Taxonomic notes on the entedonine genera *Rhynchentedon* and *Pediobomyia* (Hymenoptera, Chalcidoidea: Eulophidae) with the description of a new species

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Key words: Eulophidae; Entedoninae; *Pediobius*; *Horismenus*; *Rhynchentedon*; *Pediobomyia*; Oriental; Australasian; distribution.
The genera *Rhynchentedon* and *Pediobomyia* are reviewed, redescribed and their placement within so-called *Pediobius*-complex of genera is discussed. A new species (*Rhynchentedon achterbergi* spec. nov.) is described from Malaysia. The new species is characterized by the specific shape of petiole (with protruding dorsal callus). The number of setae at the submarginal vein is found to be variable in *Pediobomyia darwini* Girault. New geographical records are reported for both *Rhynchentedon* and *Pediobomyia*.

Introduction

The genus *Pediobomyia* was named by Girault (1913) to accomodate the single species *P. darwini* described from Australia. The genus was briefly discussed by Bouček (1988). In 1919 Girault described the monotypic genus *Rhynchentedon* for his *R. maximum* from Singapore. Bouček (1988) characterized this genus as having the "lower face unusually narrowed below eyes, with strongly concave genae but median part produced, with small mouth; mandibles reduced to small lobes, without distinct teeth" and corrected the ending of the type species name (Bouček, 1988). So far both genera were known just from their types and a few additional specimens (Bouček, 1988).

Both genera belong to the complex of genera allied to *Pediobius* within the subfamily Entedoninae Förster, 1856. The complex includes *Pediobius* Walker, 1846, *Rhynchentedon* Girault, *Pediobomyia* Girault, *Myrmocata* Bouček, 1972, and *Microdonophagus* Schauff, 1986 This genus-complex represents a monophyletic lineage characterized by the wide and robust propleural flange (bending to anterior margin of pronotal panel), the sharply toothed lateral metapleural callus and the propodeal submedian foveae. Also members of this complex have wide robust metasomal petiole and more or less developed submedian propodeal carinae, but these characters are highly homoplastic and occur in many other entedonine genera.

The *Pediobius*-complex is close to the genera allied to *Horismenus* Walker, 1843 (as to *Edovum* Grissell, 1981, and *Alachua* Schauff & Bouček, 1987). These genera also have the wide and robust propleural flange and lateral sharply toothed metapleural callus. However, they differ from the genera allied to *Pediobius* in having a different propodeal pattern and the sharply toothed mesosternal projection interrupting or overlapping the prepectus. It is interesting, that this mesosternal projection is a gradual character within Entedoninae, and its phylogenetic value is questionable, despite it works for the generic separation to some extent. For instance, within *Pediobius* and

Rhynchentedon it is moderately expressed, so that it is hard to say whether the projection is only marked off, or forms a tooth (fig. 2, mtt).

The purpose of this paper is to clarify the generic diagnoses, to describe a new species and to provide new data on the distribution for these poorly known genera.

