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The genus *Microferonia* BLACKBURN in New Guinea

(Coleoptera, Carabidae, Licininae)*

Martin BAEHR

Abstract

The licinine carabid genus *Microferonia* BLACKBURN in New Guinea is reviewed. Three new species of the genus from New Guinea are described: *M. alticola*, sp.n., *M. avicapitis*, sp.n., and *M. habbema*, sp.n. A key to all four known species is provided.

Introduction

The Australian genus *Microferonia* is clearly characterized within the subfamily Licininae by the markedly bidentate, but on the upper border not impressed mandibles, the elongate, ovalish body, and the remarkably small head. Thus far the genus includes four species in Australia two of which seem to be very rare (MOORE et al. 1987), and three species outside of Australia, namely *M. (Genycerus) lucanoides* (ANDREWES) from Java, *M. baro* DARLINGTON from New Guinea, and *M. howei* MOORE from Lord Howe Island. This curious distribution has been certainly established by mountain hopping from northern Australia with use of New Guinea as stepping-stone. The same distribution pattern is seen in several other animal groups; within carabid beetles for example in the genera *Mecyclothorax* (Psydrinae), *Scopodes* (Pentagonicinae) and *Adelotopus* (Pseudomorphinae) that are all originally faunal elements of Australia, where they are by no means restricted to the highlands. Only *Adelotopus* has crossed Java to the west and is also found in Malaysia. For the other genera the high mountains of Java apparently form the most westerly part of their range.

Thus far, a single species of *Microferonia* (*M. baro* DARLINGTON) was known from New Guinea. But similarly to the genera *Mecyclothorax* and *Scopodes* mentioned above, actually New Guinea is far richer in species than it was believed before. Accordingly, through courtesy of Mr. A. RIEDEL, München, I received three specimens of *Microferonia* from Irian Jaya representing three different species that are described below.

Measurements

Measurements were made under a stereo microscope using an ocular micrometer. Length has been measured from apical margin of labrum to apex of elytra, hence, length measurements may slightly differ from those of DARLINGTON (1968). Length of prothorax has been taken from apex of anterior angles to apex of posterior angles, width of base of prothorax at position of posterior marginal seta, width of apex between the most advanced parts of the apex.

* Results of the entomological explorations of A. RIEDEL in New Guinea in 1993.

Types

The types of the new species are donated to the Zoologische Staatssammlung, München, though are kept as permanent loan in the working collection of the author (CBM-ZSM).

Key the the species of *Microferonia* BLACKBURN of New Guinea

- 1 Larger species, body length >7.5 mm; colour reddish-piceous 2
- Smaller species, body length <6 mm; colour black 3

- 2 Pronotum wide at base, ratio width base/apex c. 1.7, lateral margin almost evenly rounded, widest diameter behind middle; elytra shorter and wider, ratio length/width c. 1.55; aedeagus rather curved, apex neither upturned nor knobbed (see DARLINGTON 1968, fig. 170). Mt. Wilhelm, central Papua New Guinea, at 2.135-3.050 m *baro* DARLINGTON
- Pronotum narrower at base, ratio width base/apex c. 1.5, lateral margin in posterior half almost straight, widest diameter in front of middle; elytra longer and narrower, ratio length/width c. 1.65; aedeagus less curved, apex slightly upturned and knobbed (Fig. 1). Juliana Top, eastern central Irian Jaya, at 3.400 m *alticola* sp.n.

- 3 Base of pronotum much wider than apex, widest diameter of pronotum near base, posterior marginal pore absent; aedeagus evenly curved, internal sac without sclerotized parts (Fig. 3). Vogelkop, western Irian Jaya, at 1.900-2.100 m *avicapitis* sp.n.
- Base of pronotum little wider than apex, widest diameter of pronotum in middle, posterior marginal pore present; male unknown. Lake Habbema, central Irian Jaya, at 3.200 m *habbema* sp.n.

