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***Pterorhopalus mizotai* (Coleoptera, Carabidae, Paussinae, Paussini), a New Genus and Species of Platyrhopalina from Sabah, Borneo**

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Abstract. *Pterorhopalus mizotai* gen. et sp. nov. (Paussini, Platyrhopalina) is described based on a single specimen collected with a Malaise trap in the Crocker Range, Negeri Sabah, Borneo, Malaysia. A key to the genera of the subtribe Platyrhopalina is presented. The new genus is related to *Platyrhopalus*, but is readily distinguished from it by the structure of the antennae. Convergence of the elytral colour pattern among the Oriental paussines is discussed.

Key words: taxonomy, Coleoptera, Carabidae, new genus, new species, Malaise trap, Crocker Range, mouthpart structures.

Introduction

The paussine subtribe Platyrhopalina is restricted to the the Oriental zoogeographical region. The following genera in the subtribe are known: *Platyrhopalus* Westwood, 1833 (16 species in two subgenera; the other subgenus is *Stenorhopalus* Wasmann, 1918), *Platyrhopalopsis* Desneux, 1905 (three species in two subgenera; the other subgenus is *Platyrhopalides* Wasmann, 1918), *Euplatyrhopalus* Desneux, 1905 (six species), and *Lebioderus* Westwood, 1838 (nine species) (Luna de Carvalho, 1987; Maruyama *et al.*, 2008; Nagel, 2010). In 1999, Mr. Kôji Mizota of Miyagi University of Education (a graduate student at Hokkaido University at that time) gave me a specimen of an extraordinary Paussini species characterized by bird wing-like antennae. This species was found to be a member of Platyrhopalina based on a character state shared with all known species of Platyrhopalina, except for those of *Platyrhopalopsis*: the fourth segment of each tarsus is reduced. However, it could not be affiliated with any known genus of the subtribe that has the same tarsal state. Consequently, I decided to establish a new genus to include this species.

Key to the genera and subgenera of Platyrhopalina

1. Antennal club forming a flattened circular disc; body very broad; legs short with tibiae flattened and subtriangular; segment IV of tarsi not reduced 2: Genus *Platyrhopalopsis*
- Antennal club not forming a flattened circular disc, sometimes circular; body more or less elongate; legs not or slightly subtriangular; segment IV of tarsi reduced 3
2. Body strongly convex. Pronotum more than twice as wide as long; unicolor Subgenus *Platyrhopalopsis*
- Body gently convex. Pronotum less than twice as wide as long; with a pair of red maculae on elytra Subgenus *Platyrhopalides*
3. Pronotum with anterior part produced laterally 4
- Pronotum with anterior part roundly convex laterally, or slightly rounded 5
4. Antennal club flattened; fore margin smooth, not dentate; hind margin with two or three large triangular processes Genus *Euplatyrhopalus*
- Antennal club convex; fore margin serrate or dentate; hind margin with 4 acute processes, apically equipped with a short trichome Genus *Lebioderus*
5. Antennal club subtriangular. Legs not compressed

- Genus *Pterorhopalus*
- Antennal club circular, oval or subquadrate. Legs compressed 6: Genus *Platyrhopalus*
 - 6. Antennal club more or less convex; hind margin rounded or crenate. Pronotum widest around anterior 1/5 - 1/4, with anterior part convex laterally Subgenus *Platyrhopalus*
 - Antennal club rather flattened; hind margin with 3 acute processes. Pronotum widest around base, with anterior part not convex laterally Subgenus *Stenorhopalus*

***Pterorhopalus* gen. nov.**

Type species. Pterorhopalus mizotai sp. nov.

Etymology. A combination of the Greek πτερον (pteron) meaning a wing and ῥόπαλον (rhopalon) meaning a club, in referring to the bird wing-like antennal club. Gender, masculine.

Diagnosis. This genus is similar in pronotal shape and some other character states to *Platyrhopalus*, but easily distinguished from it by a combination of the following character states: 1) the antennal segment II long, cylindrical; 2) the antennal club flattened, 3) with distinct trichomes on each subsegment, 4) the legs slender, not flattened.

Description.

Body (Fig. 1) rather slender.

Head (Fig. 1) flattened above; clypeus slightly margined; temple gently rounded. Antenna (Fig. 2) with segment I long, cylindrical; club subtriangular, flattened, 5-subsegmented; fore margin slightly sinuate; hind margins of subsegments I-IV with large trichomes. Mentum (Fig. 3) rounded at base; anterior corners acutely produced. Maxillary palpus (Fig. 3) with segment III subtriangular, acutely produced inward; segment IV almost parallel-sided; segment V elongate, subconical. Labial palpus (Fig. 3) long, slender; segment II slightly dilated apically; segment III narrower than apical part of segment II, subconical.

