

TAXONOMIC REVISION OF THE TERMITOPHILOUS TRIBE TERMITOHOSPITINI (Coleoptera: Staphylinidae)

II. The Genus *Termitoecia* Bernhauer¹

By David H. Kistner²

Abstract: The genus *Termitoecia* Bernhauer is redescribed and illustrated and 2 new species, *T. asetosa* and *T. hirsutus*, are described from Australia where they are found with *Schedorhinotermes reticulatus* (Froggatt). Both previously described species of *Termitoecia* are redescribed and a key to all the species is provided.

The purpose of this paper is to redescribe the genus *Termitoecia* Bernhauer and the previously described species. New material of the genus provided by Dr F. J. Gay has made possible the delimitation of the species through the use of dissection material that was not possible in the past. Furthermore this material from Australia has provided 2 new species, so this paper will provide the description of the 2 new species also.

All of the species appear to be host specific at the species level, however the genus is only known from 2 species of *Schedorhinotermes*. The situation is complicated by the fact that the same species of termite seems to have more than 1 species of *Termitoecia* which makes it difficult to compare the termite species. Perhaps in the future when species are known from more species of termites it will be possible to investigate the evolution of the host-termitophile association more thoroughly. The genus is not known from nests of *Schedorhinotermes* outside of Australia.

The methods used in this study were described by Kistner (1968). All measurements are given in millimeters unless stated otherwise.

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tion of specimens cited. Specimens cited (DK) are in my collection. Thanks are given to A. E. Emerson, University of Chicago, for 1 of the host determinations and for reading this manuscript and making helpful suggestions. Thanks are given to F. J. Gay for the host determinations credited to him in the text. I particularly want to thank the following Shinner assistants for their help on various aspects of this study: James Clover, Margaret Enger, Lynette Hawver, Robert Palmer, Norris Sadler, and Karen Wells, all from Chico State College.

Genus *Termitoecia* Bernhauer

Termitoecia Bernhauer, 1921: 20.—Seevers, 1957: 207.

A highly distinctive genus which is immediately recognizable by its overall shape as well as the shapes of the mandibles and other mouthparts and the shapes of the legs. Seevers (1957) thought it was most closely related to *Termitospectrum* from which he distinguished it by the pronotal form, the distinctive elytra, the distinctive mentum and the shape of the abdomen. Whether further study will show it to be closely related to *Termitospectrum* or not is problematical. Right now *Termitospectrum* is the only genus even remotely related to *Termitoecia*.

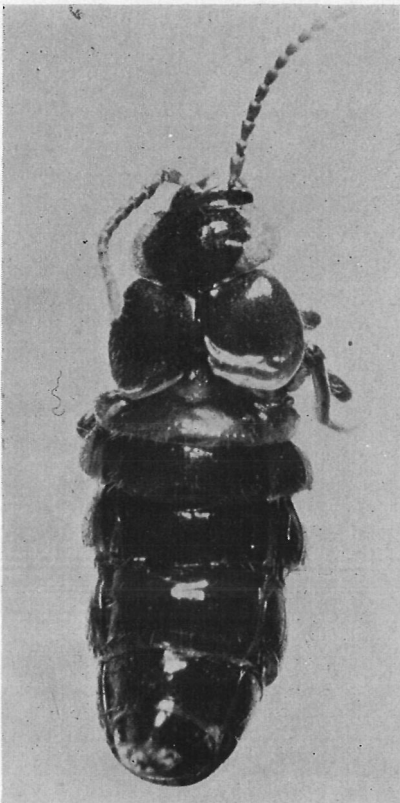


Fig. 1. Dorsal appearance of entire beetle, *Termitoecia hirsutus*.

