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AUSTRALIAN TERMITOPHILES ASSOCIATED WITH *MICROCEROTERMES* (Isoptera: Amitermitinae)

I. A new subtribe, genus, and species (Coleoptera, Staphylinidae) with notes on their behavior[1]

By **David H. Kistner**[2]

Abstract: A new subtribe (Microceroxenina) of the tribe Athetini is described. The single included genus and species (both new) is *Microceroxenus alzadae* which was captured with *Microcerotermes turneri* in North Queensland. Behavioral observations are presented which support the interpretation that *Microceroxenus* is well-integrated into the social life of the termites. Observations of the release of alates by the host termites are presented which support the interpretation that the release of alates in these termites is simultaneous among colonies in a given area, is of short duration, and occurs rather infrequently.

Not many species of termitophiles have been found with termites of the genus *Microcerotermes* Silvestri (Amitermitinae) or even from the genera related to *Microcerotermes* such as *Amphidotermes* or *Globitermes* (Ahmad 1950). Only 1 species of staphylinid has been previously recorded and that species is *Termitochara kraatzi* Wasmann which was collected with *Microcerotermes sikorae* (Wasmann) from Madagascar (Seevers 1957). The same species of termitophile has also been recorded from a nest of *Capritermes capricornis* (Wasmann), which belongs to an entirely different subfamily (Termitinae), by Wasmann (1893). No one really believes either of these termites is the true host of the species as the nearest relatives of *Termitochara* are found principally with the Nasutitermitinae.

It was therefore a real pleasure to open up a *Microcerotermes* nest and find numerous staphylinids there, particularly when opening up nests of the same genus in Africa had never yielded any staphylinids. We had ample opportunity to take notes on their behavior. After study, it was clear that the genus was new and that it represents a new subtribe of the Athetini and represents an entirely new invasion of the termite nest niche.

It is therefore the purpose of this paper to describe the subtribe, genus and species, to present the behavioral observations, and to add some notes on the behavior of its host, *Microcerotermes turneri* (Froggatt). The methods used in this study have been

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described previously by Kistner (1968). All measurements are in mm unless otherwise indicated.

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Tribe ATHETINI

Subtribe MICROCEROXENINA Kistner, new subtribe

Distinguished from all other subtribes of the Athetini by the following characters: Moderate physogastry. Peculiar shape of abdominal segments VII, VIII, and IX. Unique mandibles (fig. 2G and 2H) with their specialized inner margins.

Genus **Microceroxenus** Kistner, new genus

A highly distinctive genus which is related to *Acrotona* Thomson from which it is distinguished by the shape of the mandibles plus the shape of abdominal segments VII, VIII, and IX.

Overall shape as in fig. 1. Head capsule wider than long with antennae inserted between the eyes very near to anterior tentorial pits. Eyes large, well-developed, with many facets oriented anteriorly and laterally. Eyes more or less round in shape when viewed from side. Head normally inserted very slightly under pronotum. Antennae 11-segmented, shaped as in fig. 3C, with all the petioles distinct. Gula long with sides slightly divergent from anterior to posterior. Submentum slightly extended, fused to the gula. Mentum about 2× as long as submentum, fused to submentum. Mandibles asymmetrical, shaped as in fig. 2G and 2H (note the extra teeth developed toward apex of each mandible). Maxillae shaped as in fig. 2D; palpi 4-segmented. Maxillary acetabula not margined. Labium shaped as in fig. 2E; palpi 3-segmented. Labrum shaped as in fig. 2F.

Pronotum wider than long, shaped as in fig. 1, arched dorsoventrally, with an evenly rounded posterior border. Hypomera strongly reflexed ventrally to about 1/3 the width of the pronotum. Prosternum extremely short (0.05) with normal length anterolateral articulation processes. Procoxal cavities closed behind by membranes containing well-developed and sclerotized mesothoracic peritremes. Elytra without distinction, shaped as in fig. 3E, lateral edges not reflexed ventrally to any great extent. Wings present, of normal size, with the usual staphylinid venation. Mesosternum about 1/2 the length of the metasternum. Mesosternal intercoxal process broad, acarinate, but coming to an obtuse point between legs. Mesocoxal acetabula not margined. Pro-, meso-, and metalegs shaped as in fig. 2A, 2B, and 2C respectively; tarsal formula, 5-5-5.

