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The ant-parasitic genus *Rhipipalloidea* Girault (Hymenoptera: Eucharitidae), with a description of a new species

Tomohiro Maeyama,[1] Mitsuyo Machida[1] and Mamoru Terayama[2]

[1]*Department of Biology, Graduate School of Arts and Sciences, The University of Tokyo, 3–8-1 Komaba, Meguro, Tokyo 153–0041, Japan (Email: ss57210@hongo.ecc.u-tokyo.ac.jp).*
[2]*Laboratory of Applied Entomology, Department of Agriculture, The University of Tokyo, 1–1-1 Yayoi, Bunkyo, Tokyo 113–8657, Japan.*

Abstract The genus *Rhipipalloidea* Girault (1934), from the Australian region is revised. *Rhipipalloidea gruberi* Girault (1940) is synonymised with *R. mira* Girault 1934. A new species, *R. madangensis*, is described from Papua New Guinea. This species is separated from *R. mira* from Australia by the distinct striation on the head, and ramose, 12-segmented antennae of the females. Males and a host for the genus are described for the first time.

Key words Eucharitidae, Hymenoptera, new species, new synonymy, *Rhipipalloidea*.

INTRODUCTION

The Eucharitidae is a morphologically diverse family that is widely distributed in the world, but is particularly well represented in the tropics and subtropics. All species are specialised parasites of ants. The genus *Rhipipalloidea* Girault, a member of this family, was previously represented by two species, *R. mira* Girault and *R. gruberi* Girault, both occurring in Australia and known only from females (Hedqvist 1978; Boucek 1988). Recently, we reared a species of *Rhipipalloidea*, including males, from pupae in the nest of an arboreal ant, *Camponotus* sp., in Papua New Guinea. This represents the first record of the genus outside of Australia. Specimens were compared with the holotypes of *R. mira* and *R. gruberi*, and the latter is proposed as a junior synonym of *R. mira*.

MATERIALS AND METHODS

Measurements and special terms used in this paper follow those in Heraty (1985, 1986, 1989). We used the following abbreviations: DWM, dorsal width of mesosoma; FWL, forewing length; HE, height of eye; HL, head length; HW, head width; LM, length of mesosoma; LOL, diameter of lateral ocellus; LP, length of petiole; OOL, distance between eye and posterior ocellus; POL, distance between posterior ocelli; TL, total body length. Collections are abbreviated as: ANIC, Australian National Insect Collection, Canberra; MNHA, Museum of Nature and Human Activities, Hyogo, Japan; NIAES, National Institute of Agro-Environmental Sciences, Tsukuba, Japan; QMBA, Queensland Museum, South Brisbane.

TAXONOMY

Rhipipalloidea Girault

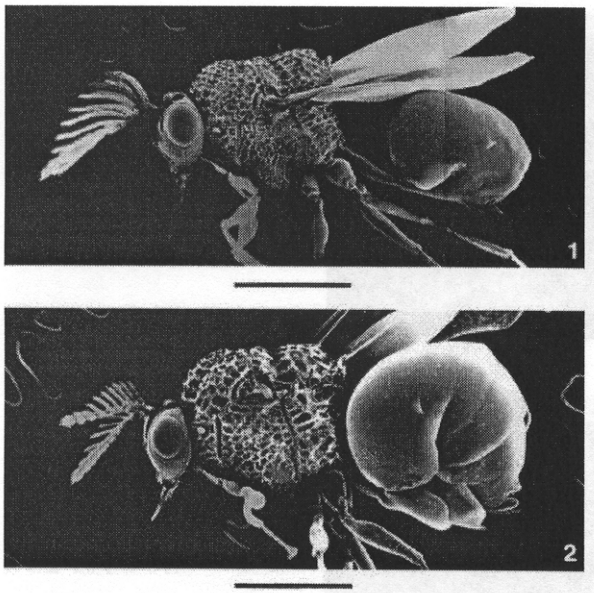
Rhipipalloidea Girault (1934): 1 [306].
Rhipipallus Kirby (1886): 28; Hedqvist 1978: 244 (as senior synonym of *Rhipipalloidea*).
Rhipipalloidea: Boucek 1988: 530 (revived from synonymy with *Rhipipallus*).
Type species. *Rhipipalloidea mira* Girault 1934, by monotypy.
Generic diagnosis. This genus is distinguished from the other genera of Eucharitinae by the following combination of characteristics: (i) male antennae short and ramose, flagellomeres 2–5 (flagellomere 1 absent in all Eucharitinae) wider than long; (ii) female antennae very short and serrate or ramose; (iii) genae fused posterior to the mandible; (iv) frenum flange-like, hardly or not bidentate; (v) postmarginal vein indistinct to absent.
Remarks. In the Eucharitidae four genera, *Obeza* Heraty, *Stilbula* Spinola, *Stibuloida* Boucek and *Pseudochalcura* Ashmead, have been associated with nests of the ant genus *Camponotus* Mayr (Clausen 1940a,b, 1941; Heraty & Barber 1990; Heraty 1994), and these form a monophyletic group within the Eucharitinae (Heraty 1994). *Rhipipalloidea* appears to be the most related to *Pseudochalcura* of the New World based on the short and ramose or serrate antennae, shape of the mesosomal frenum, and strongly fused genae (see Heraty 1986).