Overall shape as in fig. 1. Head capsule oval in shape, wider than long with no nuchal ridge nor any neck. Antennae inserted between eyes very near to anterior tentorial pits. Gula short, with sides only slightly divergent from anterior to posterior. Gula, submentum, and mentum all fused together. Eyes present, rounded in shape, with facets directed both anteriorly and laterally, non-setose. Antennae 11-segmented, shaped as in fig. 3C; with no coeloconic sensillae on terminal segment. Mandibles asymmetrical, and highly modified in shape as in fig. 2A and 2B. Maxillae shaped as in fig. 2D; palpi 4-segmented. Maxillary acetabulae not margined. Labium shaped as in fig. 2C; palpi 3-segmented, with the 2nd segment extremely long as is characteristic of *Termitohospitini*. Labrum shaped as in fig. 2H.

Pronotum highly distinctive in shape, as in fig. 1. Note collar-like shape with lightly pigmented area on each side of pronotum. Extent and precise appearance of lightly pigmented lateral areas somewhat variable by species. Pronotum with a distinctly impressed midline extending from anterior to posterior borders. Pronotum with anterior borders completely arched. Dorsal surface of pronotum reflexed ventrally to about 1/4 total width of pronotum. Prosternum evenly rounded between legs with

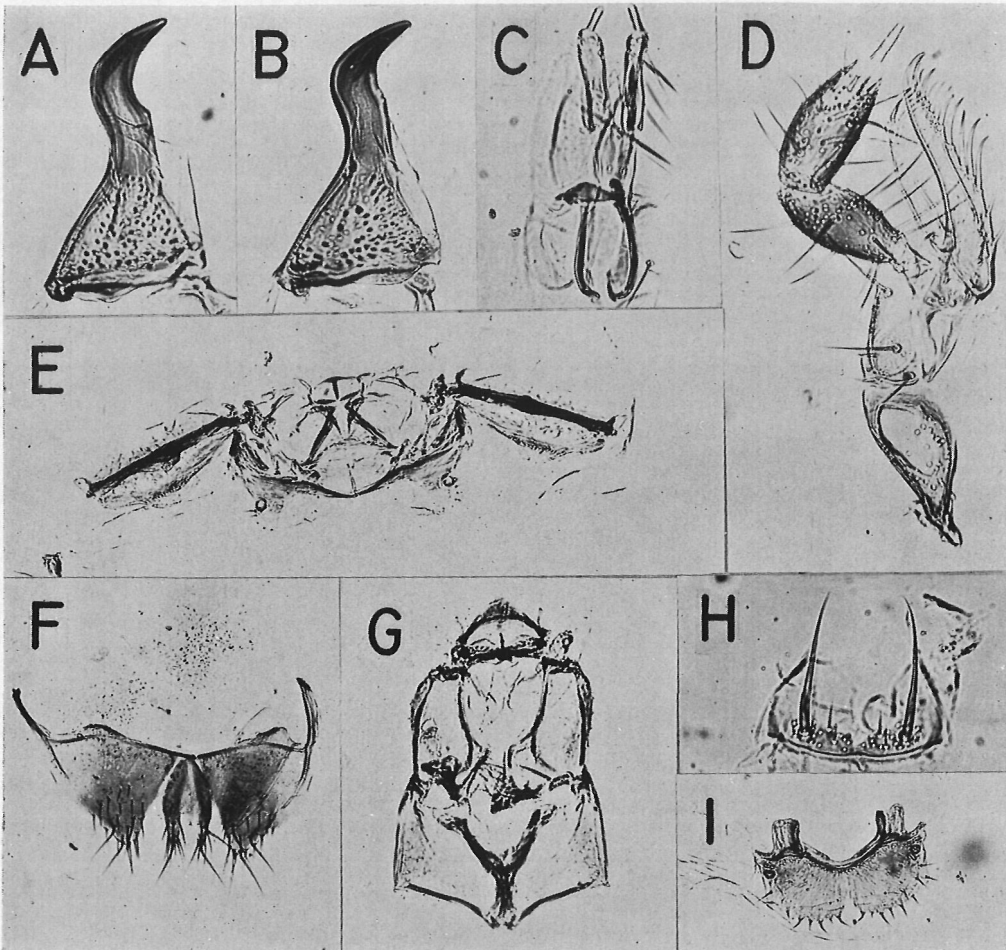


Fig. 2. *Termitoecia hirsutus*: A, right mandible; B, left mandible; C, labium; D, maxilla; E, meso- and metanotum with abdominal tergite I; F, abdominal segment IX of ♂ unfolded; G, meso- and metasternum with scutellum; H, labrum; I, abdominal tergite II.

