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A new species of Trichopseniini (Coleoptera, Staphylinidae) found with *Schedorhinotermes* termite (Isoptera, Rhinotermitidae) in Khao Yai National Park, Thailand

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Abstract

Schedolimulus komatsui Kanao & Maruyama, **n. sp.** (Aleocharinae, Trichopseniini) is described from Khao Yai National Park, East Thailand. This is a new record of Trichopseniini from Thailand. *Phorilimulus* Pasteels & Kistner, 1971 is synonymized with *Schedolimulus* Pasteels & Kistner, 1971, and *Schedolimulus* is redescribed. *Phorilimulus minutus* Pasteels & Kistner, 1971 is transferred to *Schedolimulus.* A key to the species of *Schedolimulus* is given.

Key words: *Schedolimulus, Phorilimulus,* Aleocharinae, Trichopseniini, taxonomy, synonymy, termitophily

Introduction

Eighteen species of five genera of rove beetles belonging to the aleocharine tribe Trichopseniini are known to be associated with *Schedorhinotermes* termites (Rhinotermitidae) in Peninsular Malaysia, Borneo, Java, New Guinea and Australia (Kemner 1925; Kistner 1969; Pasteels & Kistner 1971; Bourguignon *et al*. 2007). Two of these genera, *Schedolimulus* and *Phorilimulus*, were described by Pasteels and Kistner (1971) to include each a single species from Sarawak. Since then no additional records of these genera have been published. In 2007, the second author (MM) and his colleagues investigated a fauna of termitophilous insects in Khao Yai National Park, Thailand, and found a new species of Trichopseniini in a nest of *Schedorhinotermes* termites. Our morphological observations revealed that the new species shares diagnostic character states of *Schedolimulus* and *Phorilimulus*, and we concluded that the two names are synonyms. We redescribe *Schedolimulus* and describe the new species, which is the first record of Trichopseniini from Thailand.

Material and methods

The field research was conducted by M. Maruyama, Mr. Yûji Katayama and Dr. Takashi Komatsu in Khao Yai National Park, 30 km northeast of Bangkok, in 2007. A carton nest (about volleyball-sized, Fig. 1) was dug out from soil (30 cm depth), and crushed little by little on a white plastic tray to find symbionts. The beetles were observed and photographed on a fragment of the carton nest. The specimens were collected in 2 ml tubes with 80% ethanol.

The technical procedures used here are generally described as in Maruyama (2006). All measurements are in millimeters.

In the description the number of macrosetae on tergite IX refers to one side of the body.

The termite host was identified by Dr. Yoko Takematsu.

The holotypes and most paratypes of the new species are deposited in the Kyushu University Museum, and some of the paratypes are deposited in the National Park, Wildlife and Plant Conservation Department, Thailand.

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Genus *Schedolimulus* Pasteels & Kistner, 1971

Schedolimulus Pasteels & Kistner, 1971: 367 (original description; type species: *Schedolimulus pumilio* Pasteels & Kistner, 1971, by original designation).

Phorilimulus Pasteels & Kistner 1971: 369 (original description; type species: *Phorilimulus minutus* Pasteels & Kistner, 1971, by original designation). **New synonymy.**