The species

Microferonia baro DARLINGTON

DARLINGTON, 1968, p. 19, figs 8, 170

Types. Holotype: ♂, Mt. Wilhelm, Bismarck Rge. 7000-10000 ft., Oct 1944, Darlington (Museum of Comparative Zoology, Cambridge/Mass.).

Diagnosis. Comparatively large, piceous species, distinguished from most similar *M. alticola* by basally wider pronotum, stouter elytra, and strongly curved aedeagus that bears a straight, not upturned apex.

Note. The aedeagus of this species was figured by DARLINGTON (1968, fig. 170). Apparently no new records of this species are available.

Microferonia alticola sp.n.

Figs 1, 4

Types. Holotype: ♂, IRIAN JAYA, Jayawijaya-Prov. leg. A. Riedel, 1993/ Upper Sape (Digul) -Valley, N. Mt. Juliana, 3400 m, 16.-17.IX. (CBM-ZSM).

Diagnosis. Comparatively large, reddish-piceous species, distinguished from most similar *M. baro* Darlington by basally narrower pronotum, longer and narrower elytra, and far less curved aedeagus that bears a slightly upturned apex.

Description.

Measurements. Length: 7.7 mm; width: 3.1 mm. Ratios. Width/length of pronotum: 1.25; width base/apex of pronotum: 1.61; width pronotum/head: 1.78; length/width of elytra: 1.65; width elytra/pronotum: 1.37.

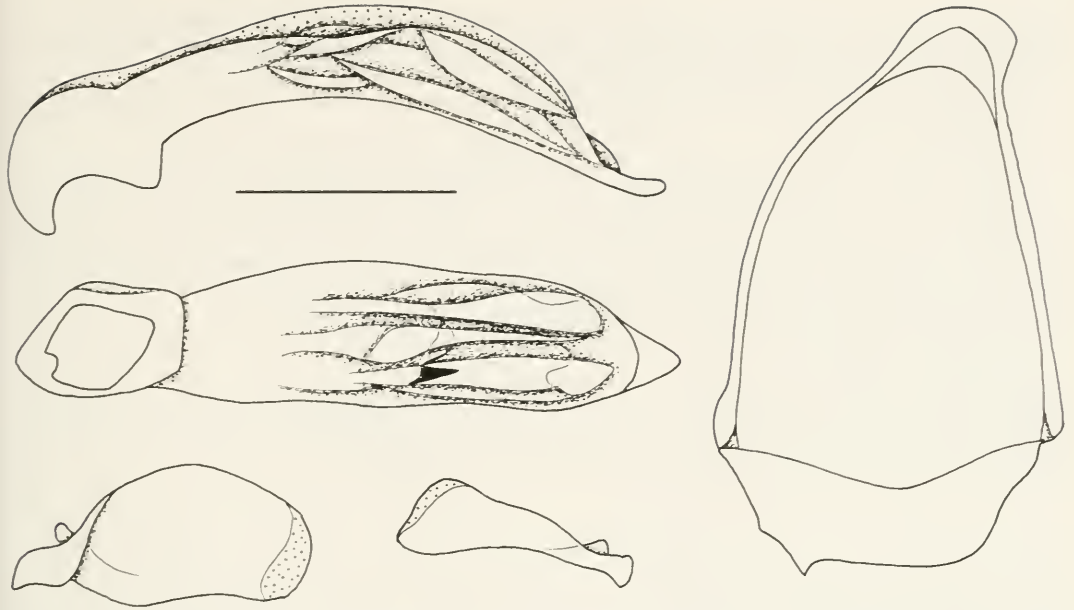


Fig. 1: *Microferonia alticola* sp.n. ♂ genitalia: aedeagus, left side and lower surface; parameres; genital ring. Scale: 0.5 mm.

