

# ZOOLOGISCHE MEDEDELINGEN

UITGEGEVEN DOOR HET

RIJKSMUSEUM VAN NATUURLIJKE HISTORIE TE LEIDEN  
(MINISTERIE VAN WELZIJN, VOLKSGEZONDHEID EN CULTUUR)

Deel 61 no. 7

4 juni 1987

ISSN 0024-0672

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## SOUTHEAST ASIAN *TERMITODIUS*: A TAXONOMIC REVIEW, WITH DESCRIPTIONS OF FOUR NEW SPECIES (COLEOPTERA: APHODIIDAE)

by

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and

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Krikken, J. & Huijbregts, J.: Southeast Asian *Termitodius*: a taxonomic review, with descriptions of four new species (Coleoptera: Aphodiidae).

Zool. Med. Leiden 61(7), 4-vi-1987: 97-111, figs. 1-18. — ISSN 0024-0672.

Key words: Coleoptera, Scarabaeoidea, Rhyparinae; Asia; *Termitodius*, new species.

Four new species of the rhyparine genus *Termitodius* Wasmann are keyed, described and discussed: *T. interruptus* and *monticola* from Sulawesi, *hammondi* from Borneo, and *neglectus* from Sumatra. They show termitophilic adaptations; two species are microphthalmic and flightless. *Notocaulus* Quedenfeldt of Africa is transferred from the Rhyparinae to the Eupariini (Aphodiinae).

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### 1. INTRODUCTION

Members of the pantropical scarabaeoid subfamily Rhyparinae are widespread in southeast Asia. They possibly are more numerous in species there than anywhere else. The species recorded up till now are in the genera *Rhyparus* Westwood, *Stereomera* Arrow, and *Sybacodes* Fairmaire. If one also includes Micronesia, then the genus *Termitodiellus* Nakane should be added (cf. Cartwright & Gordon, 1971). Some (possibly all) of the species are termitophilic, as evidenced by the presence of trichomes. The rhyparine

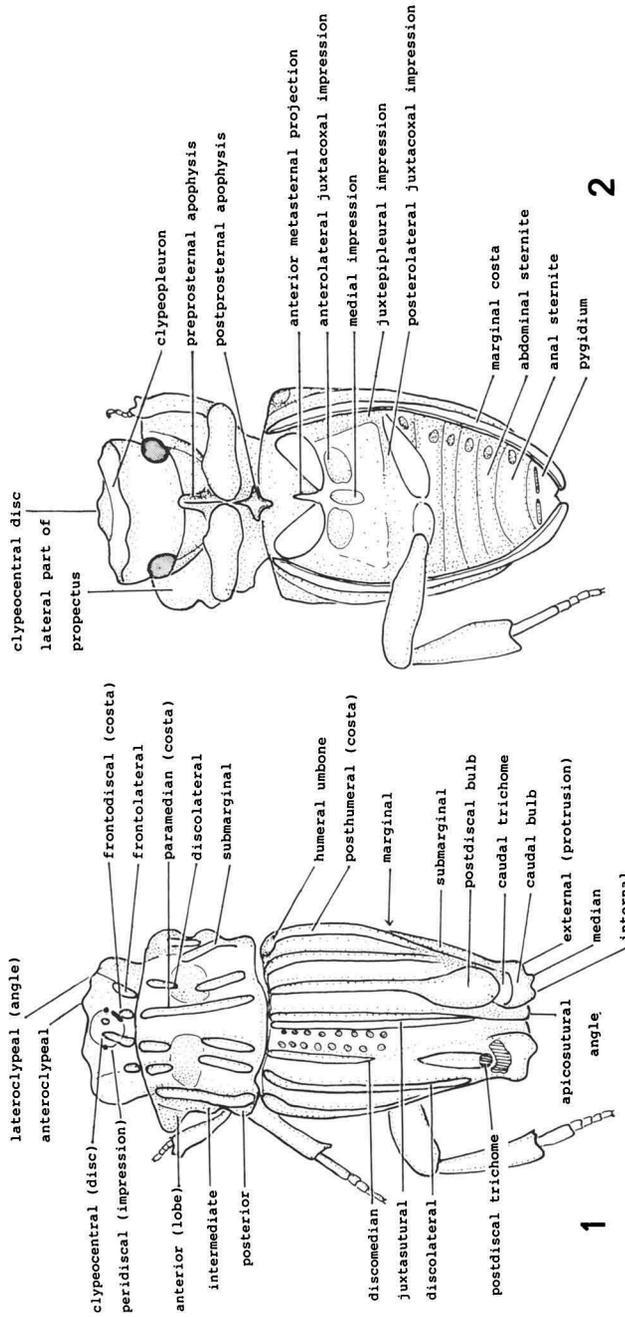
genera were keyed and discussed by Krikken (1970), and little was added since about the southeast Asian rhyparine fauna. In this paper we describe from the Greater Sundas four new species of *Termitodius* Wasmann. This is a genus hitherto thought to be limited to the New World (Reyes-Castillo & Martínez, 1979, Cartwright & Woodruff, 1969, etc.), although Krikken (1970: 472) already alluded to an Asian occurrence (he had seen the Sumatran species described below). The present report then comprises the first formal descriptions of *Termitodius* species from the Old World tropics (if one disregards the earlier combination of the single known *Termitodiellus* species with *Termitodius*). These records are based on material in the London, Paris and Leiden museums. The direct stimulus to describe the novelties came from the fact that two new species were recently added to the two we already had. They were collected in 1985 during Project Wallace, the expedition of the Royal Entomological Society of London to Sulawesi, Indonesia.

