, *P. hasegawai* Takeya, 1962, and *P. occasa* Drake, 1942, from East Asia (Péricart & Golub 1996). In Taiwan, only one species, *P. hasegawai*, has been recorded to date (Takeya 1962; Tomokuni 2006).

Recently, the author observed a collection of Tingidae from Taiwan and found an indeterminate species of *Perissonemia*. After careful morphological examination, this species was found to differ from all other species of the genus and was presumed to be an undescribed species. In the present study, *P. miyamotoi* **sp. nov.** is described as a new species in Taiwan. An identification key to Taiwanese species of this genus is also presented herein.

Material and methods

Dried specimens were used to observe morphological characteristics. For the examination of the genitalia, the male terminalia were removed from the body after softening the specimens in hot water. The removed parts were immersed in hot 15% KOH solution for 5 minutes and then soaked in 99% ethanol for further dissection. The male genitalia were preserved in small polyethylene vials containing 50% glycerin and mounted on a pin with the respective specimens. Morphological characteristics were observed, illustrated, and measured under a stereoscopic microscope (SZ60; Olympus, Tokyo, Japan) equipped with an ocular grid. Measurements were performed using a micrometer on the ocular grid. The specimens were imaged using a digital microscope (Dino-Lite Premier M, Opto Science, Tokyo, Japan), and image stacks were processed using Adobe Photoshop 2021 ver.22.5.1. Morphological terms were generally assigned in accordance with previous monographs (Drake & Davis 1960; Takeya 1962, 1963; Drake & Ruhoff 1965).

All specimens used in this study were deposited at the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan (ELKU) and the Kyushu University Museum, Fukuoka, Japan (KUM).

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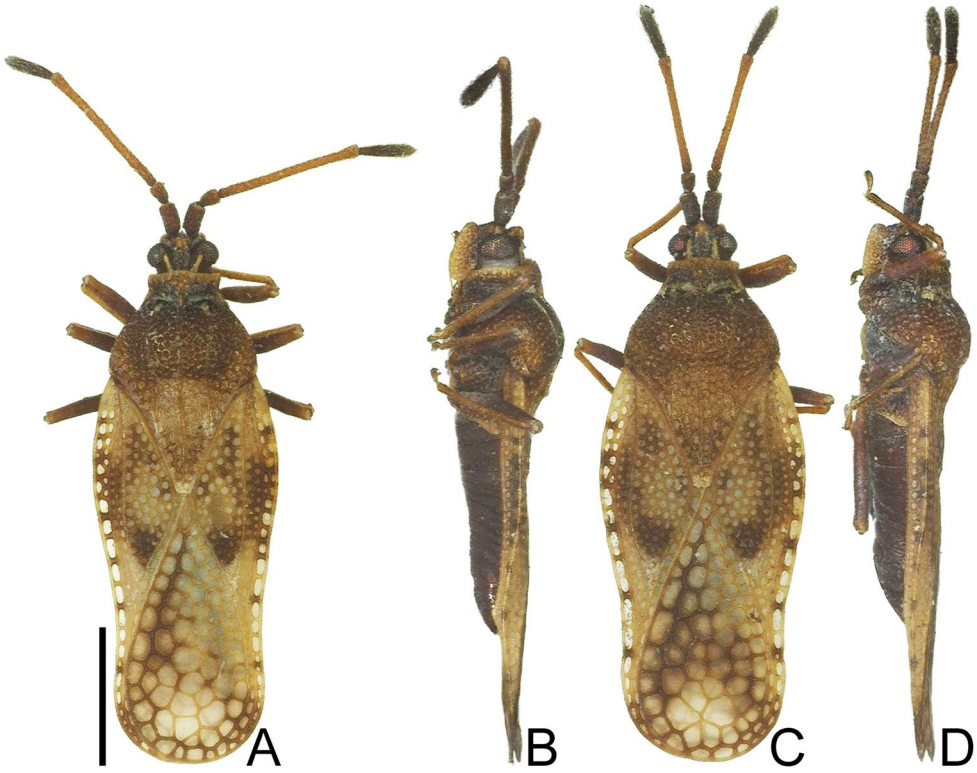

FIGURE 1. Dried specimens of *Perissonemia miyamotoi* **sp. nov.** from Taiwan, dorsal (A, C) and lateral (B, D) views: male (A, B) and female (C, D). Scale bar: 1.0 mm.