Colour. Reddish-piceous to piceous, wide lateral margins of pronotum and elytra, and suture of elytra lighter; mouthparts including clypeus, antennae, and legs reddish-piceous; basal two thirds of terminal palpomeres blackish, apex contrastingly light reddish. Lower surface of head and abdomen almost black, of prothorax dark piceous.

Head. Small in comparison to prothorax. Eyes large though laterally little produced, with small orbits. Clypeus rather narrow, bisetose, anterior central part of clypeus membranous. Labrum medially deeply, v-shaped, slightly asymmetrically cleft for about half of its length, bisetose. Mentum without tooth, ligula bisetose, glossa and paraglossae about equal in length. Palpi slender and elongate, apical palpomeres thickened, both terminal palpomeres extremely sparsely pilose. Both mandibles bidentate, though lower tooth in right mandible larger than in left mandible. Clypeofrontal suture shallow, slightly curved. Frons convex, near clypeal suture with shallow, linear impression on either side. Both supraorbital pores very large. Frons impunctate, with distinct, isodiametric microreticulation. Antenna slender and elongate, attaining anterior third of elytra, median antennomeres $>3\times$ as long as wide, pilose from 4th antennomere.

Prothorax. Slightly wider than long, rather quadrate, considerably wider than head, widest slightly in front of middle. Apex straight, anterior angles rather protruded though rounded. Lateral margin in anterior half convex, posteriorly straight or even faintly concave. Posterior angles rectangular though widely rounded off. Base slightly concave. Apex and lateral borders with narrow though very distinct margin, base not margined. Median line distinct though shallow, not attaining base. Anterior and posterior transverse impressions barely indicated. Basal impressions linear, situated halfway to middle and far in front of base. Disk moderately convex, near posterior angles somewhat explanate, in middle slightly uneven, with two shallow, irregular impressions on either side near middle. Apex and base medially with some longitudinal wrinkles, otherwise surface without striation or puncturation, with rather superficial, about isodiametric microreticulation. Anterior marginal seta situated slightly behind anterior third, distinctly removed from margin. Posterior marginal pore situated at lateral part of basal angle, right on margin, though in holotype both posterior marginal setae absent.

Elytra. Elongate-ovalish, widest slightly behind middle, rather depressed, considerably wider than prothorax. Humeri slightly projecting, basal and lateral margins form an obtuse angle. Lateral margin evenly rounded to apex. Striation complete, striae slightly impressed, impunctate, intervals gently convex. Scutellar striae almost wanting. 3rd interval with a large setiferous puncture in anterior third, puncture

attached to 2nd stria. Marginal series consisting of 16 punctures in almost uninterrupted series. Two additional punctures situated preapically and apically at 7th stria. Intervals impunctate, with superficial, almost isodiametric microreticulation. Wings reduced.

Lower surface. Impunctate. Metepisternum c. 1.25× as long as wide. Terminal abdominal sternite in ♂ with 2 setae on either side.

Legs. Elongate. 1st-3rd tarsomeres of ♂ anterior tarsus markedly dilatate, squamose beneath. Metatibia remarkably curved. Metatarsus very slender. 5th tarsomeres of all legs slender, lower surface setose.

♂ genitalia (Fig. 1). Genital ring short and wide, fairly asymmetric, base with characteristic denticle. Aedeagus fairly stout, straight, lower surface slightly curved. Apex triangular, almost straight, tip faintly knobbed and slightly upturned. Orificium very elongate, rather symmetric. Internal sac consisting of two rather symmetric folds, in middle with a short triangular sclerotized denticle. Parameres very dissimilar, right paramere club-shaped, apices of both parameres narrowly membranous.

♀ genitalia. Unknown.

Variation. Unknown.

Distribution. Eastern central Irian Jaya. Known only from type locality.

Collecting circumstances. Largely unknown. Presumably collected under log in rather high altitude.

Etymology. The name refers to the high altitude of the type locality.

Microferonia habbema sp.n.

