Revision of the genus *Parzaommomyia* Girault (Hymenoptera: Eulophidae), with taxonomic notes on related genera

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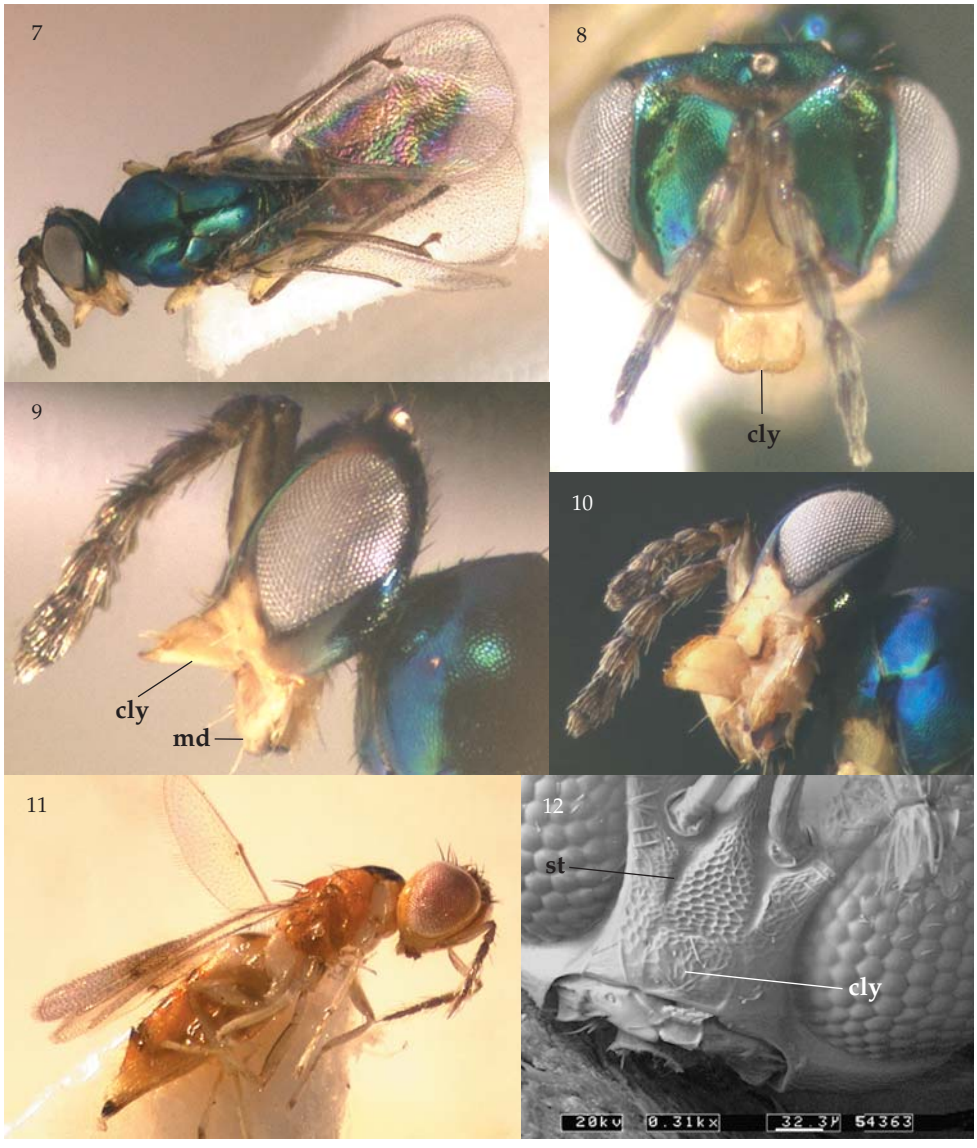
Key words.— Hymenoptera; Eulophidae; Entedoninae; phylogeny; *Parzaommomyia*; *Omphale*-complex; Australasia; Oriental; Afrotropical; Palaeotropical; distribution.
The eulophid genus *Parzaommomyia* Girault, 1915, is revised and redefined. Five new species are described and illustrated: *P. sulensis* spec. nov. from Sulawesi and West Malaysia, *P. africana* spec. nov. from Nigeria, *P. crassicornis* spec. nov. from Sulawesi, New Guinea and China, *P. achterbergi* spec. nov. from East Malaysia and Java, and *P. incompleta* spec. nov. from New Guinea. Species of this genus represent a monophyletic Palaeotropical group characterized by six synapomorphies according to the results of the cladistic analysis of all known (six) species and 20 outgroup taxa coded for twenty-nine characters. The supraclypeal area is delimited by grooves (i. e. both the clypeus and the supraclypeus are delimited), the sensory pores on the scape of the male are fused in a "sensory plaque", the posterior part of the scutellum has a distinct apical rim, the dorsellum is wide and margined, the lateral propodeal plica is diagonal, and the volsellar setae on male genitalia are enlarged. The first two characters are autapomorphies and most helpful for diagnostic purposes. The sensory pores fused in a "plaque" on the ventral edge of the scape of the male, are recorded for a first time for the eulophid subfamily Entedoninae Förster, 1856 (previously known for the subfamily Tetrastichinae Förster, 1856 only). The systematic position of the genus, its infrageneric variation and the phylogenetic relationships are discussed.

Introduction

Girault (1915) named the genus *Parzaommomyia* for the single species *P. tenuicorpus*, which is now included in the subfamily Entedoninae Förster, 1856 of the family Eulophidae Westwood, 1829. More than seventy years later, Bouček (1988) gave a more precise description of the genus and indicated its possible relationships with *Omphale* Haliday, 1833, and *Holcopelte* Förster, 1856. *Parzaommomyia* was defined by several characters, among which the "supraclypeus", an area above the clypeus, delimited by deep sutures (fig. 61, scly), was the most distinctive. Also, the long postmarginal vein was stated as a diagnostic character and regarded as being part of the most primitive wing venation in Entedoninae (Bouček, 1988).

Our recent studies on Afrotropical, Oriental and Australasian eulophid faunas revealed some undescribed species of this genus. The purpose of this revision is to show the diversity and morphological variety within the genus, as well as to provide new characters for phylogenetic analysis of the position of the genus *Parzaommomyia*.

Fig. 1, *Omphale lugens* (Walker), ♀; fig. 2, *Omphale* spec.; figs 3, 4, *O. theana* (Walker), ♀; figs 5, 6, *Holcopelte sulciscuta* (Thomson), ♀. 1, 2, 3, 5, habitus, lateral aspect; 4, forewing sector; 6, habitus, dorsal aspect.



Figs 7-10, *Clypomphale biloba* Bouček, ♀; fig. 11, *Chrysonotomyia* (= *Ladna*) *picta* (Bouček), ♀; fig. 12, *Chrysonotomyia* spec., ♀, 7, habitus, dorsal aspect; 8, head, frontal aspect; 9, head; lateral aspect; 10, head, ventro-lateral aspect; 11, habitus, lateral aspect; 12, face; cly= clypeus, md= mandibles; st= subtorular grooves.

Materials and methods

This study is based on pinned specimens deposited in two important collections, i.e., those of The Natural History Museum (formerly British Museum (Natural History)), London, UK (BMNH) and the Nationaal Natuurhistorisch Museum, Leiden, Netherlands (RMNH).

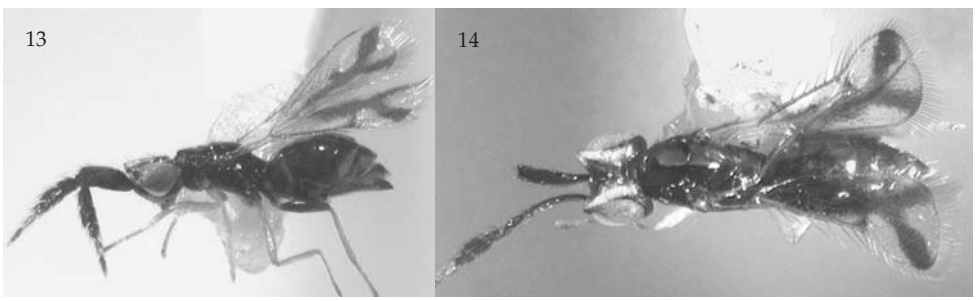
Scanning Electronic Microscopy was done in the Mineralogy Department of the Natural History Museum (London, BMNH) using an ABT-55 microscope which allows operating with uncoated specimens. General morphology pictures were done using a JVC 3-CCD colour videocamera KY-F55B with Auto-Montage software (version 3.02.005).

Terminology

The morphological terms follow Bouček (1988) and Gibson et al. (1997), but also include some original measurements (marked by asterisk) and the following abbreviations are used (in alphabetical order): APG*= anterior groove on propodeum; ATD*= mean diameter of antennal torulus; F1-F5= flagellar joints; CR= "clypeal rectangle", sutures delimiting clypeus; LPP= lateral propodeal plica; LPS*= lateral propodeal sulcus; MDO= major diameter of ocellus; MV= marginal vein; OCD= occipital-ocellar distance; OFW*= outer forewing sector, the part of disc of fore wing apically from the virtual longitudinal line drawn at point of juncture of ST; OMA= oval membranous areas on first gastral tergite; OOL= oculo-ocellar distance; PMV= postmarginal vein; POL= post-ocellar distance; PR*= parastigma (= praestigma) of submarginal vein; PSE*= propodeal spiracular elevation; SAR= scutellar apical margin; SC*= subcosta of submarginal vein; SCF*= supracoxal flange; ST= stigmal vein; SV= submarginal vein. The term "coriarious sculpture" used in this paper concerns a pattern of meshes formed by the crossing sutures (e.g., figs 56, 62; Torre-Bueno, 1962).

Phylogenetic analysis

In order to develop a hypothesis of relationships of the species of *Parzaommomyia*, a preliminary analysis of the selected genera of Entedoninae was undertaken.



Figs 13, 14, *Callifrons maculata* Schauff, Yoshimoto & Hansson. 11, habitus, lateral aspect; 12, habitus, dorsal aspect.

All known species of *Parzaommomyia* (including 5 newly described ones), and 20 outgroup taxa were chosen for cladistic analysis. Twenty-six species representing 16 genera were coded for twenty-nine characters comprising 77 states. Most are binary, but characters 1, 6, 8, 10, 11, 13, 18, 19, 20, 23, 27 were coded as multistate with three states, character 12 was coded for four states, character 5 was coded for five states. All characters were treated as unordered to avoid *a priori* weighting bias. Character states that could not be properly coded for particular species were presented as multistate. These were treated as 'uncertainty' (with '/' separator). Missing data were coded as question marks. These occurred mostly for the male characters when males were unknown or when a study of the respective character required a special, impossible work (e.g., slide preparation) with the type or limited specimens. Outgroup taxa were not assigned. ACCTRAN was used for character optimization.

An attempt was made to include all possible characters used for distinguishing of the genera analyzed. No assumptions were made regarding the value of characters as a source of phyletic information, except that autapomorphic characters were excluded from the analysis because they do not provide information about relationships.

Phylogenetic analysis and interpretations were performed using PAUP* release version 4.0b4a for Microsoft Windows (Swofford, 1998) and MacClade version 3.04 (Maddison & Maddison, 1992). The heuristic search option of PAUP* was applied using TBR branch swapping in conjunction with the random stepwise addition feature using 100 replicates. The latter option was set to examine whether alternative islands of equally parsimonious cladograms were present in the data.

A bootstrap analysis (1000 replicates using TBR branch swapping) was carried out using PAUP* to establish levels of branch support for the clades obtained.

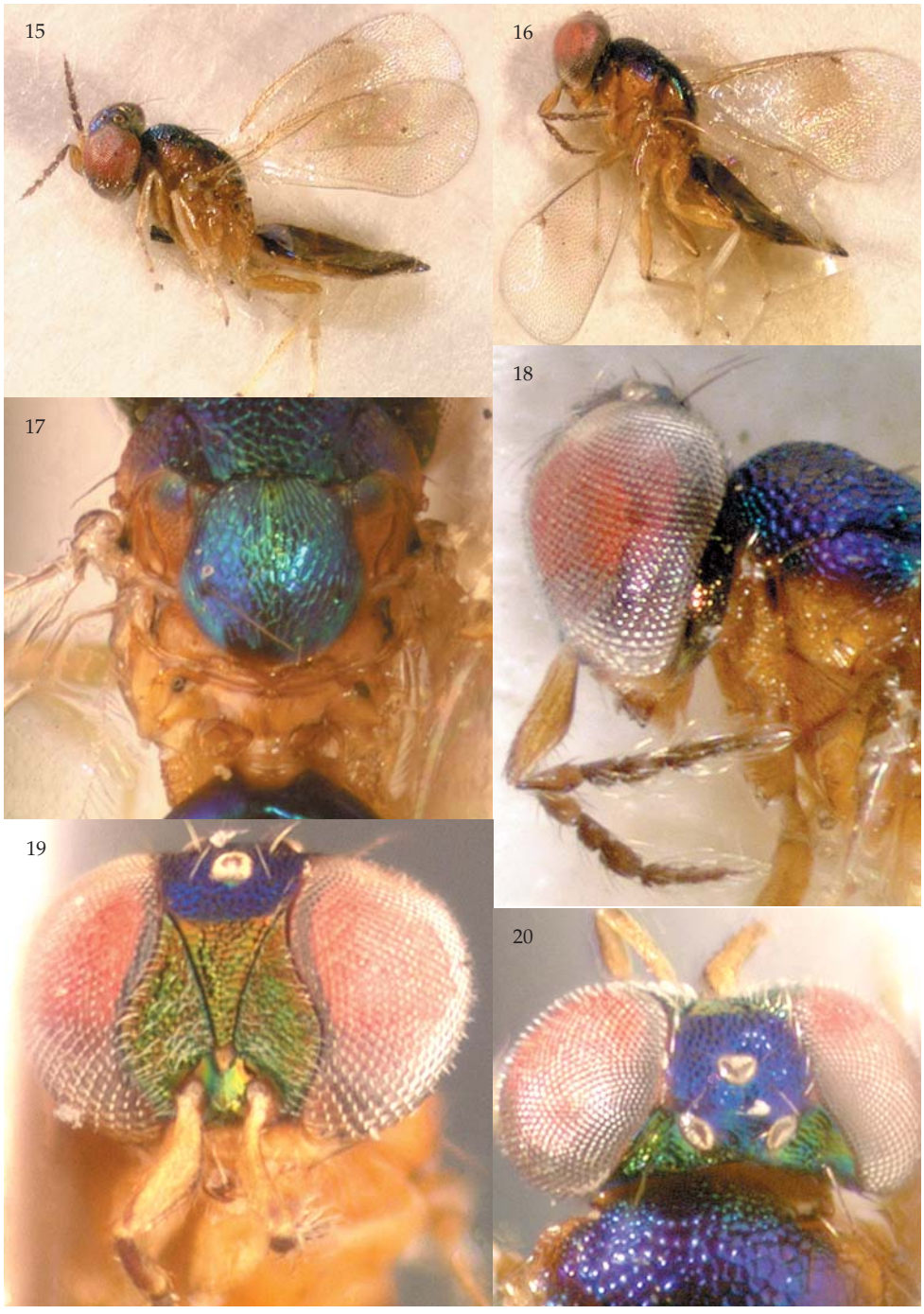
The resultant cladogram presented in fig. 84 was produced by PAUP*, then analysed by the MacClade Tree Editor to study character distribution.

