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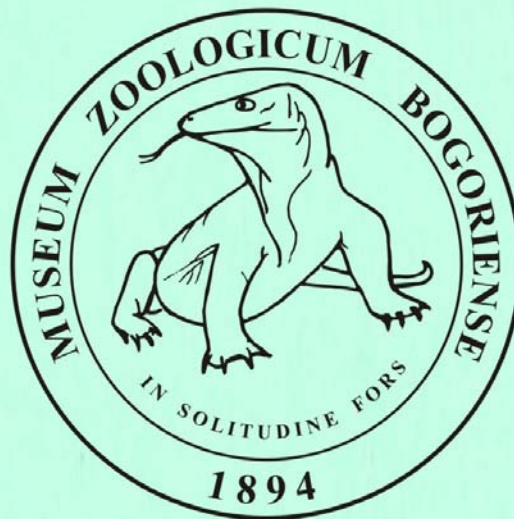
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TREUBIA

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OF THE INDO-AUSTRALIAN ARCHIPELAGO*

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**A CONTRIBUTION TO THE KNOWLEDGE OF THE
PARASITIC WASPS SUBFAMILY EULOPHINAE
(HYMENOPTERA: EULOPHIDAE) OF JAVA, INDONESIA**

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Abstract

A study of the eulophid wasp subfamily Eulophinae was carried out between 2004-2006 in Java and the adjacent small islands (e.g. Bali, Madura, Nusa Barong, Sempu, Nusakambangan and Krakataus) to determine the Eulophinae fauna of Java. As a result, 23 genera and 86 species, belonging to the subfamily Eulophinae were found, from those 11 genera and 35 species are new record for Java and Indonesia. Key to genera, generic diagnostic and the available eulophine species to the islands are presented.

Key words: Eulophidae, Eulophinae, Hymenoptera, Indonesia, Java, key to genera, new record, taxonomy.

INTRODUCTION

Within eulophid wasps, the subfamily Eulophinae are the second largest in terms of the number of recognized species and genera, after the Tetrastichinae and followed by the Entedoninae, with approximately 1,320 species in 101 genera currently recognized (Noyes 2002). Members of Eulophinae are generally small to minute (0.4-3.0 mm), with a few exceptions being longer than 3 mm. The subfamily can be defined by the following combination of characters: submarginal vein smoothly joining to parastigma; postmarginal vein well developed, usually longer than stigmal vein; dorsal surface of submarginal

vein with three or more setae; scutellum with two pairs of setae (Graham 1987; Bouèek 1988).

Bouèek (1988) arranged the eulophine genera into six tribes (Eulophini Westwood, 1829; Elachertini Ashmead, 1904; Euplectrini Ashmead, 1904; Ophelimiini Ashmead, 1904; Anselmellini Bouèek, 1988 and Keryini Bouèek, 1988). However Gauthier *et al.* (2000) combined the tribes of Eulophini, Elachertini and Euplectrini, removed the Keryini from the Eulophidae, removed the Anselmellini and Ophelimiini from the Eulophinae, moved the Elasmidae into the Eulophinae at the tribal rank, and recognized the existence of an additional tribe in the Eulophinae, the Cirrospilini. They proposed a concept of Eulophinae classification based on molecular and morphological evidence comprising three tribes: the Eulophini (including Elachertini + Euplectrini), Elasmini and the Cirrospilini, which they erected as new.

The Eulophinae have been known as an entomophagous insect which are attacking other insects and spiders (Araneida). The subfamily can be endoparasitoids or ectoparasitoids; idiobionts or koinobionts; solitary or gregarious; primary parasitoids, hyperparasitoids or facultative hyperparasitoids; or specialists or generalists. The parasitoid eulophinaecan attack eggs, larvae, and pupae but the predatory species display a specialised form of parasitism where the wasp larva consumes many prey within an enclosed space (such as a gall or an egg sac). Species that develop this way are known to consume spider eggs in silken egg sacs (LaSalle 1990). Phytophagous species again display a variety of life styles, and may be inquiline within galls (Sheng & Zhao 1995), gall-formers themselves (Somerfield 1976; Headrick *et al.* 1995) or internal seed feeders (Bouèek 1988, LaSalle 1994).

The Eulophinae have been used in biological control programs directed against dipteran and lepidopteran leaf-mining pests, and many genera have economically important species; for example, *Cirrospilus* Westwood, *Diaulinopsis* Crawford, *Hemiptarsenus* Westwood, *Sympiesis* Förster, *Diglyphus* Walker, *Semielacher* Bouèek, and *Zagrammosoma* Ashmead which all contain species which are parasitic on leafmining Lepidoptera and Diptera. Several species, namely *Diglyphus begini* Ashmead, *D. isaea* Walker, *D. intermedius* Girault and *D. minoicus* Walker have been used successfully in biological control of leaf-mining Agromyziidae (Diptera), in particular of *Liriomyza* (Baranowski 1987, Blumel 1992, Boot *et al.* 1992, Coote & Ellis

1986). A programme against the citrus leafminer, *Phyllocnistis citrella* (Stantion) (Lepidoptera: Gracillariidae), used *Cirrospilus ingenuus* Gahan and *Semiela cher petiolatus* Girault. These two species have been introduced into several countries to control the citrus leaf-miner (Schauff *et al.* 1998).

The first Indonesian species of the Eulophinae was found by Zehntner (1897), who described *Eulophus femoralis* as a parasitoid on a sugarcane pest, *Cosmopterix dulcivora* (Lepidoptera: Cosmopterigidae), from Pasuruan, East Java. Later Gahan (1922) described two species, *Sympiesis javensis* [*Diaulomella javensis* (Gahan, 1922)] and *Elasmus brevicornis* Gahan, 1922, both from West Java, adding the second and third species to the Indonesian eulophine fauna. In a series of eulophid taxonomic work, Ferrière (1930, 1933, 1940, 1941) made important progress in understanding Javanese eulophines. In this series, Ferrière (1933) described a new eulophine species, *Sympiesis javanica* [*Dimmockia javanica* (Ferrière 1933)], from West Java, which is now known as biological agent for controlling the coconut leaf beetle, *Promecotheca cumingii* (Coleoptera: Chrysomellidae) (Reddy 1972). Nine new species of Eulophinae from Java were then described by him in 1940-1941. Other useful regional work covering Indonesia is Boucek (1988), who studied Australasian Eulophidae. Wijesekara & Schauff (1994) studied the tribe Euplectrini in Sri Lanka, but they also included some specimens from Indonesia. Very recently taxonomy of Indonesian Eulophinae has been initiated by Ubaidillah *et al.* (2000, 2003, 2006) and Ubaidillah and Kojima (2002, 2006). The purpose of this paper is to improve accuracy and consistency of taxonomic identification of Javanese Eulophinae by providing the most recent information available and generic key by clarifying difficulties with line drawing of important characters, the distribution and their hosts. The present study recognises 23 genera and 48 described species of Eulophinae occurring in Java and small adjacent islands.

MATERIALS AND METHODS

Materials used in the present study were mostly freshly collected from 2002 through 2006 by the author and are now deposited in the Museum Zoologicum Bogoriense (MZB), the Indonesian Institute of Sciences (LIPI).

The materials were collected mainly by sweep netting, but also using Malaise traps and yellow-pan traps, and also by rearing from hosts. The sweep nets and yellow pan traps and sometimes the Malaise traps were applied especially to habitats where Eulophinae species diversity is presumed to be high (e.g. secondary and primary forests, forest edges, agriculture areas, grasslands). The following four collection methods were used to collect eulophine wasps and the specimens were prepared by the adequate methods according to the methods of collection (Noyes 1982). The mounting technique adopted in the present study is of Noyes (1982) with some modification in the size of the rectangle card and glue. Morphological terminology in the generic key and diagnosis follow Bouèek (1988) and Gibson (1997).

RESULT AND DISCUSSION

Taxonomy

Eulophinae

Diagnosis. Among the eulophid, the most striking, definitive features of the subfamily, characterized by the following combination of characters: antenna with 2-4 funicles, scutellum with 2 pairs of setae, sometimes with additional hairs, postmarginal vein well developed, usually longer than stigmal vein, dorsal surface of the submarginal vein with 3 or more setae, submarginal vein joining smoothly to parastigma.

Key to Javanese Genera of Eulophinae

1. Hind coxa flattened and enlarged; hind tibia with dark brown or black setae arranged in diamond-shape or wavy rows (Figure 1). Forewing elongate, narrow and wedge-shaped (Figure 2). Dorsellum hyaline, projecting backward to form triangular plate over propodeum (Figure 3).
Antenna with three funicular flagellomeres in female, four flagellomeres and first three branched in male (Figure 4). Body black to brown, sometimes with metallic tinge and few small yellow spots
..... *Elasmus* Westwood (Elasmini)

- Hind coxa neither flattened nor enlarged; hind tibia without brown or black setae, or if the setae present then they are never arranged in diamond-shape or wavy rows. Forewing not elongate or narrow (Figures 6, 11, 21). Dorsellum not hyaline, never projecting backward over propodeum (Figures 7, 9) 2
- 2. Antenna funicle with two flagellomeres (Figures 10, 15, 17) 3 (Cirrospilini)
- Antennal funicle with three to five flagellomeres (Figures 24, 29, 32, 33)..... 4 (Eulophini)
- 3. Fore wing with one or two dark infuscated areas behind proximity of marginal vein and behind stigmal vein, and/or with a clump of dark thick hairs just behind marginal vein (Figures 19, 20); torulus situated at or below level of ventral margin of eye; scutellum flattened medially, smooth or finely striated, without submedian groove (Figure 18).
Scrobe depressed, horseshoe-shaped; eye relatively large, oval; antenna short, with scape short and slender, clava three articles (Figures 16, 17); pronotum large, with four long setae; body non-metallic, yellowish brown *Trichospilus* Ferrière
- Fore wing without any dark infuscated area behind proximity of marginal vein and most area behind stigmal vein (Figures 6, 11); torulus separated from dorsal margin of oral cavity or in median part of face; scutellum not flattened medially, finely to coarsely sculptured, with or without submedian groove 4
- 4. Vertex vaulted, swollen dorsally well beyond level of dorsal margins of eyes (Figures 14, 15). Notaulus curved outward to meet axilla (Figure 13).
Axilla expanding anteriorly over to scutellar suture (Figure 13). Forewing often with infuscated areas; submarginal vein with five or six dorsal setae. Scutellum with paired, fine submedian lines; propodeum shiny, finely sculptured, with median carina indicated posteriorly. Body never metallic, but usually yellow with black stripes (Figures 13, 14) or sometimes entirely black *Zagrammosoma* Ashmead
- Vertex not vaulted (Figures 11, 13). Notaulus complete and variable (Figures 9, 11), but never strongly curved to meet anterior parts of axillae. Forewing usually without infuscate markings; submarginal vein with three or more dorsal setae (Figures 6, 11); postmarginal vein as long as or

- slightly longer than stigmal vein. Body never striped, sometimes metallic green to non-metallic yellow or entirely black
- *Cirrospilus* Westwood
5. Hind tibia with at least one spur longer than basitarsus (Figures 63, 93, 110) 6
- Hind tibia with no spurs longer than basitarsus (Figures 25, 28) 9
6. Scutellum without submarginal groove (Figures 60, 68, 74), smooth and shiny; mesoscutum with four pairs of thick, long setae; propodeum with a median carina (Figures 74, 80, 86). Pronotum transverse, dorsally with a fine median transverse carina (Figures 86, 91), area behind the transverse carina smooth and furnished with six long, thick white setae. Body black except yellowish-brown markings on legs and antenna; metasoma sometimes yellowish brown *Euplectrus* Westwood
- Scutellum with distinct sublateral groove (Figures 27, 31, 38, 46), and sculptured; mesoscutum with four or more setae, but neither thick nor long; propodeum with one or two median carinae; pronotum with or without transverse carina 7
7. Propodeum with two strong submedian carinae meeting anteriorly to form H-shape (Figures 52, 53); scutellar sublateral grooves weak, not meeting posteriorly; head without occipital carina (Figure 52); notauli complete, reaching anterior margin of scutellum; pronotum anteriorly with transverse carina (Figures 50, 52).
Petiole very short, much broader than long; longest metatibial spur reaching half length of the second metatarsomere
- *Euplectromorpha* Girault
- Propodeum with single median carina, split anteriorly or with a basal cup like, with a Y or T-shaped (Figure 109); occipital carina present or absent; scutellar sublateral groove prominent and often meeting anteriorly 8
8. Hind tibia with one spur (Figure 110); antennal funicle with four articles in both sexes (Figure 108); pronotum with transverse carina (Figure 106); propodeum with single median carina (Figure 109)
- *Metaplectrus* Ferrière
- Hind tibia with two prominent spurs (Figure 116), outer spur shorter than inner one; pronotum with a weak transverse median carina anteriorly,

- with pronotal collar gradually sloping to form a neck (Figure 116); scutellum coarsely sculptured and with sublateral grooves that may or may not curve to meet each other posteriorly; propodeum with a median carina (Figure 119) *Platyplectrus* Ferrière
9. Notaulus complete (Figures 38, 42, 45), reaching posterior margin of mesoscutum; male flagellomeres unbranched (Figures 39, 45); scutellum with sublateral grooves (Figures 38, 42), median disk of scutellum sometimes with elongated median pit or depressed (Figures 21, 22) 10
- Notaulus absent or if present then incomplete; first three male funicular articles usually branched (Figures 48, 101); scutellum without sublateral grooves (Figures 49, 111); median disk of scutellum without any elongated median pits or not depressed (Figures 49, 120) 18
10. Propodeum with two submedian carinae connected in middle, forming an H- or X-shaped structure (Figures 97, 100) 11
- Propodeum with one median carina, forming a Y or T-shaped structure (Figures 22, 28) 12
11. Metasomal petiole long, one and half times as long as abdominal terga (Figure 100); mesonotum and scutellum very coarsely and irregularly rugose (Figure 100); pronotum with distinct transverse carina; scutellum with an elongated pit or depressed (Figure 100).
Head with occiput concave (Figure 100), without temple, dorsolaterally almost touching the eyes; posterior vertex, just behind the posterior ocelli with transverse carina; eyes large and hairy; scrobe shallow, lower face slightly convex with tentorial pit on each side dorsal margin of the clypeus; antennal funicle with five articles (Figure 98) *Stenopetius* Bouèk
- Metasomal petiole short or transverse (Figure 96); pronotum without transverse carina; mesonotum and scutellum finely reticulated; scutellum flat or slightly convex, without elongated median depression, with complete sublateral grooves meeting posteriorly; temples developed; antennal funicle with four articles (Figure 96)
..... *Stenomesus* Westwood
12. Scutellum with an elongated median pit or depressions (Figures 21, 22); pronotum and mesoscutum irregularly reticulated; pronotum with indistinct transverse carina; propodeum with median carina expanding anteriorly into a raised, triangular, cup-shaped structure; plicae present and costulae

- absent (Figure 22); body metallic bluish-green or metallic green
 *Alophomorphella* Girault
- Scutellum without median pits or depressions; plicae and costulae present or absent 13
13. Propodeum with plicae, costulae and irregular transverse rugae (Figure 28); scutellum with complete sublateral grooves converging but not meeting posteriorly and having their margins relatively sharp; funicle with four articles (Figure 29); clypeus with tentorial pit present (Figure 30)
 *Diglyphomorpha* Ashmead
- Propodeum with both costulae and irregular transverse rugae absent; scutellum with sublateral grooves converging and meeting each other posteriorly (Figures 42, 46); clypeus with tentorial pit absent 14
14. Pronotum with sharp transverse carina anteriorly (Figure 56); propodeum with distinct plicae (Figure 57) 15
- Pronotum without transverse carina; propodeum with or without plicae. 16
15. Pronotum long and broad; notauli deep throughout their length, reaching the anterior margin of scutellum (Figure 56); metasomal tergum number two much larger than any other tergum dorsally and covering more than half abdominal terga (Figure 56) *Euplectrophelinus* Girault
- Pronotum short, transverse; notauli very fine posteriorly (Figure 114); second metasomal tergum short, and if longer than any other metasomal terga, then it is never longer than half length of abdominal terga
 *Necremnoides* Girault
16. Propodeum with median carina forked posteriorly to form large cell or nucha areola above petiolar insertion; plicae incomplete, projecting from anterior corners of nuchal areole (Figure 26); scutellar submarginal grooves sinuate (Figure 27) or with rows of alveolate reticulation and converging medially but not connected posteriorly; scutellar disk smooth and shiny or very finely reticulated.
 Antennal funicle consisting of four or five funicles in both females and males; antenna sometimes with very narrow gap between apex of apical-most funicular article and base of clava (Figure 25); eyes setose
 *Deutereulophus* Schulz

- Propodeum with median carina not defining posterior areola (Figure 86); scutellar submarginal grooves complete, not converging medially, and curving inward at posterior margin of scutellum and meeting or nearly meeting each other (Figure 88); scutellar disk with deep punctured or moderately reticulated 17
- 17. Disks of mesoscutum and scutellum with deep punctures (Figures 31, 38); scutellar submarginal grooves punctate, sharply carinate inner sides; propodeal median carina T-shaped anteriorly, often raised into a perpendicular lamina and sometimes propodeum lateral to median carina depressed, and with shallow groove besides the carina (Figure 31); plicae present, curved outward to the lateral propodeal margin; area between plicae smooth or sometimes with irregular sculpture.
Vertex with transverse carina (Figure 32); frons sometimes with short transverse carina situated below median ocellus and as long as diameter of median ocellus. Antennal funicle with four articles in both female and male (Figure 32), in male clava sometimes hardly defined
..... *Diglyphomorphomyia* Girault
- Disks of mesoscutum and scutellum lacking deep punctures; scutellar submarginal grooves faint, meeting posteriorly to form U-shape; propodeal median carina usually simple, sometimes Y-shaped anteriorly (Figure 32); plicae absent, replaced by groove; disk of propodeum smooth medially.
Occiput with or without transverse carina; short transverse carina on frons absent; antennal funicle with four articles in female (Figure 35) and five in male; midlobe of mesoscutum with three or more pairs of setae (Figure 38), sometimes with irregularly placed additional setae
..... *Elachertus* Spinola
- 18. Antennal funicle with three articles (Figure 49) 19
- Antennal funicle with four or five articles (Figures 102, 112) 20
- 19. Mandibles reduced, not touching each other medially when closed; basitarsus at least of metatarsomere, distinctly shorter than second tarsomere; scutellum with two pairs of long setae only, without scattered short setae; occiput not excavated and not margined. Pronotum elongate *Eulophus* Geoffroy

- Mandibles normal, touching each other medially when closed; basitarsus at least metatarsomere, distinctly longer than second tarsomere; scutellum with scattered short setae in addition to two pairs of long setae; antennal funicle consisting of three articles (Figure 49); occiput strongly excavated and dorsally margined, occipital carina present but weak. Pronotum short, conical in outline; mesoscutal disk posteriorly with a pair of long setae, and dense short setae over the disk; notauli absent (Figure 49)
..... *Eulophomorpha* Dodd
- 20. Propodeum with plica complete, connected to median carina by irregular transverse costula, the area between plica and costulae smooth (Figure 111); antennal funicle comprised of four articles (Figure 111). Notauli incomplete (Figure 111); mesoscutal disk irregularly setose; scutellum without submedian grooves, reticulate, sometimes uniformly or finely reticulated as in mesoscutum (Figure 111). Post marginal vein usually more than twice the length of stigmal vein (Figure 113) .
..... *Pnigalio* Shrank
- Propodeal transverse costulae absent, plicae sometime present; antennal funicle comprised of four or five articles 21
- 21. Mesoscutum hairy, with surface not shining but irregularly reticulated; propodeum with complete step-like plicae, hence the area between plicae slightly higher than the area lateral to plica; propodeal disk reticulately sculptured (Figure 115). Antennal funicle comprised of four articles in both sexes. Notaulus incomplete or barely indicated (Figure 115), mesoscutal disk evenly setose; scutellum with submedian grooves absent. Submarginal vein with three or more dorsal setae; postmarginal vein at least twice as long as stigmal vein (Figure 115)
..... *Notanisomorphella* Girault
- Mesoscutum not hairy; mesoscutal disk dull, reticulately sculptured; propodeum without complete step-like plicae 22
- 22. Torulus located above mid-height of face; scape when rested exceeding beyond level of vertex (Figure 47). Antenna with funicle consisting of four or five articles; branches of male flagellomeres covered with very short hairs (Figure 48).
Mesosoma slightly flattened; notaulus absent; axilla only slightly advanced anterior to scutellar margin. Forewing at least 2.6 times longer than broad;

- costal cell seven to 15 times as long as broad. Body slender; legs elongate; females sometimes brachypterous. Propodeal median carina and plicae present or absent *Hemiptarsenus* Westwood
- Torulus located below mid-height of face; scape when rested never exceeding beyond level of vertex. Antennal funicle with four articles in both sexes (Figures 101, 102), but five in a few species; branches of male flagellomeres covered with long hairs (Figure 101). Body not slender, or if slender, then legs are not elongate. Notaulus incomplete or terminated in anterior half of axillae; mesosoma not flattened. Propodeal median carina complete, incomplete or absent; propodeal costula and plica incomplete or absent. Forewing usually less than 2.6 times longer than broad; costal cell usually less than seven times longer than broad; submarginal vein with four or more dorsal setae; postmarginal vein longer than stigmal vein (Figure 105) *Sympiesis* Förster

Tribe Cirrospilini

Diagnosis. Antennal funicle with two flagellomeres in both sexes; face with transverse groove; frontoclypeal suture present laterally; propleuron separated distally; mesoscutum with two pairs of large setae; hind basitarsus short, and hind tibia with one spur; postmarginal vein present, most often about equal in length to stigmal vein; submarginal vein with three or more setae on dorsal surface.