Figs 2, 5

Types. Holotype: ♀, IRIAN JAYA, Jayawijaya-Prov. leg. A. Riedel, 1993/ Lake Habbema, 3200 m, 17.X. beaten at night (CBM-ZSM).

Diagnosis. Comparatively small, black species, distinguished from most similar *M. avicapitis* sp.n. by comparatively narrow base of pronotum, presence of posterior lateral pronotal pore and seta, and larger head.

Description.

Measurements. Length: 5.55 mm; width: 2.43 mm. Ratios. Width/length of pronotum: 1.39; width base/apex of pronotum: 1.62; width pronotum/head: 1.81; length/width of elytra: 1.51; width elytra/pronotum: 1.36.

Colour. Black, pronotum and elytra with narrow reddish margins; mouthparts, antennae, and legs paleous, tarsi slightly lighter, terminal palpomeres slightly darker than basal ones, apex whitish. Lower surface black.

Head. Small in comparison to prothorax. Eyes large though laterally little produced, with small orbits. Clypeus bisetose, anterior central part of clypeus membranous. Labrum medially deeply, v-shaped, cleft for about half of its length, bisetose. Mentum without tooth, ligula bisetose, glossa and paraglossae about equal in length. Palpi rather slender and elongate, apical palpomeres thickened, both terminal palpomeres extremely sparsely pilose. Both mandibles bidentate, though lower tooth in right mandible larger than in left mandible. Clypeofrontal suture very shallow, slightly curved. Frons convex, near clypeal suture with shallow, rather irregularly shaped impression on either side that bears an asetose pore. Both supraorbital pores very large. Frons impunctate, with distinct, isodiametric microreticulation. Antenna slender and elongate, almost attaining anterior third of elytra, median antennomeres c. 3× as long as wide, pilose from 4th antennomere.

Prothorax. Considerably wider than long, laterally markedly convex, much wider than head, widest slightly behind middle. Apex straight, anterior angles barely protruded, rounded. Lateral margin evenly convex to basal angles. Base distinctly concave, basal angles widely rounded off. Apex and lateral borders with narrow though distinct margin, base not margined. Median line distinct though shallow, ending at posterior quarter. Anterior and posterior transverse impressions barely indicated. Basal impressions elongate, linear, situated halfway to middle and slightly in front of base. Disk rather convex, near posterior angles widely explanate, rather even. Disk without any wrinkles or punctures, with rather superficial, about isodiametric microreticulation. Anterior marginal seta situated slightly behind anterior third, distinctly removed from margin. Posterior marginal seta situated at lateral part of basal angle, close to margin.



Fig. 2: *Microferonia habbemaie* sp.n. ♀ genitalia: stylomeres 1 and 2, and lateral plate. Scale: 0.2 mm.

Elytra. Elongate-ovalish, widest slightly behind middle, surface markedly convex, considerably wider than prothorax. Humeri barely projecting, basal and lateral margins without any angle. Lateral margin evenly rounded to apex, slightly incurved at the very tip. Striation complete, striae well impressed, impunctate, intervals gently convex. Scutellar striae almost wanting. 3rd interval with a large setiferous puncture in anterior third, puncture attached to 2nd stria. Marginal series consisting of 14 punctures that are more widely spaced in middle. Two additional punctures situated preapically and apically at 7th stria. Intervals impunctate, with highly superficial, transverse microreticulation, rather glossy. Wings reduced.

Lower surface. Impunctate. Metepisternum c. 1.25 × as long as wide. Terminal abdominal sternite in ♀ with 4 setae on either side.

Legs. Elongate. Structure of ♂ anterior tarsus unknown. Metatibia moderately curved. Metatarsus very slender. 5th tarsomeres of all legs slender, lower surface setose.

♂ genitalia. Unknown.