Outgroup taxa

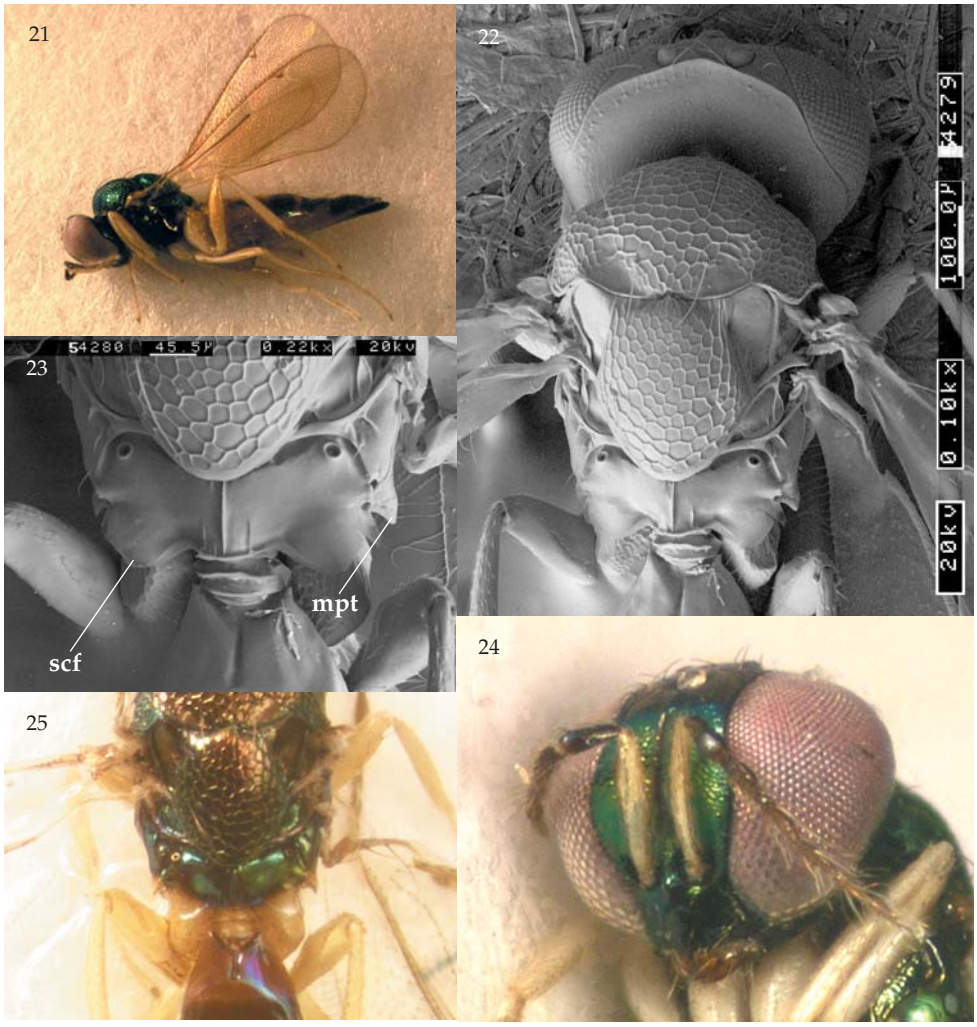
There were three groups of outgroup taxa included in the analysis (Table 2).

1. "*Omphale* genus complex"

The presence of the delimited clypeus may suggest an affiliation of *Parzaommomyia* with other genera that also have this presumably synapomorphic character. These genera represent a rather recognizable group including *Omphale* Haliday, 1833 (figs 1-4), *Holcopelte* Förster, 1856 (figs 5-6), *Clypomphale* Bouček, 1988 (figs 7-10), *Callifrons* Schauff, Yoshimoto & Hansson, 1994 (figs 13-14), *Chrysonotomyia* Ashmead, 1904 (figs 11, 12), *Zaommomyiella* Girault, 1913 (figs 15-20), *Perditorulus* Hansson, 1996, *Tropicharis* Hansson, 1998 (figs 21-25), *Eprhopalotus* Girault, 1916 (figs 26-27), *Ametallon* Ashmead, 1904 (figs 28-32), *Monteithius* Bouček, 1988 (figs 33-38), *Astichomyia* Girault, 1917 (figs 39-43). Species of these genera were studied and included in the matrix. Species of *Chrysonotomyia* possess the subtorular grooves (fig. 12, st), combined with the delimited clypeus they constitute a lowerface pattern rather similar to that of *Parzaommomyia*. A study on the relationships between these genera was an auxiliary aim of our phylogenetic analysis.



Figs 15-20, *Zaommomyiella oculata* Girault. 15, 16, ♀ habitus, lateral aspect; 17, ♀ posterior mesosoma, dorsal aspect; 18-20, head and anterior mesosoma: 18, lateral aspect; 19, head, frontal aspect; 20, dorsal aspect.



Figs 21-25, *Tropicharis cecivora* Hansson. 21, ♀, habitus, lateral aspect; 22, ♂, head and mesosoma, dorsal aspect; 23, 25, ♂, propodeum, dorsal aspect; 24, ♀, head, latero-frontal aspect; scf= supracoxal flange; mpt= metapleural tooth.

2. *Closterocerus* and *Trisecodes*

The genera *Closterocerus* Westwood, 1833 and *Trisecodes* Delvare & LaSalle, 2000, were chosen because they have the subtorular grooves (likewise *Chrysonotomyia*, a representative of the previous group of genera). The nature and origin of both subtorular and supraclypeal grooves, are discussed below (Table 1).

3. *Chrysocharis prodice* (Walker)

Representatives of the genus *Chrysocharis* Förster, 1856, are likely phylogenetically distantly related to both the "*Omphale*-complex" and the genus *Closterocerus* (=

Table 1. Subtorular (fig. 12: st) and supraclypeal (figs 60, 61: slcy) grooves.

	Subtorular grooves	**Supraclypeal grooves**
Description	Stretching toward clypeus, along inner margin of antennal torulus	Connecting upper margins of CR with either antennal torulus; if gradually reduced then present in posterior part (just above the clypeus, e.g. *P. incompleta*, see below).
Possible origin	Continuation of scrobal grooves (directed downward)	Continuations of sutures delimiting clypeus (directed upward)
Genera	*Closterocerus*, *Chrysonotomyia*, *Trisecodes*	*Parzaommomyia*

Neochrysocharis Kurdjumov, 1912). However, species of these genera have been confused; e.g., species considered as the '*varia* group' of *Chrysocharis* by Hansson (1987) had to be transferred to *Omphale* by him later (Hansson, 1996a). *Chrysocharis chlora* (Graham**,** 1963) and *Ch. imbrasus* (Walker**,** 1847) had been treated as members of the genus *Closterocerus* (Burks, 1975; Hansson, 1985, 1987), but were transferred later to the genus *Chrysocharis* (Hansson, 1990, 1995a, b).

Characters and character states

Head

1. Shape of the frontal sulcus: (0) absent; (1) straight transverse; (2) angulate.

2. Position of the frontal sulcus: (0) closely to the median ocellus; (1) distantly from the median ocellus.

3. Subtorular grooves: (0) absent; (1) present (Table 1).

4. Supraclypeal grooves: (0) absent; (1) present (Table 1).

5. Scrobal grooves: (0) absent; (1) present connected (of "inverted Y" shape), and sutured; (2) present disconnected and sutured (of "inverted U" shaped); (3) present long, sutured: nearly subparallel in anterior half; (4) the same as previous but depressed, not sutured.

6. Mandibles: (0) bidentate; (1) tridentate; (2) multidentate.

7. Malar space (length of gena): (0) long, 1/2-1/3 of eye height; (1) short, present just as a narrow strip.

8. Malar sulcus: (0) absent; (1) present as a suture; (2) present as a row of meshes.

9. Clypeus: (0) undifferentiated; (1) delimited.

10. Pores on male scape: (0) absent; (1) present as a groove; (2) present concentrated; (3) present as a plaque.

Mesosoma

11. Pronotum: (0) reduced dorsally; (1) short conical, no collar; (2) conical, with collar.

12. Notauli: (0) deeply complete, sutured; (1) deeply traced anteriorly; (2) somewhat traced posteriorly; (3) widely traced, not margined.

13. Large setae on mid mesoscutum: (0) two pairs; (1) one pair; (2) three pairs and more.

14. Median groove on scutellum: (0) absent; (1) present.

15. Posterior margin of scutellum: (0) evenly curved; (1) overlapping the dorsellum.

Table 2. List of included outgroup taxa.

1.	*Chrysocharis prodice* (Walker), 1839
2.	*Closterocerus congruens* (Nees), 1834
3.	*Closterocerus trifasciatus* Westwood, 1833
4.	*Trisecodes agromyzae* Delvare & LaSalle, 2000
5.	*Astichomyia latiscapus* Girault, 1917; figs 39-43
6.	*Ametallon chapadae* Ashmead, 1904; figs 28-32
7.	*Chrysonotomyia auripunctata* (Ashmead), 1894
8.	*Chrysonotomyia picta* (Bouček), 1988; fig. 13
9	*Callifrons maculata* Schauff, Yoshimoto & Hansson, 1994; figs 11, 12
10.	*Clypomphale biloba* Bouček, 1988; figs 7-10
11.	*Eprhopalotus hansoni* (Schauff), 1991; figs 26-27
12.	*Holcopelte sulciscuta* (Thomson), 1878; figs 5, 6
13.	*Holcopelte obscura* (Förster), 1841
14.	*Monteithius varius* Bouček, 1988; figs 33-38
15.	*Omphale clypealis* (Thomson), 1878
16.	*Omphale salicis* (Haliday), 1833
17.	*Omphale isander* (Walker), 1839
18.	*Perditorulus penicillatus* Hansson, 1996
19.	*Tropicharis cecivora* Hansson, 1998; figs 21-25
20.	*Zaommomyiella oculata* Girault, 1913; figs 15-20

16. Posterior rim on the scutellum (SAR): (0) absent; (1) present.

17. Median groove on mesoscutum: (0) absent; (1) present, complete or incomplete.

18. Dorsellum: (0) reduced, or poorly visible; (1) narrow bar; (2) wide, delimited by rim.

19. Lateral tooth on metapleuron: (0) acute, protruding laterally; (1) calliform; (2) absent.

20. Anterior propodeal groove (APG): (0) absent; (1) somewhat traced; (2) wide, distinctly margined.

21. Median area of propodeum: (0) with no pattern; (1) with median carina; (2) with two submedian carinae; (3) irregularly carinate or striate; (4) with pattern of wide meshes and hollows.

22. Basal cup of propodeum: (0) absent; (1) present.

23. Lateral plicae: (0) absent; (1) present nearly vertical; (2) present diagonal.

24. Costula: (0) absent; (1) present.

25. Projection below the propodeal spiracle: (0) absent; (1) present.

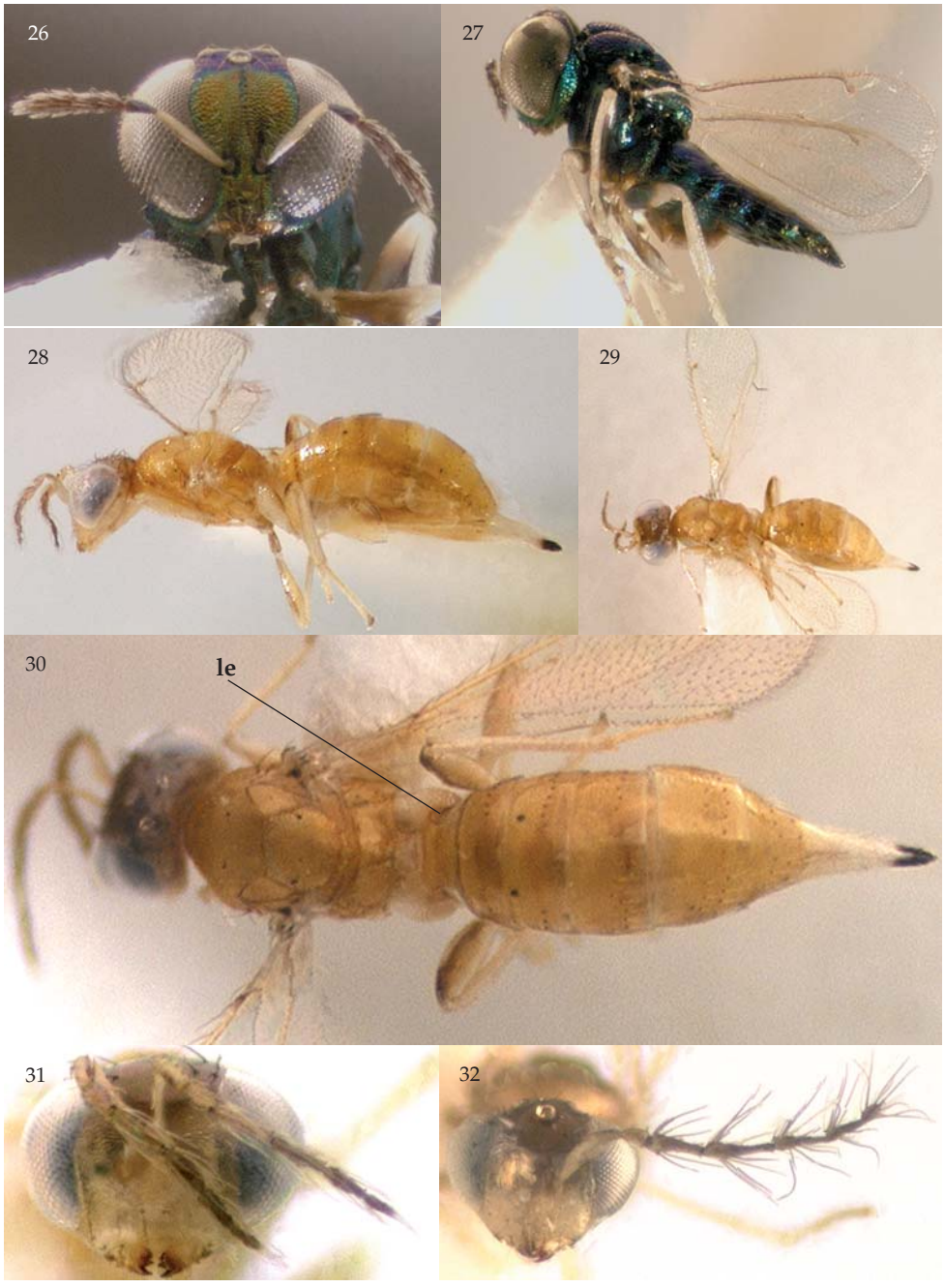
26. Postmarginal vein: (0) at least as long as half of RW; (1) shorter than half of RW.