Abbreviations of the morphological terms used in this paper are: POL: post-

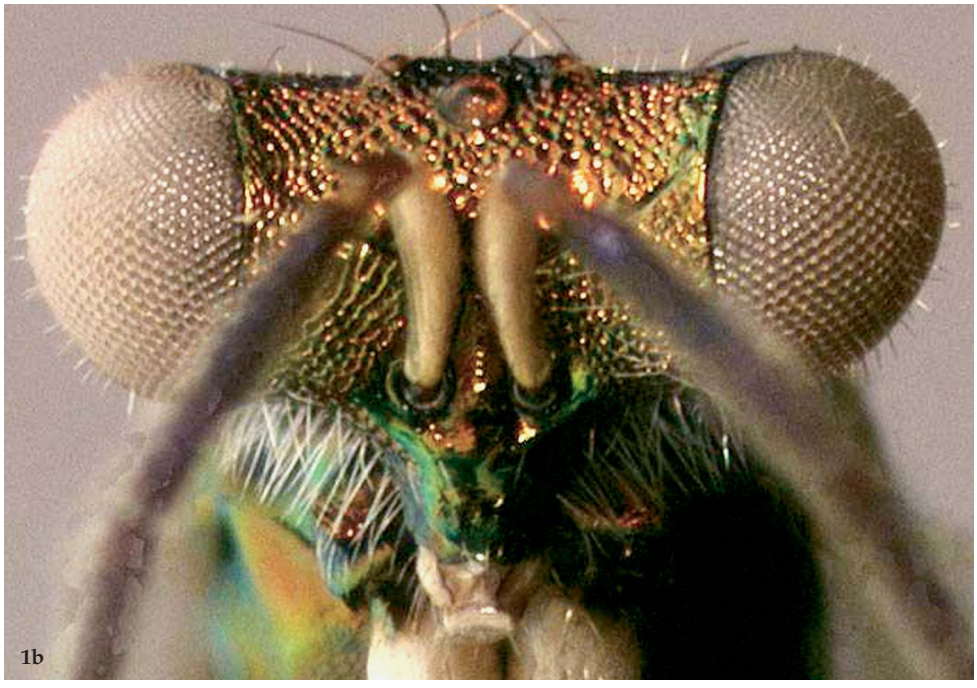

Fig. 1a, *Rhynchentedon maximus* Girault, China, Macau (BMNH); fig. 1b, *R. achterbergi* spec. nov., holotype, face, anterior aspect.

ocellar distance; OOL: oculo-ocellar distance; MDO: major diameter of posterior ocellus; OCL: oculo-occipital distance, MV: marginal vein; ST: stigmal vein; PMV: postmarginal vein; pt: petiole; hc: hind coxa; mtt: mesosternal tooth; pf: propleural flange; smc: submedian carina; sf: submedian fovea; sp: spiracle; ls: lateral propodeal sulcus; nc: propodeal nucha.

Genus *Rhynchentedon* Girault, 1919

Rhynchentedon Girault, 1919: 166. Type species (by original designation): *Rhynchentedon maximum* Girault, 1919.

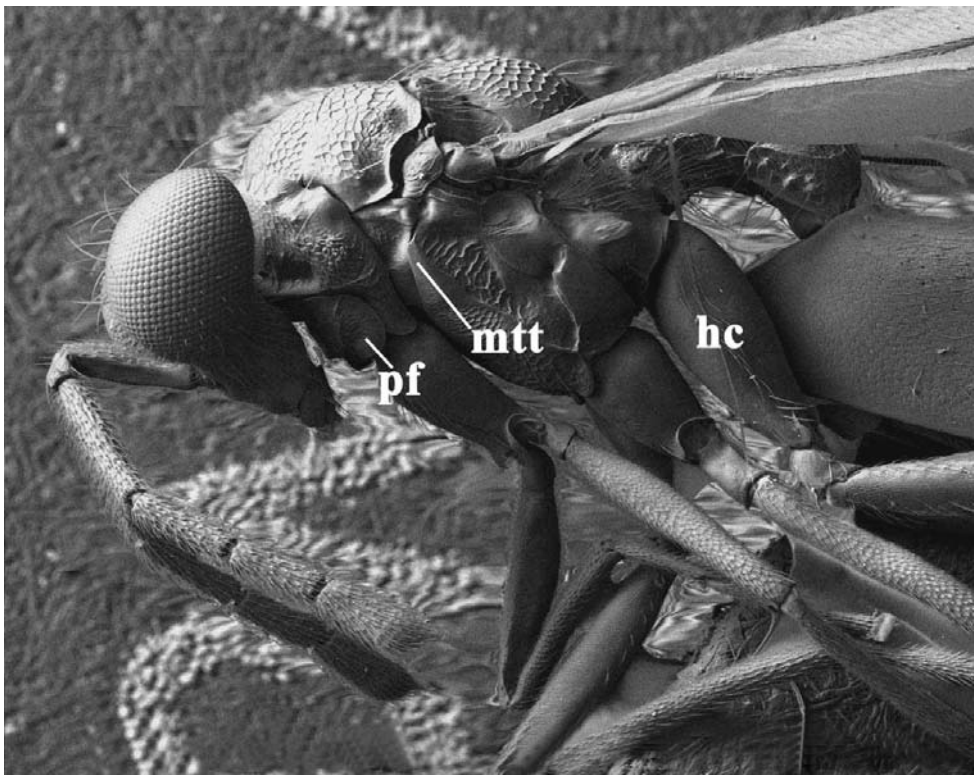

Fig. 2, *Rhynchentedon achterbergi* spec. nov., holotype, ♀; pf – pronotal flange, mtt – mesosternal tooth, hc – hind coxa.