♀ genitalia (Fig. 2). Both stylomeres markedly depressed, foliaceous. Stylomere 1 short and wide, triangular, with short, acute apex, laterally with 2 very short ventral ensiform setae, mediodorsally with a fairly elongate dorsal ensiform seta, on median rim with two closely attached nematiform setae originating in a small groove. Apex of stylomere 2 without any setae. Lateral plate conspicuously triangular, with a fringe of several nematiform setae at apex.

Variation. Unknown.

Distribution. Central Irian Jaya. Known only from type locality.

Collecting circumstances. The specimen was beaten from low foliage at night in rather high altitude.

Etymology. The name refers to the type locality.

Microferonia avicapitis sp.n.

Figs 3, 6

Types. Holotype: ♂, Irian Jaya, Manokwari-Pr., Anggi, Iray, Gn. Disbehey, 1900-2100 m, 19.3.1993, leg. A. Riedel (CBM-ZSM).

Diagnosis. Comparatively small, black species, distinguished from most similar *M. habbemaie*, sp.n. by wide base of pronotum, absence of posterior lateral pronotal pore and seta, and comparatively small head.

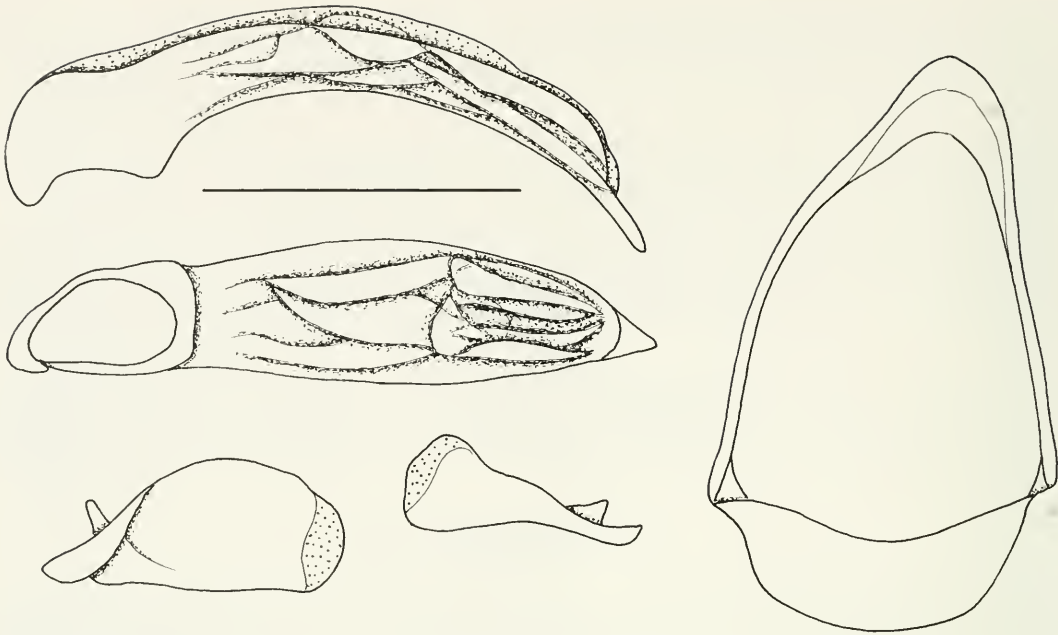


Fig. 3: *Microferonia avicapitis* sp.n. ♂ genitalia: aedeagus, left side and lower surface; parameres; genital ring. Scale: 0.5 mm.

Description.