Technical note. — The SEM pictures (figs. 3-14) were taken with a JEOL JSM 840A scanning electron microscope. It should be noted that, being uniques, most of the specimens had to remain uncoated. As magnification scales in SEM pictures are inherently unreliable with respect to detail, one should instead refer to the measurements given in the descriptions. The notation “ $\times 40$ ” indicates magnification at which the feature concerned is distinct.

## 2. GENERIC DIAGNOSIS AND MORPHOLOGICAL TERMINOLOGY

The morphological terminology employed in this paper is illustrated in figs. 1-2. We consider the terms employed by Reyes-Castillo & Martínez (1979) incomplete for our descriptive purposes. It is necessary to homologise the characters of the rhyparines to facilitate consistent descriptions. Without comparison of the diagram with actual specimens and with the descriptions a critical identification is impossible. As for the punctuation and other microsculpture: dense means separated by less than their own diameter, abundant means separated by more than one and less than five diameters, sparse means separated by more than five diameters (or whatever equivalent).

Diagnosis. — Habitus compact, but typically rhyparine: pronotum with set of symmetrically arranged longitudinal costae, including two paramedians; elytra also longitudinally costate, discal costae (cf. diagram, fig. 1) separated by two or three (variably distinct) rows of punctures. Ratio length of elytra to length of pronotum less than ca 2.2, ratio length of elytra to width ca 1.5.



Figs. 1-2. Diagrammatic explanation of morphological terms employed in this paper (asymmetrical, showing some diversity on left and right sides). Generalized rhyparine (*Termitodius/Rhyparius*).

Elytra with very strongly developed caudal and postdiscal bulbs ("knobs"), separated by trichome-like organ. Metacoxae very long, more than 0.6 distinct in dorsal view. Head normally deflexed, fitting in anterior prothoracic cavity. Clypeus with circular, raised central area (clypeocentral disc). Frons with set of four small (usually longitudinal) protrusions. Clypeal margin usually distinctly deflexed (forming a clypeopleuron). Pronotal disc laterally concave (disco-lateral impression), with various costae (cf. diagram, fig. 1); margin with expanded flange, which usually is strongly "auriculate" in front. Preprosternal apophysis strongly developed; postprosternal apophysis shape more or less like the head of a fox<sup>1</sup>. Colour generally blackish or brownish. Pilosity very fine, dense on tarsi, elsewhere mainly limited to certain protrusions. Alae reduced in some species. Anterior metasternal projection ca triangular, narrowly separating mesocoxae. Metasternum with variably developed impressions. Six abdominal sternites visible; anal sternite broader than others. Pygidial surface usually modified. Metatarsal segment 1 long in relation to subsequent segments. Protibial spur reduced. Mentum with impression fitting against preprosternal apophysis. Larva, cf. Reyes-Castillo & Martínez (1979).

Type-species. — *Termitodius coronatus* Wasmann.

### 3. KEY TO SPECIES OF *TERMITODIUS* IN SOUTHEAST ASIA

See comparative illustrations for more differences in ridges and other protrusions.

- 1a. Discomedian costa obsolete halfway elytral disc. Paramedian and discolateral ridges (apart from interruption by discolateral impression) not reaching pronotal base (margin of base reflexed). Posthumeral elytral costa obsolescent about halfway elytral length. Elytra and parts of pronotum very shiny. Eyes well-developed. Sulawesi . . . . . *interruptus*
- 1b. Discomedian costa distinctly extending to postdiscal bulb of elytra. Paramedian and discolateral ridges (apart from interruption by discolateral impression) reaching pronotal base. Posthumeral elytral costa extending to distal declivity . . . . . 2
- 2a. Eyes well-developed. Alae complete. Elytra shiny. Frontodiscal costae

1. The Afrotropical genus *Notocaulus* Quedenfeldt (cf. Krikken, 1970: 472) has no postprosternal apophysis like the genuine Rhyparinae and, judged from characters other than the longitudinal pronotal and elytral costae, has to be transferred to the Eupariini in the Aphodiinae.