Diagnosis.— This genus is quite distinctive in having: the lower face narrowed and elongate (fig. 1); the propleural flange wide (fig. 2, pf); the mandibles reduced; the propodeum with diverging submedian carinae and setose posteriorly and the axilla densely setose. In addition, the spiracles are placed in depressions and the transepimeral sulcus continued in a drop-shaped fovea.

Description.— Head with large, moderately pubescent eyes; lower face narrowed and elongate; surface above clypeus somewhat convex, but clypeus not delimited, pointed downwards, produced and somewhat bilobed; gena not incised, malar sulcus absent, mandibles lamellifom, although large, pointed downwards; vertexal suture absent; occipital carina complete, forming small triangular peaks laterally (just near eye margins), occiput without depressions; frontal sulcus U-shaped, scrobal grooves sutured, disconnected from each other; subtorular grooves absent, occipital median line convex, head dorsally with regular pubescence, but very dense below arms of frontal sulcus and on gena (fig. 1), tentorial pits absent; ratio of flagellar segments 3:2 (♀) or 4:1 (♂); antenna with one anellus, setae on male flagellum homogeneously placed.

Pronotum carinate, bearing 10 strong setae (5 setae on each side) and only a few very short setae on column; lateral pronotal panel without carinae, but with somewhat convex calli on either side, propleura broadly separated, bending pronotum and

forming wide "ear-like" propleural flanges (fig. 2, pf). Posterior margin of prepectus straight, slightly overlapped by mesosternal projection (fig. 2); notauli reduced, visible just by very shallow depression; mid lobe of mesoscutum with two pairs of setae; axillae densely setose or bearing 8-9 setae; trans-scutellar suture simple, not sulcate; scutellum with one pair of setae; mesosternal protuberance (fig. 2, mtt), although might be repetitive, indicated by a smooth triangle anterior to femoral depression, upper end of the triangle somewhat overlapping hind margin of prepectus, transepimeral sulcus continued in a drop-shaped fovea: metapleuron tooth-bearing, with elongate fovea below this tooth.

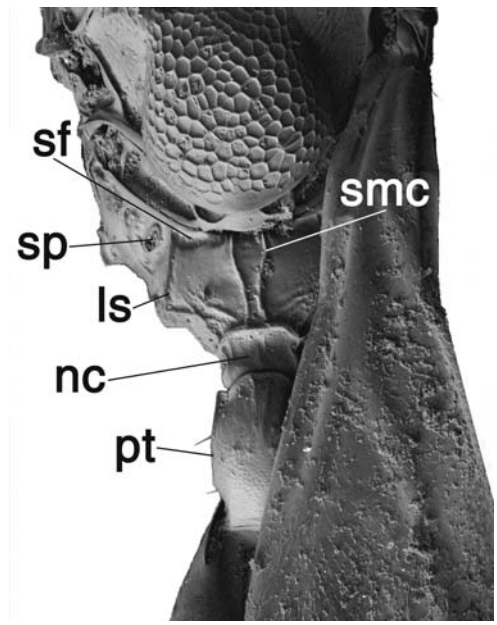

Fig. 3, *Rhynchentedon maximus* Girault, holotype, ♀; propodeum, smc – submedian carina; sf – sublateral fovea, sp – spiracle, ls – lateral sulcus; nc – nucha; pt – metasomal petiole.