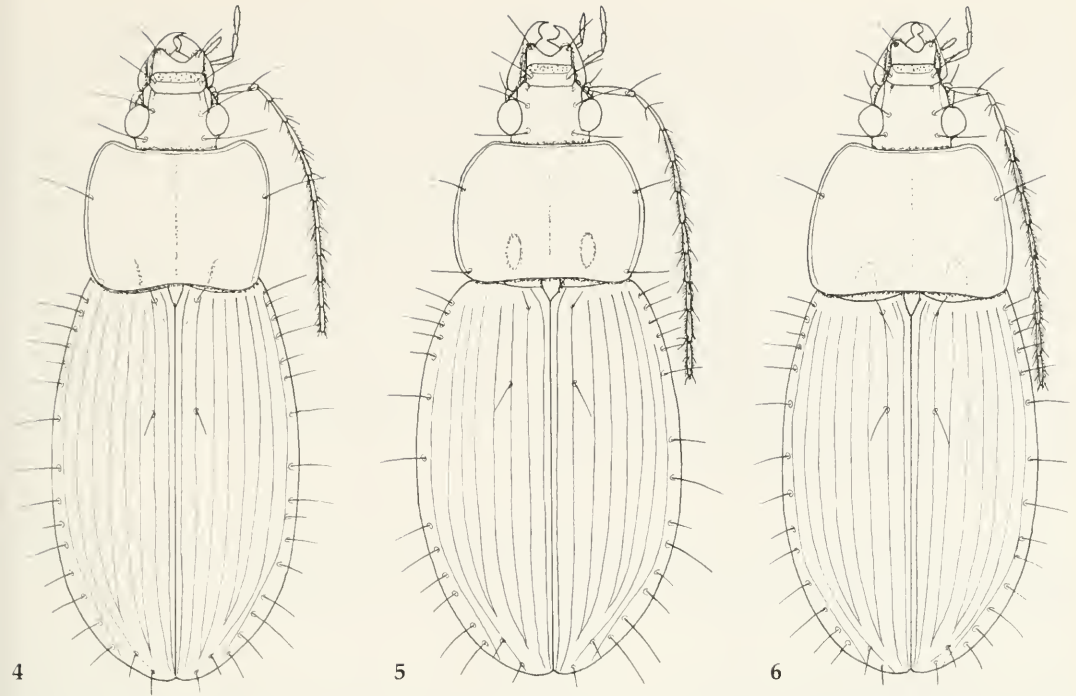
Measurements. Length: 5.75 mm; width: 2.42 mm. Ratios. Width/length of pronotum: 1.38; width base/apex of pronotum: 1.77; width pronotum/head: 1.97; length/width of elytra: 1.50; width elytra/pronotum: 1.23.

Colour. Black, pronotum with narrow reddish margins; mouthparts, apical antennomeres, and legs piceous, tarsi slightly lighter, terminal palpomeres slightly darker, apex whitish. Lower surface black.

Head. Very small in comparison to prothorax. Eyes large, laterally moderately produced, with small orbits. Clypeus bisetose, anterior central part of clypeus membranous. Labrum medially fairly deeply, v-shaped, barely asymmetrically cleft for less than half of its length, bisetose. Mentum without tooth, ligula bisetose, glossa and paraglossae about equal in length. Palpi slender and elongate, apical palpomeres thickened, both terminal palpomeres sparsely pilose. Both mandibles bidentate, though lower tooth in right mandible larger than in left mandible. Clypeofrontal suture very shallow, slightly curved. Frons convex, near clypeal suture with wide, shallow, rather irregularly shaped impression on either side that bears a small asetose pore. Both supraorbital pores very large. Frons impunctate, with distinct, isodiametric microreticulation. Antenna slender and elongate, attaining anterior third of elytra, median antennomere $>3\times$ as long as wide, pilose from 4th antennomere.

Prothorax. Considerably wider than long, laterally markedly convex, almost twice as wide as head, widest in basal third. Apex straight, anterior angles moderately protruded, rounded. Lateral margin evenly convex to basal angles. Base slightly concave, basal angles widely rounded off. Apex and lateral borders with narrow though distinct margin, base not bordered. Median line distinct though shallow, almost attaining base. Anterior and posterior transverse impressions barely indicated. Basal impressions large, shallow, situated halfway to middle, attaining base. Disk moderately convex, near posterior angles barely explanate, rather even. Medially at apex with some inconspicuous longitudinal striae, otherwise disk without wrinkles or punctures, with rather superficial, about isodiametric microreticulation. Anterior marginal seta situated slightly behind anterior third, distinctly removed from margin. Posterior marginal pore and seta absent.