Key to species of *Rhipipalloidea*

1 Antennae ramose and 12-segmented; head distinctly striated ..... *R. madangensis*
– Antennae serrate and eight-segmented; head coarsely rugoso-alveolate ..... *R. mira*

Rhipipalloidea madangensis sp. n. (Figs 1–20)

Types. Papua New Guinea: holotype female, Madang (8 km north), Madang Province, 19–27.x.1993, T. Maeyama



Figs 1,2. *Rhipipalloidea madangensis* sp. n.: **(1)** male, lateral habitus; **(2)** female, lateral habitus (left wings removed). Scale bar = 1 mm.

(NIAES); paratypes: five females, three males, same data as holotype (MNHA, NIAES, QMBA).

Female (Fig. 2). HL 1.20–1.23 mm; HW 0.70–0.75 mm; HE 0.36–0.40 mm; LM 1.30–1.45 mm; DWM 1.33–1.35 mm; LP 0.53–0.55 mm; FWL 3.0–3.1 mm; TL 3.4–3.5 mm.

Head and dorsum of mesosoma black with metallic blue lustre; lateral surfaces of mesosoma blackish brown; gastral tergum 1 dark brown, pair of yellow spots laterally; tergites 2 and 3 yellow, median longitudinal brown band and brown posterior margin; tergite 4 yellow; eye grey; antenna, mandible and labrum yellowish brown; legs yellow except coxae brown; wings hyaline, brown spot at stigmal vein.

Head (Figs 11,12) strongly transverse, 1.6–1.7 times as wide as high, with straight posterior margin in full-face view; gena straight; vertex and occiput transversely striate; frons with longitudinal striae; lower face transversely striate; clypeus broadly convex on anterior margin. In dorsal view 0.9 times as wide as mesoscutum; dorsal occipital margin rounded, without carina. Right mandible with acute apical tooth and two triangular teeth; left mandible with acute and blunt apical tooth. Labrum with seven long stout marginal setae. Antenna (Fig. 13) short, 12-segmented, flagellomeres 0.67 times as long as head width; scape three times as long as broad; pedicel as long as broad; flagellomeres 2–5 shorter than long; flagellomeres 6–10 longer than wide; terminal segment short, slightly longer than that preceding, two times as long as broad; ramus of flagellomere 2 3.8 times as long as shaft; flagellomere 6 3.7 times as long as broad; flagellomere 9 2.7 times as long as broad; flagellomere 10 as long as broad. Eye convex, glabrous, separated by 2.4 times their height; malar space shorter than HE; POL 2.8 times LOL; POL 2.6 times OOL.