normal length anterolateral articulation processes. Procoxal cavities closed behind by membrane containing strap-like sclerotized mesothoracic peritremes. Mesosternum only slightly shorter than metasternum, shaped as in fig. 2G. Mesothoracic intercoxal process broad and completely fused to metasternum. Mesothoracic coxal cavities not margined and insertion of mesothoracic legs widely separated. Metasternum smooth with no unusual features, shaped as in fig. 2G. Meso- and metanotum shaped as in fig. 2E. Elytra highly modified into a thick lobe-like structure. This lobe-like structure, shaped as in fig. 3D, is filled with an extensive layer of fleshy material between dorsal and ventral surfaces. Lateral edges of elytron hyaline; elytra with an indentation on apical third which is very full of small pores when examined under high magnification. Wings apparently not present. Pro-, meso-, and metalegs shaped as in fig. 3F, 3B, and 3A, respectively; tarsal formula 4-4-5.

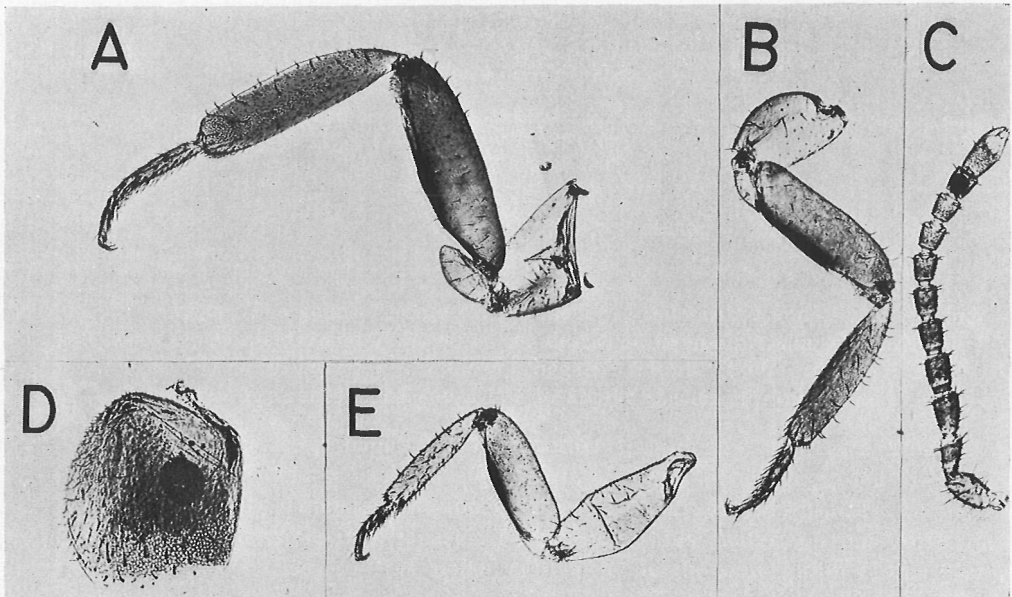


Fig. 3. *Termitoecia hirsutus*: A, metaleg; B, mesoleg; C, antenna; D, elytron; E, proleg.