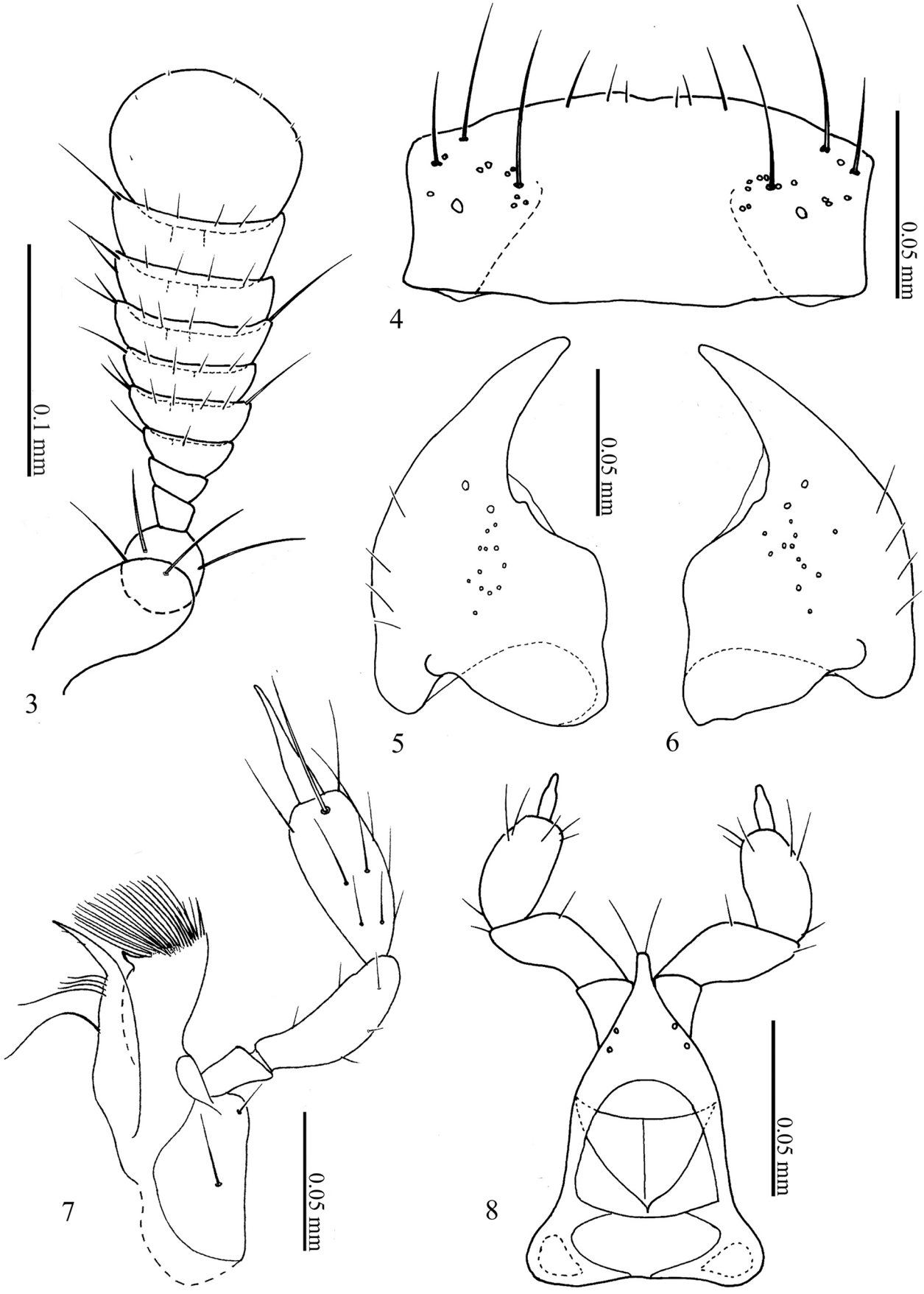
Diagnosis. This genus is distinguished from the other limuloid genera of Trichopseniini by the distinctive shape of the antenna in which base of each segment (segments VI–IX) is covered by an apical flange of the preceding segment, and the presence of thick and long spurs on the metatibia. It is most similar to the genus *Hamitopsenius* Wasmann, 1916 but easily distinguished by the aforementioned characters.

Redescription. Overall shape limuloid (Fig. 2).

