

Prorhinopsenius neotermitis sp. n.

(Coleoptera, Staphylinidae, Trichopseniinae), guest of *Neotermes*
(Isoptera, Kalotermitidae) in Papua New Guinea*

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Abstract

The first termitophilous staphylinid to be a guest of a Kalotermitidae is described: *Prorhinopsenius neotermitis*, spec. nov. (Trichopseniinae), was discovered in galleries of *Neotermes* sp. A on Manus Island and in New Ireland. A distinct subspecies, *P. n. awarensis*, subsp. nov., occurs with *Neotermes papua* (DESNEUX) in mainland New Guinea. Since most Trichopseniinae are guests of Rhinotermitidae, like the type-species *Prorhinopsenius micronesiae* (SEEVERS), which occurs in nests of *Prorhinotermes*, the association of *P. neotermitis* with *Neotermes* species most probably results from a recent change of host.

Key words: termitophilous Staphylinidae, Kalotermitidae, taxonomy, new species, Papua New Guinea.

Résumé

Nous décrivons le premier staphylin termitophile associé à un Kalotermitidae. *Prorhinopsenius neotermitis*, spec. nov. (Trichopseniinae), a été découvert dans les galeries de *Neotermes* sp. A sur l'île de Manus et en Nouvelle-Irlande. Une sous-espèce distincte, *P. n. awarensis*, subsp. nov., se rencontre avec *Neotermes papua* (DESNEUX) en Nouvelle-Guinée. Etant donné que la plupart des Trichopseniinae sont associés à des Rhinotermitidae, telle l'espèce-type *Prorhinopsenius micronesiae* (SEEVERS) qui vit dans les nids de *Prorhinotermes*, l'association de *P. neotermitis* avec des espèces de *Neotermes* résulte très probablement d'un récent changement d'hôte.

Mots-clés: Staphylinidae termitophiles, Kalotermitidae, taxonomie, nouvelle espèce, Papouasie-Nouvelle-Guinée.

Introduction

A large number of beetles live in association with termites. In the family Staphylinidae alone, KISTNER (1979) counted 133 genera and 435 species of termitophiles, and many new taxa have been described since then. It is therefore highly remarkable that none of them has thus far been reported as a guest of Kalotermitidae, although

this family comprises more than 330 species which constitute about 15% of the world termite fauna (EMERSON 1955).

The subfamily Trichopseniinae is composed exclusively of termitophilous species, most of which are guests of Rhinotermitidae (SEEVERS 1941, PASTEELS and KISTNER 1971, KISTNER 1979). We will report herein the discovery and description of a new species of Trichopseniinae associated with the kalotermitid genus *Neotermes* in Papua New Guinea, and discuss its relationships.

Methods

The beetles were found during field trips specifically aimed at surveying the termite and termitophile faunas of Papua New Guinea. Pieces of wood containing termites were opened with a machete or more finely dissected with a wood chisel. Beetles were collected when seen running in termite galleries. They were fixed in FAA or directly preserved in 70% ethanol. Dissections were made after digestion of the soft tissues by 6% KOH. After dehydration, two specimens were mounted on slides in balsam. Type material is deposited in the Institut Royal des Sciences Naturelles, Brussels.

Systematic account

Subfamily **Trichopseniinae** SEEVERS, 1941
Genus *Prorhinopsenius* PASTEELS and KISTNER, 1971

PASTEELS and KISTNER (1971) provided a detailed diagnosis of the genus *Prorhinopsenius*, which they created to accommodate a single species formerly known as *Hamitopsenius micronesiae* SEEVERS, 1957. The combination of the following characteristics justifies the assignment of the present new species to this genus. Body form limuloid (Figs 1-2), head capsule much wider than

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Figs 1-2 – *Prorhinopsenius neotermitis*, sp. n., subsp. *neotermitis*, paratypes from New Ireland; 1, dorsal view of female; 2, ventral view of male; scale bar = 0.5mm.

long, completely covered by pronotum. Foramen magnum very large. Antennae inserted considerably lateral to the tentorial pits, 11-segmented, segments 7-11 much broader than 3-6, petioles not covered by lateral extensions of the segments (Fig. 9). Scape fitting into genal groove (Fig. 9). External border of mandibles produced into large expansions (Fig. 9). Maxillary palp 4-segmented (Fig. 4). Pronotum without macrosetae, semicircular in front, with bisinuate posterior border. Prosternum very short, with long anterolateral processes (Fig. 10). Elytra with narrowly overlapping lateral border (Fig. 11). Mesosternum short, with carina between mesocoxal fossae (Fig. 12). Metasternal plates very large, allowing space for major part of hind leg (trochanter to first tarsal segment) in repose (Fig. 12).