1. Genus *Cirrospilus* Westwood (Figures 5-12)

Cirrospilus Westwood, 1832: 128. Type species *Cirrospilus elegantissimus* Westwood, by monotypy. Synonymized under *Cirrospilus* by Bouček (1988: 612).

Atoposoma Masi, 1907: 276. Type species *Atoposoma variegatus* Masi, by monotypy. Synonymized under *Cirrospilus* by Bouček (1958: 172).

Atoposomoidea Howard, 1910: 9. Type species *Atoposomoidea ogimae* Howard, by monotypy. Synonymized under *Cirrospilus* by Peck (1951: 458).

Winnemana Crawford, 1911: 620. Type species *Winnemana argei* Crawford, by monotypy. Synonymized under *Cirrospilus* by Graham (1975: 281).

- Gyrolasella* Girault, 1913: 105. Type species *Gyrolasella consobrinus* Girault, by monotypy. Synonymized under *Cirrospilus* by Bouèek (1988: 612).
- Cirrospilomella* Girault, 1913: 265. Type species *Cirrospilomella fasciatus* Girault, by monotypy. Synonymized under *Cirrospilus* by Bouèek (1988: 612).
- Pseudiglyphomyia* Girault, 1913: 267. Type species *Pseudiglyphomyia biguttatus* Girault, by monotypy. Synonymized under *Cirrospilus* by Girault (1916: 222).
- Cirrospilopsis* Girault, 1915: 263. Type species *Cirrospilopsis nigrivariatus* Girault, by monotypy. Synonymized under *Cirrospilus* by Bouèek (1988: 612).
- Parzagrammosoma* Girault, 1916: 222. Type species *Zagrammosoma pulchra* Girault, by monotypy. Synonymized under *Cirrospilus* by Bouèek (1988: 612).
- Austrolynx* Girault, 1916: 222. Type species *Austrolynx flavitibia* Girault, by monotypy, synonymized under *Cirrospilus* by Bouèek (1988: 612).
- Ootetrastichoides* Li, 1936: 221. Type species *Ootetrastichoides habachi* Li, by monotypy, synonymized under *Cirrospilus* by Graham (1975: 281).

Diagnosis. Antennal funicle with two flagellomeres in both sexes; notauli complete, generally deep, straight to meet scuto-scutellar suture, or meeting axilla (Figures 10, 14, 19, 23); position of axilla (Figures 14, 19, 24, 33) variable between anterior to or lateral to scutellum; mesosoma slightly convex or slightly depressed; scutellum with two pairs of setae, and with submedian lines (sometimes faint and difficult to see in some species); propodeum variable in the shape, varying from relatively short to quite long; median carina of propodeum varying from complete to absent especially in the group with very short propodeum (Figures 19, 23, 27, 33); dorsellum generally longer than the propodeum in the group with short propodeum (Figure 27) and shorter than propodeum in the group having long propodeum; postmarginal vein as long as or slightly longer than stigmal vein.

Biological information. Biological information on *Cirrospilus* is available only for limited species (Bouèek & Askew 1968, LaSalle & Schauff 1992, Yefremova 1997, Noyes 2002). They are primarily solitary or gregarious ectoparasitoids of leaf-mining larvae of Diptera, Coleoptera and Lepidoptera, but a few species are hyperparasitoids or facultative hyperparasitoids. A few Australian species have been noted egg parasitoids or gall associates (Bouèek

1988). Parasitoid forms can be idiobionts or koinobionts, or specialists or generalists. The biological information of Javanese species is still very poorly known, except for *C. ambiguous* collected from agromyzid leafminer, *Liriomyza* spp. and one unidentified species from a lepidopteran leaf miner (Hansson and LaSalle 1996).

Distribution. *Cirrospilus* is worldwide in its distribution, mainly occurs in the Australian/Pacific, Palearctic, Nearctic and Afrotropical regions. So far three described species and six undescribed species are recorded in Java, but these figures show that the Javanese species of this genus are relatively diverse, in terms of area covered, compare with other regions, such as Afrotropical (11 spp.), Nearctic (27 spp.), Europe (eight spp.), Neotropic (three spp.), Orient (13 spp.) and Palearctic (30 spp.).

Discussion. *Cirrospilus* is the largest genus in the tribe Cirrospilini, with about 150 species currently recognized as valid. The number of species recorded here is likely to be considerably underestimate because many areas are still very poorly surveyed. For instance, only 13 species have been known in the Indonesia, while the fauna in Queensland has about 50 species. Morphological and biological diversity make this genus very difficult to study taxonomically. Boucek (1988) suggested that five species groups are probably recognized in the Australasian species. The status of these groups is still uncertain for the Indonesian species and there may actually be only two species groups in Indonesia.

Cirrospilus ambiguous Hansson and LaSalle
(Figures 9-10)

Cirrospilus ambiguous Hansson & LaSalle, 1996: 194-196.

Biological information. This species is recorded mainly as a parasitoid of leafmining Agromyzidae on vegetables crops, *Liriomyza huidobrensis*, *L. sativae* and *L. trifolii*, which are considered to be economically important pests in many countries (LaSalle and Parrella 1991, Ubaidillah *et. al* 2000).

Distribution. Indonesia: Java and East Lesser Sunda, **Sulawesi and Halmahera (new records)**; also South Africa, Tanzania, India, Taiwan, Malaysia.

Specimens examined. *West Java:* 1 ♀ (MZB), Perhutani Garut, Leuwi Pari, 13.vi.2005. 07°41'S 107°50' E. Sutrisno, H & E. Cholik, sweep net; 1 ♀ (MZB), Central Java, Cilacap, West Nusakambangan, Karanganyar, 07°42'S 108°42'E; 5 ♀ (MZB) D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Bawah, 07°35'S 110°24'E, alt 910 m, 15.vii.2005, Ubaidillah & Darmawan; 5 ♀ (MZB), Bali, Singaraja, Pemeron, 08°10'S 115°02'E, 9.ix.2005, R. Ubaidillah & J. Kojima, sweep sample bush. 2 ♀ (MZB) Bali, Badung, Mangwi, Kuwun, 08°13'S 115°09'E, 10.ix.2005, R. Ubaidillah & J. Kojima, sweep sample longbean; 1 ♀ (MZB) Bali, Badung, Mangwi, Boa, 08°30'S 115°11'E, 10.ix.2005, R. Ubaidillah & J. Kojima, sweep sample longbean; 1 ♀ (MZB), Ndona Woloweku (Farm), Central Flores, *East Lesser Sunda*, 24.i.2003 R. Ubaidillah; 1 ♀ (IUNH), Molonggota, Tinggola, Gorontalo, North Sulawesi, 8.ix.2003, Ubaidillah & Kojima; 1 ♀ (MZB), Patunuang Nature Reserve, 05°03'S 119°43'E, Maros, South Sulawesi, 8.ix. 2003, Ubaidillah & Kojima; 2 ♀ (MZB), Jati, 01°05'N 29°29'E, Jailolo, Halmahera, North Maluku, 8.ix.2003, Ubaidillah & Kojima.

***Cirrospilus variegatus* (Masi)**

(Figures 5-8)

Atoposoma variegatum Masi, 1907: 276. Combined to *Cirrospilus* by Bouèek & Askew (1968: 39).

Biological information. This species has been recorded from the host of bucculatricid moths (*Bucculatrix thurberiella*), gracillarid moths (*Phyllonorycter corylifoliella*, *P. messaniella*, *P. pyrifoliella*, *Metriochoa inferior*, *M. latifoliella*, *M. neglecta*) nepticulid moths (*Stigmella malella*, *S. mespilicola*), lyinetiid moths (*Leucoptera coffeina*, *L. coffeella*, *L. malifoliella*, *L. meyricki*); agromyzid moths (*Liriomyza trifolii*) and tephritid dipteran (*Bactrocera oleae*).

Distribution. Indonesia: **Java and Sulawesi (new record)**; also recorded from New Zealand, Australia; India, Sweden, Italy, Hungary, Maroco, Turkey, Azerbaijan, Turkmenistan, Uzbekistan, Ethopia, Kenya Uganda and Tanzania.

Specimens examined. *West Java*: 1 ♀ (MZB), Bogor, Jasinga, around Gua Gudawang, 06°27'S 106°30'E, 21.iii.2004, R. Ubaidillah, sweep sample; 3 ♀ (MZB) North Sulawesi; Gorontalo, Labanu, edge of Tangale Nat.res, 00°44'N 122°51'E, 14.1x.2003, R. Ubaidillah, sweep sample; 3 ♀ (MZB) North Sulawesi; Gorontalo, Attinggola, Molonggoto, 00°56'N 123°01'E, 14.1x.2003, R. Ubaidillah, sweep sample.

***Cirrospilus ingenuus* Gahan**
(Figures 11-12)

Cirrospilus ingenuus Gahan, 1932: 753.
Scotolinx quadristriata Subba Rao & Ramamani, 1966: 412. Synonymized by Ujiye & Adachi (1995: 96).

Biological information. The species is best known to be a parasitoid of the citrus leafminer, *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae), is an important pest of citrus and related Rutaceae in Southeast Asia, Australia, East and West Africa (Heppner 1993, Argov & Rössler 1998).

Distribution. Indonesia: West Java; also wide range distribution found from Australia (New South Wales, Queensland, South Australia, Victoria); China (Guangdong, Jiangxi); India (Delhi, Punjab, Rajasthan); Japan; Philippines; Taiwan; and Thailand.

Specimens examined. *West Java*: 2 ♀ (MZB), Bogor, T.N. Gunung Gede Nat. Park, Bodogol, 06°46'S 106°51'E, 12.viii.2004, R. Ubaidillah, sweep sample; 1 ♀ (MZB), Bogor, Bogor Botanic Garden, altitude 250 m, 8.vi.2004, R. Ubaidillah.

2. Genus ***Trichospilus*** Ferrière
(Figures 16-20)

Trichospilus Ferrière (1930): 358. Type species *Trichospilus pupivora* Ferrière, 1930, by monotypy.

Diagnosis: Small (0.9-2.0 mm long); body predominantly yellow-orange or almost brown; head short; frontovertex convex, with sparse hairs; scrobes

depressed, horseshoe-shaped; eye relatively large, oval; antennal torulus situated at or below the level of ventral margin of eye; antenna short (Figures 34, 35), with scape short and slender, funicle with two articles, and clava three articles; pronotum large, with four long setae (paired dorsolateral setae and one laterally) along posterior margin; notaulus complete, reaching posterior margin of mesoscutum; median disk of mesoscutum with two pairs of setae; scutellum without sublateral grooves (Figure 36), with two pairs of setae; propodeal median carina ending anteriorly in small lamina; plica present; metasoma semi-oval in dorsal view and flat dorsally, with petiole short and transverse.

Biological information. They are gregarious pupal parasitoids mainly of lepidopteran caterpillars (Noyes 2002).

Distribution. Indonesia: Java and **Sulawesi (new record)**, Africa, China and one species, *T. diatraeae* occurs widely in tropical and subtropical areas throughout the world, but the last one seems to have been introduced into various parts of the world from tropical Asia as biological control agents. (Dharmaraju 1963, Bouèek 1976, Noyes 2002).

Discussion. This genus is easily recognized by the combination character in diagnosis. This is a small genus, with eight species so far recognized (Ferrière 1930, Cherian & Margabandhu 1942, Bouèek 1976, 1988, Zhu & Huang 2002a, Ubaidillah 2006). Of the eight species, three (*T. boops* Bouèek, 1976, *T. ferrierei* Bouèek, 1976 and *T. vorax* Bouèek, 1976) are known only from Africa, another three species *T. pupivorus* Ferrière, 1930, *T. politus* Ubaidillah, 2006 and *T. striatus* Ubaidillah, 2006 were described from Indonesia and *T. lutelineatus* (Liao *et al.* 1987) has been recorded only from Zhejiang, China (Noyes 2002). The remaining one, *T. diatraeae* Cherian and Magabandhu, 1947 was described from India.

Trichospilus pupivorus Ferrière

(Figure 20)

Trichospilus pupivorus Ferrière, 1930: 358-359.

Trichospilus pupivorus Ferrière: Bouèek, 1988: 633.

Biological information. This species has been known to be an endoparasitoid and gregarious of larvae of noctuid moths (*Anadevidia*

peponis, *Helicoverpa armigera*, *Sesamia calamistis*, *Speia vuteria*, *Spodoptera frugiperda*, *S. litura*, *S. mauritia*, *Tiracola plagiata*), pyralids (*Cnaphalocrocis medinalis*, *Corcyra cephalonica*, *Haritalodes derogate*, *Lamprosema annubilobata*, *Palpita machaeralis*, *Tirathaba rufivena*), hyblaeaid (*Hyblaea pueria*), limacodid (*Thosea cervina*), tortricids (*Cryptophlebia williamsi*), oecophorid (*Nephantis serinopa*, *Opisina arenosella*) and larva of a nymphalid butterfly (*Ariadne merione*).

Distribution. This is Southeast Asian origin species which has been imported into other areas of the world. So far, the species has been recorded from Mauritania, Barbados, India, Sri Lanka, Burma, Malaysia, Indonesia and New Guinea (Noyes 2002).

Specimens examined. 2♀ (MZB), Ciburayut, Gombong, Sukabumi, West Java, 18–14.vi.2004, M. Rofik, Malaise traps; 1♀ (MZB), Bogor Botanical, Garden, Bogor, 8.v.2002, R. Ubaidillah; 1♀ (MNHN), Bantimurung, secondary seasonal forest, South Sulawesi, 20 m, 31.vii-11.viii.2005, Dougeron, C. Villemant.

***Trichospilus politus* Ubaidillah**

(Figures 16-19)

Trichospilus politus Ubaidillah, 2006: 218-220

Distribution. Known only from West Java and North Sulawesi.

Specimens examined. ♀ (Holotype, MZB), labelled “INDONESIA, West Java, Bandung, Ciwidey, Gunung Patuha 07°09’59" S 107°24’39"E, 13.x.2004, Coll. R. Ubaidillah” and “♀ *Trichospilus politus* Ubaidillah, sp. nov. Holotype”; 1♀ (Paratype, MZB), Dumoga Bone NP, Torout, Sulawesi, v.1985, J.S. Noyes.

3. Genus ***Zagrammosoma*** Ashmead

(Figures 13-15)

Hippocephalus Ashmead, 1888: vii. Type species *Hippocephalus multilineatum* Ashmead, by monotypy. Primary homonym *Hippocephalus* Swainson, 1839.

Zagrammosoma Ashmead, 1904: 354. Replacement name for *Hippocephalus* Ashmead 1904.

Mirzagrammosoma Girault, 1915: 279. Type species *Mirzagrammosoma lineaticeps*, by monotypy.

Diagnosis. Antennal funicle with two articles in both sexes; vertex vaulted between the eyes (Figures 39, 40, 32). Mesoscutum with notaulus distinct and complete to apex of advanced axilla at a distance well separated from scuto-scutellar suture. Axilla advanced, the major part placed anterior to scuto-scutellar suture (Figures 41, 42). Submarginal vein with five to six dorsal setae. Scutellum with very fine submedian lines, sometimes difficult to see. Propodeum with fine sculpture, shiny, and with the median carina indicated only for a short distance posteriorly.

Biological information. *Zagrammosoma* are ectoparasitoids of larvae of leafmining insects (Lepidoptera, Coleoptera, Hymenoptera, and Diptera). Five species have been recorded as a parasitic of agromyzid flies (*Z. latilineatum*, *Z. lineaticeps*, *Z. mirum*, *Z. multilineatum* and *Z. talitzkii*) and all of these species are also recorded from hosts in other orders. So, it seems unlikely that any species of *Zagrammosoma* are specialists on dipterous leaf miners. When species are only known from a single host, that host is usually a Lepidoptera see in Ubaidillah *et al.* (2000). Legaspi *et al.* (1999) reported that *Z. multilineatum* is the most abundant among nine species of parasites of citrus leaf miner, *Phyllocnistis citrella*, in the Lower Rio Grande Valley of Texas. *Z. multilineatum* has also been recorded from *P. citrella* in Mexico (Perales - Gutiérrez 1996), and in Cuba (Gonzales *et al.* 1995). Other hosts of *Z. multilineatum* are *Scolioneura betuleti* (Hymenoptera: Tenthredinidae) (Nystrom & Evans 1989) and some species of Gelechiidae leaf miners of tomatoes (Geraud *et al.* 1997). *Zagrammosoma* may be important agents for the biological control of leaf mining Lepidoptera and Diptera; however, they have not been studied for biological control purposes.

Distribution. *Zagrammosoma* are predominantly known to distribute in Nearctic (nine spp.) and Neotropic (six spp.). In the present study two species of the genus are recognised in Java, of which one species is undescribed and one species *L. latilineatum* distributed from Java, Bali, and Lesser Sunda to Australia (Queensland).

Zagrammosoma latilineatum Ubaidillah
(Figures 13-15)

Zagrammosoma latilineatum Ubaidillah, in Ubaidillah *et al.* 2000: 223-224.

Biological information. This species reared from the larvae of leafmining agromyziid, *Liriomyza huidobrensis* on *Solanum tuberosum*.

Distributions. Indonesia: West Java, East Lesser Sunda; and Australia: Queensland.

Specimens examined. *West Java*: 1 ♀ (holotype-MZB), labelled, “Indonesia, West Java, Bandung, Pangalengan, ex. *Liriomyza huidobrensis*” on potato, collected 11.xi.1997, emerged 20-28.xi.97 (Rauf). *East Lesser Sunda*: 1 ♀ (MZB), Kupang, Amarasi, Nonbes 10°11’2’’S 123°49’40’’E, 2.ii.2003 (R. Ubaidillah), sweep sample.

Tribe Eulophini

Diagnosis. Antennal funicle with three to five (rarely six) flagellomeres in both sexes; first three antennal flagellomeres in male of some species with branches; face without transverse groove; propleuron meeting each other posteriorly; pairs of large setae on mesoscutum variable from one to three; postmarginal vein variable from half to twice of the length of stigmal vein, submarginal vein with three or more setae on dorsal surface.

1. Genus *Alophomorphella* Girault (Figures 21-24)

Alophomorphella Girault, 1913: 282. Type species *Alophomorphella illustris* Girault, 1913, by original designation.

Diagnosis. Funicular articles four in both sexes (Figure 23); frons reticulated, clypeus defined (Figure 23); mesoscutum and scutellum with a longitudinal median depression, scutellum with grooves joined posteriorly (Figures 21, 22), and propodeum a strong median carina (Figure 22); abdomen elongate (Figure 24); fore wing with postmarginal vein longer than stigmal vein.

Biological information. At the moment, the host only known from two species of Pyraustinae moths, *Lamprosema abstitalis* and *Omiodes diemenalist*.

Distribution. Indonesia (Halmahera, Sulawesi, Kalimantan, Java); Australia (Queensland); China. Bouèek (1988), without giving detailed information, also listed New Guinea and India.

Alophomorphella illustris Girault

(Figures 21-24)

Alophomorphella illustris Girault, 1913: 282, ♀, “Nelson (Cairns), Queensland”, Australia (QMB).

Biological information. This species is best known to be a parasitoid of two species of Pyraustinae moths, *Lamprosema abstitalis* and *Omiodes diemenalist*.

Distribution. Indonesia: Java, **Kalimantan (new record)**, Halmahera, Sulawesi; also recorded from Australia (Queensland); China; New Guinea; and India.

Specimens examined. *West Java:* 6♀ 2♂ (IUNH), Gua Gudawang (06°27' S 106°30' E), Jasinga, Bogor, 21.iii.2004, RU (4♀ 1♂ MZB, 2♀ 1♂ IUNH); *Central Java:* 1♂ (MZB) Karanganyar, 07°42' S 108°50' E, Nusa Kambangan, 31.vii.2004, RU; 1♂ (MZB) Limus Buntu, 07°44' S 108°58' E, Nusa Kambangan, 2.viii.2004, RU; 1♂ (MZB) Sodong, 07°42' S 108°50' E, Nusa Kambangan, 3.viii.2004, RU; *East Java:* 8♀ 3♂ (MZB) Meru Betiri Nat. Park, Andong Rejo, Temporedjo, Jember, 30.iv-3.v.2005, RU, H. Sutrisno, E. Cholik, and Darmawan, *South Lampung:* 2♀ 4♂ (MZB), Raja Basa, Tejang, P. Sebesi, 05°56' S 105°30', 11.viii.2005, Ubaidillah; 1♀ (MZB), Raja Basa, Tejang, P. Sebesi, the way from Cigenong to Danau, 05°56' S 105°30', 12.viii.2005, Ubaidillah; 2♀, 2♂ (MZB) Raja Basa, Tejang, P. Sebesi, 05°53' S 105°31' E, around Cocoa plantation, 14.viii.2005, Ubaidillah.