Taxonomy

Genus *Perissonemia* Drake & Poor, 1937

Perissonemia Drake & Poor, 1936: 439. Unavailable name.

Perissonemia Drake & Poor, 1937: 2. Type species by original designation: *Perissonemia torquata* Drake & Poor, 1937.

Remarks. Among the Oriental tingid genera, *Perissonemia* strongly resembles *Eritingis* Drake & Ruhoff, 1962 in general appearance, but the former can be distinguished from the latter by the following characteristics: total length of antenna longer than pronotum (shorter in *Eritingis*); collar raised towards its apex (not raised in *Eritingis*); and paranotum carinate at level of callus and humerus, not carinate in remaining parts (carinate in anterior half and not carinate in posterior half in *Eritingis*).

Perissonemia miyamotoi sp. nov.

(Figs 1–5)

ZooBank taxon LSID:

zoobank.org:act:DB9E85CE-7354-45DA-BB2B-CFF552DCF5FE

Type series. HOLOTYPE (macropterous ♂, ELKU), "[Taiwan] Alishan (Chiayi County) 8.iv.1965 S. Miyamoto". **PARATYPES** (macropterous 1 ♂ 4 ♀♀, KUM), as holotype.

Diagnosis. *Perissonemia miyamotoi* **sp. nov.** is recognized among other species of *Perissonemia* by a combination of the following characters: pronotal disc and marking on hemelytron brown (Fig. 1); posterior process and hemelytron except marking pale brown; frontal and median spines distinct (Fig. 2); occipital spine reaching middle part of compound eye; buccula with 3 rows of areolae at highest part; rostrum reaching posterior margin of mesosternum (Fig. 4A); lateral carina of pronotum present on pronotal disc and posterior process; costal area of hemelytron with 2 rows of areolae in basal part and a single row in remaining parts (Fig. 3); subcostal area with 2 rows of areolae throughout its length; discoidal area with 6 rows of areolae at widest part; sutural area with 6 rows of areolae at widest part.