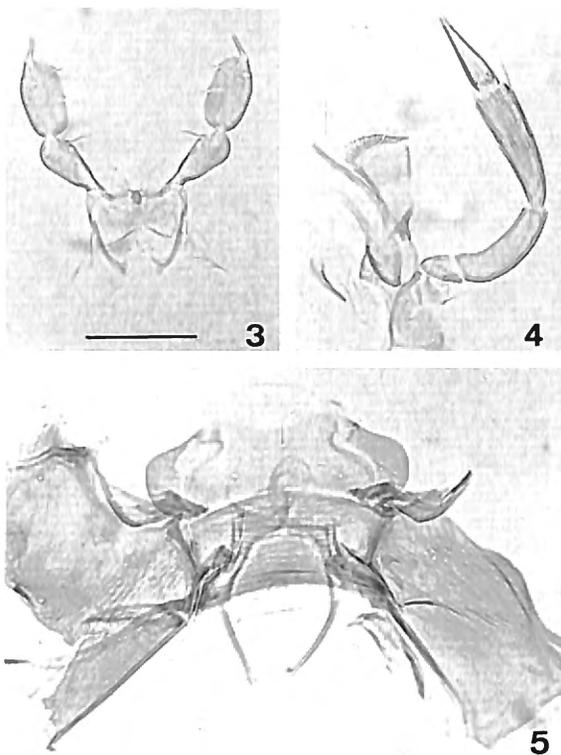
***Prorhinopsenius neotermitis* spec. nov.**

The description of the species is based on specimens collected on Manus Island and in New Ireland, which therefore represent the nominotypical subspecies, *P.*

neotermitis neotermitis. Other specimens coming from a site on the north coast of mainland New Guinea display slightly different features which led us to describe them below as a distinct subspecies.

Color dark to very dark ferrugineous throughout, antennae paler. Antennae (Fig. 9) and maxillae (Fig. 4) very similar to those of *P. micronesiae*. Mandibles (Fig. 9) with broad lateral expansions, more rounded anteriorly than in *P. micronesiae*. Labrum with smooth anterior border; clypeus short and wide, with one long bristle on each side (Fig. 9). Labium as in Fig. 3: palp 3-segmented, segment 2 distinctly longer than wide. The only discrepancy with the generic diagnosis of PASTEELS and KISTNER (1971) lies in the length of the gula. The gula is reported to be extremely short (0.02mm), much shorter than mentum in *P. micronesiae*, whereas it reaches 0.05-0.09mm and is about as long as the mentum in *P. neotermitis* (Figs 5-6). In our opinion, this sole difference does not justify the creation of a new genus.

Pronotum semiellipsoidal, without macrosetae. Prosternum and prolegs as in Fig. 10. Meso- and metanotum as in Fig. 11. Elytra with numerous punctuations and a



Figs 3-5 – *Prorhinopsenius neotermitis*, sp. n., subsp. *neotermitis*, paratype female from Manus Island; 3, labium; 4, maxilla (without cardo); 5, mentum, gula with cardo of maxillae. Scale bar = 0.1mm.

few short setae along external border; membranous wings well developed (Fig. 11). Meso-, metasternum and legs (Figs 12-13) very similar to those of *P. micronesiae*. Abdominal chaetotaxy as follows. Tergites III-VIII with antepical row of 6-12 long setae, decreasing in number with size of tergite (Figs 15-17). Numerous shorter setae on tergite and sternite surface. Sternites III and VIII with numerous setae of various lengths (Figs 18, 20). Sternites IV-VII with antepical row of 8-16 long setae (Fig. 19). Two thick macrosetae on each posterolateral margin of sternites III-VI (Figs 1-2, 18). Abdominal segment IX with long lateral plates (Fig. 14). Spermatheca as in Fig. 7. Male genitalia as in Figs 21-22.