Discussion. Girault (1913) described *A. illustris* based on a single female from Nelson (= Gordonville, near Cairns), Queensland, Australia. I examined the holotype (QMB), but its poor condition makes recognition of the species very difficult. All that remain are the forelegs mounted on a pointed card and the other legs together with the crushed head mounted on a glass slide. Girault's (1913) original description is very brief, referring mainly to coloration, and is

insufficient to recognize the species. We followed Bouèek (1988) and Zhu & Huang (2001) for identification of the species.

2. Genus *Deutereulophus* Schulz (Figures 25-27)

Eulophopteryx Ashmead, 1904: 341. Type species *Eulophopteryx chapadae* Ashmead, by original designation. Preoccupied by *Eulophopteryx* Möschler, 1878:684.

Deutereulophus Schulz, 1906: 146 Replacement name for *Eulophopteryx* Ashmead, 1904 (not *Eulophopteryx* Möschler, 1878).

Entedonomorpha Girault, 1913: 261. Type species *Entedonomorpha tennisoni* Girault, by original designation. Synonymized under *Deutereulophus* Schulz by LaSalle and Schauff (1992:17-18).

Diagnosis. Vertex margined, with fine transverse carina; posterior ocellus in the margin of the vertex; occiput strongly concave (Figure 25); eye reaching posterior margin of head in dorsal half. Antennal funicle with three (Figure 25) or four flagellomeres and basal flagellomeres in both sexes serrate to pedunculate. Pronotum semiglobose anteriorly, collar relatively long and broader than anterior portion of mesoscutum; notauli complete; mesoscutal mid disk with a pair of setae; sublateral scutellar grooves present, sinuate and converging medially. Postmarginal vein subequal or slightly longer than stigmal vein. Median carina of propodeum forked at nucha, forming large areole enclosing nucha; plicae incomplete, projecting from anterior corners of nuchal areole; carina present posterior to spiracle, patch of setae usually present posterior to carina, distinct from callus setae. Petiole has dorsal and lateral flanges (Figure 26).

Biological information. Unknown.

Distribution. This genus is wide range in distribution found from Australia (New South Wales and Queensland); Indonesia (**Java, new record**), China; Brazil: Mato Grosso and Pará; Guam; United States of America (Arizona, Florida, Georgia, Kentucky, Louisiana, Maryland, Texas and Virginia).

Deutereulophus timorensis Ubaidillah (Figures 25-27)

Deuterulophus timorensis Ubaidillah, 2004: 64-66.

Biological information. Unknown.

Distribution. West Java, Sumatra and Sulawesi (new record), East Lesser Sunda.

Specimens examined. *West Java*: 1 ♀ (MZB), Ciamis, Panjalu, Dukuh, Situ Lengkong, 18.vi.2005. 07°07'S 108°16'E, altitude 800 m, Ubaidillah & Darmawan, Sweeping net; 1 ♀ (MZB), Ciamis, Sidamulih, Ceubereum, 9.vi.2005. 07°38'S 108°35'E, R. Ubaidillah & Darmawan; 1 ♀ (MZB), C.A. Leuweng Sancang, Garut, track from Cijeruk to Cikalomberan, 12.v.2005, altitude 33 m, 07°48'S 107°50'E, R. Ubaidillah & Darmawan, sweep sample; *Sumatra*: 1 ♀, (MZB) Lampung Selatan, Raja basa, Tejang P. Sebesi, 05°56'16"S 105°30'6"E, 11.viii.2005, R. Ubaidillah; 1 ♀, 1 ♂ (MZB) Lampung Selatan, Raja basa, Tejang P. Sebesi, around cocoa plantation, 05°56'16"S 105°30'6"E, 14.viii.2005. R. Ubaidillah; 1 ♀, (MZB) Lampung Selatan, Raja basa, P. Sebuk around cocoa plantation, 05°53'14"S 105°31'49"E, 14.viii.2005. R. Ubaidillah; *Krakatau*: 1 ♀ (MZB), Krakatau Is, P. Sertung East, 06°04'06"S 105°24'43"E, the way from post to plot-1; *East Lesser Sunda*: 1 ♀ (MZB, holotype), Nusa Tenggara Timur, Boenthuka, West Amalobon, Timor Tengah Selatan District, (Farm & paddy field) 10°07'46"S 123°48'60"E, 1.ii.2003, R. Ubaidillah, sweep sample; *Sulawesi*: 6 ♀ (MZB, paratypes), South Sulawesi, Patunuang Nature Reserve, Maros, 18.ix., 2003, R. Ubaidillah & J. Kojima.

***Deutereulophus tennysoni* (Girault)**

Entedonomorpha tennysoni Girault, 1913: 262. Combined by LaSalle and Schauff (1992:17-18).

Biological information. Unknown.

Distribution. West, Central and East Java, Sumatra, Krakataus, Sulawesi (new record), Australia (Queensland).

Specimens examined. *West Java*: 2 ♀ (MZB), Nat. Park Gede Pangrango, Sukabumi, Bodogol, 10 Mei.2005, altitude 800 m, Research station, Darmawan, sweep sample; 2 ♀ (MZB), Ciamis, Sidamulih, Ceubereum, 9.vi.2005, 07°38'S 108°35'E. R. Ubaidillah & Darmawan; 1 ♀ (MZB),

Perhutani Garut, Leuwi Pari, 13.vi.2005, 07°41' S 107°50'E, Sutrisno, H & E. Cholik, sweep net; *Central Java*. 2♀ (MZB), Indonesia, D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Bawah, 07°35' S 110°24' E, altitude 910 m, 14.vii.2005, Ubaidillah & Darmawan; 1♀ (MZB) D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo atas, 07°37' S 110°25' E, altitude 1,110 m, 13.vii.2005, Ubaidillah & Darmawan; *East Java*: 2♀ (MZB), Malang, Lawang Sumberngepoh, 29.v.2004, R. Ubaidillah, Sweeping; 19♀6♂ (MZB), Jember, Tempurejo, Andongrejo, Meru Betiri N.P, altitude 264 m, 30iv-3.v, 2005, 08°24' S 113°44' E, altitude, 264 m. 03.v. 2005. Ubaidillah, R; *Sumatra*: 5♀ (MZB) Lampung Selatan, Raja Basa, Tejang, P. Sebesi, 05°56' S 105°30' E, 11.viii.2005, Ubaidillah; *Krakatau*: 2♀, 1♂ (MZB), Southeast Rakata, 06°08' S 105°25' E, 20.viii.2005, Ubaidillah; *Sulawesi*: 1♀ (MZB) North Sulawesi; Gorontalo, Bone Bolango, Tiang Kabila, Toto Utara, 00°34' N 123°05' E, 13.ix.2003, R. Ubaidillah; 2♀ (MZB) South Sulawesi; Karaenta, primary seasonal forest, 300m, 30.vii-11.viii. 2005, 05°02' S 119°40' E, 18.ix.2003, Daugeron, C & Villemant, C, Malaise Trap.

3. Genus *Diglyphomorpha* Ashmead (Figures 28-30)

Diglyphomorpha Asmead, 1904a: 352,372, Type species *Diglyphus maculipennis* Asmead [D. aurea (Howard) Monotype and original designation.

Diagnosis. This genus is supported by a number of features, including antennal funicle with four flagellomeres (Figure 29), propodeum with plicae, costula and irregular transverse rugae, scutellum with complete sublateral grooves converging but not meeting posteriorly and having their margins relatively sharp, anterior median scutellum sometimes with faint elongate depression, notauli complete though sometimes partially obscured by mesoscutal sculpture (Figure 28).

Biological information. This genus is known as primary parasitoid of nepticulid moth *Stigmella malella* (Stainton, 1854) on *Malus pumila*.

Distribution. This genus restricted to Canary Islands, Croatia, Grenada and St. Vincent, Indonesia, **Java (new record)**.

Diglyphomorpha aurea (Howard)

(Figures 28-30)

Elachistus aureus Howard, 1894: 106. Combined to *Diglyphomorpha* by Bouèek (1977: 11-12).

Ardalus politus Howard, 1897: 162. Synonymized under *Diglyphomorpha aurea* by Bouèek (1977: 11-12).

Diglyphus maculipennis Riley, Ashmead and Howard 1904: 167. Synonymized under *Diglyphomorpha aurea* by Bouèek (1977: 11-12).

Biological information. Unknown.

Distribution. Indonesia, **West Java (new record)**, Granada.

Specimens examined. *West Java*: 1 ♀ (MZB), G. Halimun Nat. Park, Citalahab 06°44' S 106°31' E, 3449 Fit, 22. viii. 2004, R. Ubaidillah, sweep sample; 1 ♂ (MZB), West Java, Bogor, Cibinong, Nanggawer, 26. vi. 2004, sweep sample. R. Ubaidillah; 1 ♀ (MZB), *Central Java*: Jogjakarta, Kaliurang, Telaga Putri, 22. v. 2004, R. Ubaidillah, sweeping; 1 ♀ (MZB), Purwokerto, Batu Raden, Melung, Curug Gede, 07°19'55"S 106°13'36"E, 15. x. 2004, R. Ubaidillah, sweeping sample.

4. Genus ***Diglyphomorphomyia*** Girault

(Figures 31-33)

Diglyphomorphomyia Girault, 1913: 281, Type species *Diglyphomorphomyia nigriscutellum* by original designation.

Diagnosis. Antennal funicle with four flagellomere in female and four or five in male; notauli complete, reaching the anterior margin of axilla or scutellar margin; mid disk of mesoscutum with two or three long pairs of setae, and sparse small setae, mesoscutelar mid disk with deep punctures; scutellum with submedian groove that meet posteriorly to form a U-shaped, scutellar disk with deep punctures (Figure 31); head short, margined behind the posterior ocelli (Figures 31, 32, 33); propodeum smooth, with median carina, ended anteriorly with small cup, plica present, behind propodeal trachea with transverse carina connecting from plica to propodeal lateral margin.

Biological information. Host unknown. All Javanese species of *Diglyphomorphomyia* were mainly collected in shrubs habitats at the forest edges which their altitudes are ranging from 50-700 m.

Distribution. *Diglyphomorphomyia* is the first recorded from Indonesia and previously was known to be restricted to Australia, China and India, with 5 described species, two species were described from China and three species from Queensland Australia. Five specimens containing of one species were examined in this study, which were collected from West Java and Krakataus Islands.

Discussion. *Diglyphomorphomyia* can be recognized by the combination of several characters, submedian scutellar groove meet posteriorly to form a U-shaped and scutellar disk with deep punctures; head short and margined behind the posterior ocelli. The genus differs from *Elachertus* by specialized deep punctures on scutellar disk and short head; however one undescribed species of *Diglyphomorphomyia* from East Java lack of the generic attributes and appear closer to *Elachertus*.

Distribution. This genus restricted to China, Indonesia, **Java (new record)** and Australia.

***Diglyphomorphomyia* nr *specimenipennis* (Girault, 1913)**

(Figures 31-33)

Sympiesomorphelleus specimenipennis Girault, 1913: 278, combined under *Diglyphomorphomyia* by Bouèek (1988: 649).

Biological information. Unknown.

Distribution. Indonesia, Anak Krakatau and Sebesi Island.

Specimens examined. *West Java*: 1B& (MZB), Sukabumi, Situgunung. 4.ii.2004. R. Ubaidillah. *Krakatau*: 2♀ (MZB), Anak Krakatau east, 06°06'10"S 105°26'27"E, 17.viii.2005, R. Ubaidillah, sweep sample; 1♂ (MZB) Lampung Selatan, Raja Basa, Tejang, P. Sebesi, 06°56'16"S 105°30'6"E, 11.viii.2005, R. Ubaidillah, sweep sample.

5. Genus *Elachertus* Spinola

(Figures 34-46)

- Elachertus* Spinola, 1811: 151. Type species *Diplolepis lateralis* Spinola, 1808 by subsequent designation.
- Ardalus* Howard, 1897: 161. Type species *Ardalus aciculatus* Howard, by subsequent designation. Synonymized under *Elachertus* by Bouèek (1988: 639).
- Cirrospiloideus* Ashmead, 1904: Type species *Miotropis platynotae* Ashmead by monotypy and original designation. Synonymized to *Elachertus* by Schauff & LaSalle (1993: 493).
- Pseudelacherteus* Girault, 1913: 260 Type species *Pseudelacherteus nigrithorax* Girault, 1913 by original designation. Synonymized under *Elachertus* by Bouèek (1988: 639).
- Sympiesomorphelleus* Girault, 1913: 75-76. Type species *Sympiesomorphelleus suttneri* Girault, 1913 by original designation. Synonymized to *Elachertus* by Bouèek (1988: 639).
- Diglyphomorphella* Girault, 1913: 280 Type species *Diglyphomorphella delira* Girault, 1913 by original designation. Synonymized under *Elachertus* by Bouèek (1988: 639).
- Parentedon* Girault, 1913: 279. *Parentedon australis* Girault, 1913, by monotypy and original designation. Synonymized under *Elachertus* by Bouèek (1988: 639).
- Ardaloides* Girault, 1915: 288. Type species *Ardaloides simithorax* Girault by original designation. Synonymized under *Elachertus* by Bouèek (1988: 639).
- Euplectromorphella* Girault, 1915: 280. Type species *Euplectromorphella cicatricose* Girault, 1915 by monotypy. Synonymized under *Elachertus* by Bouèek (1988: 639).
- Proardalus* Girault & Dodd, in Girault, 1915: 283. Type species *Proardalus nigricaput* Girault & Dodd, 1915 by monotypy & original designation. Synonymized under *Elachertus* by Bouèek (1988: 639).
- Epardalus* Girault, 1917: 5. Type species *Elachistus cidariae* Girault, 1917 by original designation. Synonymized under *Elachertus* by Peck (1955: 455).
- Peteenus* Erdős, 1961: 471. Type species *Peteenus pulcher* Erdős, 1961, original designation. Synonymized under *Elachertus* by Bouèek (1988: 639).

Diagnosis. Antennal funicle with four flagellomeres in both sexes (Figures 35, 45), lateral surface of male's scape apically, usually with area of sensory pits and these pits forming tight group, separated from each other by less than their own diameter. Notauli complete reaching the anterior margin of scutellum (Figures 36, 46); in some species, the notauli curving to meet axillae well anterior of scutellar margin; mesoscutal mid disk with 3 or more pairs of setae, sometimes with irregularly placed setae; faint submedian grooves of scutellum meeting posteriorly to form a U-shaped (Figures 36, 46), scutellum without a median groove, sculpture absent or very weak and sunken. Postmarginal vein longer than stigmal vein (Figure 45). Propodeum without plicae or costula; median carina usually simple, often slightly Y-shaped anteriorly (Figures 36, 46); median panels smooth, not rugulose.

Biological information. This genus has been recorded from several hosts, mainly primary parasites on lepidopteran moths family Agonoxeniidae (*Agonoxena argaula*, *A. pyrogramma*), Arctiidae (*Hyphantria cunea*, *Spilosoma virginicum*, *Utetheisa pulchella*) Argyresthiidae (*Argyresthia oreasella*), Blastobasidae (*Blastobasis glandulella*, *Blastodacna atra*), Coleophoridae (*Coleophora follicularis*, *C. laricella*, *C. limosipennella*, *C. pruniella*), Depresariidae (*Agonopterix heracliana*, *A. hypericella*), Elachistidae (*Perittia obscurepunctella*), Epermenidae (*Epermenia illigerella*), Gelechiidae (*Anacamptis populella*, *Exoteleia dodecella*, *Phthorimaea operculella*), Geometridae (*Eulithis diversilineata*, *Eupithecia spermaphaga*, *Glena bisulca*), Gracillariidae (*Acrocercops dives*, *Caloptilia cuculipennella*, *C. packardella*, *C. theivora*, *C. calybites auroguttellus*, *Gracillaria syringella*, *Marmara fasciella*, *Parectopa robiniella*, *Parornix devoniella*, *P. geminatella*, *Phyllocnistis citrella*, *Phyllonorycter acernella*, *P. anderidae*, *P. blancardella*, *P. coryli*, *P. emberizaepennella*, *P. messaniella*, *P. nicellii*, *P. nigrescentella*, *P. oxyacanthae*, *P. platanoidella*, *P. pomonella*, *P. sorbi*, *P. spinicolella*, *P. stettinensis*, *P. tenerella*), Lymantriidae (*Dasychira plagiata*, *Lymantria dispar*, *L. monacha*, *Orgyia definite*, *O. leucostigma*, *O. pseudotsugata*), Lyonetiidae (*Bedellia somnulentella*, *Leucoptera coffeella*, *L. laburnella*), Noctuidae (*Acronicta megacephala*, *Eublemma gayneri*, *Mamestra brassicae*), Noliidae (*Bena prasinana*), Notodontidae (*Clostera curtula*, *Heterocampa guttivitta*, *Schizura ipomaeae*, *S. unicornis*), Oecophoridae (*Antaeotricha leucillana*,

Lethata anophthalma), Pyralidae (*Acrobasis caryivorella*, *Dioryctria abietella*, *D. zimmermani*, *Haritalodes derogate*, *Omiodes indicata*), Sesiidae (*Synanthedon pictipes*), Tortricidae (*Acleris variana*, *Adoxophyes orana*, *Amorbia cuneana*, *Ancylis comptana*, *A. mitterbacheriana*, *Archips argyrospila*, *A. crataegana*, *A. rosana*, *A. xylosteana*, *Argyrotaenia pinatubana*, *A. velutinana*, *Barbara colfaxiana*, *Cacoecimorpha pronubana*, *Choristoneura fumiferana*, *C. murinana*, *C. rosaceana*, *Cnephasia chrysantheana*, *Cydia caryana*, *C. latiferreana*, *C. nigricana*, *Epinotia celtisana*, *E. fraternana*, *Eucosma recissoriana*, *Eupoecilia ambiguella*, *Lathronympha strigana*, *Lobesia (Polychrosis) botrana*, *L. viteana*, *Notocelia roborana*, *Pandemis cinnamomeana*, *Platynota idaeusalis*, *P. rostrana*, *P. stultana*, *Proteoteras aesculana*, *Rhopobota myrtillana*, *Rhyacionia buoliana*, *R. duplana*, *R. frustrana*, *Sparganothis pettitana*, *S. pilleriana*, *S. sulfureana*, *Spilonota ocellana*, *Strepsicrates smithiana*, *Tortrix viridana*, *Zeiraphera griseana*), Yponomeutidae (*Prays acmonias*), HesperIIDae (*Ancyloxypha numitor*, *Calpodes ethlius*, *Lerema accius*, *Panoquina ethlius*, *P. nero*, *P. silvicola*, *Perichares philetus*, *Urbanus proteus*). However, some as hyperparasites on wasps, family Braconidae (*Dolichogenidea tasmanica*) and Eulophidae (*Eulophus orgyiae*).

Distribution. Worldwide in distribution and it is newly recorded from Java where nine species are recognized in the island, four species from those belong to undescribed species.

***Elachertus auripes* (Girault)**

(Figures 38-41)

Pseudelachertus auripes Girault, 1913: 261. Transferred into *Elachertus* by Bouèek (1988: 642).

Proardalus nigricaput Girault and Dodd, 1915: 288. Synonymized under *Elachertus* by Bouèek (1988: 642).

Biological information. Unknown.

Distribution. Indonesia: **Central Java (new record)**, also recorded in Australia (Queensland) and China (Guangxi).

Specimen examined. *Central Java*: 1 ♀ (MZB), Purwokerto, Batu Raden, Melung, Curug Gede, 07°19'55" S 106°13'36" E, 15.x.2004, R. Ubaidillah, sweeping sample.

***Elachertus petiolifuniculus* Zhu and Huang**
(Figures 44-46)

Elachertus petiolifuniculus Zhu and Huang, 2001:331-332.

Biological information. Unknown.

Distribution. Indonesia: **West Java (new record)**, also recorded from China (Tibet).

Specimens examined. *West Java*: 1 ♀ (MZB), Bogor, Bogor Botanic Garden, 10.vi.2004, R. Ubaidillah, sweeping; 1 ♀, 1 ♂ (MZB), Cibodas, (1 ♀, 30.i.2004; 1 ♂, 11.vi.2004), R. Ubaidillah, sweeping; 1 ♀ (MZB), Bogor, Yunokal, Halimun, 4. v. 2004, R. Ubaidillah, sweep sample; 3 ♂ (MZB), Sukabumi, Situgunung, 4.ii. 2004, R. Ubaidillah, sweeping.

***Elachertus simithorax* (Girault)**
(Figures 42-43)

Ardaloides simithorax Girault, 1915: 288. Transferred into *Elachertus* by Bouèek (1988: 642).

Biological information. Unknown.

Distribution. Indonesia: **East Java and Bali (new record)**, also recorded from China (Fujian, Hainan, Yunnan and Taiwan) and Australia (Queensland).

Specimens examined. *Central Java*: 1 ♀ (MZB), Solo, Karanganyar, Tawangmangu, Grojokansewu 07°38'56" S 111°07'08" E 17.x.2004, R. Ubaidillah, sweep sample; 1 ♂ (MZB), D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Bawah, 07°35' S 110°24' E, altitude 910 m, 14.vii.2005, Ubaidillah & Darmawan; *Bali*: 1 ♀, 1 ♂ (MZB), Negara, Melaya, Blimbingsari, Palasari, 08°14'21" S 114°30'18" E, 12.ix.2005, R. Ubaidillah & J. Kojima, sweep forest edge; 1 ♂ (MZB), Badung, Petang, Carangsari, 08°26'29" S 115°13'05" E, 10.ix.2005, R. Ubaidillah & J. Kojima, sweep sample coffee.