Abdomen shaped as in fig. 1, physogastric. Segment I fused to metanotum, abbreviated, shaped as in fig. 2E. Segment II represented by tergite alone which is highly modified and shaped as in fig. 2I. Segments III-VII with 1 tergite, 1 sternite, and 2 pairs of paratergites each. The abdomen is evenly rounded and so lacks what might be called a dorsal rim although the outer paratergites appear to be fused to the sternites. Segment VIII represented by a sternite and tergite alone. Segment IX shaped as in fig. 2F. Spermatheca sclerotized, variable by species. ♂ genitalia bulbous, variable by species.

Type-species: *Termitoecia fabulosa* Bernhauer (Blackwelder 1952: 377).

KEY TO SPECIES OF TERMITOECIA

1. Tergites III-VII with no anteapical setae **fabulosa**
At least some tergites of segments III-VII with anteapical setae 2
2. Tergites III-VI with 6 apical setae 3
Tergites III-VI with many apical setae, in excess of 16 **hirsuta**
3. Lateral areas of pronotum completely brown in color, with scarcely any differentiation from the median area; tergites IV and V with 4 anteapical setae **asetosa**
Lateral areas of pronotum defined but with wide bands of brown pigmentation; tergites IV-V with no anteapical setae **wilsoni**

Termitoecia fabulosa Bernhauer Fig. 4D, 4F.

Termitoecia fabulosa Bern., 1921: 21, Australia, Queensland, Herberton, no host indicated, Field Museum Natural History, Chicago.—Seevers, 1957: 207, fig. 31B, gave host as *Schedorhinotermes intermedius* Brauer.

Color reddish brown throughout, abdomen somewhat darker than rest of specimen. Head with a transverse row of setae on epicranium about level with posterior border of eyes. Gula-submentum with only a few long yellow setae. Lateral areas of pronotum slightly tan in color with about 8 long black setae on each. Brown area in center of pronotum with a row of 4 setae to each side of impressed midline. Elytra with 7 black setae each, of which only 3 are long. Macrochaetotaxy of abdominal segments II-VIII as follows: 0, 4, 4, 4, 4, 2, 4-4. All sternites with only an apical row of black setae. Median lobe of ♂ genitalia shaped as in fig. 4D. Spermatheca shaped as in fig. 4F.

Measurements: Pronotal length, 0.45-0.47; elytral length, 0.40-0.41; width of tergite IV, 0.80-0.81. Number measured, 2.

MATERIAL EXAMINED. 1, Holotype, Australia, Queensland, Herberton, (FMNH); 2, Queensland, 24 km (15 mi) SE of Gin-Gin, 30.VII.1969, ex galleries, Coll. J. A. L. Watson & R. A. Barrett (CSIRO, DK).

Notes: The host specimen of the holotype was redetermined as *Schedorhinotermes actuosus* (Hill) by Dr A. E. Emerson. The host of the newly captured Queensland specimens was determined also to be *S. actuosus* by F. J. Gay. Specimens of the latter termite colony are in the Australian National Insect Collection, Canberra, while the specimen of the former is in the Emerson Collection of the American Museum of Natural History, New York.

Termitoecia wilsoni Cameron Fig. 4A, 4G.

Termitoecia wilsoni Cameron, 1943: 349, Australia, New South Wales, Bogan River, with termites, Coll. J. Armstrong.—Seevers, 1957: 208, fig. 31C.

Most closely related to *T. asetosa* from which it is distinguished by the chaetotaxy as well as the shape of the median lobe of the ♂ genitalia.

Color reddish brown throughout, median portion of pronotum and abdomen a little darker than rest of body. Head with a transverse staggered row of 8 setae on epicranium. Gula-submentum with 8 to 10 long yellow setae. Lateral areas of pronotum well-defined but with wide bands of brown pigmentation enclosed within them and with about 12 setae on each. Median area of pronotum with a row to each side of midline with about 7 seta each. Elytra with 10 to 12 black setae and a few other short yellow setae. Macrochaetotaxy of abdominal tergites II-VIII as follows: 0,6, 6, 6, 4-6, 4-6, 4-6. Sternites of all segments with both an apical and an anteapical row of short black setae. Median lobe of ♂ genitalia shaped as in fig. 4A. Spermatheca shaped as in fig. 4G.