- contiguous with clypeocentral costae. Sublateral surface of metasternum without distinct pits. Sumatra ..... *neglectus*
- 2b. Eyes reduced (less than ten facets over greatest width, ventral view). Alae reduced (may be absent). Elytra opaque (alutaceous). Frontodiscal costae separated from clypeocentral costae ..... 3
- 3a. Anterior metasternal projection abruptly declivous, strongly projecting. Caudal bulb extending greatly beyond elytral apex. Metasternal surface almost entirely covered with symmetrical pattern of pits (two anterolateral juxtacoxal pits well defined). Apico-internal angle of metatibia almost straight. Postprosternal apophysis with pointed apex. Borneo ..... *hammondi*
- 3b. Anterior metasternal projection gradually declivous. Caudal bulb not extending beyond elytral apex. Metasternal surface with few pits (the two anterolateral juxtacoxal pits subcontiguous). Apico-internal angle of metatibia strongly produced. Postprosternal apophysis with broad, blunted apex. Sulawesi ..... *monticola*

#### 4. SPECIES ACCOUNTS

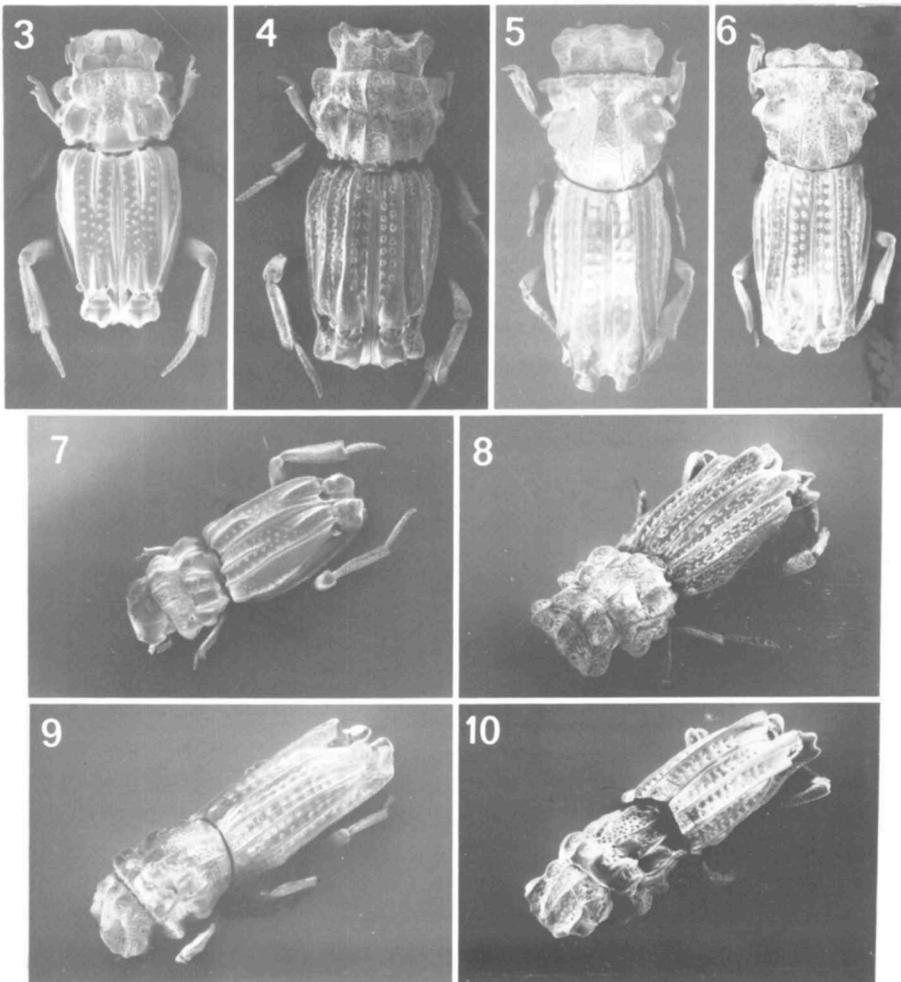
***Termitodius interruptus* spec. nov.**  
(figs. 3, 7, 11, 15)

Material examined. — Seven records, seven specimens.

N SULAWESI: Dumoga Bone NP: Page Subcamp, 4-8.ix.1985, Huijbregts, HH 440, 302 m, multistratal evergreen forest: window trap, 1 holotype, in Leiden. Toraut, i.1985, BM team, 300-400 m, multistratal evergreen forest: fungi on logs, 1 paratype, in BM. i.1985, BM team, 200-300 m, multistratal evergreen forest: small hard brackets on logs, 1 paratype, in BM. 15-21.viii.1985, Huijbregts, HH 416, 234 m, multistratal evergreen forest: window trap, 1 paratype, in Leiden. Toraut: Base Camp area, x.1985, BM team, 190 m, under bark of fallen tree, 1 paratype, in BM. Toraut: plot A, xi.1985, BM team, 200 m, multistratal evergreen forest: window trap, 1 paratype, in BM. Toraut: site 2, xi. 1985, Barlow, 220 m, multistratal evergreen forest: Rothamsted trap, 1 paratype, in BM.