Elachertus sobrinus (Girault and Dodd)

Parentedon sobrinus Girault and Dodd, 1915, in Girault, 1915: 283. Transferred into *Elachertus* by Bouèek (1988:642).

Biological information. Unknown.

Distribution. Indonesia: **West Java, Bali (new record)**, Sumba Island, Sulawesi; Australia, Queensland.

Specimens examined. *West Java*, 1 ♀ (MZB), Bogor, Bogor Botanic Garden, 8.vi.2004, R. Ubaidillah, sweeping; 1 ♂ (MZB), Bogor, Ciampea, 06°32'S 106°41'E. 11.x.2004, sweep sample. R. Ubaidillah; 1 ♂ (MZB), Perhutani Garut, Leuwi Pari, 13.vi.2005. 07°41'S 107°50'E. Sutrisno, H & E. Cholik, sweep net; *Bali*: 1 ♀ (MZB), Singaraja, Pameron, 08°10'S 115°02'E, 9.ix.2005, R. Ubaidillah & J. Kojima, sweep sample bush; 4 ♂ (MZB), Negara, Melaya, Blimbingsari, Palasari, 08°14'21"S 114°30'18"E, 12.ix.2005, R. Ubaidillah & J. Kojima, sweep forest edge; *Krakatau*: 2 ♀ (MZB), Anak Krakatau East, 06°06'10"S 105°26'07"E 17.viii.2005. R. Ubaidillah, sweep sample; 1 ♀ (MZB), Sertung east, 06°04'6.08"S 105°24'43"E, 15.viii.2005, R. Ubaidillah; 1 ♀ (MZB); Rakata East, 06°08'60"S 105°25'14"E 19.viii.2005. R. Ubaidillah, sweep sample; *East Lesser Sunda*: 1 ♀ (MZB), Makamingit, 09°42'S 119° 52'E, Oriango, Ngada, East Sumba, 30.i.2003 (R. Ubaidillah); *Halmahera*: 2 ♀ (MZB) Jati, Tidore, North Maluku, 11.ix.2003, R. Ubaidillah; 1 ♀ (IUNH), Hoku-hoku Kie, 01°06'N 127°28'E, Jailolo, Nort Maluku, 9.ix. 2003, R. Ubaidillah & J. Kojima; *Kalimantan*: 1 ♂ (MZB), East Kalimantan, Kayan Mentarang Nat. Park., Nort Kayan, Pa'Raye, 04°00'49"S 115°44'52"E, 950m, R. Ubaidillah, Sweep sample.

Elachertus nr. isadas (Walker)

(Figures 34-37)

Biological information. Unknown.

Distribution. Indonesia: Krakataus Island, West, Central and East Java, Sulawesi.

Specimens examined. *West Java*: 2♀ (MZB), C.A. Leuweng Sancang, Garut, Cijeruk, 11.v.2005, altitude 30 m, S 07°42', E107°50', Sutrisno, H & E. Cholik, sweep sample; 3♀, 2♂ (MZB), Ciamis, Panjalu, Kertamandala, 15.vi.2005, 07°09'S 108°14'E, altitude 1000 m, Ubaidillah & Darmawan, Sweeping net; 1♂ (MZB), Bogor, Cibinong, km 46, front of Widyasatwaloka-LIPI, 6.April.2004, sweep sample. R. Ubaidillah; 2♀ (MZB) West Java, Perhutani Garut, Leuwi Pari, 13.vi.2005. 07°41'S 107°50'E. Sutrisno, H & E. Cholik, sweep net; *East Java*: 1♂ (MZB), Malang, Lawang, Sumberngepoh, 29.v.2004, sweeping; 2♀, 1♂ (MZB), Jember, Tempurejo, Andongrejo, Meru Betiri N.P, altitude 264 m, 30iv-3.v, 2005, 08°24'S 113°44'E, altitude 264 m. 03.v. 2005. Ubaidillah, R, H. Sutrisno, E.Cholik & Darmawan; *Krakatau*: 1♀ (MZB), Anak Krakatau, 06°06'10''S 105°26'07''E, 17.viii.2005, R. Ubaidillah, sweep sample; *Sulawesi*: 3♀ (MZB), South Sulawesi; Karaenta, primary seasonal forest, 300m, 30.vii-11.viii. 2005, 05°02'S 119°40'E, 18.ix.2003, Daugeron, C & Villemant, C, Malaise Trap; 1♀ (MZB) North Sulawesi; Gorontalo, Bone Bolango, Tiang Kabila, Toto Utara, 00°34'N 123°05'E, 13.1x.2003, R. Ubaidillah.

6. Genus *Eulophomorpha* Dodd

(Figure 49)

Eulophomorpha Dodd, in Girault 1915: 293, Type species *Eulophomorpha flavicornis* Girault by monotypy and original designation.

Diagnosis. Antennal funicle with two flagellomeres and three segmented of clava; occiput strongly excavated and dorsally margined, occiput strongly excavated and dorsally margined, occipital carina present but weak; pronotum short, and conical in outline; mesoscutal disk posteriorly with a pair of long setae and dense short setae over the disk, notauli absent; scutellum without any longitudinal groove, the scutellar disk with scattered short setae and two pairs long setae. Axillae advanced anteriorly over to the scutellar suture.

Biological information. This genus has been recorded as parasitoid of clavaionid spider and egg of mantids (Noyes 2002).

Distribution. This genus occurs in Indonesia: Sumatra and **Java (new record)**, also recorded from Nigeria, India, China (Hainan, Hubai and Jiangsu).

Discussion. This genus was described by Dodd (1915) based on one female collected from Harvey's Creek, Queensland Australia, and recorded first time from Indonesia by Kamijo (1996), material collected from Sumatra. The additional material now recorded from Java as a new record from the Island.

***Eulophomorpha flavicornis* Dodd**

(Figure 49)

Eulophomorpha flavicornis Dodd, in Girault 1915: 294.

Biological information. Kamijo (1996) redescribed from 2 females reared from egg sack of mantid (Mantidae).

Distribution: Indonesia: Sumatra and **West Java (new record)**. This species also recorded in Nigeria, India to South China (Hainan); and Australia (Queensland).

Specimen examined. *West Java*: 1 ♀ (MZB), Bogor, Cibinong, in front of Widyasatwaloka LIPI, 16.iv.2001, sweep sample. R. Ubaidillah.

Discussion. This species is the first record from Java and also the second specimens known from Indonesia after Kamijo (1996) reported from Sumatra. This single specimen here agrees with the original descriptions of Dodd (in Girault, 1915: 294) and redescription of Kamijo (1996: 486-7).

7. Genus ***Eulophus*** Geoffroy

Eulophus Geoffroy, 1762: 312. Type species *Ichneumon ramicornis* Fabricius by monotypy and subsequent designation.

Comedo Schrank, 1802: 308. Type species *Ichneumon larvarum* Linnaeus by monotypy. Validated by Crawford (1912: 186) and Girault (1920: 201). Synonymized under *Eulophus* by Peck (1951: 430).

Cratotechus Thomson, 1878: 219. Type species *Ichneumon larvarum* Linnaeus; subsequent designation. Synonymized under *Eulophus* by Bouèek & Askew (1968: 55).

Onychocomedo Graham, 1959: 183. Type species *Eulophus thespius* Walker, by original designation. Synonymized under *Eulophus* by Bouèek (1959: 160).

Diagnosis. Antennal funicle with three flagellomere in both sexes, first three of male antennal funicle branches; mandible reduced with very short teeth, not

touching each other medially; basitarsus, especially on mid legs, shorter than the second; notauli incomplete, not reaching posterior margin of mesoscutum; scutellum without sublateral groove, with paired setae.

Biological information. The genus has wide range of host and so far has been recorded from five orders of other insects for their host (Noyes 2002) such as, Coleoptera: Brentidae (*Piezotrachelus varium*), Chrysomelidae (*Chrysomela graminis*, *Onchocephala tuberculata* and *Phyllotreta nemorum*), and Coccinellidae (*Henosepilachna vigintioctopunctata*); Diptera: Agromyzidae (*Phytomyza angelicae*), Cecidomyiidae (*Asphondylia ignorata*, *Cecidomyia pimpinellae*, *Dasineura mali*, *D.urticae*) and Tephritidae (*Bactrocera oleae*); Hemiptera: Diaspididae (*Leucaspis pini*) and Coccidae (*Physokermes piceae*); Hymenoptera: Cynipidae (*Plagiotrochus quercusilicis*), Diprionidae (*Diprion pini*, *Neodiprion pratti*, *N. sertifer*), Ichneumonidae (*Clypeoplex cerophagus*, *Diadegma fenestrata*), Tenthredinidae (*Metallus rohweri*); Lepidoptera: Blastodacnidae (*Blastodacna atra*), Cosmopterigidae (*Cosmopterix dulcivora*), Drepanidae (*Watsonalla binaria*), Gelechiidae (*Anacamptis innocuella*, *Coleotechnites apicitripunctellus*, *Exoteleia pinifoliella*), Geometridae (*Alsophila aceraria*, *A. pometaria*, *Archiearis parthenias*, *Bupalus piniarius*, *Ectropis crepuscularia*, *Epirrita dilutata*, *Geometra papilionaria*, *Lycia pomonaria*, *Operophtera bruceata*, *O. brumata*, *Perizoma flavofasciata*), Gracillariidae (*Calybites auroguttellus*, *Gracillaria rhoifoliella*, *Phyllonorycter blancardella*, *P. mespililla*, *P. populifoliella*, *P. tremulae*), Lasiocampidae (*Eriogaster lanestris*, *Phylloidesma ilicifolia*), Lymantriidae (*Dasychira plagiata*, *Gynaephora selenitica*, *Lymantria dispar*, *L. monacha*, *Orgyia antiqua*, *O. definita*, *O. leucostigma*, *O. mixta*, *O. recens*, *O. thyellina*, *O. vetusta*), Lyonetiidae (*Leucoptera coffeella*, *L. coma*), Noctuidae (*Acronicta aceris*, *A. furcifera*, *A. grisea*, *A. hercules*, *A. intermedia*, *A. leporina*, *A. megacephala*, *A. psi*, *A. tridens*, *Amphipyra pyramidea*, *A.pyramidoides*, *Autographa gamma*, *Brachionycha sphinx*, *Cerastis rubricosa*, *Colocasia coryli*, *Cosmia affinis*, *C. trapezina*, *Dichonia ariplina*, *Dryobotodes eremite*, *D. monochroma*, *Episema caeruleocephala*, *Euplexia benesimilis*, *E. lucipara*, *Eurois occulta*, *Hada plebeja*, *Hypena crassalis*, *Lacanobia oleracea*, *Lithophane ornitopus*, *Mamestra brassicae*, *Melanchra persicariae*, *Orthosia carnipennis*, *O. cruda*, *O. gothica*, *O. hibisci*, *O. incerta*, *O. opima*, *O. stabilis*, *Phlogophora*

meticulosa, *Polia purpurissata*, *Rileyiana fovea*, *Scoliopteryx libatrix*, *Trisateles emortualis*), Notodontidae (*Cerura vinula*, *Clostera anachoreta*, *C. anastomosis*, *C. cultura*, *C. pigra*, *Drymonia ruficornis*, *Gluphisia septentrionalis*, *Heterocampa guttivitta*, *Lochmaeus bilineata*, *L. manteo*, *Misogada unicolor*, *Ptilodon capucina*, *P. cucullina*, *Ptilophora plumigera*, *Schizura unicornis*, *Symmerista albifrons*), Pyralidae (*Haritalodes derogata*, *Ostrinia nubilalis*), Sphingidae (*Laothoe populi*, *Mimas tiliae*, *Paonias excaecata*, *Smerinthus ocellatus*), Tischeriidae (*Tischeria malifoliella*), Tortricidae (*Acleris lipsiana*, *A. rosana*, *Choristoneura fumiferana*, *Cnephasia chrysantheana*, *Cochylis atricapitana*, *Dichelia histrionana*, *Epinotia nanana*, *E. nigrina*, *Epiphyas postvittana*, *Pandemis cerasana*, *Tortrix viridana*, *Zeiraphera griseana*, *Z. isertana*), Pieridae (*Pieris brassicae*).

Distribution: Worldwide in distribution, except absent in Australian region.

Discussion. This genus was firstly reported from Java by Zehntner (1896) in his description of *Eulophus femoralis* Zehntner, based on material reared from the host of the larvae of *Cosmopterix dulcivora* (Lepidoptera: Cosmopterigidae) and from chrysomelid beetle, *Onchocephala tuberculata* and *Dicladispa armigera*. I tried in vain to locate the type material(s) of *E. femoralis* and to collect a parasitoid that matches Zehntner's description.

Eulophus femoralis Zehntner

Eulophus femoralis Zehntner, 1896: 1-12.

Biological information. Hosts is *Cosmopterix dulcivora* (Lepidoptera: Cosmopterigidae) and *Onchocephala tuberculata* and *Dicladispa armigera* (Coleoptera: Chrysomelidae).

Distribution. East Java.

8. Genus *Euplectomorpha* Girault (Figures 50-54)

Euplectomorpha Girault, 1913: 276. Type species *Euplectomorpha unifasciata* Girault, by original designation.

Euplectomorpha Girault, 1915: 278, erroneously republished as "new genus".

Neoplectrus Ferrière, 1940: 134. Type species *Neoplectrus bicarinatus* Ferrière. Synonymized under *Euplectromorpha* Girault by Bouèek (1988: 634).

Diagnosis: Antenna with four funicular flagellomeres in both sexes (Figures 50,51); propodeum smooth, with two strong submedian carinae connected anteriorly to form H-shaped by raised basal cup (Figures 50, 52, 53); scutellum with sublateral grooves weak and not meeting posteriorly; hind tibia with one or two spurs distinctly longer than first tarsomere; head without occipital carina (Figure 54), notauli complete reaching the anterior margin of scutellum, pronotum with transverse carina anteriorly (Figures 50, 52); metasomal petiole short or transverse.

Biological information. This genus is known to be gregarious larval ectoparasitoids of Lepidoptera. Noyes (2002) has listed the species host record for all species.

Distribution. This genus is sporadically distributed in the regions of Afrotropics (South Africa, West Africa, Tanzania, Malawi, Uganda, Ivory Coast, Kenya, Caribbean, Central Africa, East Africa and Madagascar); Australasian (New South Wales, Queensland); Holarctic (Mongolia); Oriental (Indonesia, Sri Lanka, Taiwan).

Discussion. The genus was first known from Java by Ferrière (1940), who described two species namely *E. artanae* Ferrière and *E. viridiceps* Ferrière. Later species was synonymized to *Platyplectrus* by Bouèek (1988) as he noticed that the propodeum has one median carina. In the same year, Ferrière (1940) also described two other species which was recognized by him as *Neoplectrus bicarinata* and *Neoplectrus maculates* and later Bouèek (1988) transferred the genus to *Euplectromorpha*.

Euplectromorpha bicarinata (Ferrière)

(Figures 51-54)

Neoplectrus bicarinatus Ferrière, 1940: 146. Synonymized to *Euplectromorpha bicarinata* by Bouèek 1988: 634.

Biological information. This species has been described as an ectoparasitoid larva of the zygaenid moth, *Artona catoxantha* (Hampson) (Procridinae)

(Ferrière, 1940) and limacodiid moth, *Penthocrates bigenita* (**new host record**).

Distribution. Indonesia: West, Central and East Java, **Bali** and **South Sulawesi** (**new record**).

Specimens examined. *West Java*: 2♀ (MZB), Soebah, iv.1939, R. Awibowo, ex. *Penthocrates bigenita*; 1♀ (MZB), Salaman, xi.1938. J.v.d. Vecht, ex. Limacodid larva on coconut; 1♀ (MZB), Bogor, Yunokal, Halimun, 4.v.2004, R. Ubaidillah, sweep sample; 1♀ (MZB), West Java, Bogor, Jasinga, around Gua Gudawang, 06°27'S 106°30'E, 21.iii.2004, R. Ubaidillah, sweep sample; 1♂ (MZB) Ciamis, Sidamulih, Ceubereum, 9.vi.2005. 07°38'S 108°35'E. R. Ubaidillah & Darmawan; *Central Java*: 1♀ (MZB), D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Atas, 07°35'S 110°06' E, altitude 110 m., 15.vii.2005, Ubaidillah & Darmawan; *East Java*: 3♀, 1♂ (MZB), Jember, Tempurejo, Andongrejo, Meru Betiri N.P, altitude 264 m., 30iv-3.v, 2005, 08°24'S 113°44'E, altitude 264 m., 03.v. 2005. Ubaidillah, Sutrisno, Cholik & Darmawan; 1♀ (MZB).

Discussion. The present specimens agree with the original descriptions of Ferrière (1940). In more typical specimens, the body colour is yellowish brown and the scrobe with the upside-down V-shaped black line in, metasomal tergum 1, 5 and 6 dark brown and the rest are yellowish brown which were not mentioned in the original description.

Euplectromorpha euplectriformis (Crawford)

(Figure 50)

Elachertus euplectriformis Crawford, 41: 267-282, combined to *Euplectromorpha euplectriformis* by Girault (1917: 5).

Euplectromorpha euplectriformis (Crawford); Girault (1917: 5).

Biological information. A single specimen collected from Pacitan, East Java reared from *Olona* sp. (Lepidoptera: Limacodidae) associated with coconut plant.

Distribution. Indonesia, Sumatra and **East Java** (**new record**).

Specimens examined. *West Java*, 1♀ (MZB), Bogor, Cibinong, Biotek garden, 28.iv.2004, R. Ubaidillah, 1♀ (MZB), Ciamis, Panjalu, Panambangan,

07°07' S 108°16', altitude 800 m., 19.vi.2005, R. Sutrisno, H & E. Cholik, Sweeping net; *East Java*: 1♂ (MZB), Pacitan, ii.1939, R. Awibowo. ex. *Olono* sp. (probably misspelled of *Olona*) on coconut.

Discussion. Girault (1917) in his private publication noted that this species belongs to *Euplectromorpha* without any further explanation. However, I examined one specimen collected by A. Wibowo from Pacitan East Java (MZB) identified as *Elachertus euplectriformis* by Gahan (1939) accords to the original description by Crawford. The specimens have actually two submedian carinae on propodeum which conserve the character of *Euplectromorpha*.

***Euplectromorpha maculata* (Ferrière)**

Neoplectrus maculatus Ferrière, 1940: 136. Female, "Java" (lectotype designated by Wijesekara & Schauff (1994: 22), BMNH).

Euplectromorpha maculata: (Ferrière, 1940): Bouèek, 1988: 634.

Biological information. This species reared from the larvae of zygaenid moth, *Artona catoxantha* and the larvae of limacodid moth, *Natada nararia*.

Distribution. Indonesia: Java and Sri Lanka.

Specimen examined. *West Java*: 1♂ (MZB), Ciamis, Cipaku, Pasir Tengah 16.v.2006. R. Ubaidillah & Darwaman.

Discussion. The species can be easily distinguished from all Javanese *Euplectromorpha* by the combination characters: Thin brown band across metasomal tergum seventh, funicle, clava and pedicel brownish, clava slightly truncated, antennal scrobe with black line forms upside-down V-shaped.

9. Genus ***Euplectrophelinus*** Girault (Figures 55-57)

Euplectrophelinus Girault, 1913: 283. Type species *Euplectrophelinus saintpierrei* Girault, by monotypy and original designation.

Seletrichella Risbec, 1952: 204. Type species *Seletrichella meridionalis* Risbec. Synonymized under *Euplectrophelinus* by Bouèek (1988: 637).

Diagnosis. Pronotum relatively large (Fig, 56), margined, and with transverse carina anteriorly; propodeum has a median carina ending a cup shape anteriorly or with T-shaped (Figures 56, 57), propodeal plica distinctly reaching the posterior margin of propodeum, slightly curving outward medially; Notauli complete reaching the anterior scutellar margin, mesoscutal median disk with two pairs long setae and irregularly placed setae; scutellar grooves curving inward posteriorly meeting each other to form U-shaped groove (Figure 56). Hind tibial spur never over the first tarsomere.

Biological information. Unknown.

Distribution. Indonesia, **Java and Bali (new record)**, also recorded from Australia (Queensland) and Madagascar.

Euplectrophelinus sainpierrei Girault

(Figures 55-57)

Euplectrophelinus saintpierrei Girault, 1913: 283.

Biological information. Unknown.

Distribution. Known only from the type locality.

Specimens examined. *West Java*: 1♀, 2♂ (MZB), CA Leuweng Sancang, Garut, track Cijeruk to Cikalomberan, 12.vi.05, 07°43'S 107°50'E, R. Ubaidillah & Darmawan.

10. Genus *Euplectrus* Westwood

(Figures 58-94)

Euplectrus Westwood, 1832: 128. Type species *Euplectrus maculiventris* Westwood by monotypy.

Diplectron Dahlbom, 1857: 292. Type species *Pteromalus bicolor* Swederus, 1795, subsequent designation. Synonymized under *Euplectrus* by Dalla Torre (1898: 74).