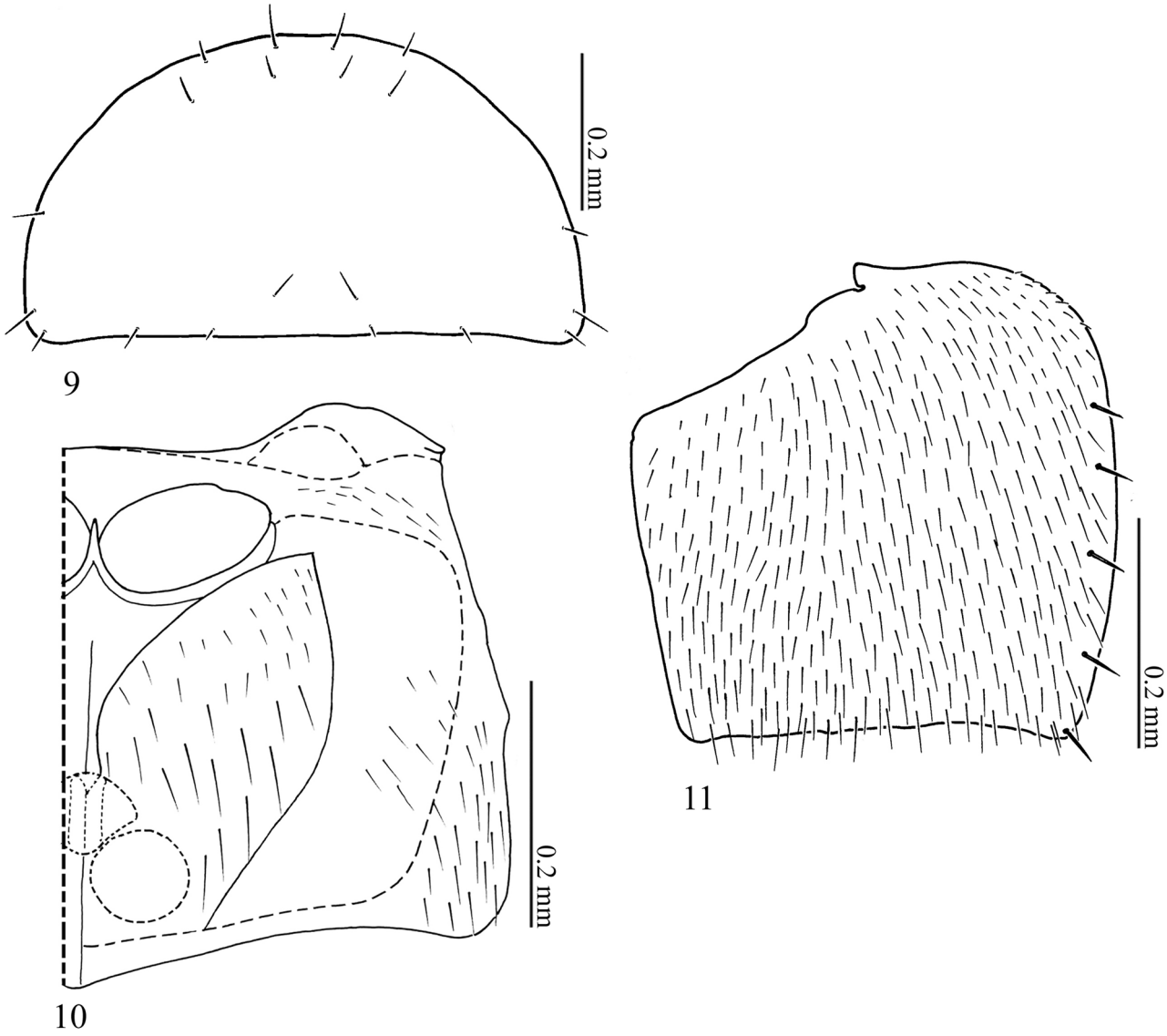
FIGURES 1–2. 1. A carton nest of *Schedorhinotermes medioobscurus*, 2. Living *Schedolimulus komatsui* beetle in the termite nest.

Head completely covered by pronotum; head capsule broadly oval when mouthparts excluded and subtriangular when included; anterior border of head capsule slightly grooved to receive antennae, but not deep. Eyes large, prominent. Antennae (Fig. 3) 11-segmented; segment I longer than other segments; segment II small, circular; segment III much smaller than other segments, subquadrate; segments IV small, transverse; segments V–X wider than long, moderately increasing in wide toward segment X; segment XI larger than segments II–X, somewhat circular; base of each segment (segments VI–IX) covered by apical flange of preceding segment. Labrum (Fig. 4) transverse, subquadrate, with 3 setae in lateral area; with several pseudopores between setae. Mandibles (Figs. 5–6) symmetrical, with lateral flange absent, with several pores around middle of dorsal surface; prostheca scarcely visible; with a small tooth at inner margin of mandible. Maxillae (Fig. 7): lacinia narrowed strongly toward apex, with a long seta around middle, 3–5 setae near apex, pointed at apex; galea truncate at apex, densely furnished with setulae; palpus 4-segmented, with a thick seta near apex of segment III. Labium (Fig. 8): palpus 3-segmented; segment I curved near base, dilated apically; segment II elliptical; segment III short, narrowed.