Pronotum (Fig. 1) panduriform, anterior part roundly convex laterally, with a transverse sulcus around middle, with a longitudinal groove along midline from near base and ending at transverse sulcus.

Elytra (Fig. 1) constricted at base, parallel-sided; shoulders somewhat protruding.

Legs (Fig. 1) long, slender; femora widest around middle; tibiae gently dilated apically; tarsi with segment IV small, invisible from under side; tarsi slightly compressed; segment I-III and V dilated apically; apex of segment III forming a large cavity to insert segment IV,

undersurface bifid.

Pygidium simplified, flattened, without gland opening.

***Pterorhopalus mizotai* sp. nov.**

Etymology. Dedicated to Mr. Kôji Mizota.

Type material. Holotype, ♀, "MALAYSIA: Sabah/ Mahua B. C., Croker / Range Park, Borneo Is. / Malaise trap, 14-23 X. / 1999, J. Naiman leg. (B)" Deposited in Sabah Parks, Malaysia.

Diagnosis. This species is similar in coloration and punctuation of pronotum to *Platyrhopalus irregularis* Ritsema, 1880 and *Pl. tonkinensis* Janssens, 1948, but is easily distinguished from them by the flattened subtriangular antennal club and the slender legs that are not compressed.

Description.

Body (Fig. 1) large, ≈ 7.4 mm.

Head (Fig. 1) chestnut brown, but gula, mouth parts and antennae yellow to yellowish orange; surface rugose, with some tubercles between eyes, densely with recumbent setae. Antenna (Fig. 2) with segment II moderately covered with suberect setae; club with dorsal surface densely with rather long recumbent setae; ventral surface convex medially, moderately with suberect setae between short recumbent setae.

Prothorax (Fig. 1) brown but ventral area irregularly paler; surface rugose, sparsely with erect setae except for mesal area of dorsal surface.

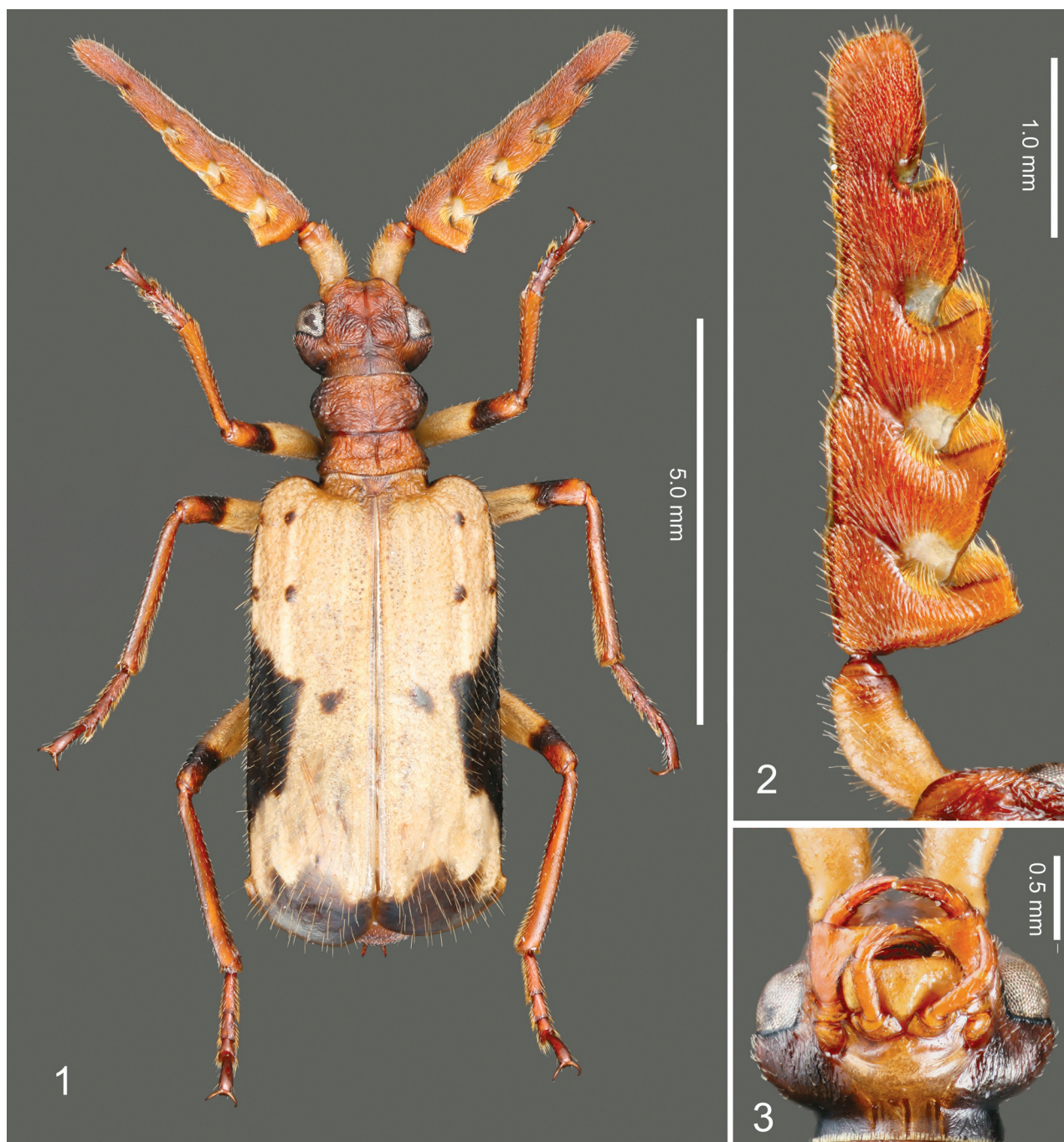
Elytra (Fig. 1) about 1.8 times longer than wide; yellow, but with several black spots and maculae: 3 pairs of small spots around basal 1/3, a pair of large lateral maculae and a pair of small spots around middle, and a pair of large maculae around apex; hypomera black except for apex; surface moderately with long suberect setae. Hind wings fully developed.