Metasoma: male genitalia

27. Volsellar setae on male genitalia: (0) absent; (1) present small; (2) present enlarged.

28. Paramerae on male genitalia: (0) absent; (1) present.

29. Number of digital spines: (0) 2; (1) 1.



Figs 26, 27, *Eprhopalotus hansoni* (Schauff), ♀; figs 28-32, *Ametallon chapadae* Ashmead, ♀ but 32 of ♂. 26, head, frontal aspect; 27, 28, habitus, lateral aspect; 29, habitus, dorso-lateral aspect; 30, habitus, dorsal aspect; 31, 32, head, frontal aspect; le= lateral edges of first metasomal (= gastral) tergite.

Figs 33-38, *Monteithius varius* Bouček, ♀. 33, habitus , dorso-lateral aspect; 34, habitus, lateral aspect; 35, habitus, dorsal aspect; 36, propodeum and posterior part of scutellum, dorsal aspect; 37, head, dorso-frontal aspect; 38, head, frontal aspect.

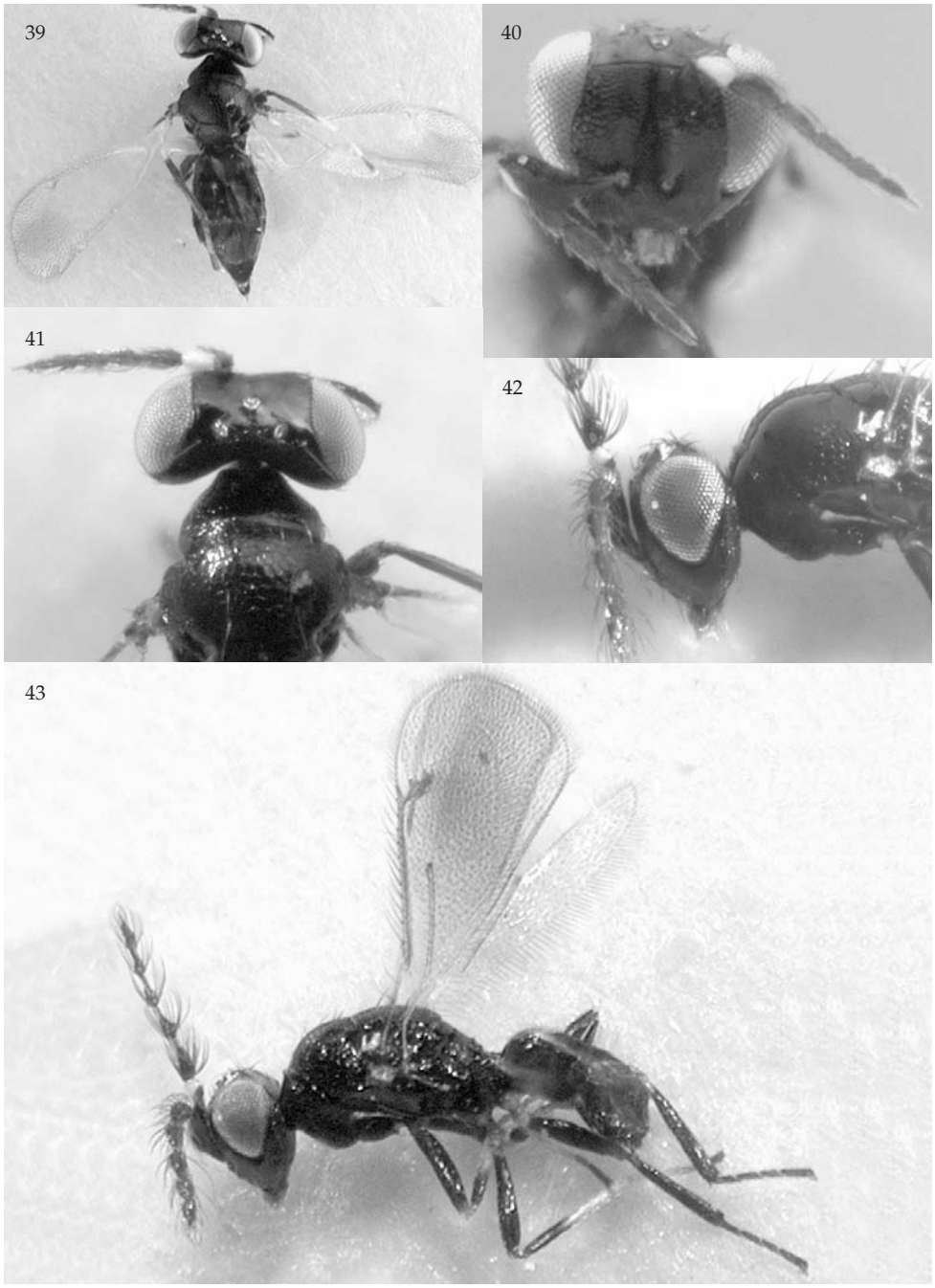
Genus *Parzaommomyia* Girault, 1915

Parzaommomyia Girault, 1915: 215; Bouček, 1988: 725. Type species (by original designation): *Parzaommomyia tenuicorpus* Girault, 1915.

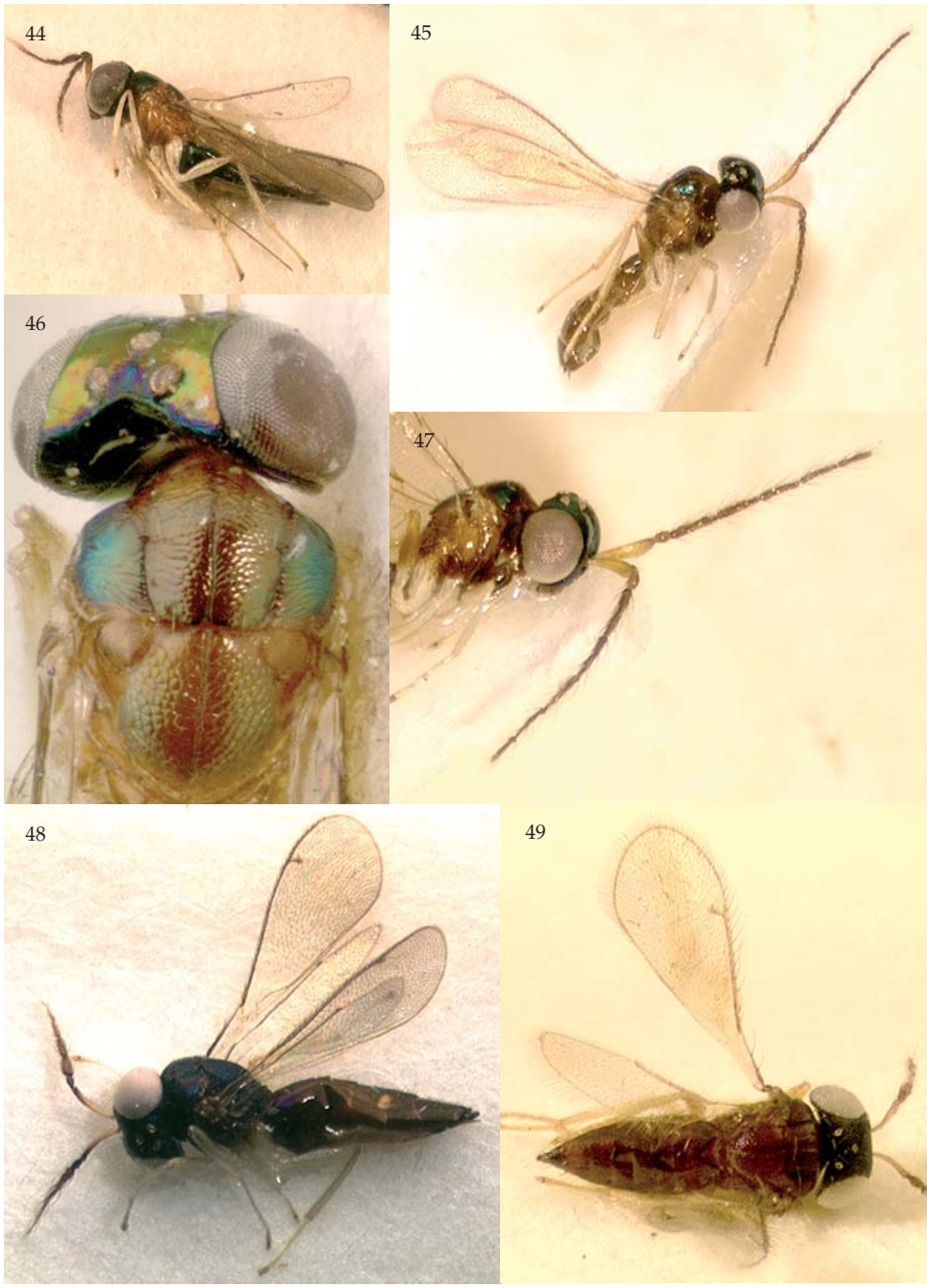
Diagnosis.— Clypeus (fig. 61, cly) delimited laterally and dorsally by deep sutures (CR complete), upper angles of this delimitation connected with toruli by grooves delimiting supraclypeus (fig. 61, scly), and forming, together with clypeal sutures, the H-shaped pattern (figs 60-62, 53, 55, 74); male scape with sensory pores fused in a "plaque" (figs 74, 82, spl); scrobal grooves sutured (fig. 60, sr); frontal sulcus angulate; notauli deep posteriorly and generally continued by fine sutures anteriorly; scutellum with alveolate, often carinate SAR (fig. 71, sar); propodeum with characteristic diagonal LPPs and deep APG; male genitalia with enlarged volsellar setae.

Description.— Ocellar triangle and vertexal sutures absent; occipital margin more (e.g., *P. africana*, fig. 67) or less (e.g., *P. crassicornis*, fig. 63) sharp; scrobal grooves distinct, sutured, forming a pattern of "inverted U" (fig. 53) or "inverted Y" (fig. 60, sr). Head poorly pubescent, eye large, with short sparse setae. Pubescence of temple moderate or absent. Tentorial pits occasionally traceable midway on lateral sutures of CR. Antenna with one ring-like anellus. Setae on antennal flagellar joints arranged in more (♂) or less (♀) distinct basal whorls. Mandibles robust, endodontal, pointed downwards, multidentate (with two big lower and some smaller upper teeth, figs 60, 61). Gena very short (*P. tenuicorpus* species group) or longer (*P. crassicornis* species group), malar suture distinct, channelled (fig. 82, ms). Anterior margin of clypeus weakly or notably produced forward (fig. 61, cly). Flagella of both sexes with 5 free joints (without "club"). Orbital-occipital distance narrow. Pronotum reduced, not carinate, almost invisible dorsally; lateral panel of pronotum rather narrow, without any shouders or carinae. Prosternum flat, subtriangular (fig. 82, psr); propleurae separated apically, not bending to lateral panel of pronotum. Mesoscutum abruptly vertical anteriorly, with two pairs of large setae medially; scutellum with one pair of setae. Axilla with one seta, axillula not outlined. Anterior mesosternum not or weakly overlapping posterior margin of prepectus (fig. 83, pp), both straight. Median scutellum and mesoscutum with longitudinal lines representing sutures or rows of punctures, situated in the same line (figs 46, 51, 58, 63-67). SC tapering at apex, joining PR anteriorly to base of the latter (SMV "broken"), costal cell rather narrow in all known species; length of PMV varies from much longer than ST (*P. tenuicorpus* species group) to slightly longer than ST (*P. crassicornis*, *P. achterbergi*). Metanotal dorsellum large, half-circular, heart-shaped or pentagonal (figs 58, 59, 65-67, 71, 73). Metapleuron weakly (*P. crassicornis*, fig. 63) or notably (e.g. *P. achterbergi*, *P. incompleta*, figs 73, 78, mpl) produced. Propodeum generally with distinct APG and LPPs (fig. 66). Metasomal petiole reduced, strongly transverse (females, figs 58, 59, 65, 66) or short conical (males, figs 73, 81). Oval membranous areas aside petiolar foramen at 1st gastral tergite small, but visible, present as narrow fissures (fig. 58, oma). Transepimeral sulcus short, slightly curved (fig. 83, tps). Ovipositor stretching along the major part of female gaster.

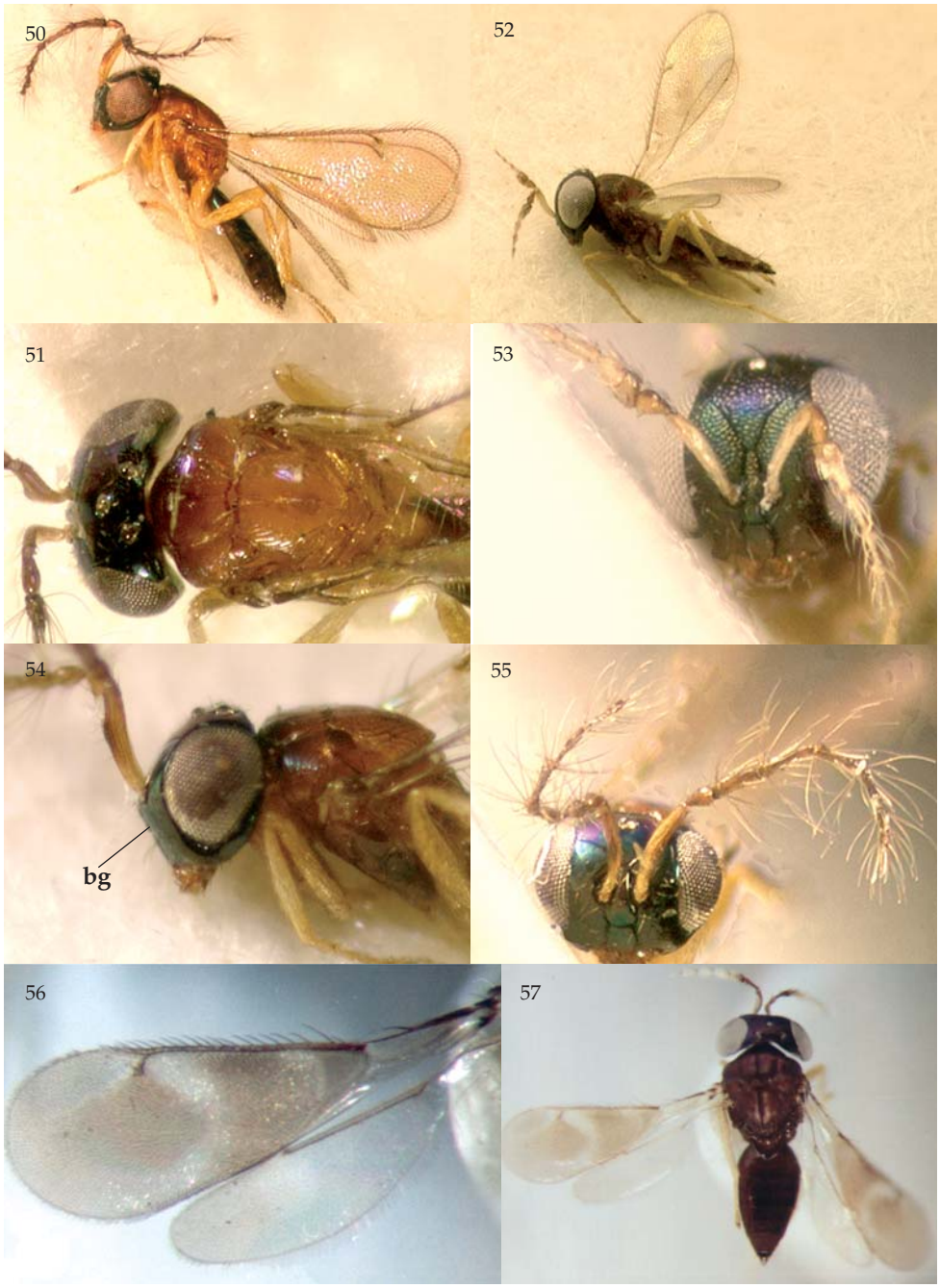
Biology.— Not known. However, we would suspect that species of this genus are