Propodeum (fig. 3) with median pattern represented by two submedian carinae (fig. 3, smc), connected posteriorly by costulae with distinct lateral plicae, the plicae delimit shallow lateral sulcus (fig. 3, ls); submedian foveae (fig. 3, sf) distinct; propodeal spiracle (fig. 3, sp) placed in depression, without distinguishable tubercle below; median propodeum glabrous, but antero-lateral part (below plica) with about 8-10 setae; propodeal callus densely pubescent – about 30 (♂) – 40 (♀) setae; supracoxal flange reduced, coxal and petiolar foramina broadly separated, postero-medial propodeum with elongate nucha (fig. 3, nc).

Fig. 4, *Rhynchentedon maximus* Girault, holotype, ♀.

ST reduced, sessile; PMV short, as long as ST.

Metasomal petiole (figs 3, 6, pt) densely setose laterally (8-10 setae), robust; oval membranous areas on first metasomal tergite absent; ovipositor present along about half of female metasoma.

Discussion.— This genus is similar to *Pediobius* in having a wide propleural flange and the characteristic propodeal pattern: two submedian carinae and with lateral submedian foveae. However, *Rhynchentedon* is easily distinguishable by the characters mentioned in its diagnosis and also by the reduced supracoxal flange and the axilla bearing several setae. This is the only

described genus having reduced lamelliform mandibles within the *Pediobius*-complex.

Two species considered for the genus differ mainly in the shape of the metasomal petiole (evenly curved in *R. maximus*, abruptly curved and with protruding dorsal callus in *R. achterbergi*).

Biology.— Unknown.

Distribution.— South China, North Borneo, New Guinea (Bouček, 1988), Malaysia, Indonesia (new records).

Fig. 5, *Rhynchentedon achterbergi* spec. nov., holotype, ♀, lateral aspect.

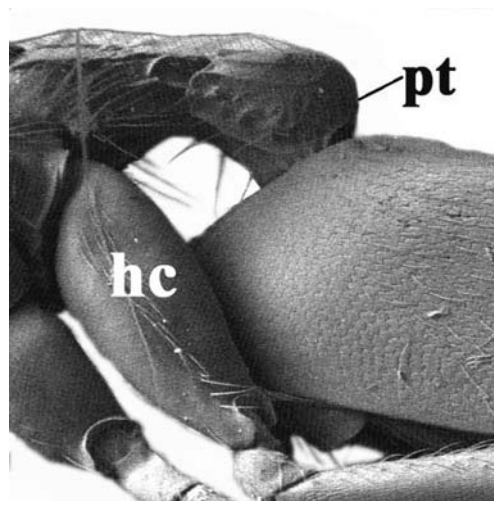

Fig. 6, *Rhynchentedon achterbergi* spec. nov., holotype, ♀: pt – petiole, hc – hind coxa.

Rhynchentedon maximus Girault, 1919 (figs 1a, 3, 4)

Rhynchentedon maximum Girault, 1919: 166.
Rhynchentedon maximus; Bouček, 1988: 705.

Material. — Holotype, ♀ (BMNH), "**Singapore**, Hym. 5-3080" (fig. 4); 1 ♀, 1 ♂ (BMNH), "**China**, Makau, R. C. L. Perkins Coll B. M. 1942-95"; 1 ♂ (BMNH), "West **Malaysia**, Perak Telok Anson, Mardi Pas, 1.IV.82, Coll: Saad, C. I. E. Coll A. 13903"; 1 ♀ (RMNH), "**Indonesia**, N. Sumatra, Ketambe, c 400 m, near N.P. Gn. Leuser, Mal. trap, xi.1994, RMNH'95, Y. v. Nierop & C. v. Achterberg"; 1 ♀ (RMNH), "Indonesia, N Seram, 11 km, E Wahai, nr PHPA-Q, coastal rainforest, 2-20.iii.1997, Mal. trap 15, RMNH'97, C. v. Achterberg & R. deVries"; 2 ♂ (RMNH), ibid., but "lowland rainforest, RMNH'97"; ♀ (RMNH), "Malaysia, SE Sabah, nr Danum Valley Field C. c. 150 m, Mal. Trap 1b, 25.xi-8.xii.1987, RMNH'87, C. v. Achterberg & T. Burghouts; 10 ♀ (ZMUC), "**Philippines**, Tawi Tawi Tarawakan, north of Batu Batu, 23 Oct. 1961, Noona Dan Exp 61-62, caught in Malaise traps".