Heteroscapus Brèthes, 1918: 9. Type species *Heteroscapus ronnai* Brèthes, 1918, by monotypy. Synonymized under *Euplectrus* by De Santis (1980: 153).

Pachyscapha Howard, 1897: 159. Type species *Pachyscapha insularis* Howard, 1897, by monotypy. Synonymized under *Euplectrus* by Ferrière (1941: 38).

Rekabia Cameron, 1904: 65. Type species *Rekabia testaceipes* Cameron, 1904 by monotypy. Synonymized under *Euplectrus* by Kerrich (1974: 636).

Diagnosis. Hind tibial spur two, enlarged and elongated; the longest hind tibial spur always much longer than first tarsomere (Figures 63, 94); scutellum without longitudinal groove and mostly rather fine sculpture or even almost smooth; mesoscutum with four pairs of long thick white setae; pronotum short with a fine transverse carina (Figures 60, 65, 68, 77, 80).

Biological information. Wide range of host has been reported to be attacked by the members of this genus, such as species of the Aphididae, Lophopidae (Hemiptera), Arctiidae, Coleophoridae, Ctenuchidae, Epiplemidae, Gelechiidae, Geometridae, Gracillariidae, Hesperidae, Lasiocampidae, Limacodidae, Lymantriidae, Noctuidae, Nolidae, Papilionidae, Pieridae, Pyralidae (Lepidoptera), Braconidae, Eulophidae (Hymenoptera).

Distribution. This genus is worldwide in distribution with 40 species found in the Oriental region out of the approximately 105 recognized species. Twenty recognized species including nine undescribed species recorded from Java which is relatively diverse compare with other regions such as Afrotropical (12 spp.), Nearctic (13 spp.), Europe (four spp.), Neotropic (11 spp.), Australian (13 spp.) and Palearctic (six spp.).

Euplectrus ceylonensis Howard

(Figure 58-63)

Euplectrus ceylonensis Howard, in Howard and Ashmead, 1896: 641.

Euplectrus insulanus Crawford, 1911: 281. Synonymized by Ferrière, (1941: 34).

Biological information. This species has been recorded as parasitoids of noctuid moths (*Euproctis flava*; *E. fraterna*, *E. scintillans*) and lymantriid moth (*Trichoplusia orichalcea*).

Distribution. Indonesia: **West Java and Central Java (new record)**, Sumatra; India (Maharashtra, Tamil Nadu), Malaysia, Sri Lanka.

Specimens examined. *West Java*: 1♂ (MZB), C.A. Leuweng Sancang, Garut, track from Cijeruk to Cikalomberan, 12.v.2005, altitude 33 m, 07°48'S 107°50'E, R. Ubaidillah & Darmawan, sweep sample. *Central Java*. 1♀

(MZB), Cilacap, Nusakambangan, Karanganyar, 07°42'S 108°50'E, 29.vii.2004, R; Ubaidillah, sweep sample.

Euplectrus cinctiventris Ferrière

(Figures 64-66).

Euplectrus cinctiventris Ferrière, 1941: 36.

Biological information. Unknown.

Distribution. Indonesia: **West Java (new record)**, also recorded in Papua New Guinea (Morobe Prov.), China (Hainan), Dominican Republic, Mexico, South Africa (Cape Prov.), Uganda, Venezuela.

Specimen examined. *West Java*: 1♀ (MZB), Sukabumi, Situgunung, 4.ii.2004, sweep sample, R. Ubaidillah.

Euplectrus colliosilvus Wijesekara & Schauf.

(Figures 67-69)

Euplectrus colliosilvus Wijesekara & Schauf, 1994: 5, 7-8.

Biological information. Unknown.

Distribution. Indonesia: **Central and East Java (new record)**, Sri Lanka (Galpalama and Hortain Plain).

Specimens examined. *Central Java*: 2♀ (MZB), Cilacap, Nusakambangan, Karanganyar, 07°42'S 108°50'E, 29.vii.2004, sweep sample, R; Ubaidillah. *East Java*: Situbondo, Baluran Nat. Park, Boma, 08°13'44"S 114°27'38"E, 15.ix.2005, R. Ubaidillah & J. Kojima, forest; *Bali*: 1♀ (MZB), Negara, Cekek, Bali Barat Nat. Park, 08°13'44"S 114°27'24"E, 12.ix.2005, R. Ubaidillah & J. Kojima, sweep sample bush.

Euplectrus euplexiae Rohwer

(Figures 70-72)

Euplectrus euplexiae Rohwer, 1921: 135.

Biological information. This species is best known to be parasitoid of noctuid moths (*Condica capensis*, *Helicoverpa armigera*, *Selepa celtis*, *S.docilis*, *Spodoptera mauritia*).

Distribution. Indonesia: **Central Java (new record)**, also recorded from India (Haryana and Tamil Nadu).

Specimens examined. *Central Java*: 2♀ (MZB), Cilacap, West Nusakambangan, Karanganyar, 07°42'S 108°42'E, 30.vii.2004, sweep sample, R. Ubaidillah; 1♀ (MZB), Tegal Jaya, Guci (*Alium*), 07°12' 14"S 109°09' 14"E. 15.x.2004. sweep sample. R. Ubaidillah.

Euplectrus fulvicoxis Ferrière
(Figures 73-75)

Euplectrus fulvicoxis Ferrière, 1941: 32.

Biological information. Unknown.

Distribution. Indonesia: West Java.

Specimens examined. *West Java*: 1♀ (MZB), Cibodas 30.i.2004, sweep sample, R. Ubaidillah; 1♂ (MZB), G. Gede Nat. Park, Bodogol, 06°46'S 106°31'E, 11.viii.2004, sweep sample, R. Ubaidillah; 1♂ (MZB), G. Halimun Nat. Park, Citalahap 06°44'S 106°31'E, 13. viii. 2004, sweep sample, R. Ubaidillah.

Euplectrus laphygmae Ferrière
(Figures 76-78)

Euplectrus laphygmae Ferrière, 1941: 40.

Biological information. This species has been known to be larval parasitoids of arctiids and noctuids (Lepidoptera).

Distribution. Indonesia: West and **Central Java (new record)**, East Lesser Sunda, China (Fujian and Hubei), Benin, Cameroon, Congo, Israel, Ivory Coast, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, Sudan, Uganda, Zimbabwe.

Specimens examined. *West Java*: 3♀ (MZB) Bogor, Cibinong, Nanggawer, 26.vi.2004, sweep sample, R. Ubaidillah; 4♀, 5♂ (MZB), Bogor, Cibinong, Biotek Garden, (1♀, 1♂, 28.iv. 2004; 3♀, 4♂, 12.vi.2004), sweep sample, R. Ubaidillah; 2♀, 3♂ (MZB), Bogor, Bogor Botanic Garden, (1♀, 2♂, 10.vi. 2004; 1♀, 8.vi.2004; 1♀, 2.vi.2004); sweeping, R. Ubaidillah; 1♀ (MZB,

Bogor, Rumpin, Grendeng, 06°27'S 106°30'E, 2.vii.2004, sweep sample, R. Ubaidillah; 1♂ (MZB), Bogor, Jasinga, around Gua Gudawang, 06°27'S 106°30'E, 21.iii.2004, sweep sample, R. Ubaidillah; 1♂ (MZB), Ciamis, Sadananya, Gunungsari, Cilopodan, 18.v.2004. R. Ubaidillah; 1♂ (MZB), Bogor, Ciampea, 06°32'S 106°41'E, 11.vii.2004, sweeping, R. Ubaidillah; *Central Java*: 2♀ (MZB), Cilacap, West Nusakambangan, Karanganyar, 07°42'S 108°42'E, 30.vii.2004, sweep sample, R. Ubaidillah; 3♀, 2♂ (MZB), Jogjakarta, Pakem, Padansari, 22.v.2004, sweeping at long bean crops, R. Ubaidillah; 1♂ (MZB), Solo, Karanganyar, Tawangmangu, Grojokansewu 07°38'56"S 111°07'08"E 17.x.2004, R. Ubaidillah, sweep sample.

***Euplectrus manilae* Ashmead**

(Figures 79-81)

Euplectrus manilae Ashmead, 1904: 16.

Biological information. This species was reared from the larvae of noctuid moth *Anomis erosa* and papilionid butterfly, *Papilio polytes* (Baltazar 1966)

Distribution. Indonesia: West and Central Java (new record), Malaysia, Papua New Guinea, Thailand, Philippines, China (Guizhou, Hainan, Hubei), Japan, Australia (Zhu & Huang 2002a).

Specimens examined. *West Java*: 1♀ (MZB), Sukabumi, Situgunung, 4.ii.2004, sweep sample, R. Ubaidillah; 1♂ (MZB), Bogor, Cibinong, Nanggawer, 26.vi.2004, sweep sample, R. Ubaidillah; *Central Java*: 1♀ (MZB), Purwokerto, Batu Raden, Pancuran Tujuh, 07°09'59"S 107°24'39"E, 15.x.2004, R. Ubaidillah, sweeping sample.

***Euplectrus noctuidiphagus* Yasumatsu**

(Figures 82-84)

Euplectrus noctuidiphagus Yasumatsu, 1953: 184.

Biological information. This species was reared from the larvae of noctuid moth, *Eudocima tyranna*.

Distribution. Indonesia: **West and Central Java (new record)**, China (Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan, Zhejiang), Taiwan, Japan, and Nepal.

Specimens examined. *West Java*: 1♀ (MZB), Ciamis, Sadananya, Gunungsari, Cilopodan, 18.v.2004, R. Ubaidillah; 1♀ (MZB), Ciamis, Panjalu, dukuh Situ Lengkong, 18.vi.2005, 07°07'S 108°16'E, altitude 800 m., Ubaidillah & Darmawan, Sweeping net; 1♀ (MZB), Ciamis, Panjalu, Panambangan, 19.vi.2005, 07°08'S 108°15'E, altitude 800 m., H. Sutrisno & E. Cholik, Sweeping net; 1♀ (MZB), Ciamis, Panjalu, Situ Ciater, 16.vi.2005. 07°09'S 108°19'E, Ubaidillah & Darmawan, Sweeping net; 1♂ (MZB), Bandung. Kec. Rancabali, setu Patenggang, Patuha, 19.v.2005, A. Suwito & Sarino; 1♀ (MZB), Bandung, Kec. Cablong, Desa Cablong, Curug Dago, Tahura, Ir. Juanda, altitude 770 m., 20.v.2005, Awit Suwito & Sarino; 1♂ (MZB), Sukabumi, T.N. Gunung Gede Nat. Park, Bodogol, altitude 800 m., 11.v.2005, A. Suwito, Sarino, Rina; *Central Java*: 1♀ (MZB) D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo atas, 07°37'S 110°25'E, altitude 1,110m., 13.vii.2005, Ubaidillah & Darmawan.

Euplectrus parvulus Ferrière

(Figures 85-87)

Euplectrus parvulus Ferrière, 1941: 33.

Euplectrus plecopterae Mani, 1941: 31. Synonymized to *Euplectrus parvulus* by Chatterjee (1945: 95).

Biological information. This species has been recorded from wide range host of lepidoteran larvae such as, geometrids (*Ascotis selenaria*, *Isturgia disputaria*), lophopids (*Pyrilla* sp.), noctuids (*Plecoptera reflexa*), and undescribed pyralid moth.

Distribution. Indonesia: **West and Central Java (new record)**, East Lesser Sunda, China (Guangxi), India.

Specimens examined. *West Java*: 2♀, 2♂ (MZB), Bogor, Sukamantri, 06°40'S 106°45'E, 17.ix. 2004, R. Ubaidillah; 1♀ (MZB), Bogor, Jasinga, around Gua Gudawang. 06°27'S 106°30'E, 21.iii.2004, R. Ubaidillah, sweep sample; 2♀ (MZB); Ciamis, Sadananya, Gunungsari, Cilopodan,

18.v.2004, sweep sample, R. Ubaidillah; 1♀ (MZB); 1♀ (MZB), Cianjur, Cibodas Botanic Garden, 11.vii.2004, sweep sample, R. Ubaidillah; 1♀, 2♂ (MZB), Bogor, Ciampea, 06°32'S 106°41'E, 11.vii.2004, sweep sample, R. Ubaidillah; 1♂ (MZB), Bogor, Rumpin, Grendeng, 06°27'S 106°30'E, 2.vii.2004, sweep sample, R. Ubaidillah; 1♂ (MZB), Bogor, Cibinong, Nanggung, 26.vi.2004, sweep sample, R. Ubaidillah, 2♀ (MZB), G. Gede Nat. Park, Bodogol, 06°46'S 106°31'E, 11.viii.2004, sweep sample, R. Ubaidillah; *Central Java*: 1♀ (MZB, Jogjakarta, Kaliurang, Telaga Putri, 22.v.2004, sweep sample, R. Ubaidillah; Cilacap, West Nusakambangan, Karanganyar, 07°42'S 108°42'E, 30.vii.2004, sweep sample, R. Ubaidillah.

***Euplectrus xanthocephalus* Girault**
(Figures 88-94)

Euplectrus xanthocephalus Girault, 1913: 101.

Biological information. This species was reared from the larvae of noctuids moths.

Distribution. Indonesia: West and Central Java, Malaysia, India, China (Fujian, Jiangxi, Sichuan), Japan, Papua New Guinea, Australia.

Specimens examined. *West Java*: 1♀, 3♂ (MZB), Bogor, Cibinong, Biotek Garden, (1♀, 2♂, 28.iv. 2004; 1♂, 12.vi.2004, sweep sample, R. Ubaidillah; 2♀ (MZB), Bogor, Cibinong, Nanggung, 26.vi.2004, sweep sample. R. Ubaidillah; 1♂ (MZB), Bogor, Ciampea, 06°32'S 106°41'E, 11.vii.2004, sweeping, R. Ubaidillah; *Central Java*: 1♀ (MZB), Cilacap, Nusakambangan, Sodong, 07°45'S 108°58'E, 30.vii.2004, sweep sample, R. Ubaidillah; 1♀ (MZB), Jogjakarta, Pakem, Padansari, 22.v.2004, sweeping kacang panjang, R. Ubaidillah; 1♀ (MZB), Tegal Jaya, Guci (*Alium cepa*), 07°12' 14"S 109°09' 14"E. 15.x.2004, sweep sample. R. Ubaidillah.

***Euplectrus* sp nr *platyhypenae* Howard**

Biological information. Unknown.

Distribution. Indonesia: West and Central Java.

Specimens examined. *West Java*: 1♀ (MZB), Cianjur, Cibodas Botanic Garden, 30.i.2004, sweep sample, R. Ubaidillah; 1♀ (MZB), Bogor, G. Salak, Curugngangka, 01.ii.2004, sweep sample, R. Ubaidillah; *Central Java*: 1♀ (MZB), Purwokerto, Batu Raden, Pancuran Tujuh, 07°09'59"S 107°24'39"E, 15.x.2004, R. Ubaidillah, sweeping sample.

Discussion. This species is very similar to *E. platyhypenae* Howard, 1885, but the latter has hind coxa yellow. With the types of the latter species available in the future, it could be determined whether these species are the same or different. This species is also close to *E. cinctiventris*, but differ on those two-minute setae between posterior ocelli and longer funicles.

11. Genus *Hemiptarsenus* Westwood (Figures 47-48)

Hemiptarsenus Westwood, 1833: 122-123. Type species *Hemiptarsenus fulvicollis* Westwood by original designation.

Eriglyptoideus Girault, 1913: 154. Type species *Eriglyptoideus varicornis* Girault, by original designation and synonymized under *Hemiptarsenus* by Bouèek (1988: 626)

Hemiptarsenoideus Girault, 1916: 220. Type species *Hemiptarsenoideus semialbiclava* Girault designated by Gahan and Fagan (1923). Synonymized under *Hemiptarsenus* by Girault (1917: 8).

Neodimmockia Dodd, 1917: 361. Type species *Neodimmockia agromyzae* Dodd, synonymized under *Hemiptarsenus* by Girault (1924: 4).

Notanisomorpha Asmead, 1904: 356. Type species *Notanisomorpha collaris* Asmead. Synonymized under *Hemiptarsenus* by Schauff and LaSalle (1993: 494).

Diagnosis. Antennae inserted above mid height of face in both sexes; scape when rested exceeding beyond level of vertex (Figure 47); antennal funicle consisting of four articles and first three of male funicle branches with covered very short hairs (Figure 48); notauli incomplete, axilla not acutely extending; scutellum with sublateral groove absent; propodeal median carina absent; metasomal petiole transverse to short; forewing at least 2.6 times longer than broad; costal cell 7 to 15 times as long as broad. Body slender; legs elongate; females sometimes brachypterous.

Biological information. This genus is known to be larval parasitoid of leaf-mining of agromyziid flies, such as *Agromyza (mobilis, oryzae, parvicornis)*, *Butomyza angulata*, *Dizygomyza (iraeos, iridis, pygmaea)*, *Chromatomyia (fuscata, horticola, milii, nigra, primulae, syngenesiae)*, *Liriomyza (bryoniae, congesta, huidobrensis, pusilla, sativae, strigata, trifolii)*, *Ophiomyia phaseoli*, *Phytoliriomyza variegata*, *Phytomyza (hendeli, melana, minuscule, plantaginis, ranunculi)*, *Pseudonapomyza spicata*; chloropid *Meromyza americana*; bacculitrigid moths *Bucculatrix cantabricella*; cosmopterigid moth *Stagmatophora naviella* and curculionid beetles *Ceutorhynchus assimili* and *Hypurus bertrandi*.

Distribution. Wide distribution throughout, but mainly is recorded from Holarctic (15), Nearctic (8), Palearctic (8) and Oriental (9) where only one species is found from Java.

Hemiptarsenus varicornis (Girault)

(Figures 47-48)

Eriglyptoideus varicornis Girault, 1913:154.

Hemiptarsenoideus semialbiclava Girault, 1916: 221. Synonymized with *Hemiptarsenus varicornis* by Bouèek (1988: 627).

Hemiptarsenus antennalis Masi, 1917: 208. Synonymized with *Hemiptarsenus varicornis* by Kerrich (1969: 210).

Neodimmockia agromyzae Dodd, 1917: 362-363. Synonymized with *Hemiptarsenus varicornis* by Bouèek (1988: 627).

Hemiptarsenus ophiomyzae Risbec, 1957: 247. Synonymized with *Hemiptarsenus varicornis* by Bouèek (1988: 627).

Biological information: This species is larval parasitoids of leaf miner agromyziid flies, *Agromyza phaseoli*, *Liriomyza (bryoniae, congesta, huidobrensis, pusilla, sativae, strigata, trifolii)*, *Pseudonapomyza spicata* and *Ophiomyia phaseoli*.

Distribution. Worldwide in distribution.

Specimens examined. *Central Java:* 5 ♀ (MZB), Semarang, Ambarawa, Candi Gedong Songo, 07°05'16"S 110°40'27"E, 16.x.2004, sweep sample, R Ubaidillah; 1 ♀ 1 ♂ (IUNH), Prambanan, Cepoko, 07°44'S 110°30'E, sweep sample, J. Kojima; 15 ♀ 1 ♂ (MZB)

Bali, Singaraja, Pameron, 08°10'S 115°02'E, 9.ix.2005, R. Ubaidillah & J. Kojima, sweep sample bush; *Bali*: 1♀ (MZB), Singaraja, Sariti Mayong, 08°14'46"S 114°58'01"E, 11.ix.2005, R. Ubaidillah & J. Kojima, sweep long bean; 6♀ 6♂ (MZB), Badung, Mangwi, Kuwun, 08°13'S 115°09'E, 10.ix.2005, R. Ubaidillah & J. Kojima, sweep sample longbean; 8♀ 3♂ (MZB), Badung, Mangwi, Kuwun, 08°13'S 115°09'E, 10.ix.2005, R. Ubaidillah & J. Kojima, sweep sample longbean; *East Lesser Sundas*: 6♀ 4♂ (MZB), Woloweku, Ndonga, Central Flores Flores Island, 24.i.2003 (R. Ubaidillah); 3♀ 2♂ (IUNH), Takari-Takari (9°58'S 124°01'E), Kupang, Timor Island, 1.i.2003 (R. Ubaidillah); *Sulawesi*: 2♀ 1♂ (MZB), Patunuang Nature Reserve, Maros, South Sulawesi, 05°03'S 119°43'E, Maros 18 .ix. 2003, Ubaidillah & Kojima; *Halamaheira*: 2♀ 1♂ (MZB), Taduma, Ternate, North Maluku, 10.ix.2003 (Ubaidillah & Kojima).

12. Genus *Metaplectrus* Ferrière (Figures 106-110)

Metaplectrus Ferrière, 1941: 18-19. Type species *Metaplectrus thoseae* Ferrière, 1941 by monotypy.

Diagnosis. Antenna with four funicular flagellomeres in both sexes (Figure 108); occipital carina present, weak; pronotum with transverse carina anteriorly (Figure 332); notauli complete to meet scuto-scutellar suture, scutellum always with sub-lateral grooves curve to meet posteriorly; scutellum disk has two pairs of setae; propodeum with single median carina, divided anteriorly and forms a basal cup (Figures 106, 109); hind tibia always has one spur longer than first metatibia (Figure 110).