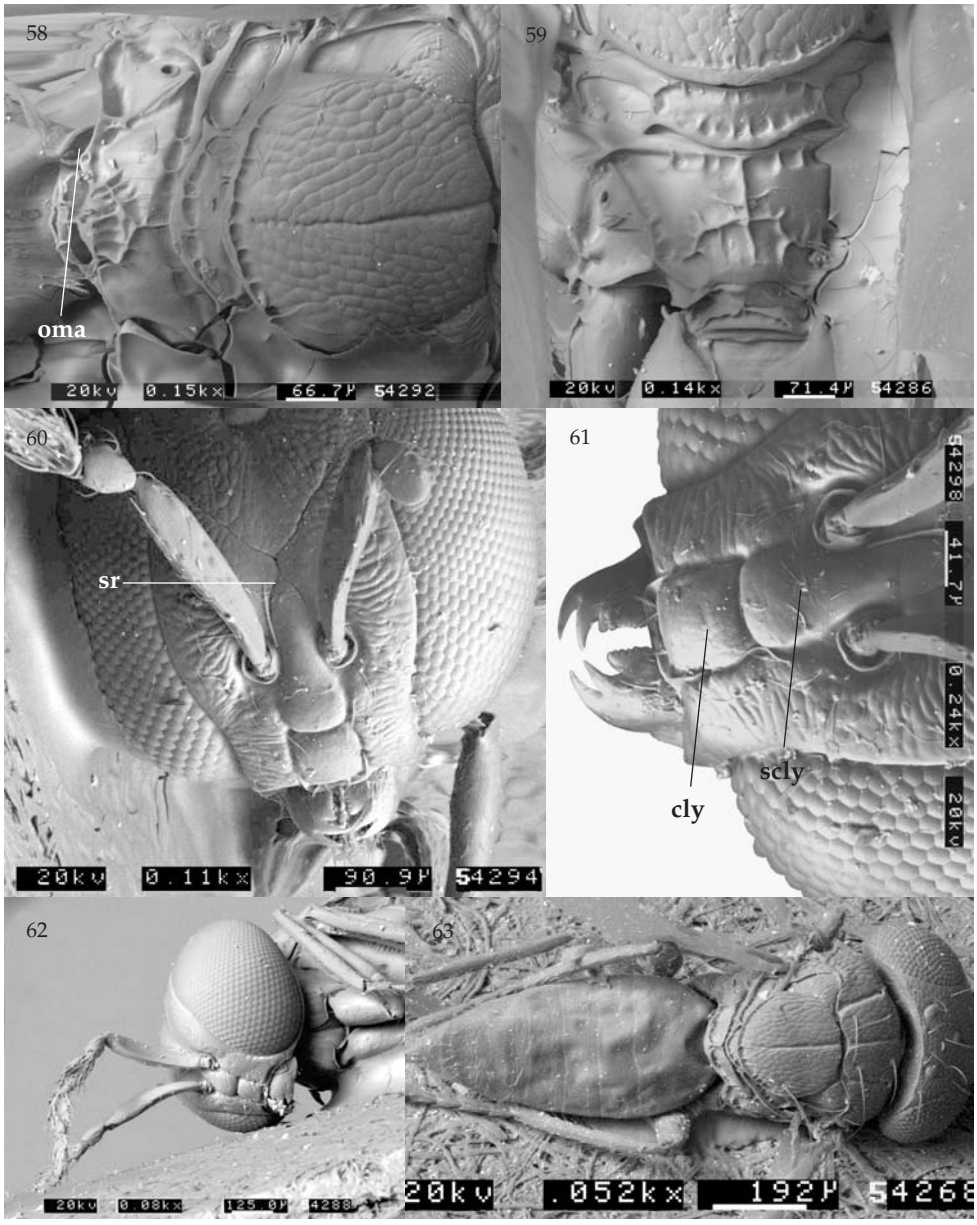
Figs 39-43, *Astichomyia latiscapus* Girault, ♀, but 42 and 43 of ♂. 39, habitus, dorsal aspect; 40, head and anterior mesosoma, dorsal aspect; 41, head, frontal aspect; 42, head, lateral aspect; 43, habitus, lateral aspect.



Figs 44-47. *Parzaommomyia tenuicorpus* Girault, ♀, but 45 and 47 of ♂; fig. 48, *Parzaommomyia sulensis* spec. nov., ♀; fig. 49, *Parzaommomyia crassicornis* spec. nov., ♀. 44, 45, 48, habitus, lateral aspect; 46, dorsum, dorsal aspect; 47, head and fore mesosoma, lateral aspect; 49, habitus, dorsal aspect.



Figs 50, 51, 54, 55, *Parzaommomyia crassicornis* spec. nov., ♂; figs 52, 53, *Parzaommomyia crassicornis* spec. nov., ♀; figs 56, 57, *Parzaommomyia achterbergi* spec. nov., ♀. 50, 52, habitus, lateral aspect; 51, head and mesosoma, dorsal aspect; 53, 55, head, frontal aspect; 54, head and anterior part of mesosoma, lateral aspect; 56, forewing; 57, habitus, dorsal aspect; bg= bulge of lower face.



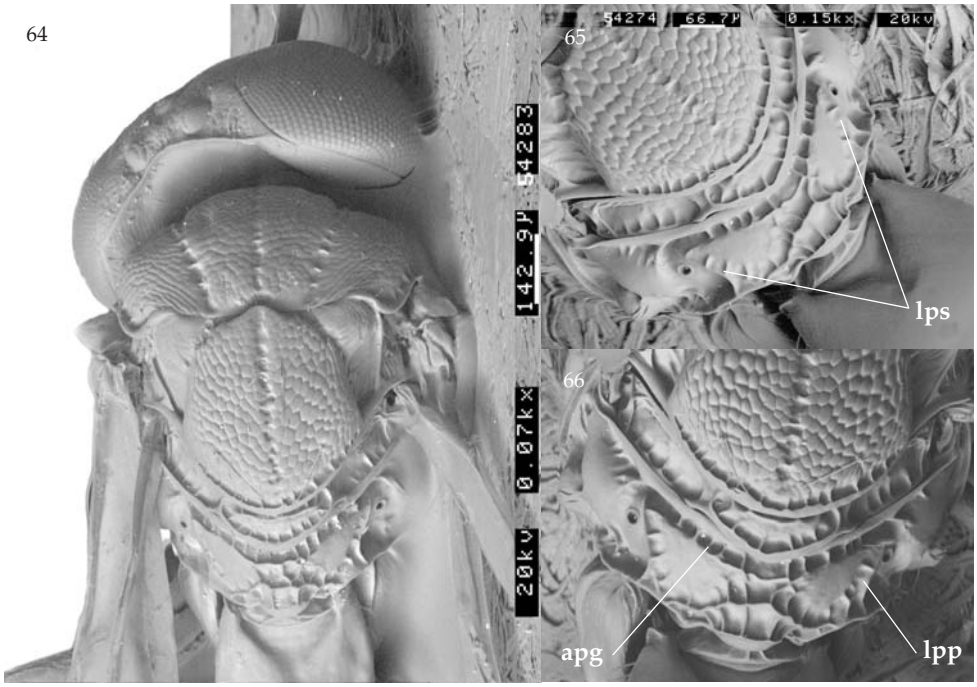
Figs 58-62, *Parzaommomyia tenuicorpus* Girault, ♀; fig. 63, *Parzaommomyia crassicornis* spec. nov., ♀. 58, posterior part of scutellum and propodeum, dorsal aspect; 59, propodeum, dorsal aspect; 60, head, frontal aspect; 61, face, frontal aspect; 62, head and anterior part of mesosoma, ventro-lateral aspect; 63, body, dorsal aspect. cly= clypeus; oma= oval membranous areas; scly= supraclypeus; sr= scrobal grooves.

cecidomyid parasitoids as in the related genus *Holcopelte*. It is interesting, that all entedonine genera having the clypeus delimited and as far as their biology is known, are parasitoids of gall formers. For instance, the genera *Omphale*, *Holcopelte*, *Chrysonotomyia* contain parasitoids of gall midges (Cecidomyidae), and *Eprhopalotus* attacks cynipid leaf galls (Schauff, 1991).

Distribution.— Palaeotropical. The representatives of this genus are rather rarely collected.

Key to species of the genus *Parzaommomyia* Girault

1. Malar space comparatively long, visible, 0.3-0.8 times as long as oral fossa, PMV at most 2.6 times as long as ST and at most 0.25 times as long as OFW; male face somewhat to notably bulging below antennal toruli ..... (*P. crassicornis* species group) 2
- Malar space short, reduced, present just as a narrow stripe (at most 0.2 times as long as oral fossa), PMV at least 3 times as long as ST and at least 0.5 times as long as OFW; face of males (when known) evenly curved ..... (*P. tenuicorpus* species group) 4
2. Supraclypeal grooves complete, female head and median dorsum of mesosoma coriarious in female, nearly smooth in male 3
- Supraclypeal grooves incomplete (not reaching toruli, fig. 74), malar space 0.7 times as long as oral fossa, scrobes not joining below frontal sulcus (of "inverted U"-shaped); propodeum (fig. 73) smooth, with characteristic pattern of deep APG, complete median carina and SCF bearing costula ..... ***P. incompleta*** spec. nov.
3. Propodeum with characteristic pattern of deep APG and forked basal cup continued downwards into two submedian carinae, metapleural callus somewhat produced (figs 78, 81); fore wing with two distinct fuscous spots in female, transparent in male; female antenna with F1 separated from F2 (fig. 77) ..... ***P. achterbergi*** spec. nov.
- Propodeum (fig. 71) with short single median carina and narrow APG not forming a cup medially; metapleural callus small, blunt; fore wing transparent in both sexes; female antenna with F1 fused with F2, and both rather wide (figs 53, 70); male face distinctly bulging below antennal toruli (fig. 54, bg) ..... ***P. crassicornis*** spec. nov.
4. Scrobal grooves joining below frontal sulcus (Y-shaped, fig. 60, sr) 5
- Scrobal grooves not joining below frontal sulcus (U-shaped), median propodeum with deep APG and median pattern represented by four ridges: two submedian carinae and two lateral carinulae; LPS somewhat grooved (delimited by LPP); figs 67-69 ..... ***P. africana*** spec. nov.
5. Propodeum with short median carina diverging posteriorly in pattern of minute carinulae (figs 58, 59) ..... ***P. tenuicorpus*** Girault
- Propodeum without median carina, median area with three rows of wide meshes separated by elevated septae (figs 65, 66) ..... ***P. sulensis*** spec. nov.



Figs 64-66, *Parzaommomyia sulensis* spec. nov., ♀. 64, head and mesosoma, dorsal aspect; 65, 66, propodeum; apg= anterior propodeal groove; lpp= lateral propodeal plica; lps= lateral propodeal sulcus.

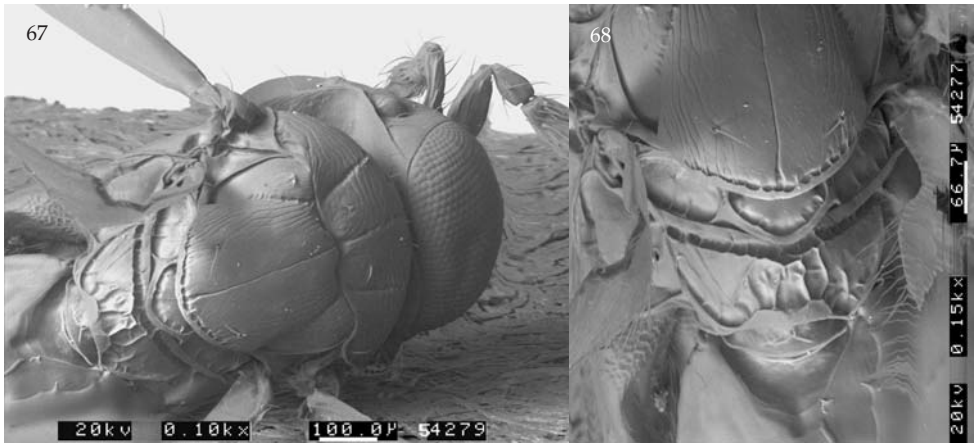
P. tenuicorpus species group

Parzaommomyia tenuicorpus Girault, 1915
(figs 44-47, 58-62)

Parzaommomyia tenuicorpus Girault, 1915: 215; Bouček, 1988: 725.

Material.— 2 ♀♀ (BMNH), "**Australia**, SE Queensland, Mt. Tamborine, 21.xii.76, (Bouček)"; 1 ♂ (BMNH), "Gap Creek, 5km ESE Mt Finnigan, 15.50 S 145.20 E, ex ethanol, 13-16.v.1981 (Naumann)"; 1 ♀ (BMNH), "N. N. S. Wales, Tooloom scrub, 8.i.77, (Bouček)"; 1 ♀ **Papua New Guinea** (BMNH), "Apingan, 15.vi.1982 (Grootaert)"; 2 ♀♀ (BMNH), "**Indonesia**, Java, Tjibodas, 5,000-7,000 ft, vii.1913, "1913-523" (Koningsberger)".