Pronotum (Fig. 9) semicircular. Prosternum reduced in length with long anterolateral processes. Prothoracic coxal cavities extremely small, closed behind by membrane; only long articular process on procoxa articulating with edge of proventral cavity anterolateraly. Mesoventrite (Fig. 10) short, approximately 1/5 length of metaventrites (Fig. 10), with an acute but carinate process between mesothoracic coxal cavities. Mesocoxal cavities margined posteriorly, much larger than metacoxal cavities. Shelves on metaventrites covering metatrochanter and metafemur in repose. Fore leg (Fig. 12) with femur thick, flattened; tibia narrowed, slightly dilated apically. Mid leg (Fig.13) with femur dilated apically; tibia slightly narrowed apically. Hind leg (Fig. 14) with femur widest around middle; tibia dilated apically. Tarsal formula 5-5-5.



FIGURES 3–8. *Schedolimulus komatsui*, mouthparts. 3. Antenna. 4. Labrum. 5–6. Mandible. 7. Maxilla. 8. Labium.



FIGURES 9–11. *Schedolimulus komatsui*, thorax. 9. Pronotum. 10. Meso- and metaventrites. 11. Elytra.

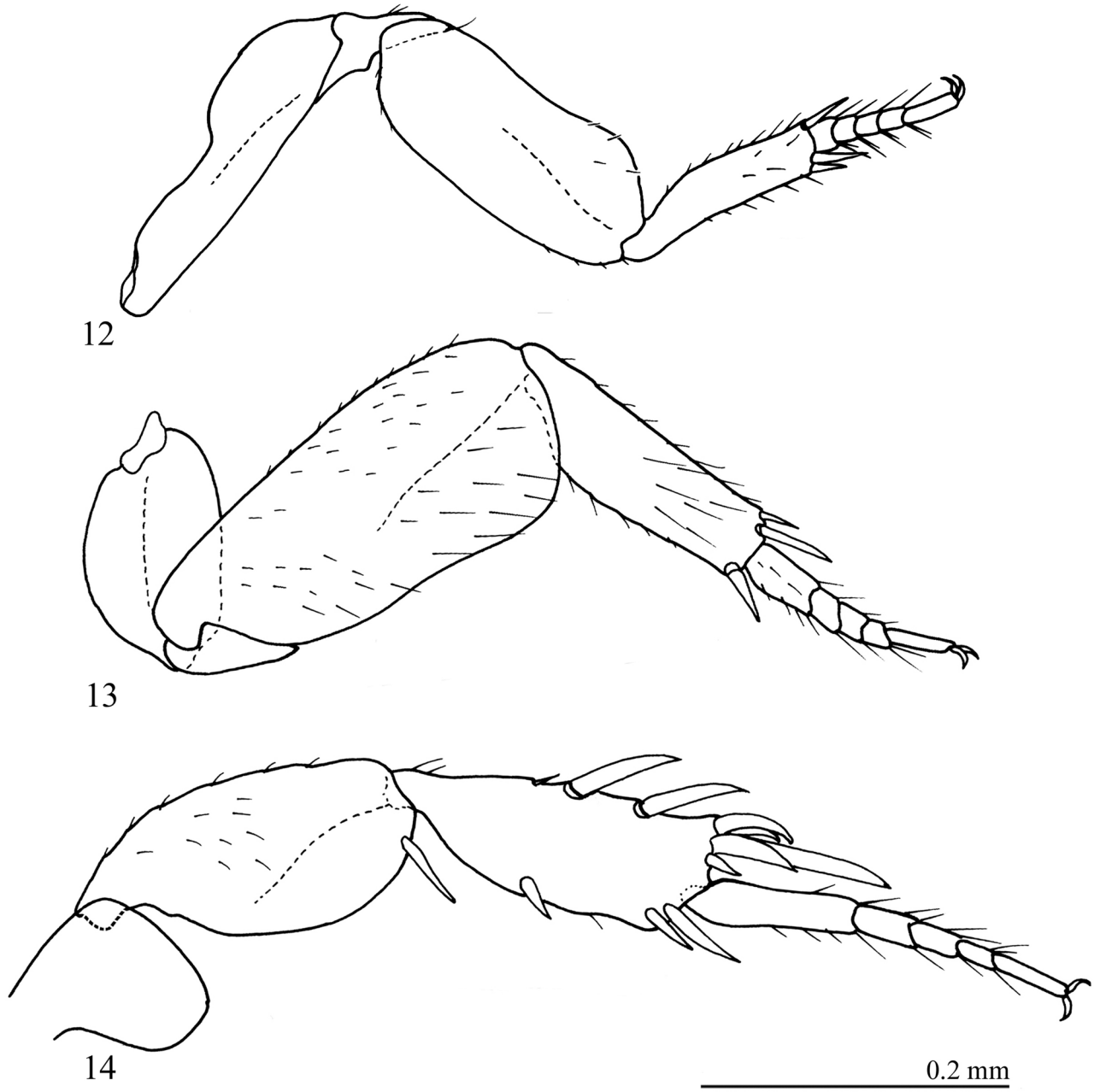
Abdomen (Fig. 2) not physogastric, narrowed posteriorly.