Biological information. This genus is known to be larval parasitoid of limacodid moths *Comana fasciata*, *Narosa conspersa*, *Natada nararia* and *Thosea cervina*. Bouček (1988) and Noyes (2002) have listed the host record of all the available information for the host species for this genus.

Distribution. This genus is distributed restrictedly from Sri Lanka, Taiwan to Australia- Victoria. Two species described from Sri Lanka (Gadd 1945, Wijesekara & Schauff 1994), one species representative in Taiwan and

one species described from Indonesia- Sumatra (Ferrière 1941) and one described from Victoria, Australia. This genus found in Java as a new record.

Discussion. This genus is distinguished by the following combination of characters: hind tibia with one spur only and it is longer than basitarsus; propodeum with a median carina, both sexes with four funicular articles. Gauthier *et al.* (2000) placed this genus under Eulophinae based on their phylogenetic study and the close relationships to *Platyplectrus*.

Metaplectrus thoseae Ferrière
(Figures 106-110)

Metaplectrus thoseae Ferrière, 1941: 19.

Biological information. This species has been known as an ectoparasitoid larva of the limacodid moth *Thosea cervina* (Moore) (Limacodidae) (Ferrière 1941).

Distribution: Indonesia: Sumatra, West and East Java and **Bali (new record)**; also recorded from India (Himachal Pradesh and Uttar Pradesh) and Malaysia.

Specimens examined. *West Java:* 1♀ (MZB), Bogor, Jasinga, around Gua Gudawang. 06°27'S 106°30'E, 21.iii.2004, R. Ubaidillah, sweep sample; 1♂ (MZB), Ciamis, Sadananya, Gunungsari, Cilopodan, 18.v.2004. R. Ubaidillah; *Central Java:* 1♀ (MZB), Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Bawah, 07°35'S 110°24'E, altitude 910 m., 14.vii.2005, Ubaidillah & Darmawan; 1♀ (MZB), D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Atas, 07°35'S 110°06'E, altitude 110 m., 16.vii.2005, Ubaidillah & Darmawan; *East Java:* 1♂ (MZB), Jember, Tempurejo, Andongrejo, Meru Betiri N.P, to Bande Alit, 08°24'S 113°44'E, altitude, 264 m., 03.v. 2005. Ubaidillah, R, E.Cholik & Darmawan; 1♀ (MZB), Pacitan, Alaskubong, forest fragment (left) 100 m, 24-28.vii.2005, 08°08'38"S 111°00'34"E, Dougeron, C. & Villemant, C, MT2INDO004; *Bali :* 1♀ (MZB), Negare, Melaya, Palasari, Taman Wisata Villa 08°15'24"S, 114°33'04"E, 13.ix.2005, R. Ubaidillah & J. Kojima, sweep sample bush.

13. Genus *Necremnoides* Girault
(Figure 114)

Necremnoides Girault, 1913: 288. Type species *Necremnoides tricarinatus* Girault, by monotype and original designation.

Diagnosis. Pronotum short, transverse; notauli very fine posteriorly (Figure 114) and curving outward to meet anterior margin of axilla; scutellar sublateral groove very fine and not meeting posteriorly; propodeum with a single median carina and costula; second metasomal tergum short, and if longer than any other metasomal terga, then its never longer than half length of abdominal terga.

Biological information. Unknown.

Distribution. This genus is newly recorded from Indonesia and it was found previously only in Australia.

Discussion. This genus is closely related to *Elachertus*, differs mainly on short and transverse pronotum. As pointed out by Bouèek (1988) in his holotype examination, the genus also has fine sublateral grooves which was overlooked by Girault (1913). As the genus is now understood, there are only two described species so far namely *N. fulvipropodeum* Girault and *N. tricarinatus* both are distributed in Queensland Australia. The Javanese species fitted the definition of *Necremnoides* by Bouèek (1988) and Girault (1913) and it belongs to undescribed species.

Necremnoides fulvipropodeum Girault
(Figure 114)

Necremnoides fulvipropodeum Girault, 1915: 292.

Biological information. Unknown.

Distribution. West Java.

Specimen examined. *West Java*: 1♀ (MZB), T.N. Gede Pangrango, Bodogol, Sukabumi 10 Mei 2005, altitude 800 m., Darmawan.

14. Genus *Notanisomorphella* Girault (Figure 115)

Notanisomorphella Girault, 1913: 287. Type species *Notanisomorphella australiensis* Girault, by original designation.

Crateulophus Masi, 1917: 206. Type species *Crateulophus niger* Masi, by monotypy, synonymized under *Notanisomorphella* by Bouèek (1988: 627).

Raurua Risbec, 1952:188. Type species *Raurua australis* Risbec by monotypy. Synonymized under *Notanisomorphella* by Bouèek (1988: 627).

Sunha Delucchi, 1962: 53. Type species *Sunha bicolor* by monotypy; original designation, synonymized under *Notanisomorphella* by Bouèek (1988: 627).

Diagnosis. Antennal funicle with four flagellomeres in both sexes; male of first three flagellomeres branches basally. Mesoscutal notauli absent or indicated at in the anterior margin of mesoscutal disk; mesoscutal mid disk evenly setose or with two rows of setae; scutellum without submedian grooves. Forewing with postmarginal vein at least two times as long as stigmal vein. Propodeum with a completed single median carina, and with “step-like” plicae (enclosed median panels of propodeum elevated above lateral areas) immediately medial to spiracles; propodeal median disk large, with reticulately sculptured.

Biological Information. This genus has been known to be parasitoids of Coleophoridae and other micro Lepidoptera, leaf-mining Hispine beetles, also reared from spider egg sacs.

Distribution. Sporadically spread out from Africa, India to Indonesia and New Guinea to Australia.

Discussion. *Notanisomorphella* presently comprises of ten species worldwide and Bouèek (1988) divided into two species groups based on the characters of propodeum. They are *proserpinensis*-group in which the propodeum smooth and *flaviventris*-group where the propodeum strongly punctured. One species *N. fuscocauda*, was the first recorded in this genus from Indonesia by Ubaidillah (2004) and the species can be placed in the *flaviventris*-group based on the strongly punctured propodeum. The *N. fuscocauda* was described from East Lesser Sunda (Ubaidillah, 2003) and is closely resembles to *N. flaviventris* (Girault, 1913) (holotype in QMB,

examined), but differs from the latter in having more rough sculpture on propodeum, dark brown on flagellum, and a dark brown round spot on median of metasoma. Two additional species are undescribed.

Notanisomorphella fuscocauda Ubaidillah

(Figure 115)

Notanisomorphella fuscocauda Ubaidillah, 2004: 63-64.

Biological information. Unknown.

Distribution. East Java (new record) and East Lesser Sunda.

Specimens examined. *East Java*: 1♀ (MZB), Malang, Karangploso, 26.v.2004, R. Ubaidillah, sweeping; *East Lesser Sunda*: ♀ (MZB, holotype), Woloweku, Ndona, Central Flores, Flores Island, sweep sample, 24.i.2003, R. Ubaidillah.

15. Genus ***Platyplectrus*** Ferrière

(Figures 116-119)

Platyplectrus Ferrière, 1941: 20. Type species *Platyplectrus natadae* Ferrière by original designation.

Autoplectrus Gadd, 1945: 336. Type species *Autoplectrus taprobanes* Gadd; by monotypy and original designation, synonymized under *Platyplectrus* by Bouèek (1988: 634).

Trichoplectrus Erdős, 1951: 170. Type species *Euplectromorpha szepligetii* Erdős; original designation, synonymized under *Platyplectrus* by Bouèek (1988: 635).

Diagnosis. Antennal funicular with three articles in both sexes; occipital carina often present; pronotal collar always present, gradually sloping anteriorly, sometimes with very weak collar carina that is difficult to see; notauli complete to meet scuto-scutellar suture, scutellum always with sub-lateral grooves or carinae which may or may not curve to meet posteriorly; scutellum disk has two pairs of setae; propodeum with a median carina, divided anteriorly and forms a basal cup; hind tibia always has two spurs in which one spur is always longer than first metatibial.

Biological information. This genus is known to be a solitary or gregarious larval ectoparasitoids of noctuid and limacodid moths. Noyes (2002) has listed the host of this genus.

Distribution. This genus is worldwide in distribution and it is well representative in old World by high number of species, especially in the Oriental and Australian tropical regions. Thirty-eight were described worldwide; ten species are recognized in Java, in which six species are belonging to undescribed species and two species are new record for Indonesia.

Discussion. Previous concept of *Platyplectrus* (e.g., Ferrière 1940, Bouček 1988, Wejsekara & Schauff 1994) included *Alveoplectrus* Wijesekara & Schauff, 1997 *Eurycephaloplectrus* Wijesekara & Schauff, 1997, *Metaplectrus* Ferrière, 1940 and *Euplectrus* Westwood, 1832 were placed in the sub family of Euplectrinae based on the long metatibial spur. In this study, I follow Gauthier *et al.* (2000) which placed the genus under Eulophinae on the basis of phylogenetic molecular evidence.

***Platyplectrus artonae* (Ferrière)**

Platyplectrus artonae (Ferrière), **comb. nov.** *Euplectromorpha artonae* Ferrière, 1940, Bull. Ent. Res. 31: 136. Female, "Java" (holotype, BMNH).

Biological information. Based on the specimens examined, the species was reared from the zygaenid moth *Artona catoxantha*.

Distribution. Indonesia: Java.

Discussion. Type specimens identified by Ferrière (1940) has a median carina on propodeum as the ground character of *Platyplectrus*, therefore in this study I transferred the species to *Platyplectrus*.

Specimen examined. 1 ♀ (MZB) Labelled *Cotype*. West Java, Buitenzorg, 1939. J.v.d. Vech. ex.: Larva of *Artona catoxantha*.

***Platyplectrus medius* Zhu & Huang**

Platyplectrus medius Zhu & Huang 2002b: figs. 10-21, 129-131.

Biological information. Unknown.

Distribution: Indonesia: **West Java (new record)** and South Korea (Kyunggi).

Specimen examined. *West Java:* 1 ♀ (MZB), Bandung, Tangkuban Prah, near Research Station ITB, 06°45'50''S 107°36'48''E 12.x.2004, R. Ubaidillah.

***Platyplectrus orthocraspedae* Ferrière**
(Figures 116-120)

Platyplectrus orthocraspedae Ferrière, 1941: 21.

Biological information. Ferrière (1941) noted that the types were reared from larva of limacodid moth *Orthocraspeda trima* (Moore) collected from Serang, Java and on the same host was also found in Sulawesi and one male was recorded from limacodid larvae of *Setora nitens* Walker from Bogor. Later Herting (1976) listed the host of the species is from Limacodid species of *Darna catenata* (Snellen).

Distribution: Indonesia: West Java, Sulawesi.

Specimens examined. *West Java:* 1 ♀ (MZB), Sukabumi, Cigombong, Ciburayut, 8-15. Malise Trap on *Momordioa charantia*, Rofik; 1 ♀ (IUNH), Cibodas, 30.i.2004, R. Ubaidillah; 1 ♀ (MZB) Ciamis, Panjalu, Kertamandala, altitude 1,000 m., 07°09'S 108°15'E. 15.v.2005, R. Ubaidillah and Darmawan; 1 ♂ (MZB) Bogor, Sukamantri, G. Salak, 06°45'S 106°10'34''E, 17.ix.2004, R. Ubaidillah; 1 ♂ (MZB), Sukabumi, Situgunung, 4.ii.2004, R. Ubaidillah.

***Platyplectrus truncatus* Wijesekara & Schauff**

Platyplectrus truncatus Wijesekara & Schauff, 1994: 54-55.

Biological information. Unknown.

Distribution. Indonesia: **Central Java (new record)**, also recorded from Sri Lanka.

Specimens examined. *Central Java:* 2 ♀ (MZB), Solo, Karanganyar, Tawangmangu, Grojogan Sewu, 07°37'58''S 111°07'54''E 17.x.2004, sweep sample. R. Ubaidillah.

***Platyplectrus viridiceps* (Ferrière)**

Euplectromorpha viridiceps, Ferrière, 1940: 136.

Platyplectrus viridiceps Wijesekara and Schauff, 1994: 33.

Biological information. This species has been recorded as an ectoparasitoid larva of the zygaenid moth, *Artona catoxantha* (Hampson) (Procridae) (Noyes 2002). Thakur *et al.* (1992) also reported the wasp was reared from the larva of lymantrid moth of *Euproctis scintillans* (Walker) and Herting (1976) listed as a parasitoid of lymantrid moth, genus of *Dasychira* sp.

Distribution. Indonesia: West Java, **East Java, Bali (new record)**; also recorded from India (Himachal Pradesh and Uttar Pradesh) and Malaysia.

Specimens examined. *West Java*: 1♀ (MZB), Bandung, Ciwidey, G. Patuha, 07°09'59"S 107°24'39"E, 13.x.2004. R.Ubaidillah; 1♀ (IUNH), Ciamis, Panjalu, Kertamandala, altitude 1,000 m., 07°09'S 108°15'E. 15.v.2005, R. Ubaidillah and Darmawan; 1♀ (MZB) Bogor, Gunung Gede Nat, Park, Bodogol, 06°46'S 106°41'E, 13.viii.2004. R.Ubaidillah; 1♂ (MZB) Bogor, Bogor Botanic Garden, 8.vi.2004. R. Ubaidillah; *East Java*: 1♀ (MZB), Malang, Karangploso, 26.v.2004. R. Ubaidillah; *Bali*: 1♀ (MZB), Bedugul, Baturiti, 08°17'31"S 115°10'34"E, Ubaidillah & Kojima, sweep from vegetable farm.

16. Genus ***Pnigalio*** Schrank

(Figures 111-113)

Pnigalio Schrank, 1802: 315. Type species *Ichneumon pectinicornis* Schrank, by monotypy.

Notanisomorphomyia Girault, 1913: 289. Type species *Notanisomorphomyia albicoxa* Girault, by monotypy and original designation. Synonymized under *Pnigalio* by Bouèek (1988:628).

Sympiesomorpha Ashmead, 1904: 352. Type species *Sympiesomorpha brasiliensis* Ashmead, by original designation, synonymized under *Pnigalio* by Bouèek (1988:628).

Tineophaga Rondani, 1868: 22. Type species *Tineophaga tischeriae* Rondani, by monotypy and original designation. Synonymized under *Pnigalio* by Bouèek (1988: 628).

Diagnosis. Antennal funicle with four articles in both sexes, rarely with three (Figure 112); male first to third funicular branches basally. Notauli incomplete, indicate only in the anterior margin of mesoscutal disk; mesoscutal median disk irregularly setose, especially in anterior half. Scutellum without sublateral grooves, and scutellar mid disk reticulately sculptured, sometimes distinctly more faintly sculptured than mesoscutum (Figure 111); axillae sometimes smooth. Forewing with postmarginal vein two times as long as stigmal vein; speculum present or absent, basal cell bare; basal and cubital veins setose. Propodeum with plicae complete, connected to median carina by irregular transverse costula, (Figure 111) but few species without costula and very rarely with incomplete plicae; and the area between plica and costula smooth. Metasomal petiole at most hardly longer than broad, smooth, exposed dorsally.

Biological information. This genus is known to be parasitoids of leaf-mining Lepidoptera, Coleoptera, Diptera, and gall-forming sawflies. Noyes (2002) has listed the host record of all the available information for the host species.

Distribution. The genus is worldwide in distribution and occurs in all regions such as Afrotropics; Australasian; East Africa; Europe; Holarctic; Nearctic; Oriental; Palearctic; Southern Africa. Eight species including seven undescribed species have now been recorded in Java.

Pnigalio katonis (Ishii)

(Figures 111-113)

Eulophus katonis, Ishii, 1953: 2, combined by Bouček & Askew (1968:2).

Biological information. The best known is to be an ectoparasitoid of leaf-mining agromyzids, *Agromyza albipennis*; *A. oryzae*; *A. hiedubrensis* *Chromatomyia horticola*, *C. syngenesiae*.

Distribution: Japan, Indonesia: West, Central and East Java, Sumatra, Sulawesi (new record)

Specimens examined. West Java: 1♀ (MZB), Bogor Botanic Garden, 10.vi.2004(1♀, 25.vi.2004; 1B&, 2.vi.2004), R. Ubaidillah, sweeping: 2♀, 1♂ (MZB), Bogor, Cibinong, Biotek garden, 28.iv.2004, R. Ubaidillah, sweeping; 7♀, 3♂ (MZB), C.A. Leuweng Sancang, Garut, track from Cijeruk to Cikalomberan, 12.v.2005, altitude 33 m., 07°48' S, 107°50' E, R. Ubaidillah

& Darmawan, sweep sample; *Central Java*: 4♀ (MZB), Cilacap, West Nusakambangan, Karanganyar, 07°42'S 108°50'E, 29.vii.2004, R. Ubaidillah, sweeping; 1♀ (MZB), Cilacap, Nusakambangan, Limus Buntu, 07°44'S 108°58'E, 02.viii.2004, R. Ubaidillah, sweeping; *East Java*: 32♀, 7♂ (MZB) Jember, Tempurejo, Andongrejo, Meru Betiri N.P, altitude 264 m., 30iv-3.v, 2005, S 08°24' S, 113°44' E, altitude 264 m., 03.v.2005, Ubaidillah, R, H. Sutrisno, E.Cholik & Darmawan; *Sumatra*: 18♀, 4♂ (MZB), Lampung Selatan, Raja Basa, Tejang, P. Sebesi, 05°56' S 105°30', 11.viii.2005, Ubaidillah; 1♂ (MZB), Lampung Selatan, Raja Basa, Tejang, P. Sebesi, 05°53'14" S 105°31'49", around Cacao plantation, 14.viii.2005, Ubaidillah; *Krakatau*: 4♀, 2♂ (MZB), Anak Krakatau, 06°06'10" S 105°26'07" E 17.viii.2005. R. Ubaidillah, sweep sample; 1♂ (MZB), Sertung east, 06°04'6.08" S 105°24'43"E, 15.viii.2005, R. Ubaidillah; *Sulawesi*: 1♀ (MZB) South Sulawesi; Karaenta, primary seasonal forest, 300m, 30.vii-11.viii. 2005, 05°02' S 119°40' E, 18.ix.2003, Daugeron, C & Villemant, C, Malaise Trap.

17. Genus *Stenomesus* Westwood

(Figures 95-97)

Stenomesus Westwood, 1833: 343. Type species *Stenomesus pulchellus* Westwood, by subsequent designation.

Euryscotolinx Girault, 1913: 266. Type species *Euryscotolinx guttativertex* Girault by monotypy and original designation. Synonymized under *Stenomesus* Westwood by Bouèek (1977: 401).

Nioro Risbec, 1951: 25. Type species *Nioro elegantula* Risbec by monotypy. Synonymized under *Stenomesus* Westwood by Bouèek (1977: 401).

Stenelachistus Masi, 1917: 201. Type species *Stenelachistus impressus* Masi, by subsequent designation. Synonymized under *Stenomesus* Westwood by Bouèek (1977: 401).

Diagnosis. Both sexes with four funicular flagellomeres (Figure 96), notauli complete, reaching the anterior margin of mesoscutellar line, scutellum with sublateral groove uniting posteriorly, propodeum with two submedian carinae connected at middle, forming an H- or X-shaped (Figure 97).

Biological information. This genus is best known to be larval endoparasitoids of gelechiid, gracillarid, pyralid and noctuid moths. However, some species

have been recorded as ectoparasitoid of unidentified of leafminer Curculionidae beetle (Bouèek and Askew 1968)

Distribution. This is a big genus, worldwide in distribution, with geographical range from Central America, Caribbean, Caucasus, Africa, Europe, Holarctic, Middle East, Oceanic, Oriental and Australasian, but well representative in Oriental and Holarctic regions by 4 species, respectively. So far five species have been recognized in Java and Bali and are all new records for Indonesia, in which three species belong to undescribed species.

***Stenomesus japonicus* (Ashmead)**

(Figures 95-97)

Sympiesomorpha japonica Ashmead, 1904: 63.

Sympiesomorphelleus whitmani Girault, 1916: 300. Synonymized by Kamijo (1976: 485).

Stenelachistus impressus Masi, 1917: 201. Synonymized Bouèek (1977: 402).

Euryscotolinx coimbatorensis Rohwer, 1921: 134. Synonymized by Bouèek (1977: 402).

Sympiesomorpha chilonis Ishii, 1937: 110. Synonymized by Kamijo (1976: 485).

Elachertus tabashii Nakayama, 1938: 28. Synonymized by Paik (1990: 41).

Sympiesomorpha mikan Ishii, 1953: 4. Synonymized by Kamijo (1976: 484).

Stenomeseioideus ashmead Subba Rao & Sharma, 1966: 229. Synonymized by Bouèek (1977: 402).

Biological information. This species is best known to be parasitoid of leaf-mining larvae of lepidopteran moths of the family Gracillariidae (*Acrocercops* sp., *Aristaea* sp., *Caloptilia azaleella*, *C. theivora*, *Cyphosticha coerulea*, *Dialectica scariella*, *Gracillaria* sp., *Phodoryctis caerulea*; *Phyllocnistis citrella*; *Phyllonorycter lyoniae*; *Phyllonorycter ringoniella*), Gelechiidae (*Aproaerema modicella*, *Bilobata subsecivella* and *Stomopteryx nerteria*) and unidentified leaf-mining curculionid beetle. Less frequently attacking larvae of Pyralid (*Anania verbascalis*, *Chilo suppressalis* and *Polythlipta macralis*), larvae of noctuid moths (*Agrotis crinigera*, *Helicoverpa armigera* and *Naranga aenescens*) and Lyonetiid moths (*Lyonetia clerkella*).