Mesosoma (Figs 15,17) almost as long as high, dorsal margin straight in profile, posterior margin of frenum acutely angulate in profile. Mesoscutum densely rugose areolate; disc of mesoscutum 2.4 times as long as broad, anterior margin straight; notauli strong, connected posteriorly. Axilla transverse, united broadly medially, densely punctate; scutoscutellar sulcus deeply impressed. Scutellum semicircular posteriorly, without process. Frenum flange-like, not bidentate. Mesepimeron densely rugose areolate, with strong longitudinal rugae. Propodeum densely rugose areolate. Hind femur smooth, without distinct setae; hind tibia slender, with sparse setae, without spur. Forewing (Fig. 20) with submarginal vein in basal one-third, marginal vein obscure, 0.5 times as long as submarginal vein, stigmal vein reduced, vertically short, postmarginal vein absent.

Petiole (Figs 16,18) 3.0–3.1 times as long as wide in lateral view, 1.5 times as long as hind coxa; dorsal and ventral margins parallel; in dorsal view, almost 1.7 times as long as broad, sides slightly convex, broadest at midlength. Gaster large, oval, subopaque; maximum dorsal width 1.50–1.58 mm; ovipositor acicular, straight.

Male (Fig. 1). HL 1.27–1.30 mm; HW 0.71–0.73 mm; HE 0.35–0.36 mm; LM 1.43–1.48 mm; DWM 1.18–1.23 mm; LP 0.55–0.65 mm; FWL 2.3–2.5 mm; TL 3.1–3.2 mm.

Gaster dark brown, except petiole yellowish-brown; eye black; wing vein tinged with yellowish brown.

Head (Figs 3,4,6) 1.8–1.9 times as wide as high; in dorsal view wider than mesosoma. Antenna (Fig. 5) 12-segmented, with ramose flagellomeres; scape 2.7 times as long as broad; pedicel transverse; flagellomeres 2–7 each transverse; flagellomere 8 1.8 times as long as broad; flagellomeres 9–10 each two times as long as broad; terminal segment longer than preceding five flagellomeres combined; flagellomeres 2–10 with long cylindrical ramus, longer than combined length of segments 3–11. POL 2.6–2.7 times LOL; POL 2.6–2.7 times OOL.