Holotype (female). — Length ca 3.3 mm. Colour dark brownish, posterior intervals and sides of pronotum, as well as elytral intervals, very shiny. Pilosity inconspicuous dorsally, but protrusions with numerous microsetae; legs abundantly setose. Clypeocentral disc of head with pair of posteriorly slightly divergent costae; peridiscal impression indistinct, with small pit on either side, posteriorly with narrow sulcus on either side; anteroclypeal angle distinct, lateroclypeal angle absent, lateral border very feebly concave; clypeopleuron broad, upper and lower borders more or less parallel-sided, anteromedian

angle indistinct, margin shiny; frontodiscal costae tuberculiform, widely separated from clypeoventral costae; frontolateral costae distinct; genae broadly lobiform, border rounded. Head generally abundantly, finely punctate. Pronotum with paramedian costae well defined, broadly interrupted at disco-lateral impression, abruptly ending at short distance from base; discolateral costa well defined, distinctly interrupted by disco-lateral impression; submarginal costa well defined, sinuate, depressed at discolateral impression; disco-lateral impression deep, extensive, with discolateral pit;



Figs. 3-10. *Termitodius* species, holotypes. 3, 7, *interruptus*; 4, 8, *monticola*; 5, 9, *neglectus*; 6, 10, *hammondi*. — 3-6, dorsal, 7-10, oblique views.

marginal costa absent, interval anteriorly with pit; lateral flange with broadly auriculate anterior lobe, its apex rounded, extension (in dorsal view) equal to that of median lobe; posterior lobe absent. Pronotum anteriorly crowdedly punctate, pitted between costae; derm posteriorly and laterally largely impunctate, polished; basomedian margin elevated, somewhat reflexed. Scutellum invisible ( $\times 40$ ). Elytron with juxtasutural costa well-defined, obsolescent from caudal trichome onwards; discomedian costa obsolete over some distance halfway disc, ending in elongate postdiscal bulb, bulb posteriorly with thin trichomes; bulb distinctly separated from caudal bulb by intervening, accrete, very distinct caudal trichome; discolateral costa well-defined, high, posteriorly ending gradually at postdiscal bulb; posthumeral costa well-defined, crest sharp distally, obsolescent at ca 0.6 from elytral base, continuing narrowly to small trichome, laterally at base of caudal bulb; submarginal costa proximally distinctly curved, well-defined, ending in external protrusion of caudal bulb; internal and median protrusions of bulb broadly fused, external protrusion distinct in dorsal view; marginal costa low, reaching apicosutural angle; apicosutural angles protuberant, extending (in dorsal view) slightly beyond caudal bulb; elytral interval 1 with deep postdiscal cavity; intervals 1 and 2 largely with two irregular rows of coarse punctures, their diameters smaller than width of juxtasutural costa, separated by 1-2 times their diameters; intervals 3 and 4 largely impunctate; interval 5 with incomplete row of coarse punctures; humeral umbone distinct. Alae present.

Antenna entirely orange. Eyes well developed. Preprosternal apophysis with slight protuberance on median crest (in profile); postprosternal apophysis laterally slightly protuberant, apex shortly rounded, blunt. Lateral parts of propectus largely impunctate. Anterior metasternal projection arrow-head-shaped, gradually declivous to mesosternum. Medial area of metasternum shallowly impressed; juxtepleural margin of metasternum shallowly canaliculate; anterolateral juxtacoxal impression shallow, well-defined, posterolateral juxtacoxal impression ill-defined; metasternal disc largely, abundantly punctate, most punctures with short seta. Visible abdominal sternites laterally with impression, anal sternite broad, generally convex; pygidium with pair of narrow transverse sulci. Protibia with two apico-external denticles only; terminal spur obsolete. Meso- and metatibia with strongly produced apico-internal angle. Metafemur elongate; femora generally unmodified. Length of metatarsal segment 1 ca 1.5 width of metatibial apex, nearly equal to length of segments 2-5 combined.