Measurements: Pronotal length, 0.40-0.42; elytral length, 0.32-0.36; abdominal tergite IV width, 0.83-0.87. Number measured, 4.

MATERIAL EXAMINED. AUSTRALIA: Type, No. 3194, N. S. W., Bogan River, 24.III. 1931, J. Armstrong (NMV); 2, Paratypes, N. S. W., Bogan River, with termites in cypress pine, Armstrong (NMV, BMNH); 4, Queensland, 120 km (75 mi) SSW of Cunnamulla, Wittenburra, 17.X.1960, F. J. Gay (CSIRO, DK).

Notes: The hosts of the above specimens were determined to be *Schedorhinotermes actuosus* (Hill) by F. J. Gay. Specimens of the host termites are in the Australian National Insect Collection, Canberra.

Termitoecia asetosa Kistner, new species Fig. 4B.

Most closely related to *S. wilsoni* from which it is distinguished by the shape of the median lobe of the male genitalia as well as the chaetotaxy.

Color reddish brown throughout, abdomen somewhat darker than rest of body. Head with a transverse row of 4 setae on epicranium and 2 additional setae which are at anterior corners of eye where border joins epicranium. Gula-submentum with but a few long yellow setae. Lateral areas of pronotum completely brown; these areas with about 14 setae. Median area of pronotum with a row of 4 setae on each side of impressed midline. Elytra with 2 black setae each and relatively few yellow setae and these are extremely short. Macrochaetotaxy of abdominal tergites II-VIII as follows: 2, 6, 4-6, 4-6, 4-6, 4-4, 4-6. All sternites with an apical and antepical row of dark setae. Median lobe of ♂ genitalia shaped as in fig. 4B. ♀ unknown.

Measurements: Pronotal length, 0.42; elytral length, 0.37; abdominal tergite IV width, 0.80. Number measured, 1.

Holotype (No. 13762), Australia, New South Wales, 96 km (60 mi) NW of Griffith, 9.IX.1959, Coll. F. J. Gay. In the Australian National Insect Collection, Canberra.

Notes: The host of the above specimen was determined to be *Schedorhinotermes reticulatus* (Froggatt) by F. J. Gay. Specimens of the host termites are in the Australian National Insect Collection, Canberra.