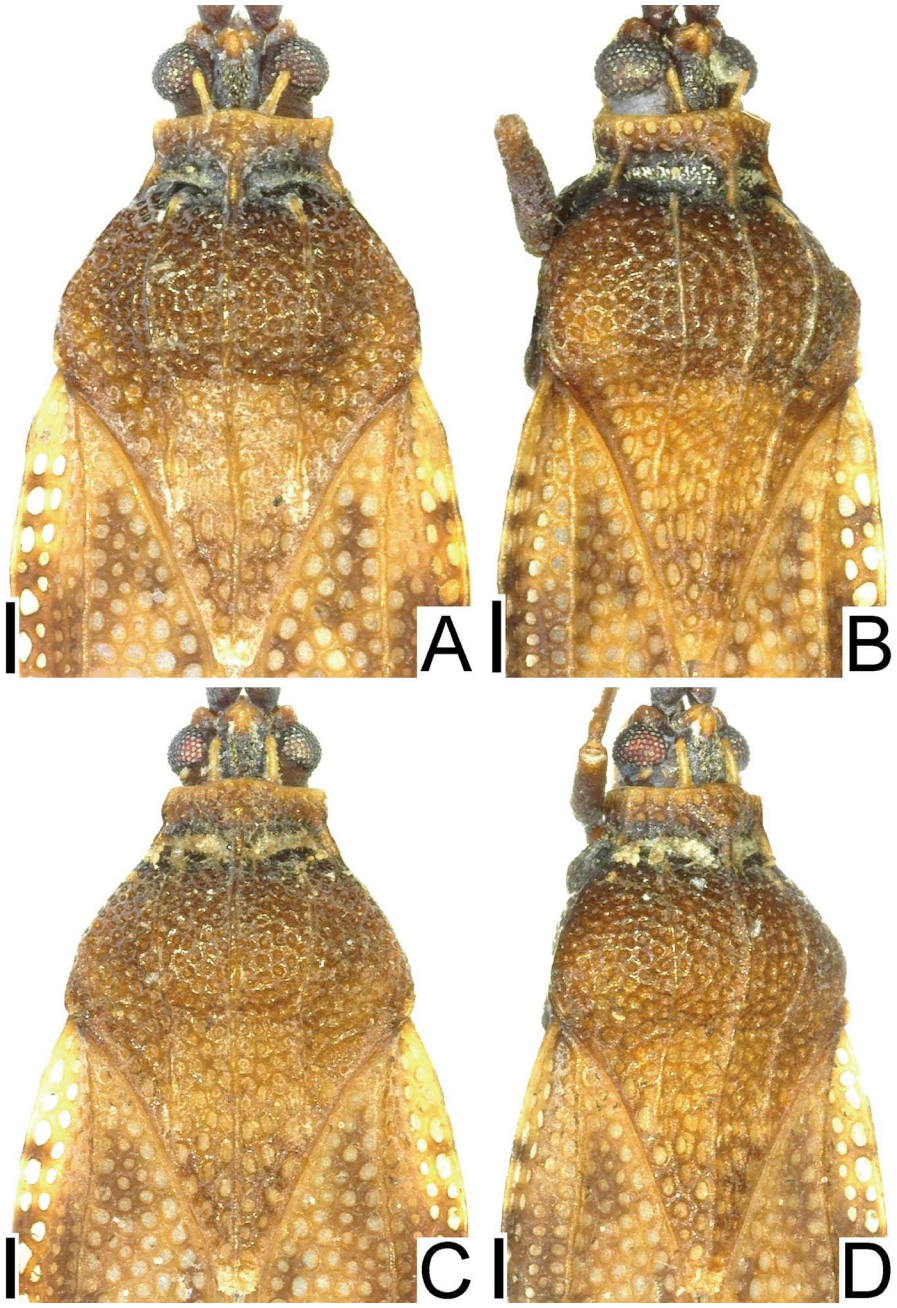

FIGURE 2. Pronota of *Perissonemia miyamotoi* **sp. nov.**, dorsal (A, C) and dorsolateral (B, D) views: male (A, B) and female (C, D). Scale bars: 0.2 mm.

Description. Macropterous male. Head, antenna except segment III, calli, collar, pronotal disc, marking on hemelytra, leg and ventral surface brown; antennal segment III, cephalic spines, buccula, posterior process and hemelytron except areolae and marking pale brown; compound eye dark red; areolae of hemelytron translucent; pubescence on body yellowish (Figs 1A, B, 2A, B, 3A, B, 4A, B).

Body 2.9 times as long as maximum width across hemelytra (Fig. 1A). Head (Figs 2A, B, 4A) covered with pubescence, with five spines; a pair of frontal spines distinct, touching each other at apices, reaching apex of clypeus; median spine distinct, as long as frontal spines, reaching beyond bases of frontal spines; a pair of occipital spines longer than median spine, reaching middle part of compound eyes;