Abdomen shaped as in fig. 1, with membranes slightly expanded between the segments giving a slight impression of physogastry. Segment I represented only by the tergite fused to the

metanotum. Segment II represented only by a tergite. Segments III-VII with 1 tergite, 1 sternite, and 2 pairs of paratergites each. Segment VIII represented by a tergite and sternite only. Dorsal margin of abdomen occurs between inner and outer paratergites. Tergite VII with a median area containing many longitudinal striae, shaped as in fig. 3A and 3B. Tergite VIII with extremely punctate sculpture, shaped as in fig. 3A. Segment IX trilobed, shaped as in fig. 3A and 3D, anterior apodemes of ♂ not very conspicuous. ♀ spermatheca sclerotized, presumed variable by species. Median lobe of ♂ genitalia bulbous, presumed variable by species.

Type-species: *Microceroxenus alzadae* Kistner, n. sp.

Microceroxenus alzadae Kistner, new species
Fig. 1-4.

Since this genus is presently monobasic, characters isolated as specific are based on experience with other genera.

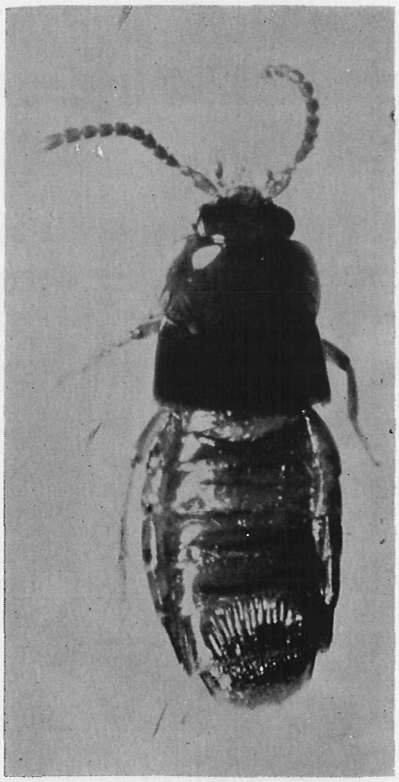

Fig. 1. Dorsal view of entire beetle, *Microceroxenus alzadae*.

Color reddish brown throughout, pronotum and appendages somewhat lighter than rest of body. Dorsal surface of entire body smooth and shiny with very few punctures and with very light and fine but regularly spaced macrosetae. Head with 2 rows of macrosetae each on disk. Pronotum with an anterior marginal row of 6 setae, a posterior marginal row of 4 setae, and a lateral marginal row of 4 on each side. Elytra with 7 setae on each, distributed as in fig. 3E. Macrochaetotaxy of abdominal tergites II-VIII as follows: 0,0,4,4,4,0,0. Sternites with a sparse apical row of short setae. Median and lateral lobes of ♂ genitalia shaped as in fig. 4A and 4B respectively.

♀ spermatheca shaped as in fig. 3A.

Measurements: Pronotal length, 0.37-0.40; elytral length, 0.22-0.25. Number measured, 10.

Holotype (No. 13601), Australia, Queensland, Kuranda, 8.VII.1962, F. J. Gay. In the Australian National Insect Collection, Canberra. Paratypes: Australia: North Queensland: 23, same data as holotype, (CSIRO, DK); 1, Mt. Lindesay, 21.IV.1958, J. H. Calaby (CSIRO); 54, 1.6 km W. of Kuranda-Mareeba, 11.X.1965, Coll. D. H., A. C., and A. H. Kistner, ex nest T-109 (DK); 30, same locality and collectors, 12.X.1965, ex nest T-109 (DK); 12, same locality and collectors, 12.X.1965, ex nest T-115 (DK); 1, same locality and collectors, 17.X.1965, ex nest T-128 (DK); 97, same locality and collectors, 17.X.1965, ex nest T-127 (DK); 1, 1.6 km S. of Clifton Beach, 16.X.1965, Coll. D. H., A. C., and A. H. Kistner, ex nest T-123, (DK).