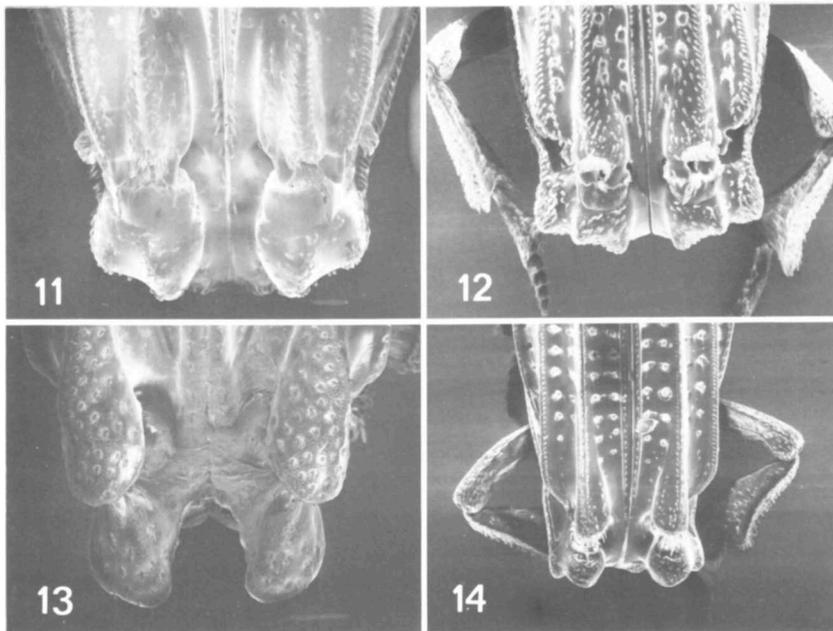
Measurements in mm. Maximum width of head 1.1. Median length of pronotum 1.1, maximum width 1.5. Maximum width of elytra combined 1.5; sutural length (to elytral apex) of elytron 2.1.

**Termitodius monticola** spec. nov.

(figs. 4, 9, 12, 16)

Material examined. — Holotype, female, N Sulawesi: Dumoga Bone NP, Clarke Camp, x.1985, BM team, lower montane forest, 1140 m, leaf litter (in BM).

Holotype (female). — Length ca 3.9 mm. Colour blackish, generally opaque. Pilosity inconspicuous dorsally, but protrusions with numerous microsetae; legs abundantly setose. Clypeocentral disc of head with pair of posteriorly slightly divergent costae; peridiscal impression distinct, with pit on either side, posteriorly with narrow, symmetrical sulci; antero-clypeal and lateroclypeal angles ill-pronounced; clypeopleuron large, broadly triangular; frontodiscal costae distinct, not contiguous with clypeocentral costae; frontolateral costae distinct, short; genae broadly lobiform, border widely rounded. Head generally coarsely, densely, evenly punctate. Pronotum with paramedian costae well defined, slightly divergent caudad, slightly interrupted at disco-lateral impression; discolateral costa well defined, broadly interrupted by discolateral impression; submarginal costa well defined, sinuate, depressed at disco-lateral impression; disco-lateral impression distinct, exten-



Figs. 11-14. *Termitodius* species, holotypes, distal parts of elytron, dorsal views. 11, *interruptus*; 12, *monticola*; 13, *neglectus*; 14, *hammondi*.

sive; marginal costa absent; lateral flange with auriculate anterior lobe, its apex rounded, extending (in dorsal view) slightly beyond median lobe; posterior lobe present, small. Pronotum with median interval densely, coarsely punctate; discolateral interval smooth posteriorly. Scutellum indistinct ( $\times 40$ ). Elytron with juxtasutural costa well-defined, obsolescent from caudal trichome onwards; discomedian costa high, well-defined, slightly undulate, uninterrupted, ending in drop-shaped postdiscal bulb, bulb posteriorly with thin trichome; bulb distinctly separated from caudal bulb by intervening, very distinct, accrete caudal trichome; discolateral costa well-defined, slightly lower than discomedian, posteriorly slightly swollen, ending at small trichome; posthumeral costa well-defined, ending abruptly on distal declivity; submarginal costa with crest undulate at base, costa generally well-defined, ending in external protrusion of caudal bulb; internal, median and external protrusions of bulb distinct in dorsal view; marginal costa obsolescent near caudal bulb; apicosutural angles protruding (in dorsal view) slightly beyond caudal bulb; elytral intervals 1 and 2 with two complete rows of closely set, very coarse punctures, their diameters more or less equal to width of juxtasutural costa; derm of intervals 1-4 more or less shiny; intervals 3 and 4 similar, though punctation distally absent, surface smooth; intervals 3 and 4 ending in deep cavity; interval 5 with complete row of very large punctures; humeral umbone moderately raised. Alae absent, elytra apparently fused.