Male. Abdominal tergite and sternite VIII (Figs. 15–16) larger than in female; posterior margin of sternite VIII (Fig. 16) slightly sinuate, rounded medially; lateral lobe of tergite IX (Fig. 17) much larger and broader than in female, especially its basal projection twice as long as in female, with long and thick macrosetae around posterior margin. Median lobe of aedeagus (Fig. 21–22) with basal capsule bulbous.

Female. Tergite and sternite VIII (Figs. 18–19) pointed at medial part of posterior margin; lateral lobe of tergite IX (Fig. 20) smaller and narrower posteriorly than in male. Spermatheca (Fig. 24) peanut-shaped.

Discussion. Pasteels and Kistner (1971) described *Schedolimulus* and *Phorilimulus* to include a single species each based on a single female and male specimen, respectively. They mentioned that *Schedolimulus* and *Phorilimulus* are very similar and share many character states but they are distinguished by the body size, presence/absence of setae on the elytra, and shape of the abdominal tergite IX. Of these characters, the body sizes are actually almost the same in reference to the measurements of each of the type species. Though Pasteels and Kistner (1971) stated that the body size of *Schedolimulus pumilio* (the type species of *Schedolimulus*) is the smallest in the whole subfamily, the pronotal length of *S. pumilio* indicated in the measurements is larger than that of *Phorilimulus minutus* (the type species of *Phorilimulus*). The presence/absence of setae on the elytra is ambiguous. They noted that the elytra of *Schedolimulus* are without setae, but in the description and illustrations of *S. pumilio* indicated the presence of setae. The morphological observation of the present new species, *S. komatsui*, revealed that the difference

in the shape of abdominal tergite IX is merely a sexual difference. Therefore, no pronounced difference between *Schedolimulus* and *Phorilimulus* was recognized, and we herein conclude that *Phorilimulus* should be synonymized with *Schedolimulus*.



FIGURES 12–14. *Schedolimulus komatsui*, legs. 12. Fore leg. 13. Mid leg. 14. Hind leg.