Meso- and metaventrites brown.

Legs (Fig. 1) with coxae and trochanters yellow; femora yellow, but base and around apical 1/6 brown, and apex reddish brown; tibiae and tarsi reddish brown; femora and tibiae moderately with suberect setae, but apical inner area of tibiae denser; apex of tibiae surrounded with ctenidium.

Pygidium reddish brown, sharply margined; disc with surface smooth, densely with short recumbent setae; abdominal sternite yellowish brown but becoming darker apically; surface densely with short recumbent setae.

Biology. The holotype was collected by a Malaise trap. No further information was available.



Figs. 1-3. *Pterorhopalus mizotai* gen. et sp. nov. 1, Habitus; 2, right antennae, dorsal view; 3, head, ventral view.

Discussion

Pterorhopalus may be related to *Platyrrhopalus* based on the following shared character states: 1) segment III of maxillary palpus subtriangular, acutely produced inward; 2) pronotum panduriform; and 3) tarsi with segment IV reduced. But the facies of *Pterorhopalus* is considerably different from that of *Platyrrhopalus*; i.e., *Pterorhopalus*

is characterised by a long, cylindrical antennal segment II; a subtriangular flattened antennal club, with distinct trichomes on each subsegment (except for the apical one); and long, slender legs that are not compressed. Although the polarity of these character states could not be estimated, they are highly distinctive among the *Platyrrhopalina*. For this reason, the new genus is established here.

Pterorhopalus mizotai is characterized by a unique colour pattern of the elytra. A similar colour pattern is observed in some Oriental paussines, e.g., *Platyrhopalus irregularis* (Java, Indonesia), *Pl. tonkinensis* (Vietnam and Laos), *Pau. desneuxi* Fowler, 1912 (Sri Lanka), *Paussus catoxanthus* (Gestro, 1923) (Luzon, Philippines), *Pau. tagalicus* Gestro, 1919 (Luzon, Philippines) and *Pau. occlusus* Darlington, 1950 (Biliran, Philippines), but they are not closely related to *Pt. mizotai* (at least they are not sister species of it), and *Pau. desneuxi*, *Pau. catoxanthus*, *Pau. tagalicus* and *Pau. occlusus* are distant, belonging to a different subtribe (Paussina). Therefore, this colour pattern is apparently convergent. The possibility exists that they are mimicking poisonous insects, but no presumable model has been found. Conversely, paussine beetles themselves can be regarded as poisonous insects as they have a strong defensive behaviour: spray aiming (Eisner & Aneshansley, 1999). Also, the colour pattern may be merely a warning colour, and the similarity among the different groups is a kind of Müllerian mimicry. However, paussine beetles are generally very rare in the Orient and their potential biomass could be low. Therefore, whether this mimicry is effective against predators, such as birds, is not clear. Field observations of these beetles are needed for further discussion of their colouration.

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