Distribution. Indonesia: **Java, Krakatau, Kalimantan, Sulawesi and Halmahera (New Record)**. Also recorded in Senegal, Egypt, United Arab Emirates, Pakistan, India, Korea, Japan, Papua New Guinea to Australia.

Specimens examined. *West Java*: 3 ♀ (MZB), Bogor, Bogor Botanic Garden, altitude 250 m., 10.v.2001, R. Ubaidillah (1 ♀, 2.vi.2004; 1 ♀, 8.vi.2004; 1 ♀, 10.vi.2004); 1 ♀ (MZB), Ciamis, Panjalu, dukuh Situ Lengkong, 18.vi.2005, 07°07' S 108°16'E, altitude 800 m., Ubaidillah & Darmawan, Sweeping net; *Central Java*: 2 ♀, 1 ♂ (MZB), Cilacap, West Nusakambangan, Karanganyar, 07°42' S 108°50' E, 29.vii.2004, R. Ubaidillah, sweeping; 1 ♀ (MZB), Cilacap, Nusakambangan, Limus Buntu, 07°44' S 108°58' E, 02.viii.2004, R. Ubaidillah, sweeping; *East Java*: 2 ♀ (MZB), Jember, Tempurejo, Andongrejo, Meru Betiri N.P, altitude 264 m., 30iv-3.v, 2005, 08°24' S, 113°44' E, altitude 264 m., 03.v. 2005, Ubaidillah, R. H. Sutrisno, E.Cholik & Darmawan; *Krakatau*: 1 ♀ (MZB), Anak Krakatau, 06°06'10'' S 105°26'07'' E 17.viii.2005, R. Ubaidillah, sweep sample; 1 ♀ (MZB), P. Panjang, 06°04'9.8'' S 105°24'43'' E 18.viii.2005, R. Ubaidillah, sweep sample; *Kalimantan*: 1 ♀ (MZB), East Kalimantan, Kayan Mentarang Nat. Park., Nort Kayan, Pa'Raye, 04°00'49" S 115°44'52" E, 950m, R. Ubaidillah, Sweep sample; *Sulawesi*: 1 ♀ (MZB) Northlawesi; Gorontalo, Bone Bolango, Tulabolo, 00°30' N 123°15' E, 13.ix.2003, R. Ubaidillah; *Maluku*: 2 ♀ (MZB), North Maluku Halmahera, Jailolo, Idham Dehe, 01°06' N 127°25' E, 8.ix.2003, Ubaidillah & Kojima; 1 ♂ (MZB), North Maluku Halmahera, Jailolo, Akeshu, 01°00' N 127°30' E, 8.ix.2003, Ubaidillah & Kojima.

18. Genus *Stenopetius* Bouèek

(Figures 98-100)

Stenopetius Bouèek, 1988: 637-638. Type species *Stenopetius rugosus* Bouèek, by monotypy and original designation.

Diagnosis. Head with occiput concave, dorso-lateral almost touching the eyes; posterior vertex, just behind the posterior ocelli with transverse carina; eyes large and hairy; scrobe shallow, lower face slightly convex with tentorial pit on the sides of posterior clypeus; clypeus not prominent; antennae filiform, inserted in middle of face, with five funicular flagellomeres; pronotum narrow, distinctly narrower than mesoscutum, with transverse carina; mesoscutum

with notauli complete to reach the anterior margin of axilla, median mesoscutal with alveolate punctures and irregular rugosity; median disk of scutellum depressed; propodeum medially with 2 carinae, connected before middle to form X-shaped; petiole narrow, slightly widening caudad, much longer than hind coxa.

Biological information. Unknown.

Distribution. Indonesia: **Java and Sulawesi (New record)**, recorded also in Australia-Queensland.

***Stenopetius nr rugosus* Bouèek**

(Figures 98-100)

Biological information. Unknown.

Distribution. Known only in West Java and North Sulawesi.

Specimens examined. *West Java*: 1♀ (MZB), Sukabumi, Salabintana 8.vii.2004, R.Ubaidillah, sweeping; 1♀ (IUNH), T.N Gede Pangrango, kab. Sukabumi, Bodogol date 1 Mei.2005. altitude 800 m., Coll. Darmawan; *Central Java*: 1♂ (MZB), D.I Yogyakarta, Sleman, Turgo Bawah, 07°35'S 110°26'E, altitude 920 m., 17.vii.2005, Ubaidillah, R & Darmawan; *Sulawesi*: 1♀ (MZB), North Sulawesi, Gorontalo, Bone Bolango, Tapa, Bone Talangi 00°35'N 123°06'E, 16.ix.2003, sweep sample, R.Ubaidillah.

Discussion. This species is very similar to the sister *S. rugosus* but can be distinguished from the latter by the presence of a median depression scutellar median disk and black body.

19. Genus ***Sympiesis*** Förster

(Figures 101-105)

Sympiesis Förster, 1856: 74. Type species *Eulophus sericeicornis* Nees, 1834 original designation.

Asympiesiella Girault, 1913: 78. Type species *Sympiesis nelsonensis*, Girault, 1913 original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Opheliminus Girault, 1913: 458. Type species; *Opheliminus grotii*, Girault, 1913 by monotypy. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Necremnomyia Girault, 1913: 292. Type species *Necremnomyia saintpierrei*, Girault, 1913 by monotypy & original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Sympiesonecremnus Girault, 1913: 292. Type species *Sympiesonecremnus boasi*, Girault, 1913 by monotypy & original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Pardiaulomella Girault, 1915: 295. Type species *Pardiaulomella consonus*, Girault, 1915 by monotypy & original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Pronecremnus Girault & Dodd, 1915: in Girault, 1915: 298. Type species *Pronecremnus speciosus*, Girault & Dodd, 1915, by monotypy and original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Diaulomella Girault, 1913: 283. Type species *Diaulomella australiensis* Girault, 1913 by monotype and original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Diaulomorphella Girault, 1915: 294. Type species *Diaulomorphella cyaneipurpurea*, Girault, 1915, by monotype and original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Pardiaulomyia Girault & Dodd, 1915 (in Girault, 1915: 294). Type species *Pardiaulomyia spadiceipes* Girault & Dodd, 1915. by monotypy; original designation. Synonymized under *Sympiesis* by Bouèek (1988: 620).

Moroceras Erdős, 1954:323. Type species *Moroceras biroii*; Erdős, 1954 by original designation. Synonymized under *Sympiesis* by Bouèek & Askew (1968:40).

Diagnosis. Both sexes have four funicular flagellomeres with rarely five; first to third male flagellomeres branched basally. Posterior margin of clypeus truncate or slightly concave; mesoscutal notauli incomplete; setae on mesoscutal midlobe usually arranged in regular longitudinal rows (if not, then propodeum without median carina or plicae); scutellum without sublateral grooves, reticulately sculptured; sculpture on mesoscutum, scutellum, and axillae nearly uniform. Postmarginal vein twice stigmal vein length or longer; disc sometimes infuscate near stigma and/or parastigma; speculum present, basal cell bare; basal and cubital veins setose; 1 long row of admarginal setae present but not entirely exposed by speculum. Propodeum without costula, and plicae usually

incomplete or absent; median carina present or absent; median panels shiny to dull and reticulately sculptured.

Biological information. This genus are best known to be solitary larval ectoparasitoids of gracillarid moths and agromizid leafminers, although it has been recorded from geometrid, gelechiid, nepticulid, pyralid, tischeriid, tortricid moths and hispid beetles *Promecotheca cumingii* and *P. nuciferae*. Three species, *Sympiesis bimaculatipennis* (Girault), *S. marylandensis* Girault and *S. sericeicornis* (Nees) have been used practically in biological control of gracillarid moths of *Phyllonorycter* spp. (Noyes 2002) and one species for controlling hispid, a pest of coconut (Fernando 1972). However, some species have been recorded as hyperparasitoid of braconid wasps (Ridgway & Mahr 1989).

Distribution. This is a big genus with worldwide distribution and this genus is well representative in Holarctic and Palearctic regions by high number of species. So far only about 15 species have been recorded from Oriental region, including eleven species are found in Indonesia. By which nine species recorded in Java and Bali, including the six species that belong to undescribed species. One species is a new record for Indonesia.

***Sympiesis dolichogaster* Ashmead, 1888**

Sympiesis dolichogaster Ashmead, 1888:7. Female [Locality not mentioned in the original citation; Noyes (2002) mentioned "U.S.A. Kansas"].

Sympiesis mikado Ashmead, 1940:164. Female, "JAPAN Atami" (lectotype female designated by Kamijo (1976:486). Synonymized under *Sympiesis dolichogaster* by Kamijo (1976: 485).

Asympiesella nelsonensis Girault, 1913:78. Synonymized under *Sympiesis dolichogaster* by Bouèek (1988:621).

Sympiesis nelsonensis Girault, 1914: 11. Female, male, "Australia-Nelson (Cairns), N.Q.". Synonymized under *Sympiesis dolichogaster* by Bouèek (1988:621).

Sympiesis nowickii Szélnyi, 1941:28. Female, male, "Hungary". Synonymized under *Sympiesis dolichogaster* by Bouèek (1959: 130).

Biological information. This species has been recorded as parasitoids mainly on larvae of gracillarid moths and it has also been recorded from geometrids, gelechiid, nepticulid, pyralid, tischeriid, and tortricid (see Noyes 2002).

Distribution: Worldwide in distribution.

Specimens examined. *West Java:* 1♀ (MZB), G. Halimun Nat. Park, M.T Botol, 1530m, 06°42'20.7"S 106°20'E, 16.viii.1997, R. Ubaidillah & M. Rofik; *Bali:* 1♀ (MZB), Bedugul, Baturiti, 08°17'31"S 115°10'34"E, 08.ix.2005, R. Ubaidillah & J. Kojima, sweep sample vegetable farm; *East Lesser Sunda:* 7♀ 4♂ (MZB), 4♀ 3♂ (IUNH), Boentukan, 10°07'S 123°48'E, West Amalon, Timur Tengah Selatan, Timor Island, 1.i.2003, R. Ubaidillah; *Sulawesi:* 1♂ (MZB), Molonggota, Tinggola, Gorontalo, North Sulawesi, 08.ix.2003, Ubaidillah & Kojima, sweep sample.

Sympiesis javanica (Ferrière)

Dimmockia javanica Ferrière, 1933, 2: 92. Transferred to *Sympiesis* by Kerrich (1969:196).

Biological information. This species is best known to be a parasitoid of hispid beetles, *Promecotheca cumingi* and *Promecotheca nuciferae* (Thompson 1955) and it has been used for biological control in controlling the population of hispid beetles of coconut pest in Malaysia (Fernando 1972, Delucchi 1974) and it has been also introduced into Sri Lanka from Singapore. The biological program in Sri Lanka has a satisfactory result in controlling *P. cumingi*.

Distribution. Central and West Java, **Sumatra (new record)**, Borneo, Singapore, Malaysia and Sri Lanka.

Specimens examined. *Sumatra:* 1♀, 2♂ (MZB), Lampung Selatan, Raja Basa, Tejang, P. Sebesi, 05°56'12" S 105°30'16", The way from Segenong to Danau, 12.viii.2005, Ubaidillah; *Krakatau:* 8♀, 3♂ (MZB), Anak Krakatau, 06°06'10"S 105°26'07"E 17.viii.2005, R. Ubaidillah, sweep sample; 1♀ (MZB), P. Panjang, 06°04'9.8"S 105°24'43"E 18.viii.2005, R. Ubaidillah, sweep sample; *West Java:* 1♀ (MZB), C.A. Leuweung Sancang, Garut, Cijeruk, 11.v.2005, altitude 30 m., S 07°42'S 107°50'E R. Sutrisno, H & E. Cholik, sweep sample; *Central Java:* 1♀ (MZB), D.I Yogyakarta, Prambanan, Pereng, 22.v.2004. R. Ubaidillah, sweep sample.

Sympiesis javensis (Gahan)
(Figures 101-105)

Diaulomella javensis Gahan, 1922:47.

Biological information. Unknown.

Distribution: Indonesia: West Java to Central Java.

Specimens examined. *West Java:* 3♀ (MZB), Cibodas, 30.i.2004, R. Ubaidillah, sweeping; 1♀ (MZB), Bandung, Kec. Cablong, Desa Cablong, Curug Dago, Tahura, Ir. Juanda, altitude 770 m., 20.v.2005, Awit Suwito & Sarino; 1♀, 1♂ (MZB), Ciamis, Panjalu, Situ Ciater, 16.vi.2005, 07°09' S 108°19', Ubaidillah & Darmawan, Sweeping net; 1♀ (MZB), Ciamis, Panjalu, Kertamandala, 15.vi.2005. 07°09'S 108°14'E, altitude 1,000 m., Ubaidillah & Darmawan, Sweeping net; *Central Java:* 1♀ (MZB), Purwokerto, Batu Raden, Pancuran Tujuh, 07°09'59''S 107°24'39''E, 15.x.2004, R. Ubaidillah, sep sample; 1♀ (MZB), Solo, Karanganyar, Ngargoyoso Bergo, 07°37'08''S 111°07'54''E 17.x.2004, sweep sample. Coll. R. Ubaidillah; 1♀ (MZB), D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Bawah, 07°35'S 110°24'E, altitude 910 m., 14.vii.2005, Ubaidillah & Darmawan; 1♂ (MZB), D.I Yogyakarta, Sleman, Pakem, Purwobinangun, Turgo Atas, 07°45'S 110°24'E, altitude 910 m., 14.vii.2005, Ubaidillah & Darmawan.