Diagnosis.— Habitus as described above; colouration similar to the following species; females have all coxae light testaceous, in male all coxae metallic green and hind femur with dorsal metallic stripe; metasomal petiole robust, evenly curved, hind coxa at most 1.5-1.7 times as long as broad in lateral view; gaster mostly 1.6-2.5 times as long as broad, but 3.3 times in the holotype.

Biology.— Unknown.

Distribution.— Singapore (Girault, 1919), Brunei, Indonesia, southern China (Macau), Malaysia (Bouček, 1988; this paper).

Rhynchentedon achterbergi spec. nov.
(figs 1b, 2, 5, 6)

Material.— Holotype, ♀ (RMNH), "**Malaysia**, SE Sabah, nr Danum Valley Field C. c. 150 m, WONO, Mal. Trap 5, 19.iv-22.v.1988, RMNH'89, C. v. Achterberg & T. Burghouts".

Diagnosis.— Metasomal petiole with convex dorsal callus, gaster 3.5 times longer than broad, hind coxa 2.3 times as long as broad in lateral view (figs 2, 5, 6).

Description.— Holotype, ♀, length of body 5 mm, of fore wing 3 mm.

Head.— Head in dorsal view 2.6 times as long as broad. Ocelli large, POL:OOL:-MDO:OCL = 12:15:7:2. Temple reduced, occipital margin sharp throughout. Eyes evenly, but not densely pubescent. Head in frontal view (fig. 1b) 1.9 times as broad as high; interocular distance 1.9 times eye width. Antenna (figs 1b, 2, 5) inserted at lower eye margin. Scape 3.6 times as long as broad, 0.8 times as long as eye height; pedicel 1.6 times as long as broad; F1 7 times as long as broad, 4.4 times as long as pedicel, F2 4 times as long as broad; F3 2.8 times as long as broad, clava two-segmented, expanded apically, with short terminal spine, 2.7 times as long as broad.

Mesosoma.— Mesosoma 1.6 times longer than broad. Pronotal collar carinate. Mesoscutum 1.5 times as broad as long; notauli indicated anteriorly as straight, narrow striae; scutellum almost circular, as long as broad and slightly shorter than mesoscutum. Propodeum (fig. 6) typical for the genus, but somewhat more alveolate, and submedian carinae subparallel, disappearing among wider posterior alveoli (like in the genus *Colpixys* Waterston, 1916). Spiracular elevation depressed as typical for the genus.

Wings.— Forewing 2.8 times as long as broad, subcosta of submarginal vein with two large setae on dorsal margin, tapering at apex and joining praestigma anterior to base of the latter; costal cell narrow, 15 times as long as broad, shorter than MV; MV slightly more than twice longer than costal cell; ST sessile, as long as PMV.

Legs.— Hind coxa 2.3 times as long as broad in lateral view; fore coxa 2.2 times as long as broad.

Metasoma.— Petiole (fig. 7) with convex dorsal callus; metasoma densely setose, elongate, 3.6 times as long as broad.

Colour.— Body green-bronze, with coppery tint on mesosomal dorsum and on upper face, metasoma dark brown; antenna brown except for pale scape and ventral margin of pedicel; legs entirely light testaceous.

Male.— Unknown.

Biology.— Unknown.

Distribution.— Malaysia: Sabah.

Etymology.— The new species is named in honour of one of its collectors, Dr Ing. Cornelis van Achterberg, who kindly supplied the collection containing the type specimen, to the author.

Genus *Pediobomyia* Girault, 1913
(fig. 7)

Pediobomyia Girault, 1913: 155. Type species (by original designation): *Pediobomyia darwini* Girault, 1913: 155.