Size larger than in *P. micronesiae*. Measurements (in mm) of entire beetles (N=4): head width, 0.712-0.795; pronotum width, 1.102-1.269; elytra length, along median line, 0.383-0.441.

Holotype: Male, dissected to expose genitalia; Manus Island, 32km from Lorengau on road to south coast (2°05'S, 147°10'E), 7 June 1984. Within galleries of large Kalotermitidae (cat. No. PNGT678) in dead wood on floor of rainforest. Collected by the authors. Host termites were determined as *Neotermes sp. A*. Paratypes: 1 female (on slides), same data as holotype. 1 female, same locality, 5 June 1984. From galleries of *Neotermes sp. A* in very hard tree stump in rainforest (cat. No. PNGT670). 1 male and 1 female, New Ireland, Lelet



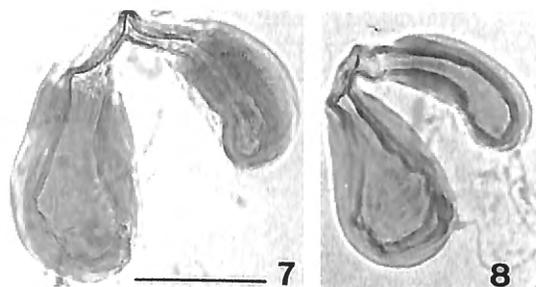
Fig. 6 – *Prorhinopsenius neotermitis*, sp. n., subsp. *awarensis*, paratype: gula, mentum, labium and maxilla. Same magnification as Figs 3-5.

Plateau (3°20'S, 151°55'E, elevation 900m), 27 May 1984. From galleries of *Neotermes sp. A* (cat. No. PNGT613) in wet forest. All paratypes were collected by the authors.

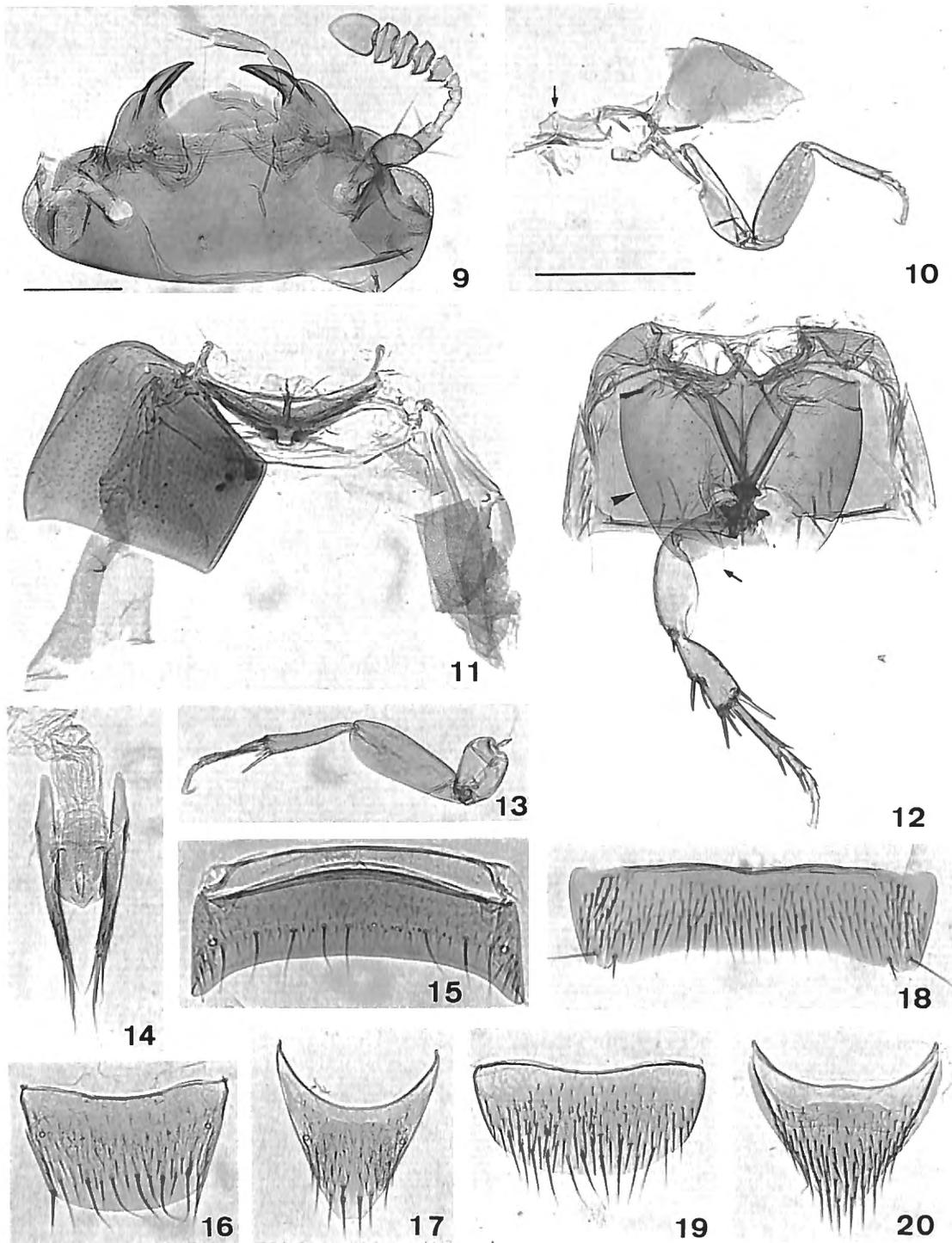
Prorhinopsenius neotermitis awarensis subsp. nov.