Antenna entirely orange. Eyes very small, ca five facets across widest point. Preprosternal apophysis with median crest slightly protuberant; postprosternal apophysis laterally slightly protuberant, apex shortly rounded, blunt. Lateral parts of propectus abundantly, coarsely punctate. Anterior metasternal projection triangular, gradually declivous to mesosternum. Medial area of metasternum with distinct, elongate, elliptic impression; juxtepipleural margin of metasternum shallowly canaliculate; anterolateral juxtacoxal impressions well-defined, subcontiguous; posterolateral juxtacoxal impression well-defined; metasternal disc largely, abundantly punctate, most punctures with short seta. Abdomen ventricose, sternites laterally with impression; anal sternite extremely broad, base with two small symmetrical pits on either side. Pygidium with well-defined transverse sulcus. Protibia with two small apico-external denticles; terminal spur obsolete. Meso- and metatibia distally dilated, with more or less produced apico-internal angle. Metafemur elongate; femora generally unmodified. Length of metatarsal segment 1 ca 1.5 width of metatibial apex, slightly longer than segments 2-5 combined.

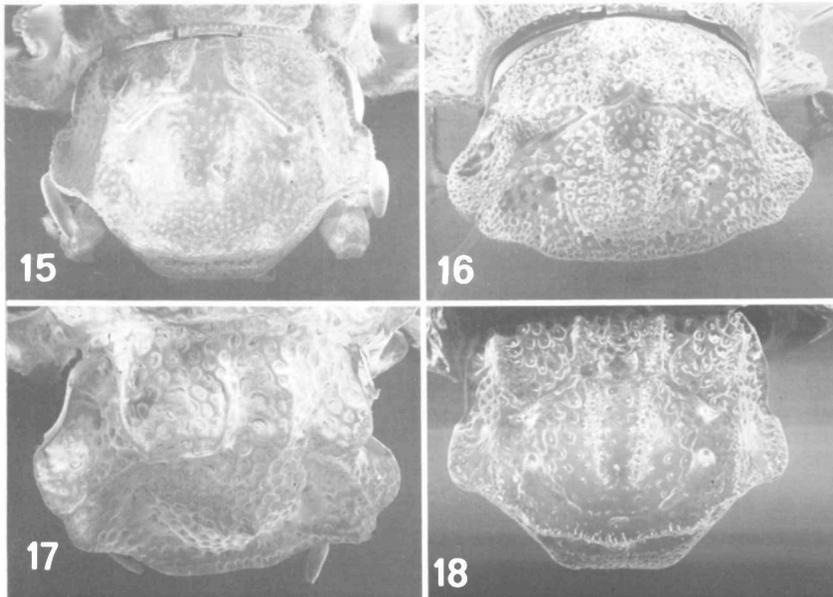
Measurements in mm. Maximum width of head 1.3. Median length of pronotum 1.2, maximum width 1.7. Maximum width of elytra combined 1.7; sutural length (to elytral apex) of elytron 2.3.

**Termitodius neglectus** spec. nov.

(figs. 5, 9, 13, 17)

Material examined. — Holotype, female, from Sumatra: Palembang, no further data, in Paris museum, from the Fairmaire collection (1906).

Holotype (female). — Length ca 3.3 mm. Colour brownish, elytra shiny. Pilosity very inconspicuous dorsally; legs sparsely setose. Clypeocentral disc of head with pair of posteriorly slightly divergent costae; peridiscal impression distinct; anteroclypeal angle distinct, lateroclypeal angle ill-pronounced, placed adjacent to distinct clypeogenal suture; clypeopleuron broad, indistinctly pointed medially; frontodiscal costae distinct, virtually contiguous with clypeocentral costae; frontolateral costae distinct; genae broadly lobiform, border subangulate in front. Clypeus abundantly, distinctly punctate; frontovertex crowded with deep punctures. Pronotum with paramedian costae well defined, broadly interrupted and (posterior section) approximated at disco-lateral impression; discolateral costa well defined, distinctly interrupted by deep, narrow disco-lateral impression; submarginal costa well defined, sinuate, depressed at disco-lateral impression; marginal costa absent; lateral



Figs. 15-18. *Termitodius* species, holotypes, head capsule (note grooves, pits). 15, *interruptus*; 16, *monticola*; 17, *neglectus*; 18, *hammondi*.

flange with auriculate anterior lobe, its apex rounded, extension (in dorsal view) equal to that of median lobe; posterior lobe absent. Pronotum with median interval densely, coarsely punctate. Scutellum invisible ( $\times 40$ ). Elytron with juxtasutural costa well-defined, obsolescent from caudal trichome onwards; discomedian costa high, well-defined, uninterrupted, ending in drop-shaped postdiscal bulb, bulb posteriorly with thin trichome; bulb distinctly separated from caudal bulb by intervening caudal depression (trichome); discolateral costa well-defined, as high as discomedian, posteriorly ending abruptly; posthumeral costa well-defined, ending gradually on distal declivity; submarginal costa proximally strongly curved, connected to posthumeral one at base; submarginal costa generally well-defined, ending in external protrusion of caudal bulb; internal and median protrusions of bulb broadly fused, external protrusion indistinct in dorsal view; marginal costa low, reaching apicosutural angle; apicosutural angles protuberant, extending (in dorsal view) distinctly beyond caudal bulb; elytral interval 1 with deep postdiscal cavity, with two complete rows of closely set, very coarse punctures, their diameters more or less equal to width of juxtasutural costa; interval 2 similar; intervals 3 and 4 similar, though punctation distally absent; interval 5 with complete row of large punctures; humeral umbone slight. Alae present; elytra not fused.