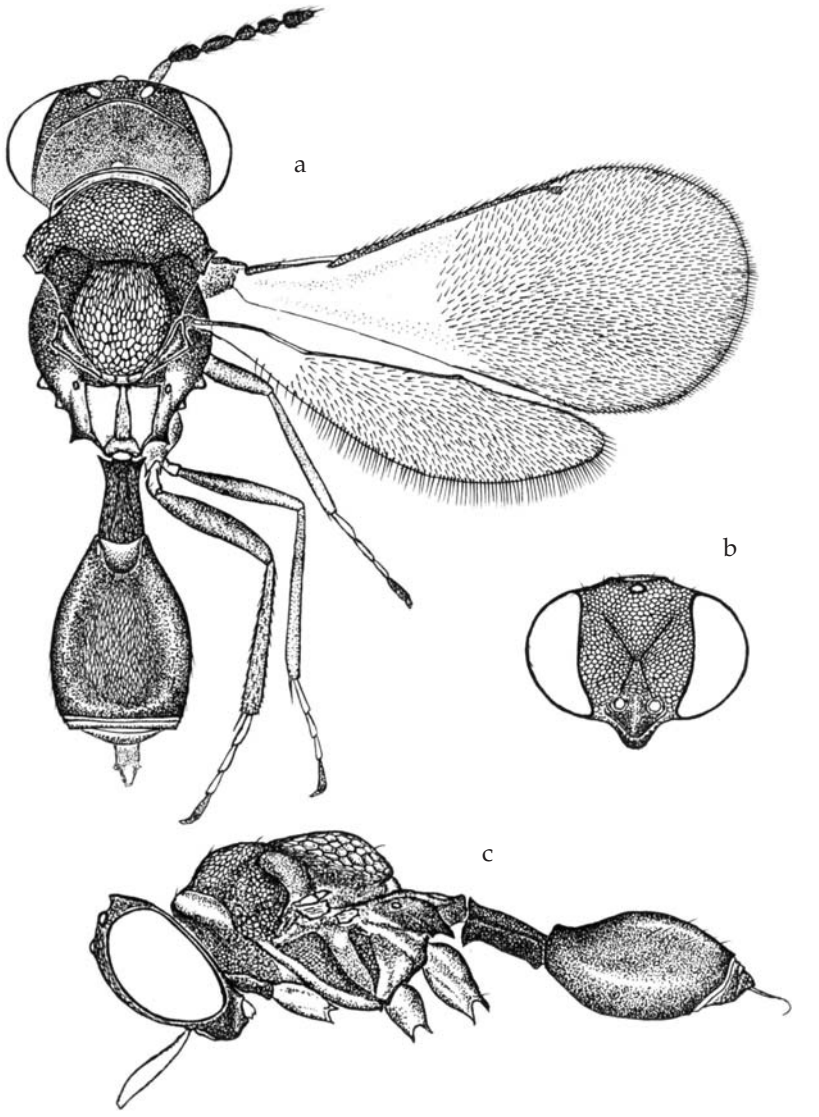

Fig. 7, *Pediobomyia darwini* Girault, ♂: a, habitus, dorsal aspect; b, face; c, habitus, lateral aspect.

Diagnosis.— The genus is easily recognizable within the *Pediobius*-complex in having face narrowed ventrally towards a very small mouth opening; frontal sulcus U-shaped, connected with deeply sutured scrobal grooves; propodeum elongate, with diverging posteriorly submedian carinae, delimited submedian strip; propodeal spiracle placed on elevations, with long pliciform protrusion below it.

Distribution.— Australasian, Oriental (Girault, 1913; Bouček, 1988, this paper); new for the Seychelles.

Pediobomyia darwini Girault, 1913
(fig. 7)

Pediobomyia darwini; Girault, 1913: 155.
Pediobomyia darwini; Bouček, 1988: 705.