Diagnosis.— Clypeus and supraclypeus well delimited, supraclypeal sutures somewhat widened below toruli (figs 60, 61), arms of frontal sulcus not reaching inner margin of eye; scrobal grooves deeply sutured, joining anteriorly (fig. 60); antenna with F1 and F2 elongate, distinctly separated; occipital margin sharp throughout, OCD rather short, almost reduced (fig. 46); head coriarious; mesosoma coriarious, with complete, deeply sutured grooves on scutellum and mesoscutum; median propodeum with shallow, poorly margined APG, median propodeal pattern represented anteriorly by a short carina continued by irregular, asymmetrical short carinu-



Figs 67, 68, *Parzaommomyia africana* spec. nov., ♀. 67, head and mesosoma, dorsal aspect; 68, posterior part of scutellum and propodeum, dorsal aspect.

lae, posteriorly; supracoxal flange narrow medially and widened laterally, with a costula transiting from LPP (figs 58, 59)**.**

Female. Length 2.1-2.3 mm. Body brown, with bright to dark bronze-green tint on dorsal mesosoma and face; antenna pale brown, F5 paler to wholly white; gaster dark brown; legs pale, hind femur sometimes brownish (figs 44, 46).

Head.— Head 2.2 times as wide as long in dorsal view; ocelli large, POL:OOL: MDO = 14:7:7; OCD rather short, occipital margin sharp throughout. Dorsally head coriarious. Eye almost bare. Head in frontal view (fig. 60) 1.3-1.5 times as wide as high; face coriarious. Anterior margin of clypeus somewhat produced. Oral fossa 8-10 times as long as malar space, eye height 22 times as long as malar space; mandible with two big lower teeth and several smaller upper teeth (figs 60, 61). Antenna inserted at the distance subequal to three ATDs above lower eye margin (figs 60, 61). Scape 5-6 times as long as wide, 0.6 times as long as eye height; pedicel about twice as long as wide; F1, F2 and F3 of the same length, 5-6 times as long as wide; F4 somewhat shorter; F5 about 3 times as long as wide, with short terminal spine.

Mesosoma (fig. 46).— 1.25 times as long as wide. Mesoscutum 2.4 times as wide as long, with 2 pairs of setae; notauli nearly complete: deeply channelled anteriorly and continued by sutures posteriorly; scutellum wide, almost as long as wide, 1.4 times as long as mesoscutum, with complete median groove and weakly reticulate, carinate SAR; metanotal dorsellum wide, with row of indistinct meshes along its posterior margin (figs 58, 59). Propodeum (figs 58, 59) with indistinct APG subdivided by septae; median propodeal pattern represented anteriorly by a short carina continued by irregular, asymmetrical short carinulae, posteriorly. LPPs complete, somewhat curved inward. Spiracle placed on weakly elevated area, with a short projection below. SCF narrow medially and widened laterally, with a costula transiting from LPP.

Wings.— Forewing almost 3 times as long as wide; SC with two setae on dorsal

Fig. 69, *Parzaommomyia africana* spec. nov., habitus, dorsal aspect.

margin; MV 1.8-1.9 times as long as SMV; PMV about 0.6 times as long as OFW and almost 6 times as long as ST, the latter almost sessile.

Metasoma.— Petiole transverse; gaster smooth, elongate, 4 times as long as wide.

Male (figs 45, 47).— Similar to female, except for the longer antennae (combined length of pedicel and flagellum about 2.2 times as long as width of head), F1 6.5, F2 and F3 5.5, F4 5, F5 4 times as long as wide; gaster pentagonal, 2.75 times as long as wide.

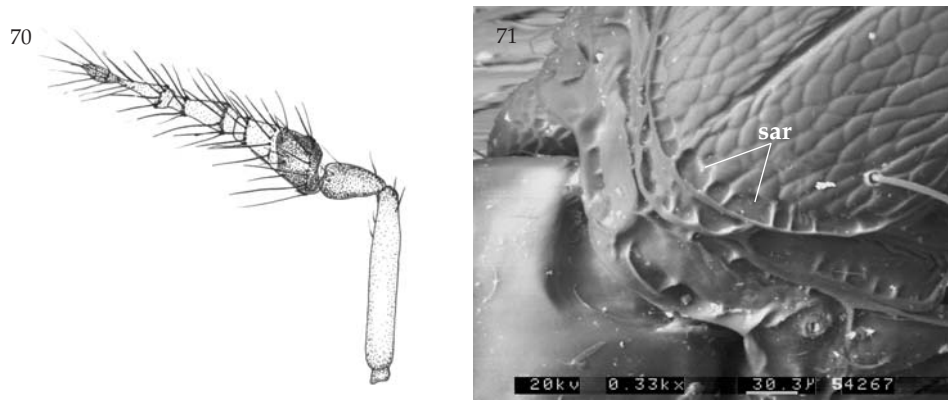
Distribution.— Australasian, Oriental.

Discussion.— *P. tenuicorpus* and *P. sulensis* are easily distinguishable by the fused anteriorly (inverted Y-shaped) scrobal grooves. *P. tenuicorpus* distinctly differs from two other representatives of the so-named species group in the structure of the propodeum.

Parzaommomyia sulensis spec. nov.
(figs 48, 64-66)

Material.— Holotype, ♀ (RMNH), "**Indonesia**, Sulawesi, Sula Isl[ands], Mangole, near Buya. Mal. trap, 11 c 460 m, 12.x.-2.xi.1993, C. v. Achterberg". Paratypes (BMNH): 1 ♀, "Sulawesi, Dumoga Bone N. P., Gunung Mogogonipa, 1000 m, v.1985, J. S. Noyes"; 1 ♀ "Sulawesi, Dumoga Bone N. P., Toraut, v.1985, J.S. Noyes"; 1 ♀ "Sarawak, Gunung Mulu National Park, ix.1978, N.M. Collins"; 1 ♀, **Malaysia**: "Malay Peninsula, Pahana Frasers Hill, 4200 feet, 28.x.1929, (H.M. Pendlebury)".

Diagnosis.— Clypeus and supraclypeus well delimited, supraclypeal sutures somewhat widened below toruli; arms of frontal sulcus not reaching eye margin, lower face smooth and shiny; eye large, almost bare, malar space very narrow, height of eye almost 30 times as long as length of malar space; scrobal grooves deeply sutured, connected anteriorly (of "inverted Y"-shaped); antenna with F1 and F2 elongate, distinctly separated; F1-F3 brown, F4 and F5 pale; occipital margin sharp, somewhat raised medially; OCD rather short; frons and vertex coriarious, lower face smooth and shiny; mesosoma coriarious, notauli and median grooves of mesoscutum and scutellum present as rows of deep meshes (figs 64-66); median



Figs 70, 71, *Parzaommomyia crassicornis* spec. nov., ♀. 70, antenna; 71, propodeum and posterior part of scutellum, dorsal aspect; sar= scutellar apical margin.

propodeum scrobiculate, without median carina, with three rows of meshes (fig. 66); LPS present as a row of wide meshes, its posterior part stretching on SCF; LPP weakly raised, continued to short costula**.**

Female. Length 2.1-2.2 mm. Body colour (fig. 48) varies from dark brown to dark blue, with metallic tint on mesoscutum (lateral areas occasionally metallic violet), scutellum, vertex and frons; antenna pale brown in basal half, darker apically, F1-F3 brown, F4 and F5 pale; gaster dark brown; legs yellow, except for brown pretarsus.

Head.— Head in dorsal view twice as wide as long; ocelli large, POL:OOL: MDO:OCD = 4.5:3.0:4.0:1.0; OCD very short, occipital margin sharp, somewhat raised and emarginate medially. Head in frontal view 1.3 times as wide as high. Height of eye slightly less than height of head (29/29.5); ratio of eye height and malar space 30:1, malar space short. Width of oral fossa 22 times as long as malar space. Mandible with two large and 2-3 smaller upper teeth. Antenna inserted about 2.5 times ATD above lower eye margin. Scape 5 times as long as wide, 1.5 times as long as eye height; pedicel 2.5 times as long as wide; flagellum with basal whorls of long setae; F1 elongate, twice as long as wide; F2 3 times as long as wide, slightly narrower and shorter than F1; F3 4.0-4.5 times as long as wide, narrower than F2; F4 of the same length and width as F3; F5 rather small, 2.5 times as long as wide, half of F4, with long terminal spine.

Mesosoma (fig. 64).— Mesosoma slightly longer than wide, coriarious, with wide meshes delimited by deep sutures, somewhat weaker on axillae. Mesoscutum twice as wide as long, with two pairs of setae; notauli and median line traced as rows of deep alveolae; scutellum wide, as long as wide or slightly longer and longer than mesoscutum, median scutellar line present as a row of deep alveolae, nearly reaching finely reticulate-carinate SAR (figs 64-66). Metanotal dorsellum wide, distinctly alveolate along its raised margin. Metapleuron blunt. Propodeum (fig. 66) without median carina, medially with three rows of wide meshes (APG first of them) separated by high septae; LPP delimiting alveolate LPS and widely stretching along comparatively narrow SCF. Spiracular area weakly raised, with very short projection below.

Wings.— Forewing almost 3 times as long as wide, SC with two setae on dorsal margin. Costal cell reduced; MV twice as long as both SMV and costal cell; PMV very long, 0.6 times as long as OFW, 4 times as long as ST, the latter short petiolate.

Metasoma.— Petiole transverse; gaster elongate elliptical, 3 times as long as wide, fourth gastral tergite with posterior margin emarginate.

Male.— Unknown.

Distribution. — Oriental (Indonesia and Malaysia).

Etymology. — Named after the type locality, the islandgroup of Sula, East Indonesia.

Parzaommomyia africana spec. nov.
(figs 67-69)

Material.— Holotype, ♀ (BMNH), "**Nigeria**, Oyo St., Ibadan, IITA compound, xi.1987, J.S. Noyes".

Diagnosis.— Clypeus and supraclypeus well delimited (forming H-shaped pattern), supraclypeal sutures somewhat widened below toruli, arms of frontal sulcus not reaching inner margin of eye; scrobal grooves deeply sutured, disconnected; occipital margin with raised sharp ridge, OCD rather short, almost reduced; head smooth and shiny; median scutellum smooth, with complete, deeply sutured median groove; lateral scutellum with coriarious sculpture; median propodeum with deep APG and median pattern represented by four keels: two submedian carinae and two lateral carinulae; LPS somewhat grooved, delimited outward by LPP (figs 67, 68).

Female (fig. 69). Length 2.1 mm. Body metallic green, except for brown propodeum, dark brown antennae and gaster. Legs pale yellow, except for brown trochanter and pretarsus. Wing venation dark brown.

Head.— Head in dorsal view twice as wide as long; ocelli large, POL:OOL: MDO:OCD = 4:3.5:3:1; OCD very short, occipital margin sharp, with raised ridge medially. Dorsal head smooth and shiny. Eye moderate, almost bare. Head in frontal view 1.2 times as wide as high; frons smooth and shiny, lower face with horizontal strigate sculpture. Eye height 10 times as long as malar space, 0.83 times as long as head in frontal view. Width of oral fossa 5 times as long as malar space. Mandible with two big teeth and one smaller upper tooth. Antenna inserted about 1.3 times ATD above lower eye margin. Scape slender, 5 times as long as wide, slightly shorter than eye height, pedicel 1.7 times as long as wide; F1 elongate, twice as long as wide; F2-F4 as long as and somewhat thinner than F1; F5 about twice shorter than the preceeding joint, with short terminal spine.

Mesosoma (fig. 67).— Mesosoma 1.3 times as long as wide, finely coriarious. Mesoscutum short, 2.5 times as wide as long, with two pairs of setae; notauli deeply channelled; scutellum wide, as long as wide and slightly longer than mesoscutum, laterally with elongate meshes delimited by deep sutures, median scutellum smooth, with deeply sutured median groove reaching finely punctate, carinate SAR (figs 67, 68). Metanotal dorsellum wide, subtriangular in shape, smooth, with a groove stretching along its raised margin. Metapleuron blunt. Median propodeum (fig. 68) with deep APG and median pattern represented by four keels; LPS grooved, delimited by long LPP, the latter continues to thin costula on widened part of SCF; propodeal nucha wide.

Wings.— Forewing three times as long as wide; SC with two setae on dorsal margin. Costal cell narrow; MV about 2.2 times as long as SMV; PMV 3.7 times as long as ST, half as long as OFW; ST very short (SMV= 2, MV= 4.5, ST= 0.35, PMV= 1.1).

Metasoma.— Petiole transverse; gaster smooth, 5 times as long as wide.

Male.— Unknown.

Distribution.— Nigeria.

Etymology.— Named after its origin, because it is the first species of the genus recorded from Africa.

P. crassicornis species group

Parzaommomyia crassicornis spec. nov.
(figs 49-55, 63, 70, 71)

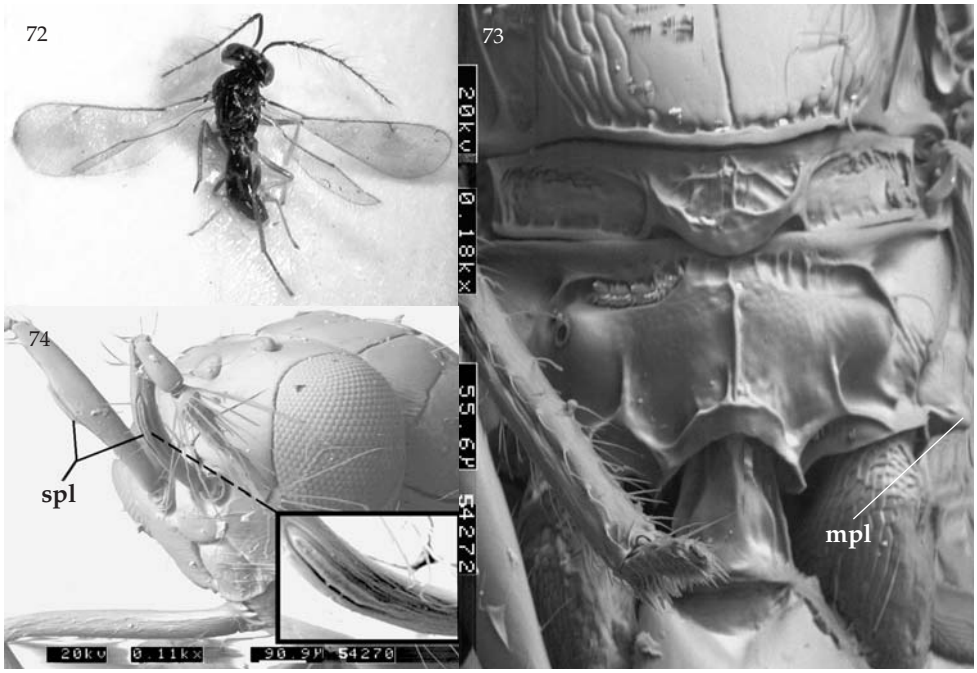
Material.— Holotype ♀ (BMNH), "**Indonesia**, Sulawesi, Dumoga Bone N. P., Gunung Mogogonipa, 1000 m, v.1985, J. Noyes". Paratypes (BMNH): 1 ♂, "**Indonesia,** Sulawesi, Dumoga Bone [N. P.], Toraut, v.1985, J.S. Noyes"; 1 ♂, ibid.; 1 ♂, "**China**, Guangdong, Ding Hu Mts., 60 km W of Guangzhou, 5.vi.1993, Zd. Bouček"; 1 ♂, "**Papua New Guinea**, Mt. Hagen, 1600 m, 17.xii.1982, Zd. Bouček".