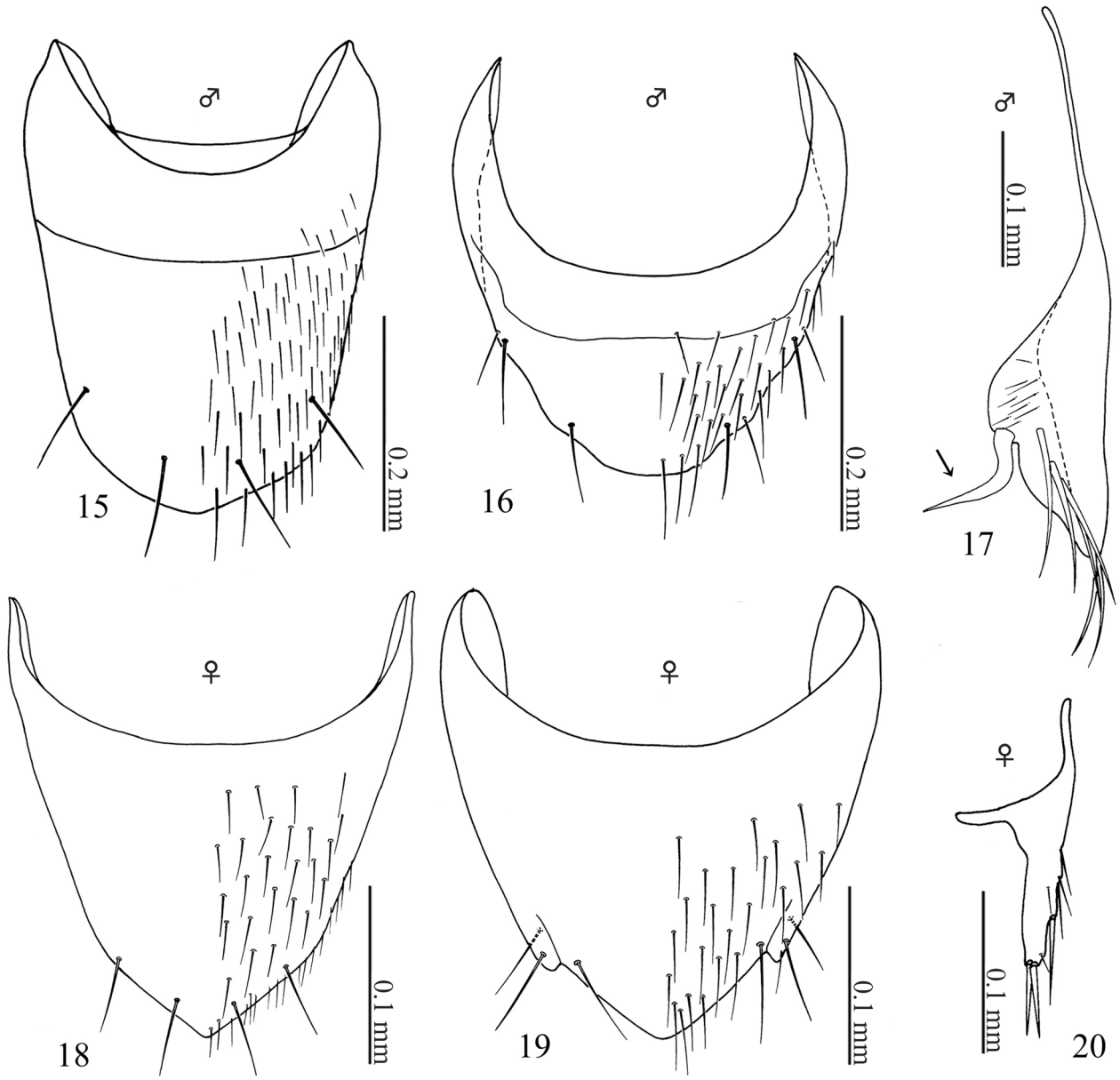
Key to the species of *Schedolimulus*

1. Elytra glabrous except for posterior areas ..... *S. pumilio* Pasteels & Kistner, 1971
- Elytra moderately, almost uniformly covered with setae 2
2. Lateral lobe of male tergite IX with macrosetae that are almost straight .....*S. minutus* (Pasteel & Kistner, 1971)
- Lateral lobe of male tergite IX with 1 thick macroseta which is situated at inner margin and curved inward..... ..... *S. komatsui* **new species**

***Schedolimulus komatsui* Kanao & Maruyama, new species**

Type material. Holotype: THAILAND: ♂, labeled "Thai: Nakhon Nayok, Khao Yai National Park, Mo Sing To (700 m alt.), 28 IX 2007, Maruyama M. and Katayama Y. leg.", "Holotype *Schedolimulus komatsui* des. Kanao & Maruyama, 2010", abdomen dissected and mounted in Euparal. **Palatypes: THAILAND:** 4 ♂♂, 2 ♀♀ and 16 specimens with sex unknown, same data as the holotype.