Notes: The hosts of all the specimens were determined to be *Microcerotermes turneri* (Froggatt) by F. J. Gay. Specimens of all the termite samples are in the Australian National Insect Collection, Canberra. Hosts of the Kistner captures are also in the col-

lection of the author.

Behavior of *Microceroxenus*: All of the specimens were captured in the moist inner part of the *Microcerotermes* nest (fig. 5). The opened nest in fig. 5 shows that there is a dryer outer part (light colored) and a moister inner part (dark colored). Most of worker termites and all of the nymphs are in this moister section. *Microceroxenus*, even with the nest disturbed, ran in among the nymphs and workers without harm or any sign of antagonism on the part of the termites. The beetles typically walk with the abdomen recurved over their backs.

Specimens were observed with the termites in petri dishes. After time to settle down

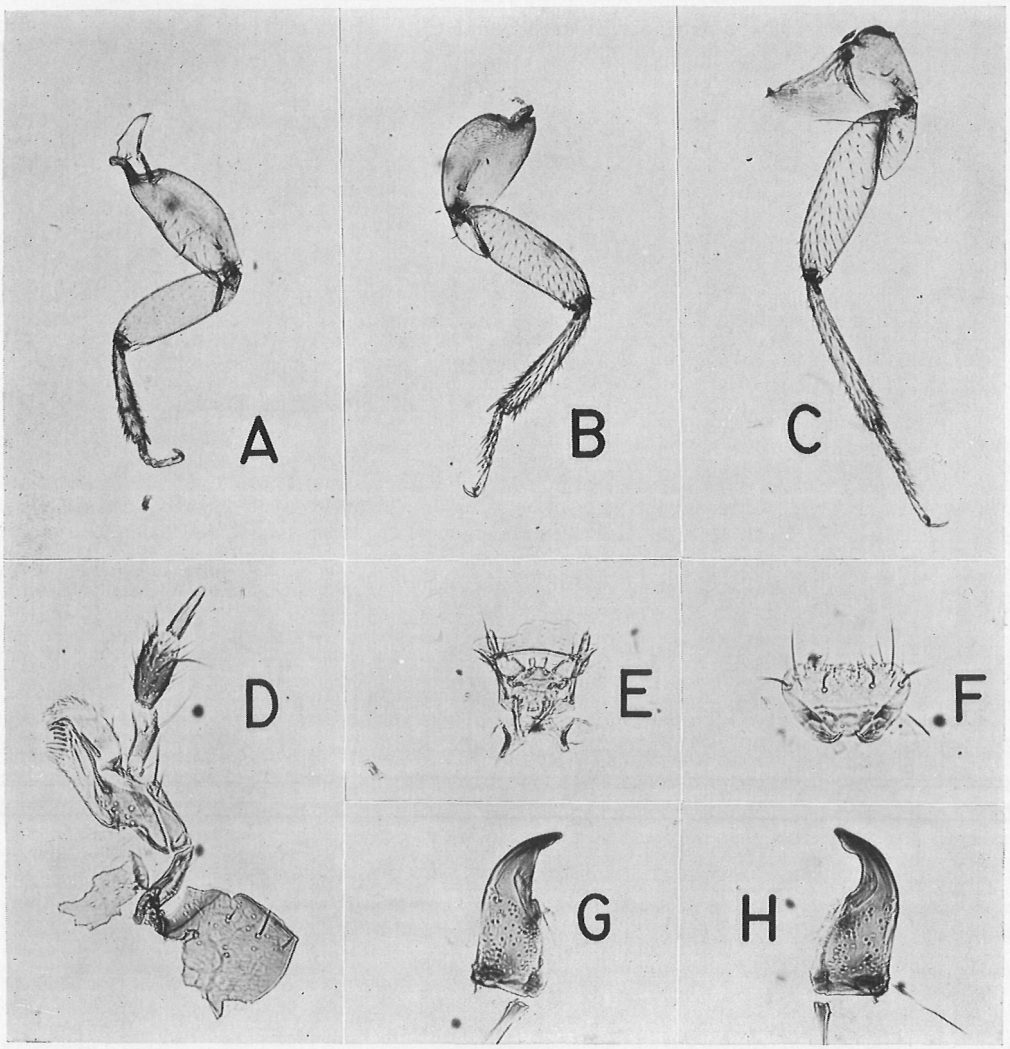

Fig. 2. *Microceroxenus alzadae*: A, proleg; B, mesoleg; C, metaleg; D, maxilla; E, labium; F, labrum; G, right mandible; H, left mandible. Scale arbitrary.