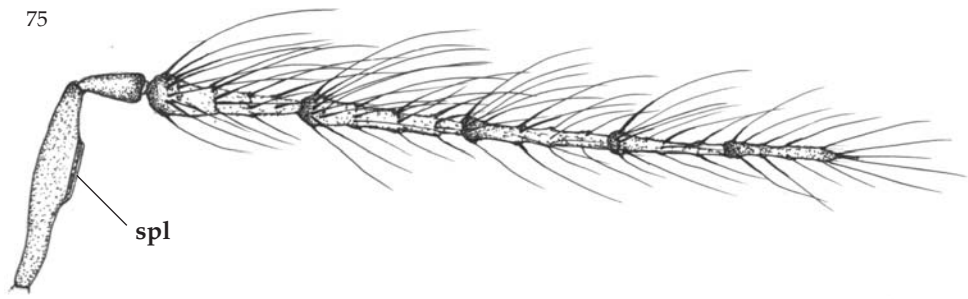
Diagnosis.— Clypeus and supraclypeus well delimited by deep sutures forming H-shaped pattern, arms of frontal sulcus not reaching inner margin of eye; scrobal grooves deeply sutured, disconnected; antenna with F1 and F2 widely fused and widened (figs 53, 70); occipital margin traced, not carinate, OCD about 1/3 of diameter of hind ocellus; head and mesosoma coriarious; median scutellum and mesoscutum with complete, deeply sutured, median groove; propodeum with narrow APG, median carina and short LPPs; SCF narrow medially, widened laterally (figs 63, 71).

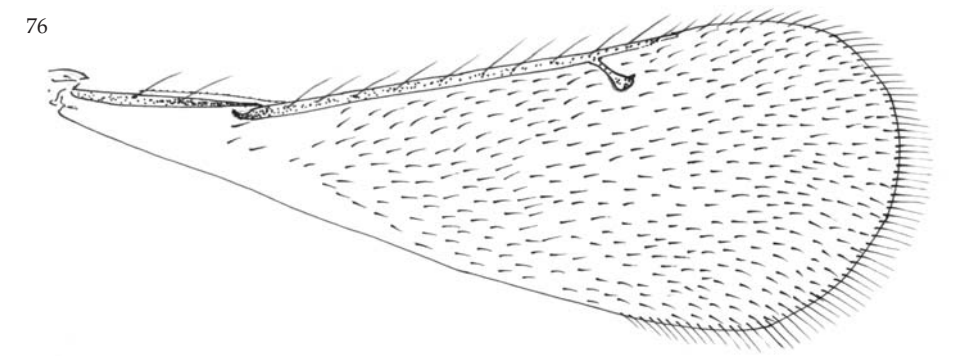
Female (figs 49, 50). Length 1.33 mm. Body mostly brown, head with green-violet metallic tint; antenna pale brown, except for darker pedicel and F1. Gaster dark brown. All legs pale brown.

Head.— Head 2.1 times as wide as long in dorsal view; ocelli small, POL:OOL: MDO = 9:4:1.4; OCD very short, occipital margin moderately sharp medially. Dorsal head light coriarious. Head in frontal view 1.2 times as wide as high (fig. 53); frons coriarious and lower face almost smooth. Eye height 3.7 times as long as malar space. Oral fossa slightly more than twice longer than malar space. Mandible with two larges lower and 2-3 smaller teeth. Antenna (figs 53, 70) inserted slightly more than ATD above lower eye margin. Scape 4.8 times as long as wide, 0.65 times as long as eye height; pedicel 1.9 times as long as wide; F1 and F2 closely attached to each other, enlarged, as long as wide; F1 subquadrate; F2 subtriangular; F3 about 1.8 times, F4 twice as long as wide, F5 2.2 times as long as wide, with long terminal spine.

Mesosoma (fig. 63).— Mesosoma slightly longer than wide. Mesoscutum short, 2.6 times as wide as long, with two pairs of setae; notauli deeply channelled; scutellum wide, as long as wide, almost twice longer than mesoscutum, median groove distinct anteriorly, disappearing posteriorly and not reaching SAR, the latter punctate and carinate (fig. 71). Both mesoscutum and scutellum coriarious. Axilla with one seta. Metanotum with irregular septae. Propodeum (fig. 71) with narrow APG and short







Figs 72-76, *Parzaommomyia incompleta* spec. nov., ♂. 72, habitus, dorsal aspect; 73, posterior part of scutellum and propodeum, dorsal aspect; 74, head, fronto-lateral aspect; 75, antenna; 76, fore wing; spl= sensory plaque on ventral edge of antennal scape; mpl= metapleuron.

median carina diverging posteriorly. PSE convex, with very short projection below; SCF scrobiculate, with lateral expansions.

Wings.— Forewing 2.6 times as long as wide; SC with two setae on dorsal margin; costal cell narrow; MV 2.1 times as long as SMV; PMV as long as ST.

Metasoma.— Petiole transverse; gaster smooth, elongate elliptical, 2.2 times as long as wide.

Male (figs 50, 51, 54, 55).— Length 1.0-1.3 mm. Head smooth, lower face bulging just below toruli (fig. 54, bg). Head in frontal view 1.3 times as wide as high. Eye height 3 times as long as malar space, 0.7 times as long as height of head. Width of oral fossa 2.1-2.25 times as long as malar space. Antenna inserted about equal to or slightly more than ATD above lower eye margin. Scape 5.4-5.5 times as long as wide, slightly longer than eye height; pedicel 1.5-1.6 times as long as wide; F1 elongate, 3.3 times as long as wide; F2 4.4 times as long as wide, slightly longer than F1, but somewhat thinner; F3 and F4 nearly 5 times as long as wide; F5 about 5 times as long as wide, with two whorls of setae and short (half of length of the joint) terminal spine; scutellum almost smooth medially, with coriarious sculpture laterally, the sculpture formed by circular sutures converging toward median groove; forewing about 2.6 times as long as wide, PMV about 1.7 times as long as ST, PMV 0.3 times as long as OFW; gaster 2.6 times as long as wide.

Distribution.— Oriental (South China, Indonesia) and Australasian (Papua New Guinea) regions.

Etymology.— The specific name, *crassicornis*, is a Latin adjective meaning "having thick antennae" and reflects the peculiar shape of F1 and F2.

Discussion.— *P. crassicornis* is easily distinguishable from the representatives of the *P. crassicornis* group. The new species differs from *P. achterbergi* in having a different median propodeal pattern (the single median carina not forming a basal cup vs. two submedian carinae ended by a cup in *P. achterbergi*) and arms of the frontal sulcus not reaching inner orbital margins (nearly reaching in *P. achterbergi*). The males differ in sculpture (head and medially scutellum smooth) and shape of the lower face (bulging), the propodeal pattern seems to be the best character to distinguish this species. Therefore, the observed diferences are considered to be the result of sexual dimorphism.

Parzaommomyia incompleta spec. nov.
(figs 72-76)

Material.— Holotype, ♂ (BMNH), "**Papua New Guinea**, "Mt. Hagen, 1600 m, 17.xii.1982 Zd. Bouček".

Diagnosis.— Apical supraclypeal sutures not reaching lower margin of torulus; arms of frontal sulcus nearly reaching inner margin of eye; scrobal grooves deeply sutured, disconnected (U-shaped); occipital margin sharp; antenna with F1 and F2 elongate, distinctly separated; occipital margin sharp medially, OCD rather short; whole head smooth and shiny; mesosoma smooth medially, coriarious laterally, with complete, deeply sutured grooves on scutellum and mesoscutum; propodeum smooth, with characteristic pattern of deep APG, complete median carina and SCF bearing costula; SPE convex, with minute projection below; metapleuron notably produced (fig. 73, mpl).

Description. Male (fig. 72). Length 2.0 mm. Body non-metallic, mostly black, except for brown legs; antenna mostly dark brown, scape somewhat pale distally. Femur brown with pale tips, tibiae and tarsi pale brown, pretarsus somewhat darker. Wing venation dark brown.

Head (fig. 74).— Head in dorsal view twice as wide as long; POL:OOL:MDO: OCD = 6:5:3:1; OCD very short, occipital margin sharp medially. Whole head smooth and shiny. Head in frontal view 1.6 times as wide as high. Eye height 3.4 times as long as malar space, almost as high as head in frontal view (24/28). Width of oral fossa 1.4 times as long as malar space. Mandible with two big lower teeth and one small upper tooth. Antenna (fig. 75) inserted 1.2 times ATD above lower eye margin. Scape 6.2 times as long as wide, with prominent sensory plica, as long as eye height, pedicel 1.6 times as long as wide; F1 elongate, 3.75 times as long as wide; F2 and F3 as long as F1, but thinner, about 5 times as long as wide; F4 and F5 about 2/3 of F1, about 6 times as long as wide, F5 with short terminal spine.

Mesosoma.— Mesosoma 1.3 times as long as wide. Mesoscutum short, 1.9 times as wide as long, with two pairs of setae; notauli deeply channelled, incomplete, median area of mesoscutum smooth, submedian and marginal areas coriarious; scutellum wide, as long as wide and slightly longer than mesoscutum, median groove complete. Propodeum (fig. 73) smooth, with characteristic pattern of deep APG and complete median carina; SCF bearing costula. SPE convex, with minute projection below. Metapleuron notably produced (fig. 73, mpl).

Wings.— Forewing (fig. 76) 2.5 times as long as wide, SC tapering at apex and joining PR anteriorly to base of the latter; SC with two setae on dorsal margin. Costal cell reduced, MV 2.3 times as long as SMV; PMV 2.8 times as long as ST.

Metasoma.— Petiole (fig. 73) conical; gaster smooth, about 2.5 times as long as wide.

Female.— Unknown.

Distribution.— Papua New Guinea (Mt Hagen).

Etymology.— Named after its characteristic incomplete supraclypeal grooves.

Parzaommomyia achterbergi spec. nov.
(figs 56, 57, 77-83)

Material.— Holotype ♀ (RMNH), "**Malaysia**, SE Sabah, nr. Danum Valley Field, C. El, 150m, Mal. trap 7, 21-25.iii.1987, C. v. Achterberg". Paratype: ♂ (BMNH), "**Indonesia**, "West Java, Tjibodas, Java 5,000-7,000 ft, viii.1913, 1913-523, Koningsberger".

Diagnosis.— Clypeus and supraclypeus well delimited by deep sutures forming H-shaped pattern, arms of frontal sulcus not reaching inner margin of eye; scrobal grooves deeply sutured, disconnected (U-shaped); antenna with F1 enlarged, separated from F2; occipital margin sharp throughout, OCD rather short; dorsal head and frons finely light coriarious; mesosoma coriarious (smoother medially in male), with complete, deeply sutured grooves on scutellum and mesoscutum; fore wing with large fuscuous spots; propodeum with characteristic deep APG with forked basal cup continued downwards into two submedian carinae, and laterad into two carinulae; LPPs distinctly raised, continuing into semicircular costulae; SCF wide and smooth; PSE without projection below (figs 78, 81).

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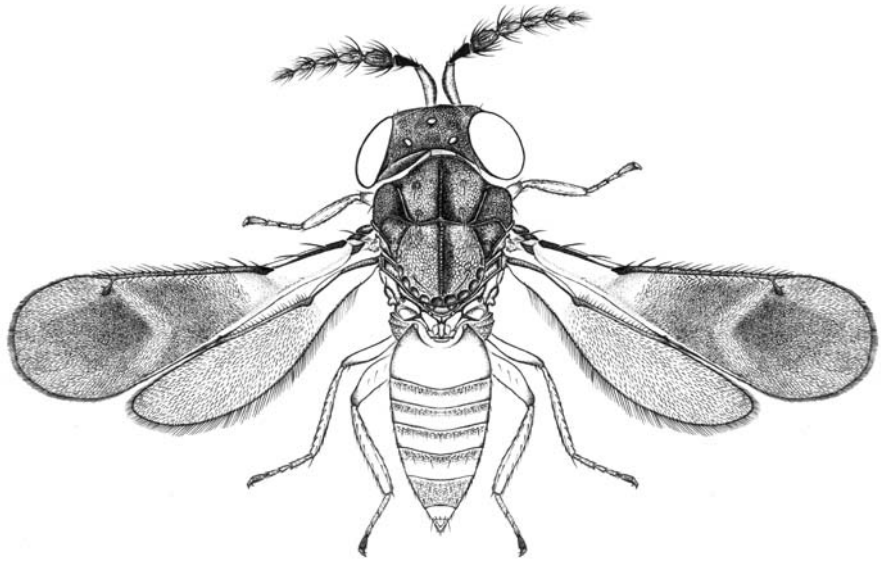

Fig. 77, *Parzaommomyia achterbergi* spec. nov., ♀, habitus.

Description. Female (figs 56, 57, 77, 78). Length 2.4-2.5 mm. Body pale brown with metallic tint on face; antennal scape pale with apex darker, pedicel dark brown, F1 brownish, rest segments pale, but their margins with brownish marks. Coxae brownish, rest legs pale, with dorsal parts of fore femora brownish. Forewing venation brown, disc of fore wing with two fuscuous spots: one in proximal part and another below stigma (figs 56, 57).

Head.— Head in dorsal view slightly more than twice as wide as long; POL:OOL: MDO = 13:5:6; OCD nearly as long as MDO, occipital margin sharp throughout. Dorsal head and frons finely light coriarious. Head in frontal view 1.27 times as wide as high. Eye height 4.5 times as long as malar space, 0.8 times as long as height of head. Scrobal grooves deeply sutured, disconnected (U-shaped). Lower face light strigate, clypeus and supraclypeus smooth. Width of oral fossa slightly more than twice as long as malar space. Mandibles multidentate, with larger lower tooth and several smaller upper teeth. Antenna inserted about twice ATD above lower eye margin. Scape 6 times as long

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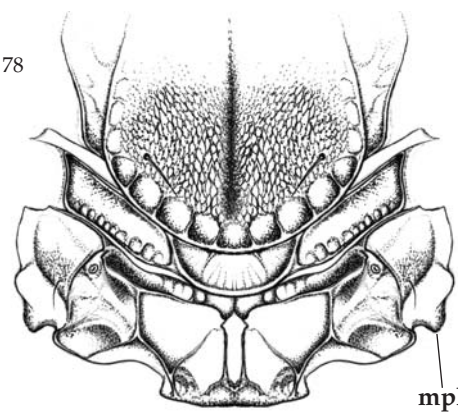

Fig 78, *Parzaommomyia achterbergi* spec. nov., ♀, posterior part of scutellum, metanotum and propodeum; mpl= metapleural callus.