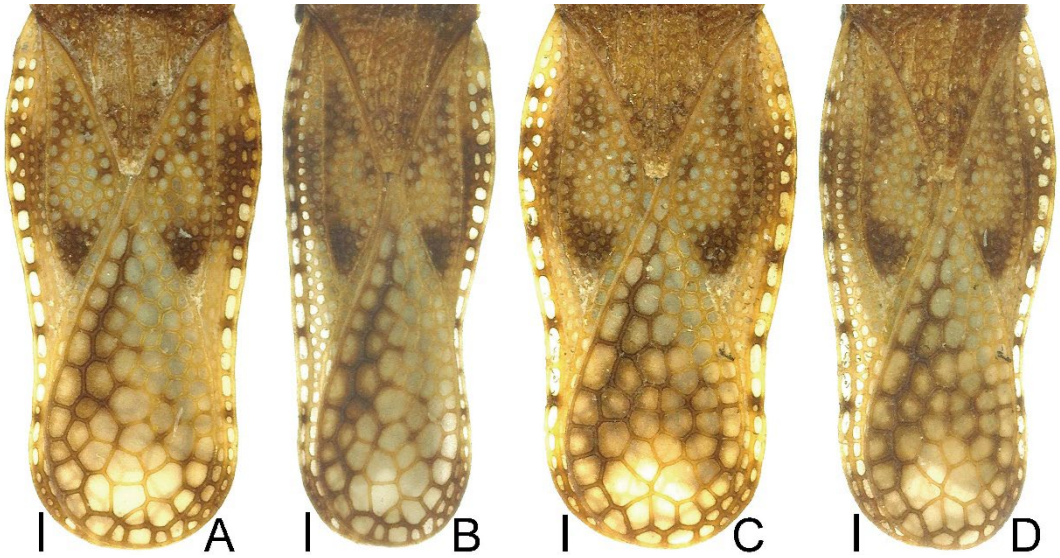

FIGURE 3. Hemelytra of *Perissonemia miyamotoi* **sp. nov.**, dorsal (A, C) and dorsolateral (B, D) views: male (A, B) and female (C, D). Scale bars: 0.2 mm.

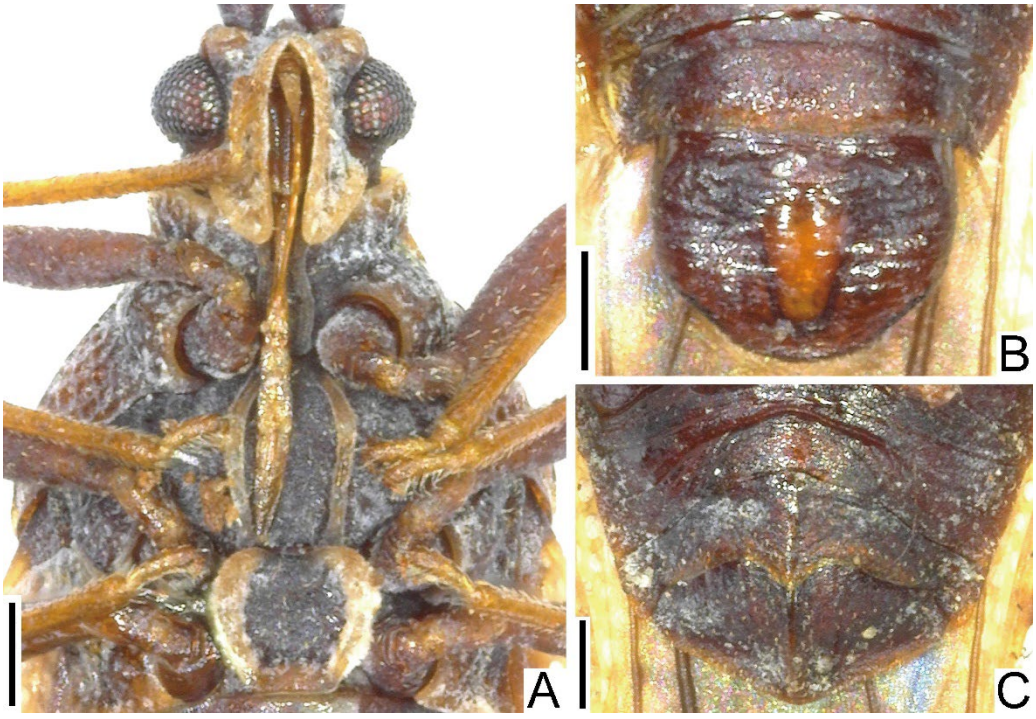

FIGURE 4. Ventral structures of *Perissonemia miyamotoi* **sp. nov.**, ventral view: rostrum (A), male (B) and female terminalia (C). Scale bars: 0.2 mm.

antenniferous tubercles obtuse, slightly curved inward; clypeus smooth. Compound eye round in outer margin. Antenna covered with pubescence; total length of antenna longer than pronotum; segment I cylindrical; segment II conical, shortest among antennal segments; segment III longest among antennal segments; segment IV cylindrical, longer than segment I. Bucculae contiguous each other at anterior ends, with 3 rows of areolae throughout their length. Rostrum reaching posterior margin of mesosternum.