in the Petri dishes, usually 1 hour or slightly longer, beetle-termite encounters are observed frequently. Worker termites and nymphs frequently licked the abdomens, particularly the flanks, of the beetles. Palpation of the beetles by the workers occurred nearly every time they passed each other. Frequent grooming of the beetles by the termites was observed, ie., passing their mouthparts over the legs and antennae of the beetles. No exchange of food was observed, however.

Because of the harmonious nature of the beetle-termite interactions and the fact that the beetles spend all their time in the most active part of the termite colony, the beetles are here interpreted as being well-integrated into the social life of the colony.

Release of alates by *Microcerotermes turneri*: On 11 October 1965, I had spent the morning locating termite nests and sampling them. It had rained the night before; the first rain after a rather long dry season. I had passed nest T109 at about 12 : 05 p.m. and

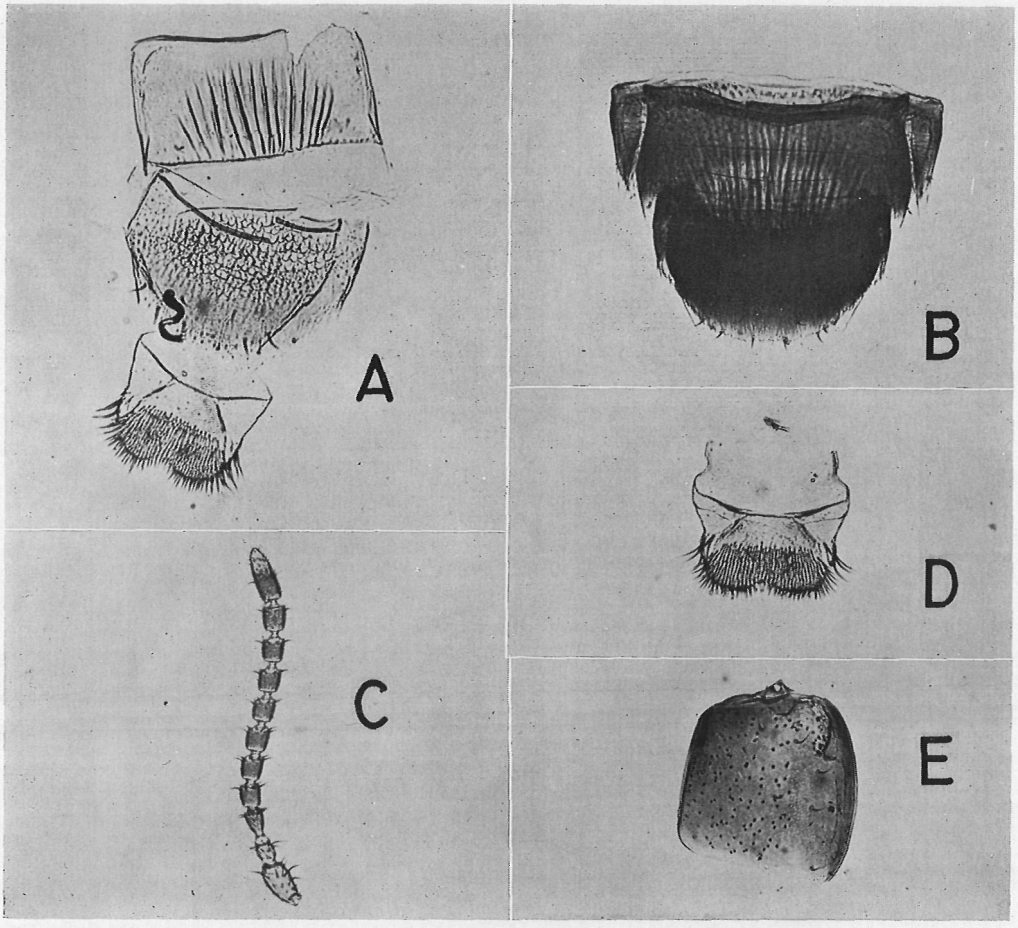

Fig. 3. *Microceroxenus alzadae*: A, abdominal segments VII, VIII, IX with spermatheca; B, abdominal segments VII, VIII; C, antenna; D, abdominal segment IX; E, elytron. Scale arbitrary.

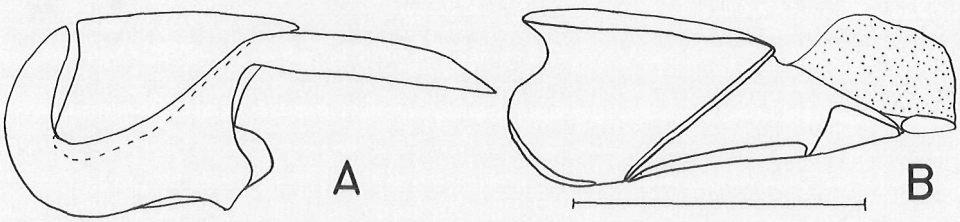

Fig. 4. *Microceroxenus alzadae*: A, median lobe of ♂ genitalia; B, lateral lobe of ♂ genitalia. Scale represents 0.25 mm.