Figs 79-83, *Parzaommomyia achterbergi* spec. nov., ♂. 79, habitus, lateral aspect; 80, head and anterior part of mesosoma, lateral aspect; 81, propodeum; 82, head and anterior part of mesosoma, ventral aspect (sensory plaque enlarged); 83, head and mesosoma, ventro-lateral aspect; psr= prosternum; ms= malar sulcus; spl= sensory plaque on ventral edge of scape; pp= prepectus; tps= trans-epimeral sulcus.

as wide, 0.7 times as long as eye height; pedicel 3.25 times as long as wide; F1 1.8 times as long as wide, just a little longer and wider than F2, which twice as long as wide; F3 2.25, F4 3, F5 2.5 times as long as wide; the latter joint with long terminal spine (as long as its joint). Flagellar joints with long setae concentrated proximally, in whorls.

Mesosoma.— Mesosoma 1.3 times as long as wide. Mesoscutum 2.3 times as wide as long, with two pairs of setae, deeply channelled notauli and complete median groove; scutellum 1.4 times longer than mesoscutum, somewhat wider than long, with coriarious sculpture, and with complete median groove reaching posterior margin of scutellum and virtually continuing the median groove on mesoscutum. SAR evenly punctate, carinate throughout (fig. 78). Axilla with one seta. Metanotum wide, half-circular in shape, distinctly outlined by somewhat raised rim, metanotal submedian area delimited by two carinulae radiating from upper margin of metanotum (fig. 78). Propodeum with distinct deep APG continued medially into forked basal cup, subdivided medially by a short ridge and continuing downward into two submedian longitudinal carinae, and laterad into two carinulae; LPPs complete, continuing into semicircular costula crossing SCF; PSE almost flat, without projection below (fig. 78).

Wings.— Forewing (fig. 56) 3 times as long as wide; SC with two dorsal setae; costal cell narrow, its width not exceeding width of SC in its widest (basal) part; MV 1.5 times as long as SMV and as costal cell; PMV 0.25 times as long as OFW, slightly longer than ST, the latter short petiolate.

Metasoma.— Petiole transverse; gaster smooth, long ovate, 1.3 times as long as wide.

Male (figs 79-83).— Similar to female in structure of propodeum (fig. 81), but differs as follows.

Length 1.6 mm. Head (figs 80, 82, 83) smooth, lower face somewhat raised (bulging) below toruli. Head in frontal view 1.2 times as wide as high; eye height 4.5 times as long as malar space, nearly 0.7 times as long as height of head. Width of oral fossa about 3 times as long as malar space. Antenna inserted 1.2 times ATD above lower eye margin. Scape about 5.5 times as long as wide, pedicel 2.25 times as long as wide, F1 elongate, 4.5 times as long as wide; F2 as long as F1, but somewhat thinner; F3 and F4 slightly shorter and narrower than F2; F5 long, somewhat longer than F4, about 10 times as long as wide, with short terminal spine (as long as half of the joint itself). Scutellum smooth medially, with coriarious sculpture laterally. Forewing about 2.5 times as long as wide, metasomal petiole conical, as long as wide; gaster pentagonal, twice as long as wide.

Distribution.— Oriental (Malaysia and Indonesia).

Etymology.— The name "*achterbergi*" is a patronym in honour of Dr Ing. Cornelis van Achterberg, the collector of the holotype.

Discussion.— The new species differs from *P. incompleta* and *P. crassicornis* in having a characteristic structure of the propodeum. As stated for *P. crassicornis* the males differ in sculpture (head and medially scutellum smooth) and shape of the lower face (bulging), the propodeal pattern seems to be the best character to characterize this species. Therefore, the observed diferences are considered to be the result of sexual dimorphism.

The possession of this character is also the main reason why we treat both studied

specimens as conspecific. Similarly to *P. crassicornis*, the differencies in the sculpture (head and median scutellum smooth) and shape of the lower face of male (somehwat bulging), are assumed to be an example of sexual dimorphism. The propodeal pattern supports this assumption. *P. achterbergi* reminds *P. africana* in having a similar propodeal pattern (submedian carinae and carinulae) and smooth scutellum medially (shared with male of *P. achterbergi*). However, *P. africana* has a long PMV, the fore wing transparent and the APG without a forked basal cup.

Results of phylogenetic analysis

Analysis of the data matrix presented in Table 3 using PAUP* produced nine identical most parsimonious cladograms (MPCs) of length 100 steps. A strict consensus

Table 3. Data matrix used for the phylogenetic analysis.

	C. prodice	*Cl. congruens*	*Cl. trifasciatus*	*T. agromyzae*	*A. latiscapus*	*A. chapadae*	*C. auripunctata*	*C. picta*	*C. maculata*	*C. biloba*	*E. hansoni*	*H. sulciscuta*	*H. obscura*	*M. varius*	*O. clypealis*	*O. salicis*	*O. isander*	*P. tenuicorpus*	*P. sulensis*	*P. africana*	*P. incompleta*	*P. crassicornis*	*P. achterbergi*	*P. penicillatus*	*T. cecivora*	*Z. oculata*
1	2	2	2	2	1	1	1	1	1	2	0	2	2	1	2	2	2	2	2	2	2	2	2	1	2
2	1	1	1	1	0	0/1	0	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0/1	1
3	0	1	1	1	0	0	1	1	0	0	0/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0
5	0	2	2	2	3	4	4	4	2	2	3	2	2	4	2	2	2	1	1	2	2	2	2	1/4	0
6	2	2	1	0	1	1	0	2	1	1	0	1	1	0/2	0	0	0	2	2	2	0	0	1	2	0
7	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	0	0	1	1	1	0	0	0	1	1
8	0	0	0	2	0	2	0	0	1/21/2		0	1	1	1	1/21/21/2			1	1	1	1	1	1	0	0	0
9	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	2	1	1	1	1	?	2	?	1	1	1	?	1	1	1	3	?	3	3	3	3	1	1	1
11	2	1	2	1	1	1	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12	3	2	2	0	3	3	3	3	3	3	0	1	1	3	3	3	3	1	1	1	1	1	1	3	3	3
13	0	0	0	2	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
14	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0
15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0
17	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0
18	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	2	2	2	2	2	2	1	0/1	1
19	1	1	1	2	1	0/1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
20	0	1	1	0	1	1	1	1	1	0	0	2	2	2	0	0	0	2	2	2	2	2	2	0	1	0
21	1	0	0	0	0	1	0	0	0	0	0	1	0/1	1	0	0	0	1/3	4	2	1	1	2	0	1	0
22	1	0	0	0	0/10/1		0	0	0	0	0	1	0/1	1	0	0	0	0	0	0	0	0	1	0	0	0
23	0	0	0	0	2	0	0	0	0	0	0	1	1	0	0	0	0	2	2	2	2	2	2	0	0	0
24	0	0	0	0	0/1	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1	1	1	1	0	0	1
25	1	1	1	1	0	1	1	1	0	1	1	1	1	1	0	0	0	1	0/1	1	1	0	0	0	1	1
26	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0	1
27	1	1	1	?	?	1	1	?	1	?	1	1	?	?	2	2	2	2	?	?	2	2	2	0	0	?
28	0	0	0	0	?	0	0	?	?	?	0	1	?	?	0	0	0	0	?	?	0	0	0	1	1	?
29	0	0	0	0	0	0	1	?	1	?	0	0	?	?	0	0	1	0	?	?	0	0	0	1	0	0

tree (CI = 0.46; RI = 0.7072; RC = 0.3324) of these MPCs is presented in fig. 84. For full list of apomorphies for each node see Table 4.

The genus *Parzaommomyia* was clearly monophyletic according to this analysis. However, the initial grouping of the genera having the clypeus delimited (the "*Omphale* genus-complex") was not supported by the results.

Genus *Parzaommomyia* (node 37)

The monophyly of *Parzaommomyia*, defined by node 37 (bootstrap value of 97%), is supported by the following six synapomorphies: the supraclypeal area delimited by grooves (ch. 4: 0 - 1), the sensory pores on male scape fused in a "sensory plaque" (ch. 10: 1 - 3), distinct SAR (ch. 16: 0 - 1), wide, margined dorsellum (ch. 18: 1 - 2), diagonal LPPs (ch. 23: 1 - 2), enlarged volsellar setae (ch. 27: 1 - 2). The two first characters are autapomorphies and most valuable for diagnostic purposes. The deep APG and the diagonal LPPs are quite distinctive for the genus; however, *Parzaommomyia* shares the former character with *Holcopelte* (node 38, ch. 20: 0 - 2). The enlarged volsellar setae on male genitalia (CI = 0.5) are essential for both: support of the monophyly of the genus and its separation from the similar genus *Holcopelte* (the volsellar setae are minute in this genus). Otherwise, the reduced malar space and long PMV, mentioned by Bouček (1988), proved to be gradual and variable within this genus, and diagnostic for *P. tenuicorpus* group only (ch. 26: 1 - 0). The distinct SAR (ch. 16: 0 - 1) is remarkable for *Parzaommomyia* and can be used for its separation from *Holcopelte*. However, this character is likely homoplastic and also occurs in some unrelated genera (e. g. *Pleurotroppopsis* Girault, 1913).

Two of the synapomorphies (i.e., the supraclypeus and the "sensory plaque") are of different value for the support of the monophyly of *Parzaommomyia*. The delimitation of the supraclypeal area is the most distinctive character facilitating separation of the species of *Parazammomyia* from very similar representatives of *Holcopelte* (figs 5, 6). The nature of the supraclypeal delimitation of *Parzaommomyia* is not quite clear. Generally, the upper clypeal margin is marked off by the level of the tentorial pits. However, the tentorial pits are occasionally traced midway of the clypeal rectangle (CR) in *Parazammomyia* species. We would suspect that the lower margin of the supraclypeal delimitation of *Parazammomyia* is not homologous to the upper margin of CR in the rest of the discussed genera having the CR delimited. Possibly the initial upper margin of CR is reduced in *Parazammomyia*, and the transverse groove of the H-shaped pattern (the baseline of the supraclypeus) of another origin. Further studies are needed to clarify the true nature of the facial grooves in *Parzaommomyia*.

The "sensory plaque" of the male scape (figs 74, 82, spl) has been previously known in the eulophid subfamily Tetrastichinae only, being the best character-state supporting their monophyly (Graham, 1987, 1991; Gauthier et al., 2000). *Parzaommomyia* is the only known entedonine genus having a similar sensory structure and this character supports the generic rank of the genus. The sensory pores of the male scape are situated in a row on its ventral margin in most Entedoninae. There are only a few exceptions which have the pores strongly concentrated (some species of *Closterocerus*, *Callifrons maculata*) or extended (*Perditorulus*). These are likely associated with

Table 4. Apomorphy list for the strict consensus of nine MPC, presented in fig. 84.

Branch	Character	Steps	CI	Change
C. prodice	9 (clypeal border)	1	0.333	1 - 0
	11 (pronotum)	1	0.333	0 - 2
	18 (dorsellum)	1	0.667	1 - 2
	22 (apical propodeal cup)	1	0.250	0 - 1
node 42	6 (mandibles)	1	0.250	2 - 0
	21 (median area of propodeum)	1	0.500	1 - 0
	26 (postmarginal)	1	0.333	0 - 1
node 41	5 (scrobal grooves)	1	0.800	0 - 2
	8 (malar sulcus)	1	0.333	0 - 1
node 40	7 (gena)	1	0.333	1 - 0
node 32	25 (spiracular protuberance)	1	0.333	1 - 0
node 30	6 (mandibles)	1	0.250	0 - 1
	8 (malar sulcus)	1	0.333	1 - 0
node 29	11 (pronotum)	1	0.333	0 - 1
	20 (APG)	1	0.500	0 - 1
node 27	3 (subtorular grooves)	1	0.333	0 - 1
	9 (clypeal border)	1	0.333	1 - 0
	12 (notauli)	1	0.750	3 - 2
	25 (spiracular protuberance)	1	0.333	0 - 1
C. congruens	6 (mandibles)	1	0.250	1 - 2
C. trifasciatus	10 (pores on male scape)	1	0.667	1 - 2
	11 (pronotum)	1	0.333	1 - 2
node 28	1 (frontal sulcus: shape)	1	0.667	2 - 1
A. latiscapus	2 (front. sulcus: placement)	1	0.333	1 - 0
	5 (scrobal grooves)	1	0.800	2 - 3
	23 (lateral propodeal plica)	1	0.667	0 - 2
C. maculata	8 (malar sulcus)	1	0.333	0 - (1/2)
	10 (pores on male scape)	1	0.667	1 - 2
	13 (setae on mesoscutum)	1	0.400	0 - 1
	29 (digital sclerites)	1	0.250	0 - 1
P. penicillatus	27 (volsellar setae)	1	0.500	1 - 0
	28 (paramerae)	1	0.333	0 - 1
	29 (digital sclerites)	1	0.250	0 - 1
node 31	27 (volsellar setae)	1	0.500	1 - 2
O. isander	29 (digital sclerites)	1	0.250	0 - 1
node 39	12 (notauli)	1	0.750	3 - 0
	14 (scutellar groove)	1	1.000	0 - 1
	17 (mid groove)	1	1.000	0 - 1
T. agromyzae	3 (subtorular grooves)	1	0.333	0 - 1
	8 (malar sulcus)	1	0.333	1 - 2
	9 (clypeal border)	1	0.333	1 - 0
	11 (pronotum)	1	0.333	0 - 1
	13 (setae on mesoscutum)	1	0.400	0 - 2
	19 (metapleuron)	1	1.000	1 - 2
node 38	12 (notauli)	1	0.750	0 - 1
	20 (APG)	1	0.500	0 - 2
	21 (median area of propodeum)	1	0.500	0 - 1
	23 (lateral propodeal plica)	1	0.667	0 - 1
	24 (costula)	1	0.333	0 - 1
node 33	6 (mandibles)	1	0.250	0 - 1
	22 (apical propodeal cup)	1	0.250	0 - 1