Antenna entirely orange. Eyes well-developed. Preprosternal apophysis with slight protuberance on median crest (in profile); postprosternal apophysis acute, apex acute. Lateral parts of propectus sparsely, finely punctate. Anterior metasternal projection arrow-head-shaped, abruptly declivous to mesosternum. Medial area of metasternum distinctly, deeply impressed, elongate; juxtepipleural and posterolateral juxtacoxal margins shallowly canaliculate; two anterolateral juxtacoxal impressions present; metasternal disc with sparse punctation. Visible abdominal sternites laterally with impression; anal sternite broad, base with pair of pits. Pygidium with pair of transverse ill-defined impressions. Protibia with two small apico-external denticles; terminal spur obsolete. Meso- and metatibiae distally dilated, with more or less produced apico-internal angle. Mesofemur with distal concavity, apparently fitting against postprosternal apophysis; metafemur elongate. Length of metatarsal segment 1 slightly exceeding width of metatibial apex, slightly shorter than segments 2-5 combined.

Measurements in mm. Maximum width of head 1.1. Median length of pronotum 1.0, maximum width 1.4. Maximum width of elytra combined 1.4; sutural length (to elytral apex) of elytron 2.1.

**Termitodius hammondi** spec. nov.

(figs. 6, 10, 14, 18)

Material examined. — Holotype, female, from Sarawak: 4th Division: Gunung Mulu NP, Camp envs, 150-200 m, 5.vii.1978, forest leaf litter, Hammond & Marshall, in BM.

Holotype (female). — Length ca 3.2 mm. Colour brownish-black, generally opaque. Pilosity inconspicuous dorsally, but protrusions with numerous microsetae; legs sparsely setose. Clypeocentral disc of head with remnants of costae, its general surface somewhat conical; peridiscal impression indistinct, with small pit on either side; antero-clypeal angle distinct, latero-clypeal angle ill-pronounced; clypeopleuron broad, more or less parallel-sided; frontodiscal and frontolateral costae distinct; genae broadly lobiform, border widely rounded. Head generally coarsely, very densely, evenly punctate. Pronotum with paramedian costae generally distinct, slightly divergent caudad, anteriorly strongly elevated, obsolete at disco-lateral impression; discolateral costa consisting of anterior lobe and low posterior costa, intervening space occupied by disco-lateral impression; submarginal costa well defined, crest strongly undulate, scarcely affected by disco-lateral impression; discolateral impression deep, extensive, bottom impunctate; marginal costa absent; lateral flange with strongly auriculate, somewhat pointed anterior lobe, extending (in dorsal view) slightly beyond subangulate median lobe; posterior lobe absent. Pronotal intervals generally crowded with coarse punctures. Scutellum invisible ( $\times 40$ ). Elytron with juxtasutural costa well-defined; discomedian costa high, well-defined, uninterrupted, ending in drop-shaped postdiscal bulb; bulb distinctly separated from caudal bulb by intervening, very distinct, accrete caudal trichome; discolateral costa well-defined, much lower than discomedian, posthumeral costa well-defined, protuberant on humeral umbone, otherwise unmodified, distally ending gradually; submarginal costa undulate near base, costa generally well-defined, ending in external protrusion of caudal bulb; internal and median protrusions fused, external protrusion of bulb indistinct in dorsal view; marginal costa reaching apicosutural angle; caudal bulb protruding (in dorsal view) slightly beyond apicosutural angles; intervals 1, 2 and 3 with two rows of closely set, very coarse punctures over anterior 0.7 of elytral length, their diameters more or less equal to width of juxtasutural costa; interval 4 deeply punctate in front; interval 5 complete row of very large punctures; intervals 3 and 4 ending in shallow cavity; humeral umbone produced, shiny. Alae strongly reduced; elytra apparently fused.