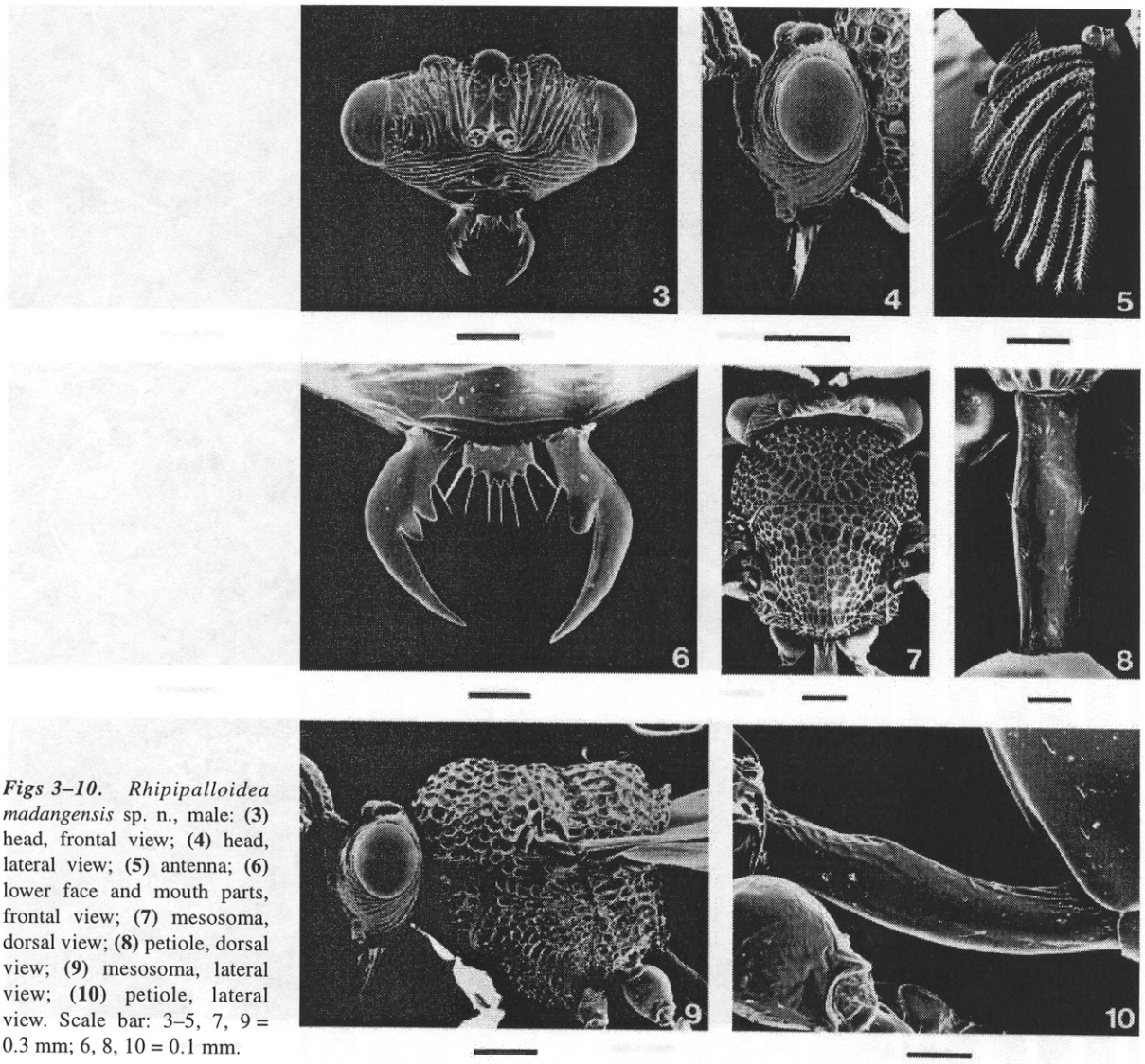
Mesosoma (Figs 7,9) enlarged, 1.2 times as long as high, with broadly rounded dorsal margin of mesoscutum; in dorsal view 1.1 times as long as broad. Mesoscutum 2.1–2.2 times as wide as long. Forewing (Fig. 19) with indistinct marginal and stigmal veins.

Petiole (Figs 8,10) subopaque and impunctate, evenly compressed dorsoventrally, four times as long as broad in lateral view, 1.7–2.2 times as long as hind coxa; dorsal and ventral margins parallel, turned upwards posteriorly; in dorsal view three times as long as broad, with parallel sides. Gaster smooth; in lateral view 1.5 times as long as high, with straight ventral margin, convex anterior and dorsal margins; in dorsal view 1.7 times as long as broad, maximum dorsal width 0.77 mm.

Host. *Camponotus* (*Tanaemyrmex*) sp. (Hymenoptera: Formicidae).

Etymology. The specific epithet refers to the type locality.

Remarks. This new species is separated from its congener *R. mira* Girault (= *R. gruberi* Girault) by the head having distinct striation (coarsely rugoso-alveolate in *mira*), and ramose, 12-segmented antennae in females (serrate and



Figs 3–10. *Rhipipalloidea madangensis* sp. n., male: **(3)** head, frontal view; **(4)** head, lateral view; **(5)** antenna; **(6)** lower face and mouth parts, frontal view; **(7)** mesosoma, dorsal view; **(8)** petiole, dorsal view; **(9)** mesosoma, lateral view; **(10)** petiole, lateral view. Scale bar: 3–5, 7, 9 = 0.3 mm; 6, 8, 10 = 0.1 mm.

eight-segmented in *mira*). This is the first record of the genus from New Guinea, and is the first record of a male.

Distribution. Papua New Guinea (Madang area).

Rhipipalloidea mira Girault (Figs 21–25)

Rhipipalloidea mira Girault 1934: 1 [306].
Rhipipallus mirus: Hedqvist 1978: 244.
Rhipipalloidea mira: Boucek 1988: 530.
Rhipipalloidea gruberi Girault 1940: 326; syn. n.