Branch	Character	Steps	CI	Change
	28 (paramerae)	1	0.333	0 - 1
node 37	4 (supraclypeals)	1	1.000	0 - 1
	10 (pores on male scape)	1	0.667	1 - 3
	16 (SAR-post.sct)	1	1.000	0 - 1
	18 (dorsellum)	1	0.667	1 - 2
	23 (lateral propodeal plica)	1	0.667	1 - 2
	27 (volsellar setae)	1	0.500	1 - 2
node 35	6 (mandibles)	1	0.250	0 - 2
	7 (gena)	1	0.333	0 - 1
	26 (postmarginal)	1	0.333	1 - 0
node 34	5 (scrobal grooves)	1	0.800	2 - 1
P.sulensis	21 (median area of propodeum)	1	0.500	1 - 4
P. africana	21 (median area of propodeum)	1	0.500	1 - 2
node 36	25 (spiracular protuberance)	1	0.333	1 - 0
P.achterbergi	21 (median area of propodeum)	1	0.500	1 - 2
	22 (apical propodeal cup)	1	0.250	0 - 1
Cl. biloba	6 (mandibles)	1	0.250	0 - 1
	13 (setae on mesoscutum)	1	0.400	0 - 1
E. hansoni	1 (frontal sulcus: shape)	1	0.667	2 - 0
	2 (front. sulcus: placement)	1	0.333	1 - 0
	5 (scrobal grooves)	1	0.800	0 - 3
	12 (notauli)	1	0.750	3 - 0
	15 (posterior scutellar margin)	1	0.500	0 - 1
	18 (dorsellum)	1	0.667	1 - 0
Z. oculata	13 (setae on mesoscutum)	1	0.400	0 - 1
	24 (costula)	1	0.333	0 - 1
node 45	1 (frontal sulcus: shape)	1	0.667	2 - 1
	2 (front. sulcus: placement)	1	0.333	1 - 0
	5 (scrobal grooves)	1	0.800	0 - 4
	20 (APG)	1	0.500	0 - 1
node 44	13 (setae on mesoscutum)	1	0.400	0 - 1
	26 (postmarginal)	1	0.333	0 - 1
A. chapadae	6 (mandibles)	1	0.250	2 - 1
	8 (malar sulcus)	1	0.333	0 - 2
	11 (pronotum)	1	0.333	0 - 1
node 43	3 (subtorular grooves)	1	0.333	0 - 1
	21 (median area of propodeum)	1	0.500	1 - 0
	29 (digital sclerites)	1	0.250	0 - 1
C. auripunctata	6 (mandibles)	1	0.250	2 - 0
M. varius	7 (gena)	1	0.333	1 - 0
	8 (malar sulcus)	1	0.333	0 - 1
	11 (pronotum)	1	0.333	0 - 2
	20 (APG)	1	0.500	1 - 2
	22 (apical propodeal cup)	1	0.250	0 - 1
	24 (costula)	1	0.333	0 - 1
T. cecivora	15 (posterior scutellar margin)	1	0.500	0 - 1
	19 (metapleuron)	1	1.000	1 - 0
	27 (volsellar setae)	1	0.500	1 - 0
	28 (paramerae)	1	0.333	0 - 1

modifications of the scape (respectively inflation and enlargement). The ventral sensory row of pores on the male scape is one of the best characters supporting the monophyly of the Entedoninae (Schauff, 1991; LaSalle & Schauff, 1994; Gauthier et al., 2000). We propose that the "sensory plaque" is a derived (i.e., raised and shortened) state of the row of sensory pores peculiar to Entedoninae. Whether or not the "sensory plaque" of the male scape of *Parzaommomyia* species is the same as that of the Tetrastichinae needs additional investigation, despites the similarity. It is evident from both morphological and molecular data (Gauthier et al., 2000) that Tetrastichinae are not closely related to Entedoninae, therefore it seems to be an example of parallelism with the Tetrastichinae.

The species group subdivision proposed in this paper, is partly supported by the cladograms obtained. The monophyly of the *P. tenuicorpus* group is strongly supported by the high bootstrap estimate (86%) and by three synapomorphies. These are: the multidentate mandibles (ch. 6: 0 - 2), the reduced gena (ch. 7: 0 - 1) and the long PMV (ch. 26: 1 - 0). The last two characters are used as key-characters for the group. The *P. crassicornis* species group remains undefined as a clade in the trees obtained. In this paper it is treated as an informal unit defined mostly by the longer malar space and a shorter PMV.

Parzaommomyia and *Holcopelte* (node 38)

The close affinity of the genera *Parzaommomyia* and *Holcopelte* has high bootstrap value (83%) and is supported by five synapomorphies. These are: the notauli deeply traced anteriorly (ch. 12: 0 - 1), APG wide and distinctly margined (ch. 20: 0 - 2), the propodeal costula present (ch. 24: 0 - 1), LPP vertical (ch. 23: 0 - 1), and also the median area of the propodeum with carina (ch. 21: 0 - 1). The two latter characters are supposed to undergo further modifications (the diagonal LPPs and various structure of the median propodeum) in *Parzaommomyia*.

Chrysonotomyia genus-complex

Node 45, representing a sister group to the rest genera + *Chrysocharis*, is supported by four synapomorphies: the frontal sulcus transverse (ch. 1: 2 - 1) and placed closely to the median ocellus (ch. 2: 1 - 0), the scrobal grooves long, subparallel in apical part (ch. 5: 0 - 4) and APG traced (ch. 20: 0 - 1). Among these characters, the first three ones are the most distinctive, making recognition of this genus-complex easy. This clade includes the genera *Chrysonotomyia* (figs 11, 12), *Monteithius* (figs 33-38), *Ametallon* (figs 28-32) and *Tropicharis* (figs 21-25).

Hansson (1998) characterized *Tropicharis* as having the transverse frontal sulcus, long subparallel scrobal grooves, widened membranous SCF (fig. 23, scf), single median carina, enlarged volsellar setae (ch. 27: 1 - 0) and paramerae on male genitalia (ch. 28: 0 - 1). Another peculiar character (not mentioned in the original generic diagnosis, but present in the type species, *T. cecivora*), is the tooth-like protrusion of the metapleuron (fig. 23, mpt; ch. 19: 1 - 0). Such a protrusion of the metapleuron is characteristic for all the representatives of the *Pediobius*-complex of genera (Gumovsky, 2001b). However, the metapleural "tooth" of *Tropicharis* is the only example among the discussed genera of Entedoninae. This character, in combination with the ones men-

tioned above, and the overhanging scutellum (figs 22, 23; ch. 15: 0 - 1), makes the genus *Tropicharis* rather easy to recognize.

The long PMV and two pairs of large setae on median mesoscutum separate *Tropicharis* from the rest representatives of this clade, having PMV short (ch. 26: 0 - 1) and one pair of median scutellar setae (ch. 13: 0 - 1).

Monophyly of the genus *Chrysonotomyia* (bootstrap value of 61%) is supported by three synapomorphies, i.e., the presence of the subtorular grooves (fig. 14, st; ch. 3: 0 - 1), the smooth median area of the propodeum (ch. 21: 1 - 0), and the digital sclerites with one spine either (ch. 29: 0 - 1). The status of this genus was earlier discussed by Gumovsky (2001a). The possession of the subtorular grooves and the absence of the diagnostic characters of *Tropicharis* (mentioned above), allow to distinguish *Chrysonotomyia* from *Tropicharis*. The subtorular grooves (also shared by *Closterocerus* and *Trisecodes*) are stretching down from the toruli (fig. 12, st) and to some extent might be confused with the supraclypeal grooves of *Parzaommomyia*. Both types of grooves are compared in Table 1.

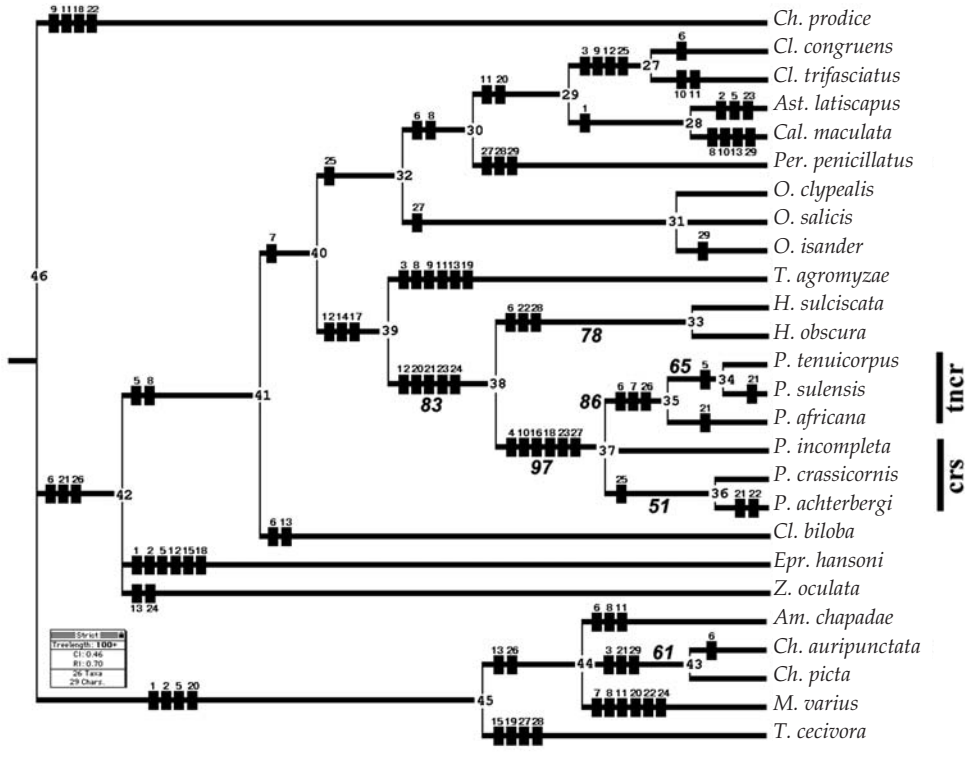

Fig. 84. The strict consensus tree of nine most parsimonious cladograms: tree length = 100; consistency index (CI) = 0.46; retention index (RI) = 0.70; rescaled consistency index (RC) = 0.33. Black hashes, numbers above them, and node numbers key to unambiguous character state changes given in text and Table 1; bootstrap values are indicated by large bold italic numbers under nodes and shown for nodes with >50% bootstrap support; tncr= *P. tenuicorpus* species group; crs= *P. crassicornis* species group.

The Australasian genus *Monteithius* (figs 33-38) and the Neotropical genus *Ametallon* (figs 28-32) are sister groups to *Chrysonotomyia*. *Monteithius* is recognizable in having a distinct basal propodeal cup (fig. 36, ch. 22: 0 - 1). The genus *Ametallon* is mainly characterized by the lateral edges of the first gastral tergite (Hansson, 1996a, fig. 30, le). Additional characters defining both genera are shown in fig. 84 and listed in Table 4.

The Neotropical *Astichomyia latiscapus* (the type species of the genus, figs 39-43) is likely to be a representative of this genus complex, but it was regarded in the analysis as the sister group of *Callifrons maculata* (node 28). Most characters supporting the monophyly of *Chrysonotomyia*-complex, are present in *Astichomyia* as well (ch. 20 - node 29; ch. 1 - node 28; ch. 2, 5 - its own node). Obviously, an additional analysis of this relationship is necessary.

Other genera

Rest of the clades, gathering outgroup taxa, were not significantly supported; the list of apomorphies supporting each clade is shown in Table 4.

The Australasian genus *Zaommomyiella* is very similar to *Parzaommomyia* in general habitus (figs 15-20). This genus is characterized by the large eyes, the narrow frons and the arms of the frontal sulcus diverging at rather acute angle (Bouček, 1988). Among these characters, the peculiar shaped frontal sulcus is the most important, together with the shortened scrobal grooves and the dense pubescence along the orbits of the eyes (fig. 19). In our trees this genus is characterized by two apomorphies: one pair of large setae on mid mesoscutum (ch. 13: 0 - 1) and the possession of the propodeal costula (ch. 24: 0 - 1).

The genus *Eprhopalotus* (figs 26, 27) may be distinguished by the complete, sutured notauli, the missing frontal sulcus and by many additional features (Schauff, 1991; Gibson et al., 1997; Schauff et al., 1998). The possession of the enlarged volsellar setae on male genitalia (shared also by *Omphale* and *Tropicharis*) is also a diagnostic character of the genus (Hansson, 1998). In the strict consensus tree it is a sister group to the large clade (node 41) containing the majority of the taxa analyzed.

Clypomphale biloba Bouček (figs 7-10) is distinguishable in having the forward produced clypeus (figs 8-10, cly), although some Nearctic species of *Omphale* (e.g., *O. excerta* Hansson) have a similar clypeus (Hansson, 1996a). However, in the analysis *C. biloba* remains far removed from *Omphale* (fig. 84), because of the tridentate mandibles (ch. 6: 0 - 1) and one pair of setae on mid mesoscutum (ch. 13: 0 - 1).

The enigmatic *Trisecodes agromyzae* (having the unique 3-segmented tarsi) is treated as a sister taxon to *Parzaommomyia* + *Holcopelte* (node 38), based on the possession of deeply sutured notauli (ch. 12: 3 - 0), the median scutellar groove (ch. 14: 0 - 1) and the mid groove on the mesoscutum (ch. 17: 0 - 1). Despite this most parsimonious choice of PAUP*, in our opinion, *Trisecodes* is likely to be more related to *Closterocerus* (in having the subtorular grooves), than to *Omphale* and *Holcopelte*. Anyway, there was no strong bootstrap support for such a grouping.

The clade containing *Omphale*, *Perditorulus*, *Callifrons*, *Astichomyia* and *Closterocerus* (node 32), is supported by a single apomorphy, i.e., propodeum without projection below the propodeal spiracle (ch. 25: 1 - 0) . The composition of the clade is interesting. The placement of *Astichomyia* in this complex is discussed above. The delimited

clypeus of *Omphale* was the initial basis for the assumption of affinity. However, such an affinity was neither supported in our trees, nor in the preceding papers dealing with various aspects of the phylogeny of Entedoninae (Schauff, 1991; Gauthier et al., 2000). However, *Omphale* and *Closterocerus* (= *Asecodes*) were neighbouring clades in the trees proposed in these papers. Considering that the data sets, character coding and tree rootings used in these studies differ considerably (e.g., morphological data in Schauff, 1991, and molecular data in Gauthier et al., 2000), such a congruence deserve detailed research of the relationships between *Omphale* and *Closterocerus*.

It was pointed out by Hansson (1996a, 1996b) that the only difference between *Omphale* and *Perditorulus* is the presence of the enlarged volsellar setae on the male genitalia in *Omphale* (not enlarged in *Perditorulus*). Males of *Perditorulus* have peculiar genitalia, in particular, the possession of paramerae and the variable number of digital spines. However, the status of *Perditorulus* requires more precise attention, because the number of digital spines is variable within the related genus *Omphale*, and the size of the volsellar setae is a gradual character.

Callifrons (figs 11, 12) has rather characteristic protrusions of the head (Schauff et al., 1994; Hansson, 1996a). This genus is regarded to be a sister group of *Astichomyia* in having a transverse frontal sulcus (ch. 1: 2 - 1). The concentrated sensillae on the male antennal scape (ch. 10: 1 - 2) are of particular interest among the characters defining this clade. This occurs also in some species of *Closterocerus* (a neighbour group in the node 29) in combination with the inflation of the scape.

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