Antenna entirely orange. Eyes small, ca six segments across widest point. Preprosternal apophysis with median crest slightly protuberant; postproster-

nal apophysis laterally acute, apex acute. Lateral parts of propectus largely, densely, coarsely punctate. Anterior metasternal projection sharply triangular, abruptly declivous to mesosternum; metasternum largely covered with various symmetrically arranged impressions: median impression, anterolateral juxtacoxal pits, juxtepipleural and posterolateral juxtacoxal margins shallowly canaliculate; metasternal punctation coarse, dense, but crowded out by the impressions. Visible abdominal sternites impressed at sutures, laterally with impression, surface generally densely, deeply punctate; anal sternite broad, with four symmetrically arranged pits along base. Pygidium with three large, ill-defined impressions. Protibia broad, with two very short apico-external denticles; terminal spur obsolete. Meso- and metatibiae dilated, almost straight. Profemur with anterior-inferior ridge; metafemur slightly expanded posteriorly; femora generally unmodified. Length of metatarsal segment 1 ca 1.5 width of metatibial apex, shorter than segments 2-5 combined.

Measurements in mm. Maximum width of head 1.0. Median length of pronotum 1.1, maximum width 1.4. Maximum width of elytra combined 1.4; sutural length (to elytral apex) of elytron 2.0.

## 5. DISCUSSION

Some of the taxonomically interesting characters of the Sundanese *Termitodius* and other rhyparine species are indicated in the diagrams explaining the morphological terminology (figs. 1-2). The shape of the cephalic margin (including the clypeopleuron) and the pronotal margin, the cephalic, pronotal and elytral costae, the pronotal and any further impressions, the elytral bulbs and associated trichomes, as well as the shape of the tibiae, are characters of foremost importance. Additionally, the microsculpture also may differ strongly among species. At first sight many of the differences in the characters of shape and microsculpture may appear to fall within the variation of the species. However, the examination of series shows that slight differences in detail may be remarkably constant, thus enabling the recognition of several rhyparine species among light catches from a single night. Therefore we are confident of the validity of the characters separating the four *Termitodius* species herein described.

We cannot be certain that the species described above are genuinely closely related inter se, because (1) they differ strongly in character details, (2) the phylogenetic status of the characters of the archipelagic *Rhyparus* remains unclarified, and (3) the rank and monophyly of *Termitodius* in relation to

other rhyparine genera have to be established in a global context. Points (2) and (3) are interrelated: *Termitodius* might well be heterogeneous and not even deserve a subgeneric rank within *Rhyparus*; they may have arisen independently from different *Rhyparus* stocks, even in Sundaland. Remarkable are the (possibly functionally related) reduction in the size of both eyes and alae in two species (*monticola* and *hammondi*) that are not closely related. Whatever the outcome of future studies, *Termitodius* as currently understood are easily recognisable on their compact, strongly tuberculate general appearance.

Although the four Asian *Termitodius* species all definitely look termitophilic, none was actually found with termites. The New World congeners were found with termites (Reyes-Castillo & Martínez, 1979), and the presence of what we have termed caudal trichomes in the Asian species is strongly indicative of similarly termitophilic habits. It is probably the overall stronger adaptation to a symphilous way of life that renders the general appearance of *Termitodius* different from that of *Rhyparus*<sup>1</sup>. Remarkable is the fact that two of the species described above are microphthalmic and have reduced hind wings. Our Sulawesi *Termitodius* specimens were collected by sifting from litter (including the microphthalmic ones), from fungi, and they were intercepted by window traps; one was found under bark, one was collected at light. Judged from the various observations concerning *T. interruptus* this species must be quite active in the forest. *Rhyparus* have been sifted from soil litter, but most of them were collected at light.

One further ecological point deserving attention in the future emerged from the Project Wallace collections: *Termitodius* and other rhyparines, like most other groups, have different species in different altitudinal zones. In the Dumoga Bone region of North Sulawesi at least one *Termitodius* species is a lowland inhabitant, while another occurs in the montane zone. This ecological differentiation holds also for *Rhyparus*.

We are, it should be emphasized, very ignorant as to the details of the taxonomy of Rhyparinae. The number of undescribed *Rhyparus* species we have seen from the Indo-Australian archipelago is considerable. Although, to our knowledge, no rhyparines have been recorded from Sulawesi up till now, the number of genuine *Rhyparus* species (i.e. apart from the two *Termitodius* described here) seems to exceed ten. We will deal with these in a subsequent paper.

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1. The qualification of *Stereomera* and *Termitaxis* as synechtrans is incorrectly attributed to Kriken (1970) by Reyes-Castillo & Martínez (l.c.: 131) — this stems from Balthasar (1964) only.

## 6. ACKNOWLEDGEMENTS

This paper is based in part on material collected whilst the authors and other workers were participants on Project Wallace, sponsored by the Royal Entomological Society of London and the Indonesian Institute of Sciences (Results of Project Wallace 39). The second author acquired financial support from the Uyttenboogaart-Eliassen Stichting (Amsterdam). The British Museum (Natural History), London (P.M. Hammond, L. Jessop) and the Muséum National d'Histoire Naturelle, Paris (A. Descarpentries, Y. Cambefort) gave specimens on loan. A. van Assen, of the RMNH Coleoptera section, produced the SEM pictures.

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