Very closely similar to *P. n. neotermitis*, from which it is best distinguished by its smaller size. Small differences appear between dissected specimens of the two subspecies in the shape of the maxillary palp (more elongated in *P. n. neotermitis*), labial palp (segment 2 more rounded in *P. n. neotermitis*), and anterior border of mentum (compare Figs 3-5 with Fig. 6), but the reliability of these criteria remains to be demonstrated. Spermatheca (Fig. 8) and chaetotaxy almost identical to those of *P. n. neotermitis*. Male genitalia unknown.

Measurements (in mm) of entire beetles (N=4): head width, 0.639-0.674; pronotum width, 0.927-0.992; elytra length, along median line, 0.296-0.357.



Figs 7-8 – *Spermathecae*; 7, *Prorhinopsenius neotermitis*, sp. n., subsp. *neotermitis*, paratype from Manus Island; 8, *Prorhinopsenius neotermitis*, sp. n., subsp. *awarensis*, paratype; scale bar = 0.05mm.



Figs 9-20 — *Prorhinopsenius neotermitis*, *sp. n.*, *subsp. neotermitis*, *paratype female* from Manus Island; 9, dorsal part of head capsule; left antenna removed to show genal groove; scale bar = 0.2mm; 10, prosternum and proleg; arrow in sagittal plane; scale bar = 0.5mm and applies to Figs 10-20; 11, meso- and metanotum, left elytron and membrane wings; 12, meso- and metasternum, right metaleg attached; arrow, trochanter; arrowhead, metasternal plate; 13, mesoleg; 14, abdominal segment IX; 15, tergites II+III; 16, tergite VII; 17, tergite VIII; 18, sternite III; 19, sternite VII; 20, sternite VIII.

Holotype: Female; New Guinea, Bogia District, Awar Plantation (4°08'S, 144°51'E), 4 May 1987 (Y. ROISIN). Among termites from galleries in dead cacao tree (cat. No. PNGT1063). Host termites were determined, after comparison with type material, as *Neotermes papua* (DESNEUX, 1905). Paratypes: 2 females (1 on slides), same data as holotype. 2 females, same locality, 30 June 1987. From colony of *Neotermes papua* (cat. No. PNGT1112) in dying cacao tree. All paratypes were collected by Y. ROISIN.