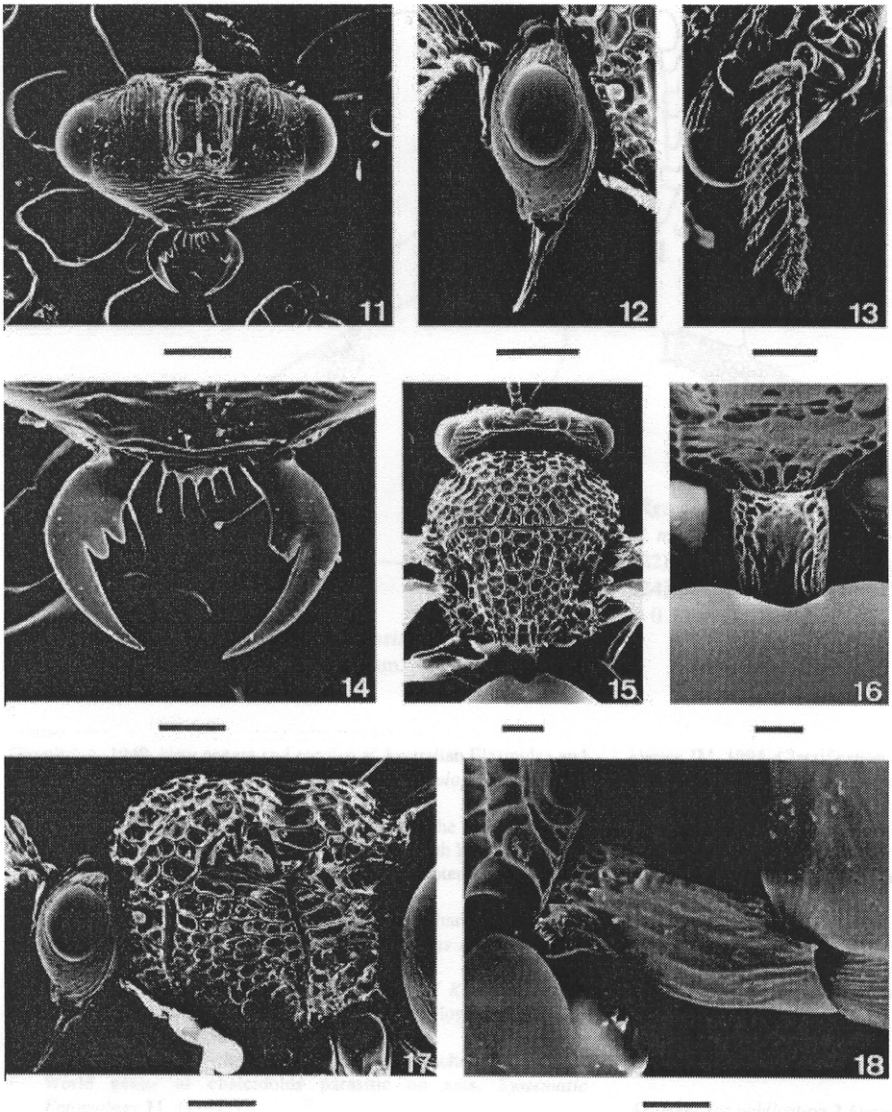
Types. *mira*: **Victoria:** holotype female, Echuca, 3.i.[19]32, F.E. Wilson (QMBA). *gruberi*: **New South Wales:** holotype female, Thredbo, Mt Kosciusko, 14.xii.[19]31, A.L. Tonnoir (ANIC).

Diagnosis (Female). Head distinctly wider than long, coarsely rugoso-alveolate, without striation. Antennae short (0.73 mm), 8-segmented; scape 2.1 times as long as broad; pedicel wider than long; flagellomeres 2–6 serrate (Figs 21,22); terminal segment oval, weakly reticulate, longer than wide; ratio of lengths of first five antennomeres 4.8:2.8:3:3.8:3.5.