Material.— 7 ♂ (TMB), "**India**, W Bengal, Darjeeling, below North Point 1200 m. No. 838, 16.x.1967, Topál leg."; 1 ♂ (TMB), ibid., "Kurseong, 1000m, No 849, 18.x.1967"; 1 ♀ (RMNH), "**Indonesia**, N. Sumatra, Ketambe, c 400 m, near N. P. Gn. Leuser, Mal. trap, ix.1994, RMNH'95"; 5 ♀ (BMNH), "**Seychelles**, Silhouette I., coastal veg. 25-28.viii.2000, J. S. Noyes"; 11 ♀ (BMNH), "Seychelles, Mahe, Pantation club, 4º45'S, 50º28'E, 3m, 19-30.viii.2000, J. S. Noyes"; 3 ♀ (BMNH), "Seychelles, Mahe, Danzil-Ase Major, 4º37'S 50º 24'E, 50m, 19-23.viii.2000, J. S. Noyes"; 1 ♀ (BMNH), "Seychelles, Mahe, Ande de la Mouche, 2m, 4º44'S 50º29'E, 22.viii.2000, J. S. Noyes"; 1 ♀ (BMNH), "Seychelles, Mahe, Morne Blanc, 450m, 4º40'S 50º26'E, 21.viii.2000, J. S. Noyes"; 3 ♀ (BMNH), "Seychelles, Mahe, 1km E Tea factory, 400m, 4º40'S 50º26'E, 30.viii.2000, J. S. Noyes".

Male (fig. 7).— Length 1.8-2.2 mm. Head and mesosoma black; legs, scape and pedicel brownish to light yellow, remainder of antenna somewhat darker.

Head in dorsal view 1.9-2.0 times as broad as long; POL 1.8-2.0 OOL, posterior ocellus separated from eye by double MDO, and separated from occipital margin by about 1.5 MDO. Occipital margin sharp, marked off by raised carina. Eyes almost bare.

Head in frontal view 1.2–1.3 times as broad as high (excluding narrowed rostrum of lower face – 1.4 times). Face narrowed ventrally forming the rostrum, the latter hiding small oral fossa (fig. 7b). Gena short, merging with rostrum. Antennal scape shorter than eye height, 5.7 times as long as broad, combined length of pedicel and flagellum 1.4-1.5 times as long as breadth of head; pedicel 1.4-1.7 times as long as broad, slightly shorter than F1, the latter about 2.4 times as long as broad; F2 and F3 twice as long as broad; clava 2-segmented, 1.66 times as long as preceding segment, 2.5 times as long as broad.

Mesosoma about 1.5-1.6 times as long as broad. Pronotum wide, with weak collar carina, transverse, 2.5 times shorter than mesoscutum; the latter twice as broad as long, reticulate. Scutellum 1.4 times as long as broad and 1.4 times longer than mesoscutum, with narrow elongate meshes anteriorly, and polygonal oval meshes posteriorly. All setae on dorsum of mesosoma very short. Dorsellum small, with two foveae, separated from the rest of metanotum.

Propodeum of typical structure for genus, space between submedian plicae weakly coriaceous, nucha convex. Sides of propodeum bare, with backward projecting horns. Legs slender: fore femur 5.5, fore tibia 11 times as long as broad; mid femur 6, mid tibia 11, hind femur 5.4 and hind tibia 7 times as long as broad; spur of fore tibia as long as or slightly shorter than breadth of its tibia; spur of mid tibia almost twice longer than breadth of its tibia; spur of hind tibia slightly longer than breadth of its tibia.

Fore wing twice as long as broad; speculum broadly open; costal cell very narrow; subcosta of submarginal vein with 1 (Indian specimens), 2 (Indonesian specimen) setae, or asetose (specimens from Seychelles); marginal vein 2-2.5 times as long as costal cell, postmarginal vein as long as or slightly shorter than stigmal; length of apical fringe of fore wing slightly longer than breadth of marginal vein.

Metasoma.— Petiole stout, twice as long as broad, widening caudad, coriaceous, with two almost parallel striae, one on each side, and two raised ridges ending by

two big horns on the bottom. Gaster elongate, 1.4 times as long as broad. Basal gastral tergite covers slightly more than 6/7 of gastral length, with surface weakly reticulate, with sparse short hairs.

Female.— Similar to male, but antenna lighter and gaster conical, 1.5–2.4 times as long as broad.

Discussion.— Despite the differences in the number of setae at subcosta of the submarginal vein, I consider all the specimens studied representing one and the same species.

Female.— Similar to male, but antenna lighter and metasoma conical.

Host.— Unknown.

Distribution.— Australiasian, Oriental (Girault, 1913; Bouček, 1988); Seychelles (Afrotropics) and Indonesia are new records.

Acknowledgements and abbreviations

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