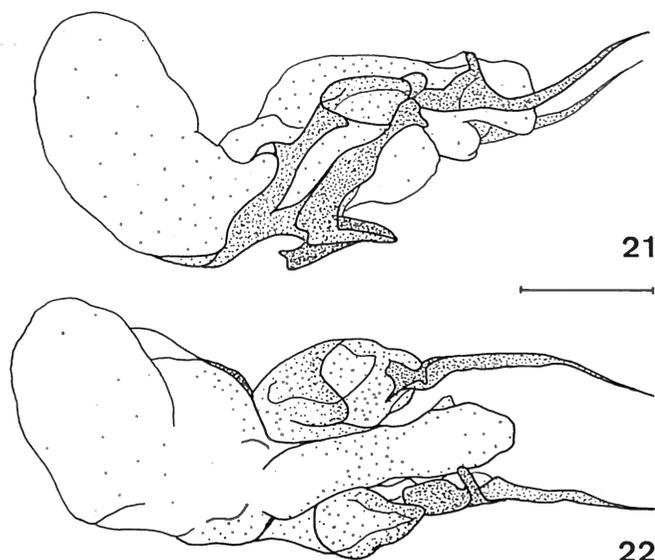
Discussion

By the shape of antennae, the presence of lateral expansions of the mandibles, and the size and shape of the metasternal plates, the new taxa described above are very closely related to and undoubtedly congeneric with *P. micronesiae*, discovered in colonies of *Prorhinotermes* sp. (Rhinotermitidae) in Koror, Palau Islands (SEEVERS 1957). In addition, they occur in the same biogeographic region. The resulting distribution of the genus *Prorhinopsenius* is remarkable for its insularity. *P. neotermitis* is markedly larger than *P. micronesiae*, has a relatively longer gula and lateral expansions of the mandibles more rounded anteriorly.

The two taxa described above occur on separate islands. Morphologically, they differ little but by size, which is meager evidence to justify the description of distinct species. The host termites themselves are closely related, although the morphological differences between them seem sufficient to consider them as distinct species. Yet, as there is no evidence for strict host species specificity in *Prorhinopsenius*, we believe it wisest to consider our specimens of *Prorhinopsenius* as belonging to allopatric subspecies.

It is very unlikely that the occurrence of the new *Prorhinopsenius* species with *Neotermes* was fortuitous, for the following reasons: (i) this association was recorded five times; (ii) the beetles were found running in galleries inhabited by *Neotermes*, while no other termite species was present in the same piece of wood; (iii) all known species of Trichopseniinae, including *Prorhinopsenius micronesiae*, are termitophilous. The association of *P. neotermitis* with *Neotermes* species can therefore be firmly established. To our knowledge, this is the first documented report of termitophilous staphylinids being guests of Kalotermitidae.

That most Trichopseniinae are guests of Rhinotermitidae suggests that this family housed the first trichopseniine invaders. PASTEELS and KISTNER (1971) presented compelling evidence that a limuloid ancestor invaded the Rhinotermitidae before the separation of the extant genera of this family and diversified at the same time as their hosts. There are nevertheless indications of later invasions of other families by trichopseniines. The occurrence of *Mastopsenius australis* SEEVERS with *Mastotermes* (Mastotermitidae) is now well established (SEEVERS 1945; WATSON and HOWICK 1975). The



Figs 21-22 — *Prorhinopsenius neotermitis*, sp. n., subsp. *neotermitis*, genitalia of holotype male; 21, from left; 22, from above. Scale bar = 0.25mm.

associations of *Termitopsenius limulus* WASMANN and *Hamitopsenius caudatus* WASMANN with two species of Termitidae, respectively *Neocapritermes opacus* (HAGEN) and *Amitermes dentatus* (HAVILAND) still await confirmation. In the present case, it is most likely that *Prorhinopsenius* originated as a guest of *Prorhinotermes* and recently invaded nests of *Neotermes*. The notable propensity of both genera to colonize coastlines and islands in the Papuan Region may have facilitated encounters between them and perhaps termitophile transfer.

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