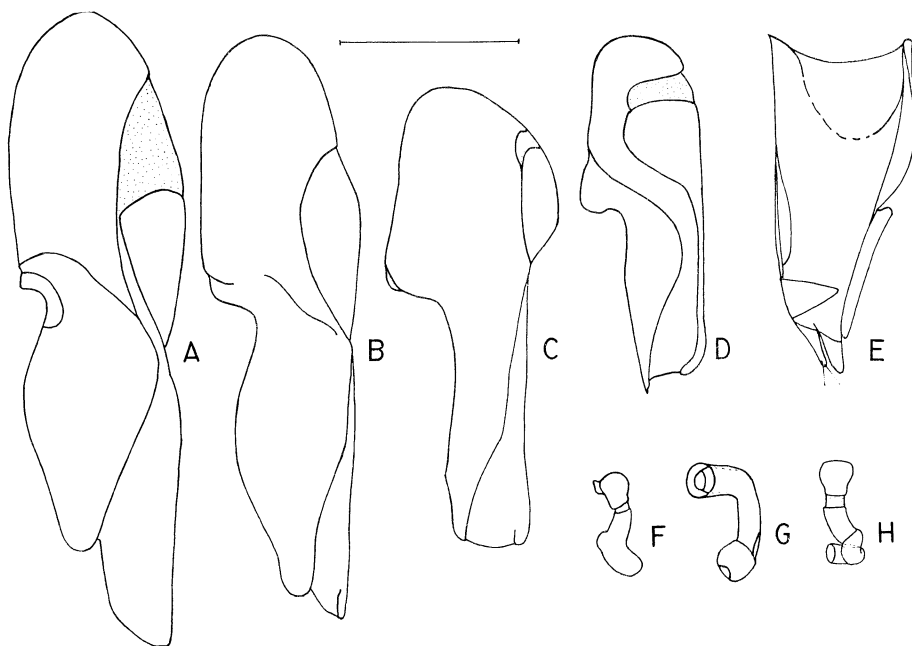


Fig. 4. Median lobes of ♂ genitalia: A, *Termitoecia wilsoni*; B, *T. asetosa*; C, *T. hirsuta*; D, *T. fabulosa*. Lateral lobe of ♂ genitalia: E, *T. hirsuta*. Spermathecae: F, *T. fabulosa*; G, *T. wilsoni*; H, *T. hirsuta*. Scale represents 0.25 mm and applies to all figures.

Termitoecia hirsuta Kistner, new species Fig. 1; 2; 3; 4C, 4E, 4H.

A highly distinctive species, probably most closely related to *T. wilsoni*, from which it is distinguished by the shape of the median lobe of the ♂ genitalia, the shape of the spermatheca, and the chaetotaxy.

Color reddish brown throughout, abdomen somewhat darker than rest of body. Head with a transverse row of 6 setae on epicranium. Gula-submentum with many long yellow setae. Lateral areas of pronotum milky white without brown pigmented patches; these areas with 14 setae on each. Median area of pronotum with a row of 6 setae running longitudinally on each side of the impressed midline; 1 seta to right of row on each side of pronotum toward anterior border. Elytra with many black setae on each. Abdominal tergite II with 12 apical setae. Tergite III with 16 apical and 2 anteapical. Tergites IV-VII with many apical and many anteapical setae in variable numbers according to width of tergite. Abdominal tergite VIII with 2 rows of 2, 6, and 4 setae each counting from anterior to posterior. All sternites with many apical and anteapical setae. Median lobe of ♂ genitalia shaped as in fig. 4C. Spermatheca shaped as in fig. 4H.

Measurements: Pronotal length, 0.50-0.52; elytral length, 0.50-0.55; width of abdominal segment IV, 0.80-0.84. Number measured, 4.

Holotype (No. 13763), Australia, New South Wales, 96 km (60 mi) NW of Griffith, 9.IX.1959, Coll. F. J. Gay. In the Australian National Insect Collection, Canberra.

Paratypes 3, same data as holotype (CSIRO, DK).

Notes: The host termites were determined to be *Schedorhinotermes reticulatus* (Froggatt) by F. J. Gay. Specimens of the termites are in the Australian National Insect Collection, Canberra. Both *T. asetosa* and *T. hirsuta* were in the same vial and taken from the same colony of termites.

REFERENCES

- Bernhauer, Max.** 1921. Results of Dr. E. Mjöberg's Swedish scientific expeditions to Australia 1910-1913. No. 22, Staphylinidae. *Arkiv Zool.* 13 (8): 1-27.
- Blackwelder, Richard E.** 1952. The generic names of the beetle family Staphylinidae, with an essay on genotypy. *Bull. U. S. Nat. Mus.* 200: 1-483.
- Cameron, Malcolm.** 1943. New species of Staphylinidae from Australia and New Guinea. *Ann. Mag. Nat. Hist. ser. 11*, 10: 336-54.
- Kistner, David H.** 1968. A taxonomic revision of the termitophilous tribe Termitopaedini, with notes on behavior, systematics, and post-imaginal growth (Coleoptera: Staphylinidae). *Misc. Publ. Ent. Soc. Amer.* 6 (3): 141-96.
- Seevers, Charles H.** 1957. Monograph on the termitophilous Staphylinidae. *Fieldiana: Zool.* 40: 1-334.