came back to it at 12 : 20 p.m. There were no alates being released at 12 : 05 and they had just begun to fly forth at 12 : 20. At 12 : 25–12 : 30 there was a large cloud of alates coming like smoke out of the nest. A quick survey of all the *M. turneri* nests I had seen that morning, 14 in all, revealed that all of them were releasing alates at that time whereas earlier in the morning none had been doing this. Clouds of alates continued to fly forth until 12 : 40–12 : 45 at which time the release of alates halted completely in all nests. Close inspection of several nests during the flight showed that the alates were emerging from hundreds of small holes all over the surface of the nest. Termite workers were in the vicinity of these holes and 12–15 minutes after the flight ceased, all the little holes had been closed with mud and carton.

No other flights were observed between 9 October and 17 October 1965. It thus appears that the release of alates is a simultaneous event in many nests, it is of short duration on a single day, and that it occurs infrequently. No nests had alates with

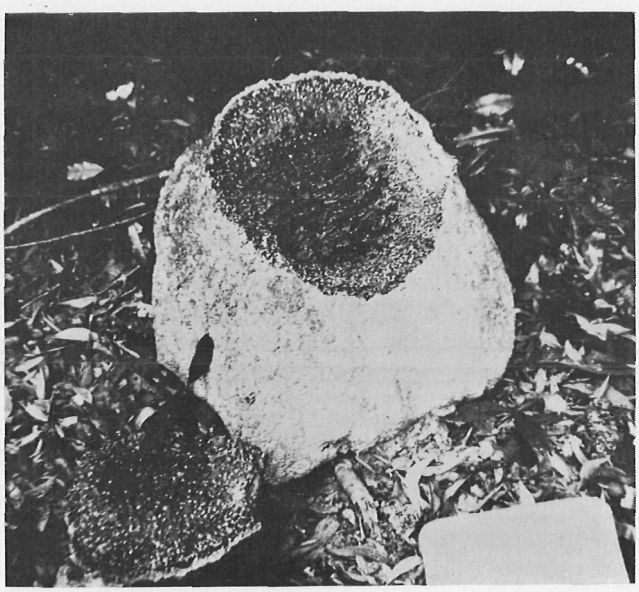

Fig. 5. *Microcerotermes turneri*: opened nest, taken in field, 1.6 km W. Kuranda-Mareeba, Queensland, Australia. Pan in lower right is 45.8 cm (18 in.) long.

wings inside them after the flight occurred whereas most nests had large numbers of alates 2 days previous.

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