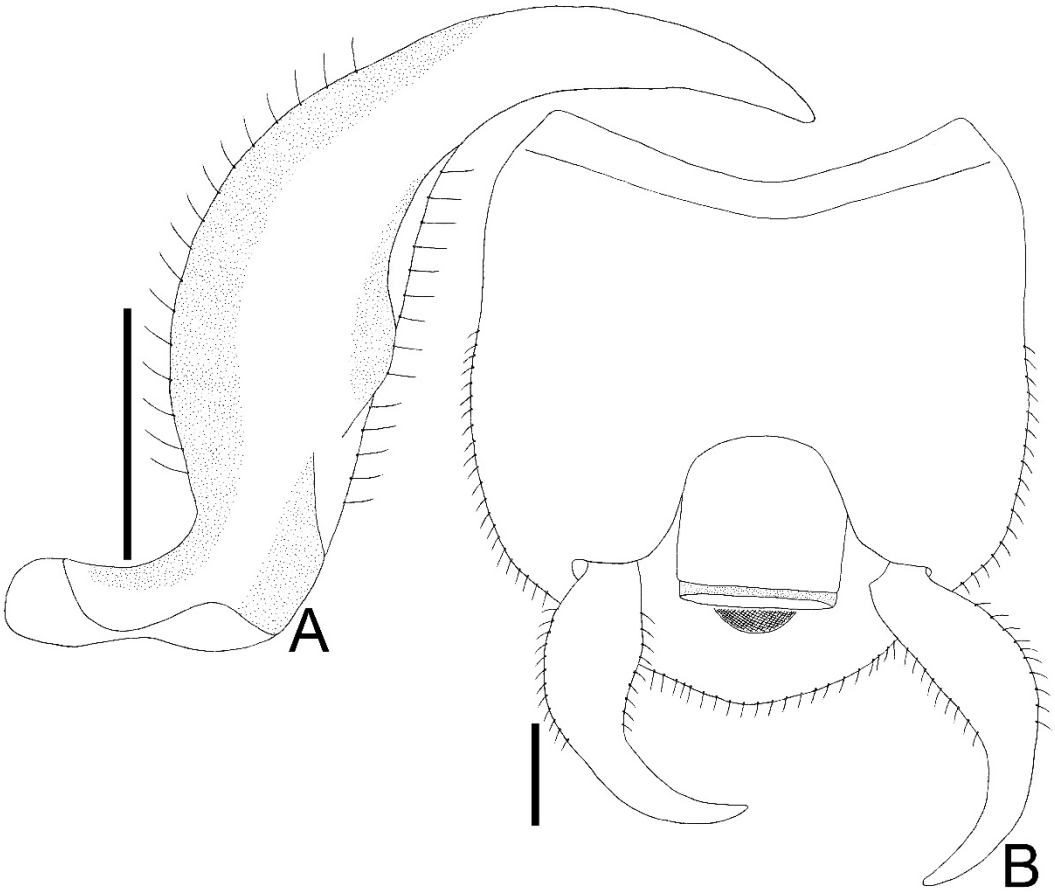

FIGURE 5. Line drawings of male genitalia of *Perissonemia miyamotoi* **sp. nov.**, dorsal view: paramere (A) and pygophore (B). Scale bars: 0.1 mm.

Pronotum (Fig. 2A, B) 1.5 times as long as maximum width across humeri, glabrous. Pronotal disc coarsely punctate. Hood absent. Calli smooth, partly covered with wax. Collar raised towards its apex, with 2 rows of areolae throughout its width, with anterior margin slightly curved outward. Pronotal carinae ridge-shaped, without distinct areolae. Median carina straight, extending to apex of posterior process. Lateral carina present on pronotal disc and posterior process. Paranotum carinate at level of callus and humerus, not carinate in remaining parts. Posterior process triangular, obtuse at apex.

Hemelytron (Figs 1B, 3A, B) 2.8 times as long as its maximum width, extending beyond apex of abdomen, glabrous; maximum width across hemelytra 1.2 times as much as maximum width across humeri; apices overlap each other in rest; costal area with 2 rows of areolae in basal part and a single row in remaining parts; subcostal area with 2 rows of areolae throughout its length; discoidal area extending beyond middle part of abdomen, with 6 rows of areolae at widest part; sutural area with 6 rows of areolae at widest part; hypocostal lamina with a single row of areolae throughout its length; Cu (cubital) vein distinct, carinate; R+M (radiomedial) vein distinct, carinate.