Diagnosis. This species is very similar to *S. pumilio* and *S. minutus* but easily distinguished from *S. pumilio* by the elytra being moderately, almost uniformly covered with setae, and from *S. minutus* by the lateral lobe of the male tergite IX with a large and curved macroseta.



FIGURES 15–20. *Schedolimulus komatsui*, abdominal parts. 15. Male tergite VIII. 16. Male sternite VIII. 17. Male tergite IX. 18. Female tergite VIII. 19. Female sternite VIII. 20. Female tergite IX.

Description. Body (Fig. 2) almost uniformly orange brown, but elytra slightly darker. Dorsal surfaces of pronotum, elytra and abdomen smooth, shiny; elytra and abdomen sparsely covered with long yellow setae. Pronotum (Fig. 9) sparsely covered with macrosetae except around mesal area. Meso- and metaventrites (Fig. 10) sparsely covered by setae. Elytra (Fig. 11) with 5 macrosetae on lateral margin. Fore leg (Fig. 12) with femur sparsely covered with setae around apex; tibia sparsely covered with setae and with 3 spurs at apex; tarsus with 2–3 setae at

apex of each segment. Mid leg (Fig. 13) with femur sparsely covered with setae; tibia sparsely covered with setae that are becoming longer toward apex, with 3 spurs (1 smaller than others); tarsus with segment I sparsely covered by setae, with 2–3 setae at apex of each of segments II–IV. Hind leg (Fig. 14) with femur covered with several setae, 1 long and thick macroseta at apex of inner margin; tibia with 7 long and thick spurs (1 apical spur longer than others) on outer margin and at apex, 3 spurs on inner margin; tarsus with segment I sparsely covered with setae, with 2–3 setae at apex of each of segments II–IV. Macrochaetotaxy of abdominal tergites III–VIII: 6, 4, 4, 4, 4, 4.