Elytra. Elongate-ovalish, widest slightly behind middle, surface markedly convex, considerably wider than prothorax. Humeri barely projecting, basal and lateral margins form a very obtuse angle. Lateral



Figs 4-6: Habitus. 4. *Microferonia alticola* sp.n. 5. *Microferonia habbema*, sp.n. 6. *Microferonia avicapitis*, sp.n. Lengths: 7.7 mm; 5.55 mm; 5.75 mm.

margin evenly rounded to apex, slightly incurved at the very tip. Striation complete, striae barely impressed, impunctate, intervals depressed. Scutellar striae present, between scutellar stria and sutural stria a short abbreviated stria present. 3rd interval with a large setiferous puncture in anterior third, puncture attached to 2nd stria. Marginal series consisting of 14 punctures that are more widely spaced in middle. Two additional punctures situated preapically and apically at 7th stria. Intervals impunctate, with extremely superficial, irregularly transverse microreticulation, glossy, slightly iridescent. Wings reduced.

Lower surface. Impunctate. Metepisternum c. 1.2× as long as wide. Terminal abdominal sternite in ♂ with 1 seta on either side.

Legs. Slender and elongate. 1st-3rd tarsomeres of ♂ anterior tarsus moderately dilatate, squamose beneath. Metatibia slightly curved. Metatarsus very slender. 5th tarsomeres of all legs slender, lower surface setose.

♂ genitalia (Fig. 3). Genital ring moderately wide, slightly asymmetric, base symmetric. Aedeagus rather delicate, slightly asymmetric, lower surface evenly curved. Apex triangular, slightly turned to right, tip not upturned. Orificium very elongate, rather symmetric. Internal sac consisting of two rather symmetric folds, without any sclerotized parts. Parameres large and elongate, very dissimilar, right paramere conspicuously club-shaped, apices of both parameres narrowly membranous.

♀ genitalia. Unknown.

Variation. Unknown.

Distribution. Vogelkop, western Irian Jaya. Known only from type locality.

Collecting circumstances. Largely unknown. Presumably collected under log in median altitude.

Etymology. The name refers to the range in the Vogelkop Peninsula.

Remarks

In spite of the fairly large number of species now known from New Guinea, specimens of *Microferonia* still seem to be rare. Actually, all four New Guinean species are known only from the holotype. This may be due to the very unsatisfactory exploration of the mountains of New Guinea and/or it may indicate a rather uncommon way of life. Although the distribution of the Australian species should be better known, because they are not high mountain dwellers, in Australia the situation is rather similar. Of the four species occurring in Australia, only *M. cinctipennis* SLOANE seems to be more common, whereas the other three species are said to be rare, and according to MOORE et al. (1987) they are known only from the type locality or have been recorded only once since description. Nevertheless, all Australian species are recorded to be fully winged, and from my experience, at least some species may be collected at light. Presumably, the Australian species are not hygrophilous, but live in rather open woodlands on the ground under litter. The New Guinean species may agree in their way of life with the Australian species, except for that they have adapted to life on high mountains and have lost their flying ability.

Since in Australia no *Microferonia* thus far has been recorded north of Gayndah in southern Queensland (MOORE et al. 1987), the occurrence of this genus in New Guinea is yet problematic from the viewpoint of zoogeography, because there is a very wide gap between the recorded Australian and New Guinean ranges. Further collecting work may demonstrate, whether this gap actually is present, whether it is a consequence of yet unsatisfactory collecting work in northeastern Australia.

Acknowledgements

My thanks are due to Mr. A. RIEDEL (München) for the kind donation of the specimens.

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Author's address:

Dr. M. BAEHR
Zoologische Staatssammlung
Münchhausenstraße 21
D-81247 München
Germany

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