Thoracic pleura (Fig. 1B) coarsely punctate. Ostiolar peritreme oblong. Prosternum (Fig. 4A) narrower than mesosternum; mesosternum narrower than metasternum. Sternal laminae lower than bucculae; anterior and posterior margins lower than lateral margin; prosternal lamina lower than mesosternal lamina; mesosternal lamina as high as metasternal lamina. Legs (Fig. 1A) smooth, covered with pubescence; femora thickest at middle.

Abdomen oblong in dorsal and ventral views. Pygophore (Figs 4C, 5B) compressed dorsoventrally, hexagonal in ventral view, flat in ventral surface, covered with pubescence. Paramere (Fig. 5A) expanded in middle part,

angularly curved inward in apical part; outer and inner margins covered with pubescence in middle part.

Measurements (n = 2). Body length with hemelytra 3.7–4.0 mm (4.0 mm in holotype); maximum width across hemelytra 1.3–1.4 mm (1.4 mm in holotype); length of antennal segments I to IV 0.2 mm, 0.1 mm, 1.0 mm, and 0.4 mm, respectively; pronotal length 1.5–1.6 mm (1.6 mm in holotype); pronotal width across humeri 1.0–1.1 mm (1.1 mm in holotype); hemelytral length 2.7–2.8 mm (2.8 mm in holotype); maximum width of hemelytron 1.0–1.1 mm (1.1 mm in holotype).

Macropterous female. General appearance very similar to that of male (Figs 1C, D, 2C, D, 3C, D, 4C) except for the following characters: body 2.7 times as long as maximum width across hemelytra; antennal segment III shorter than in male; hemelytron 2.7 times as long as its maximum width; maximum width across hemelytra 1.3 times as much as maximum width across humeri; terminalia pentagonal in ventral view.

Measurements (n = 4). Body length with hemelytra 4.0 mm; maximum width across hemelytra 1.5 mm; length of antennal segments I to IV 0.2 mm, 0.1 mm, 0.8 mm, and 0.4 mm, respectively; pronotal length 1.7 mm; pronotal width across humeri 1.1 mm; hemelytral length 2.8 mm; maximum width of hemelytron 1.1 mm.

Brachypterous morph. Unknown in both sexes.

Remarks. Among the East Asian species, *Perissonemia miyamotoi* **sp. nov.** is most similar to *P. bimaculata* from Borneo Island of the Greater Sunda Islands and southwestern China (Distant 1909; Jing 1981) in terms of morphological characteristics. However, based on a comparison between the type material of the new species and photographs of the syntype (Natural History Museum 2014) together with the original description (Distant 1909) of *P. bimaculata*, three main characters were recognized to easily differentiate *P. miyamotoi* **sp. nov.** from *P. bimaculata*: lateral carina of pronotum present on pronotal disc and posterior process (Fig. 2) (absent on pronotal disc and present on posterior process in *P. bimaculata*); costal area of hemelytron with 2 rows of areolae in basal part and a single row in remaining parts (Fig. 3) (a single row throughout its length in *P. bimaculata*); subcostal area with 2 rows of areolae throughout its length (3 rows throughout its length in *P. bimaculata*). Morphological differences between the new species and *P. hasegawai*, which are revealed by a comparison of the holotype photograph (National Museum of Natural Science 2021), the original description (Takeya 1962) and three non-type specimens of the latter, are provided in the identification key below.

Distribution. Taiwan (Chiayi County).

Etymology. The new species is named in honor of Syôiti Miyamoto, who collected type series.

Host plant. Unknown.

Biology. Adults were collected in April. The nymph is unknown.

Key to species of *Perissonemia* occurring in Taiwan

1 Pronotal disc, posterior process and hemelytron except areolae black; frontal and median spines indistinct; occipital spine reaching posterior margin of compound eye; lateral carina of pronotum absent on pronotal disc and present on posterior process; costal area of hemelytron with a single row of areolae throughout its length.....

..... *Perissonemia hasegawai* Takeya, 1962

– Pronotal disc and marking on hemelytron brown (Fig. 1); posterior process and hemelytron except areolae and marking pale brown; frontal and median spines distinct (Fig. 2); occipital spine reaching middle part of compound eye; lateral carina of pronotum present on pronotal disc and posterior process; costal area of hemelytron with 2 rows of areolae in basal part and a single row in remaining parts (Fig. 3) ..... *Perissonemia miyamotoi* **sp. nov.**

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