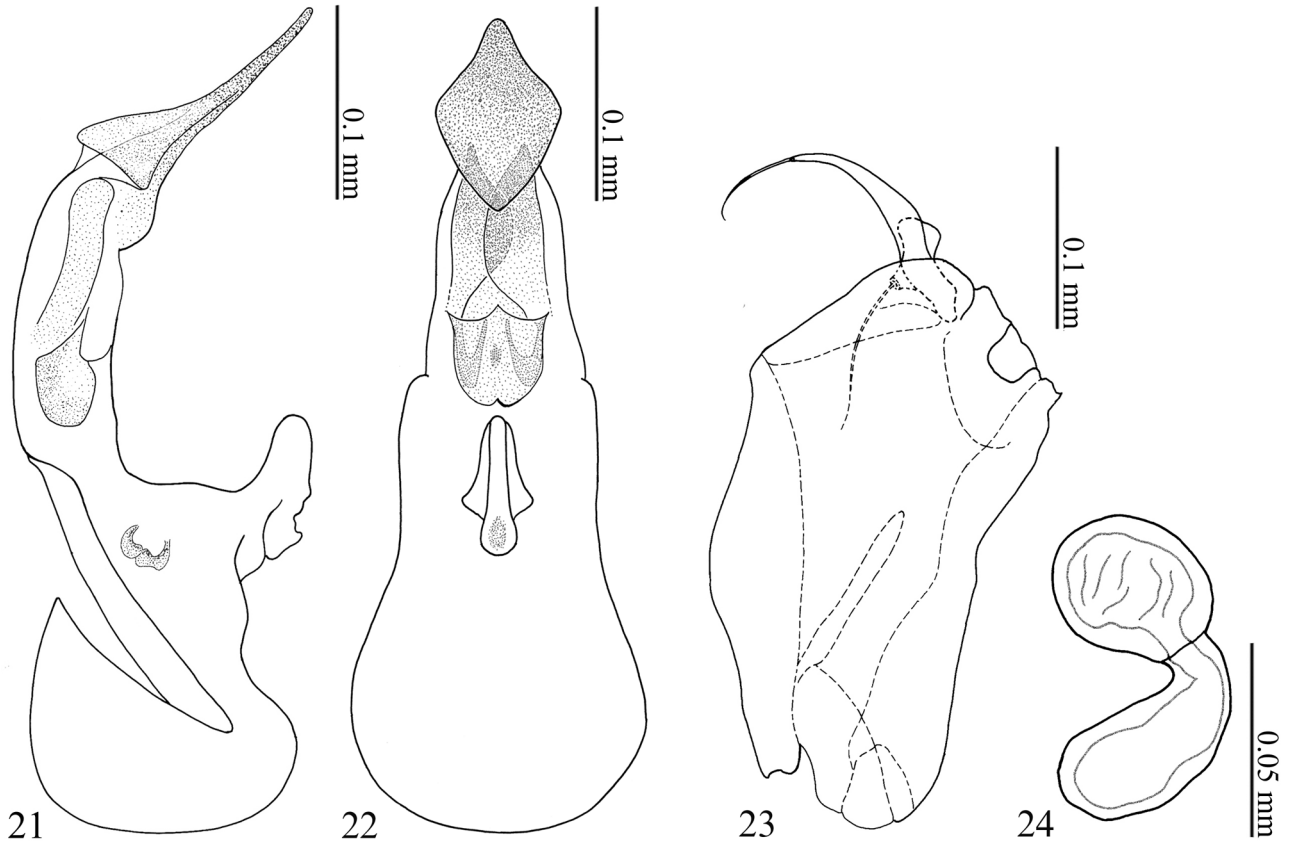
Male. Abdominal tergite VIII (Fig. 15) with 2 pairs of macrosetae, sparsely covered with setae; sternite VIII (Fig. 16) with anterior margin deeply emarginated, basal projections much longer than in female, 3 pairs of macrosetae on lateral margins; lateral lobe of tergite IX (Fig. 17) with a large macroseta (Fig. 17: arrow) around middle, which is curved inward at middle, with a row of about 6 macrosetae. Median lobe of aedeagus (Fig. 21–22) with apical lobe slightly curved paramerally in lateral view, narrowed toward apex in dorsal view; apical part of apical lobe well sclerotized; distal crest well produced. Paramere (Fig. 23): apical lobe curved, with 2 long macrosetae (1 near base, 1 apex).

Female. Abdominal tergite VIII (Fig. 18) smaller than in male, with 2 pairs of macrosetae and covered with setae; sternite VIII (Fig. 19) smaller than in male, with 3 pairs of macrosetae on lateral margins; lateral lobe of tergite IX (Fig. 20) narrowed posteriorly, much smaller than in male, with 6 macrosetae on lateral margin. Spermatheca (Fig. 24) with apical part swollen, and its inner wall sparsely wrinkled; basal part twice as long as apical part and slightly curved near apex.

Measurements. Body length: ca. 1.1–1.2; antennal length: 0.19–0.23; pronotal length: 0.37–0.39; pronotal width: 0.62–0.68; elytral length: 0.32–0.38. N=5.

Symbiotic host. *Schedorhinotermes medioobscurus* (Holmgren, 1914).

Etymology. Dedicated to Dr. T. Komatsu who helped the second author (MM) in his field research.



FIGURES 21–24. *Schedolimulus komastui*. 21, Median lobe of aedeagus (holotype), lateral view. 22, Ditto, dorsal view. 23. Paramere (holotype). 24. Spermatheca.

***Schedolimulus minutus* (Pasteels & Kistner, 1971), new combination**

Phorilimulus minutus Pasteels & Kistner, 1971: 369.

Comment. Having placed *Phorilimulus* in synonymy with *Schedolimulus* we are establishing a new combination, *Schedolimulus minutus*.

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