Mesosoma enlarged, densely punctured-reticulate, with straight dorsal margin of scutellum; scutellar apex short, frenum weakly bidentate (after Girault 1934 and Boucek 1988). Forewing as in Fig. 23.

Gaster (Fig. 25) largely smooth, 0.83 mm long, 0.59 mm wide in dorsal view. Petiole (Fig. 24) coarsely punctate, twice as long as high in profile; in dorsal view 1.67 times as long as broad.

Remarks. The holotype of *R. mira* is damaged and consists of the preserved gaster and a slide with the crushed head and antennae. The holotype of *R. gruberi* consists of the mesosoma and a slide with the crushed head, antennae and forewing. Boucek (1988) suggested that *R. gruberi* is merely a smaller form of *R. mira*. Our comparison of the two holotypes shows that the morphology of the two does not differ



Figs 11–18. *Rhipipalloidea madangensis* sp. n., female: **(11)** head, frontal view; **(12)** head, lateral view; **(13)** antenna; **(14)** lower face and mouth parts, frontal view; **(15)** mesosoma, dorsal view; **(16)** petiole, dorsal view; **(17)** mesosoma, lateral view (left wings removed); **(18)** petiole, lateral view. Scale bar: 11–13, 15, 17 = 0.3 mm; 14, 16, 18 = 0.1 mm.

significantly. Although the types of both species are incomplete, we accept Boucek's suggestion. The male is not known.
Distribution. Australia (New South Wales, Victoria).

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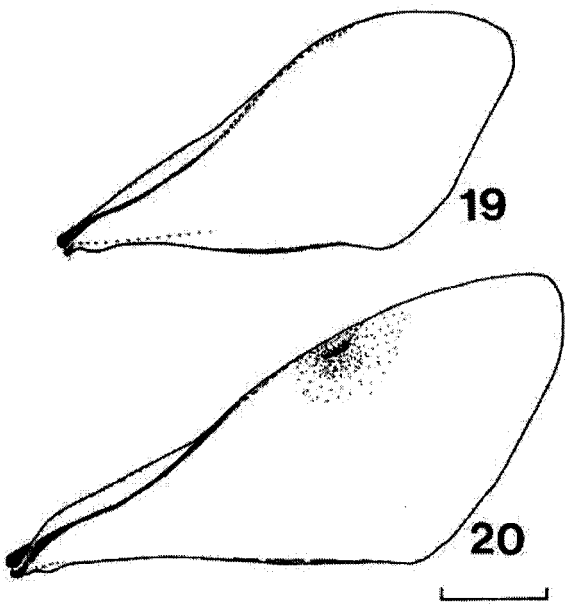
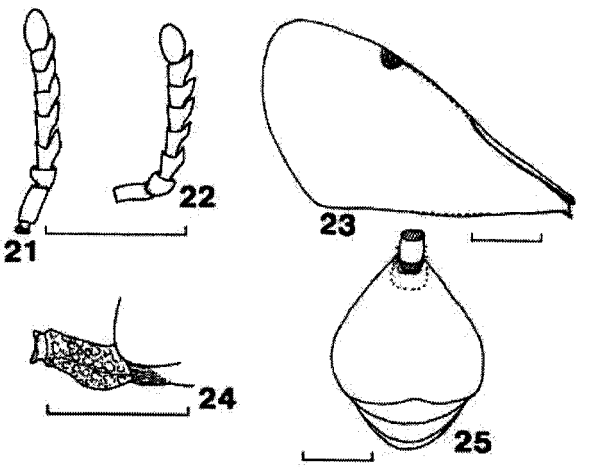


Figs 19,20. *Rhipipalloidea madangensis* sp. n., forewing: **(19)** male; **(20)** female. Scale bar = 0.5 mm.



Figs 21–25. *Rhipipalloidea* spp. female: **(21)** holotype of *R. mira* Girault, antenna; **(22–23)** holotype of *R. gruberi* Girault: **(22)** antenna; **(23)** forewing; **(24–25)** holotype of *R. mira*: **(24)** petiole, lateral view; **(25)** gaster, dorsal view. Scale bar = 0.5 mm.

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