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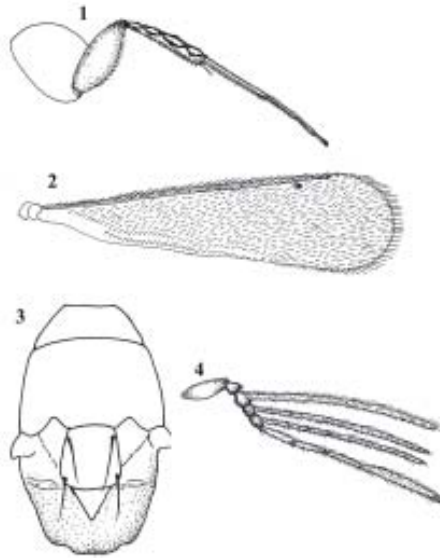
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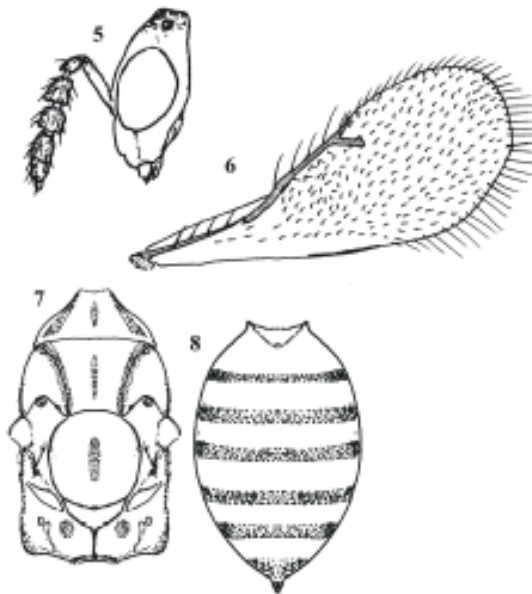
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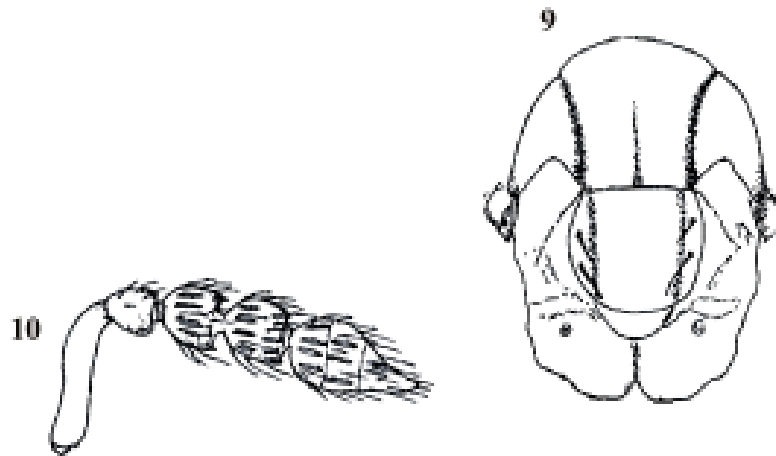
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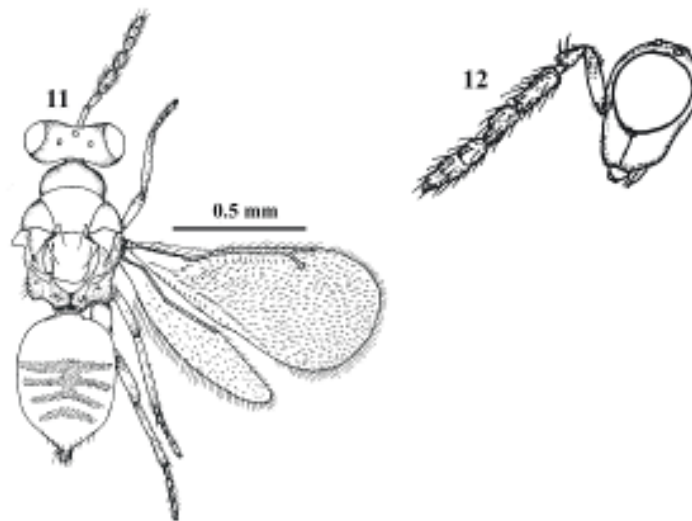
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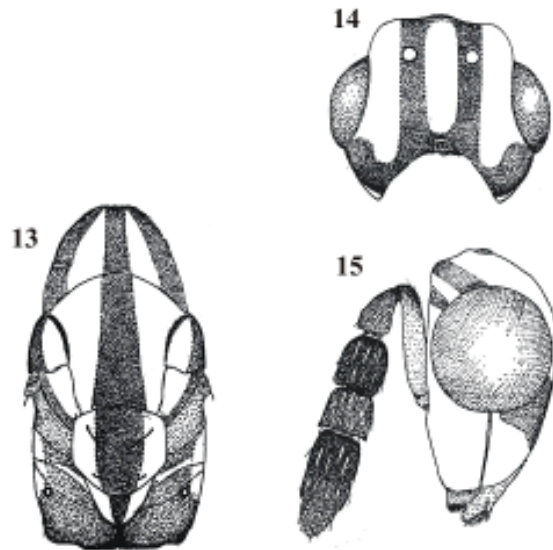
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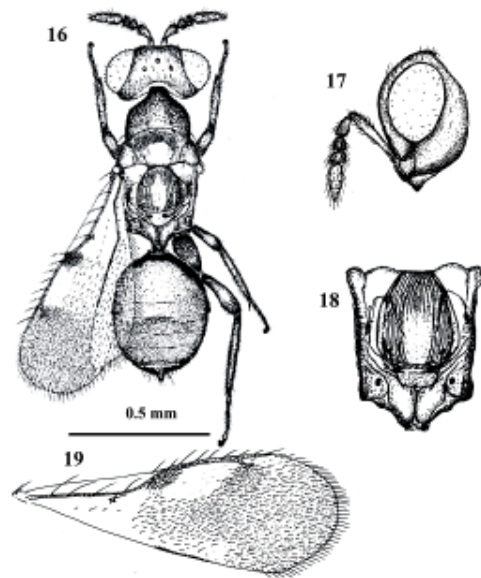
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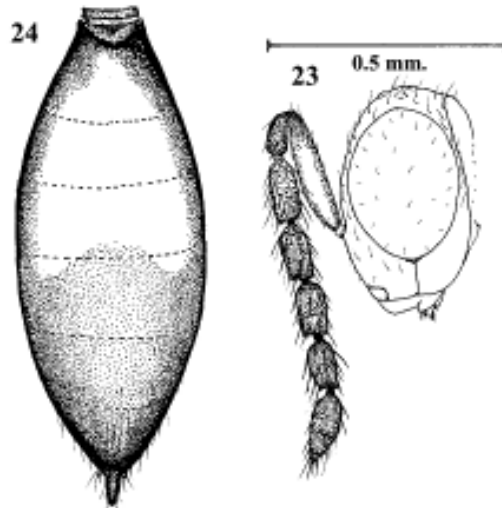
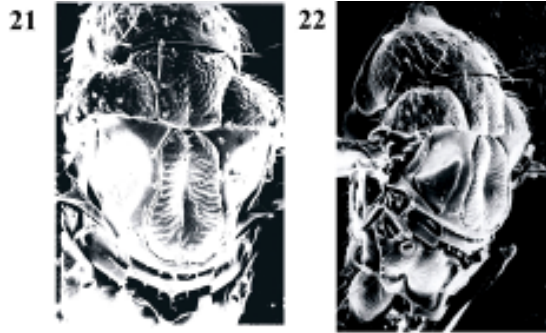
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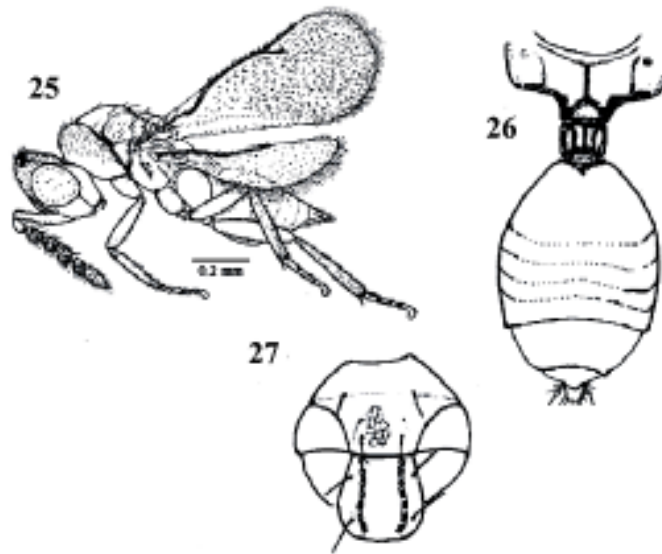
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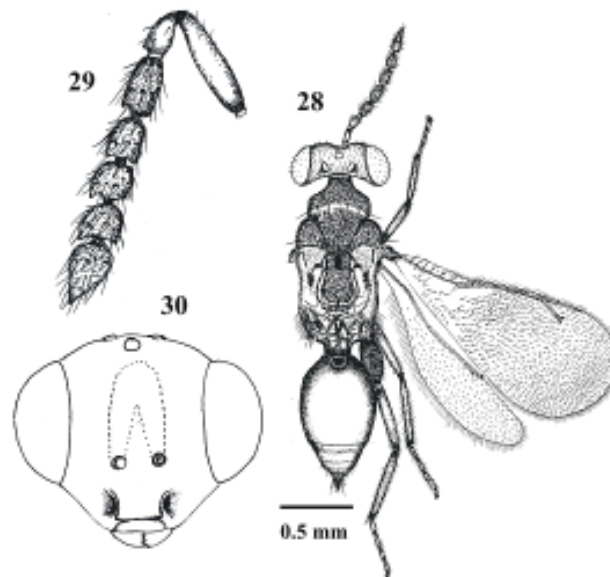
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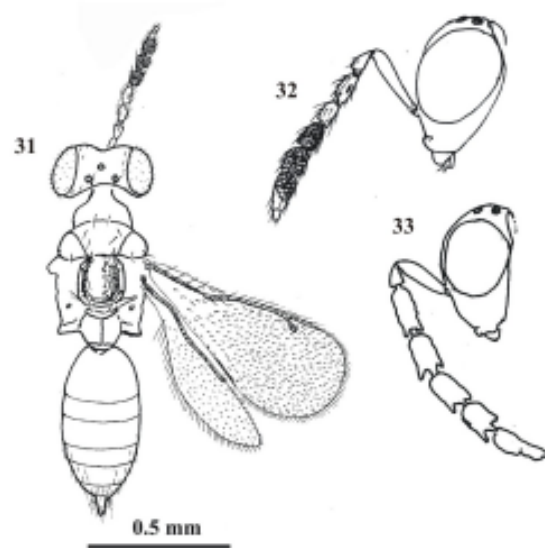
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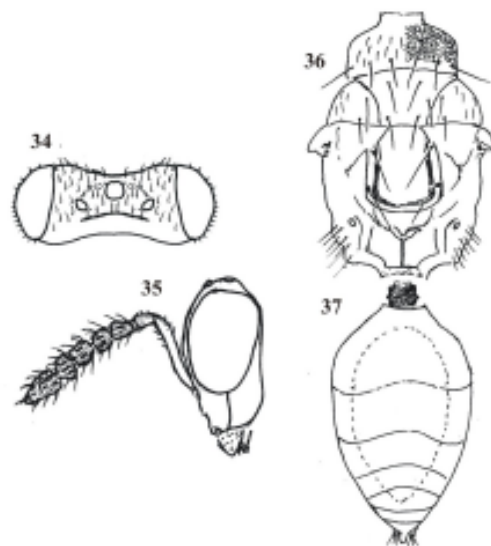
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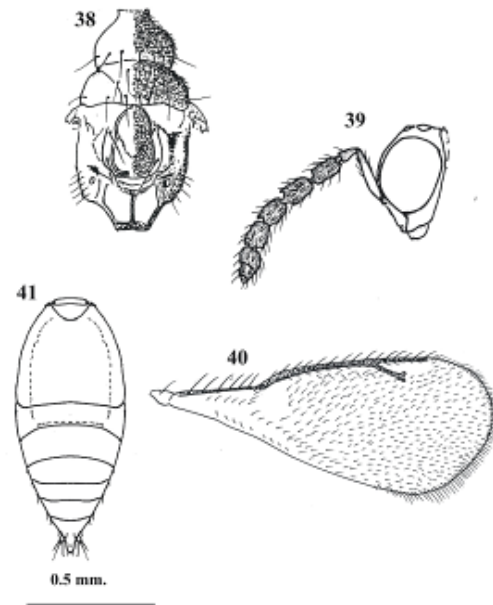
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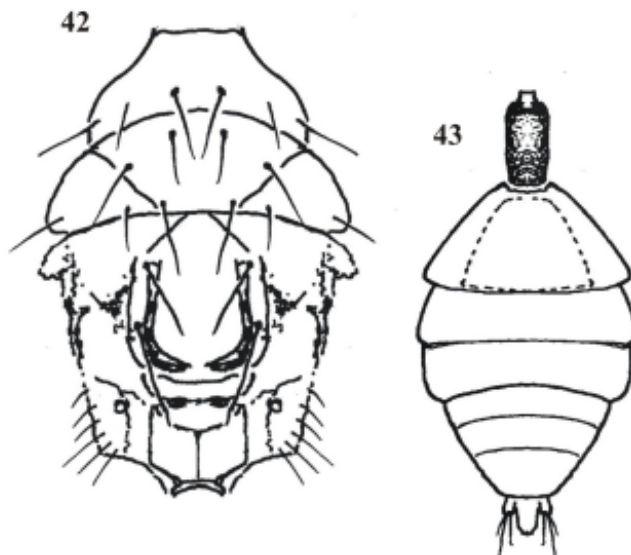
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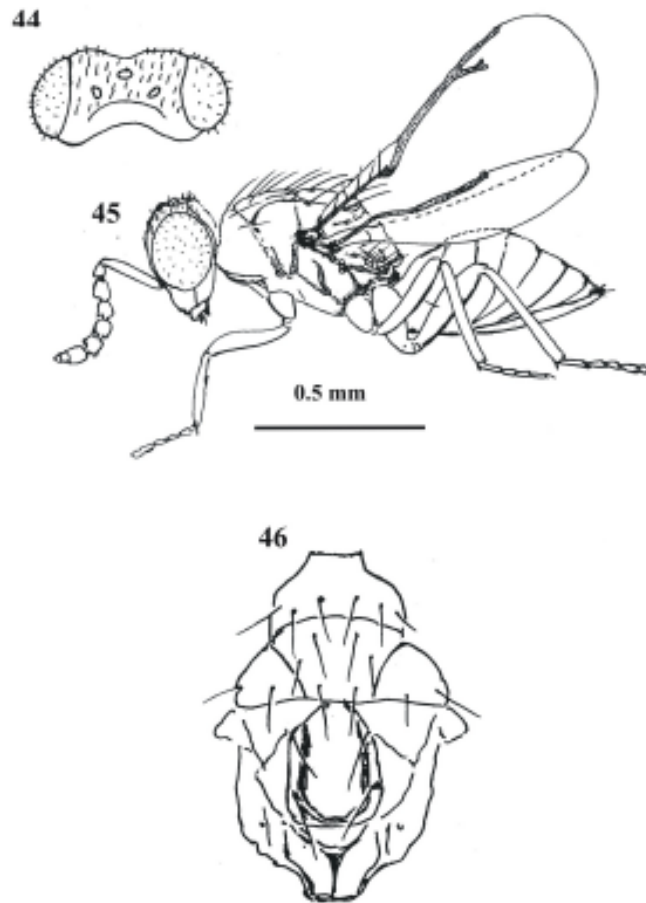
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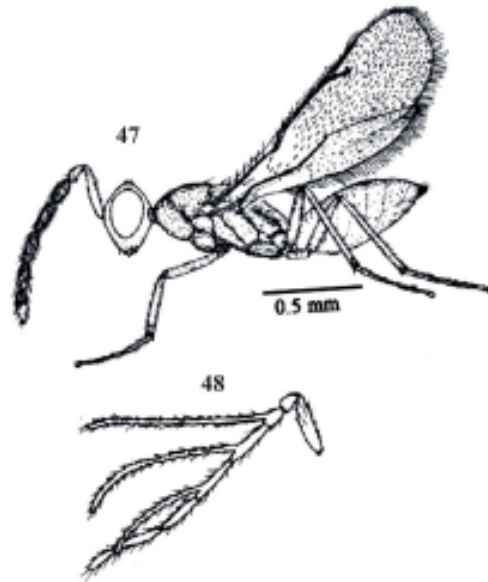
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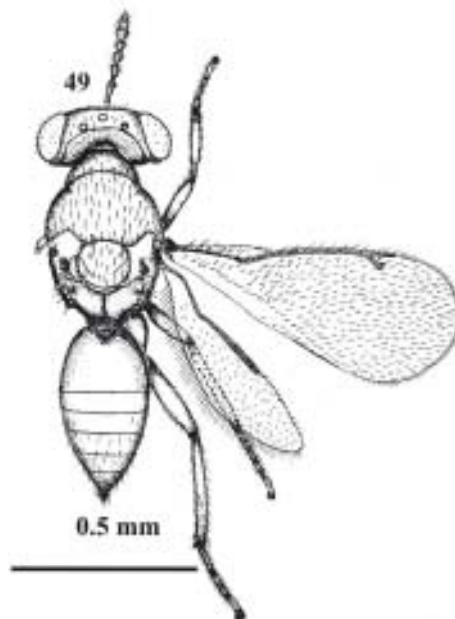
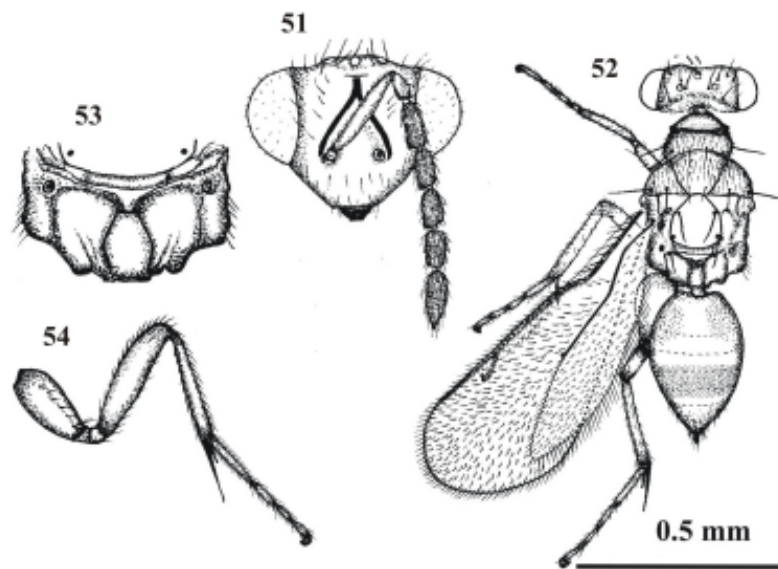


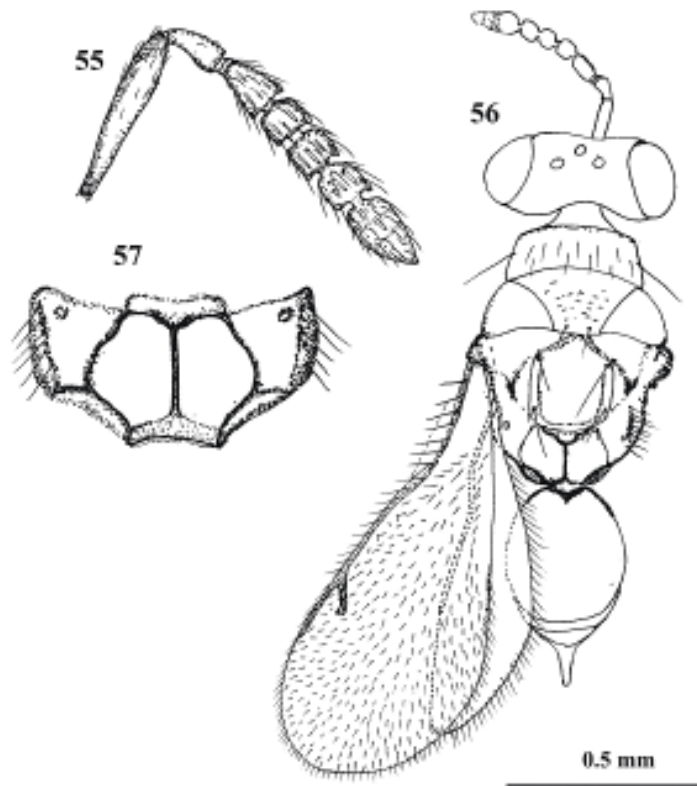
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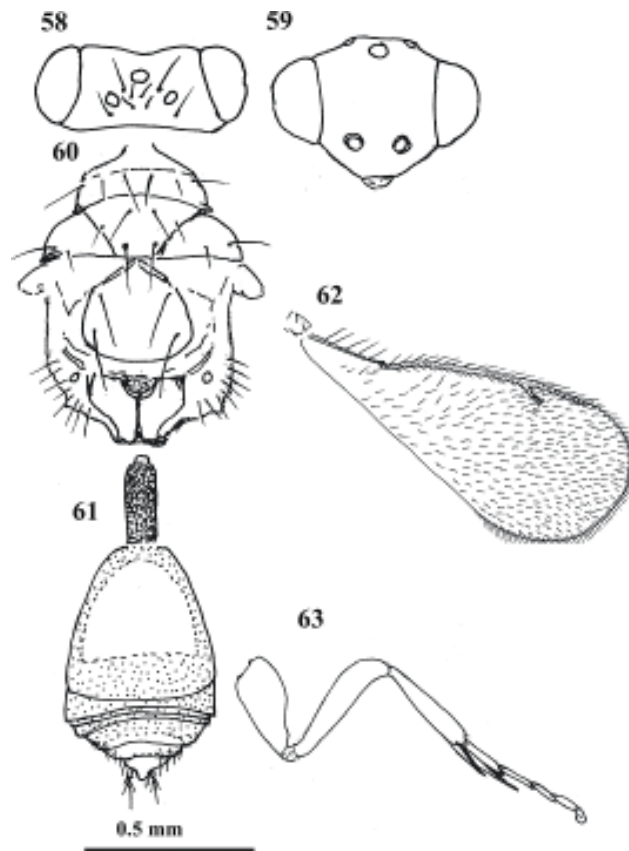
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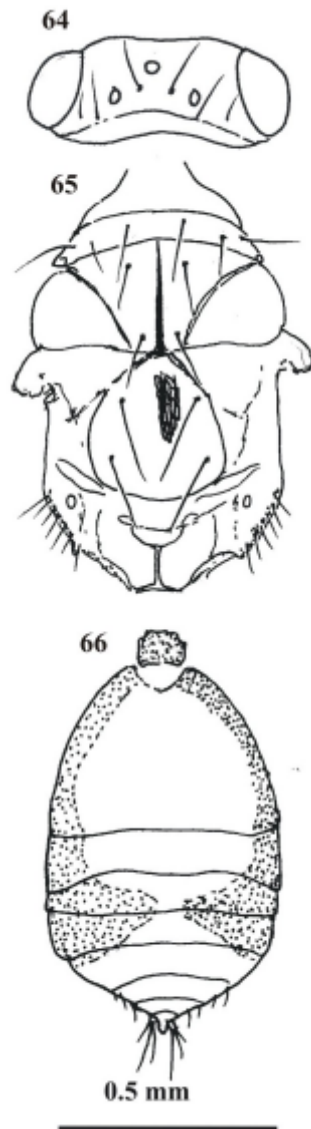
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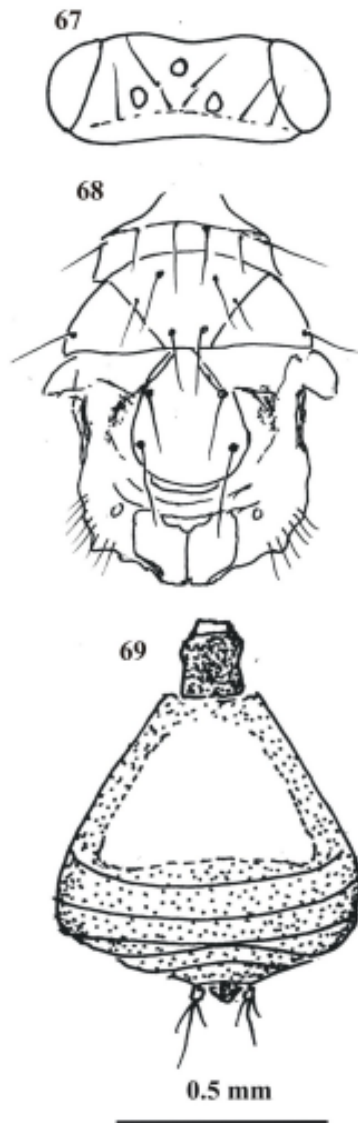
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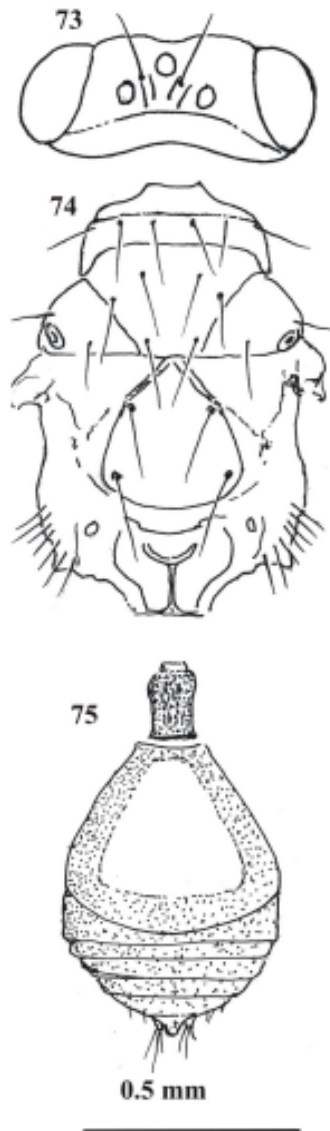
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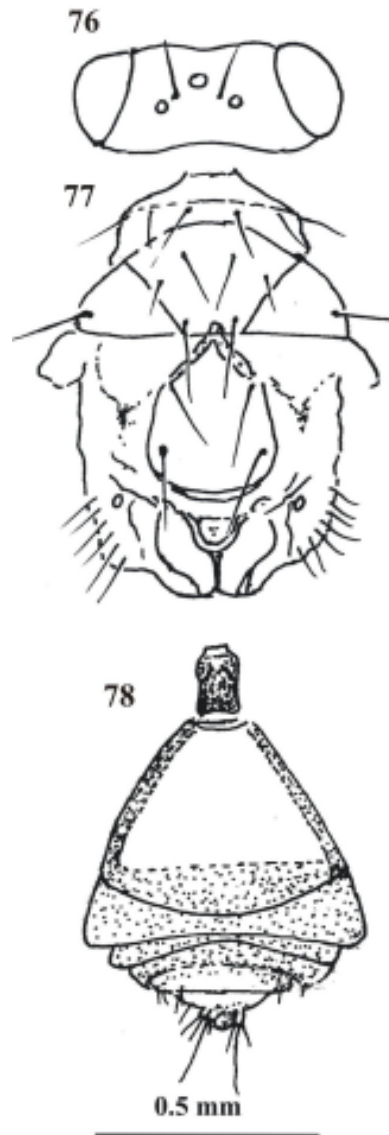
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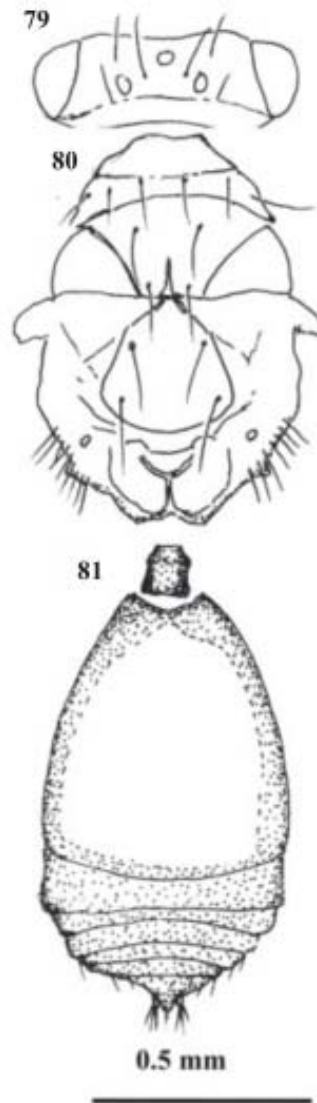
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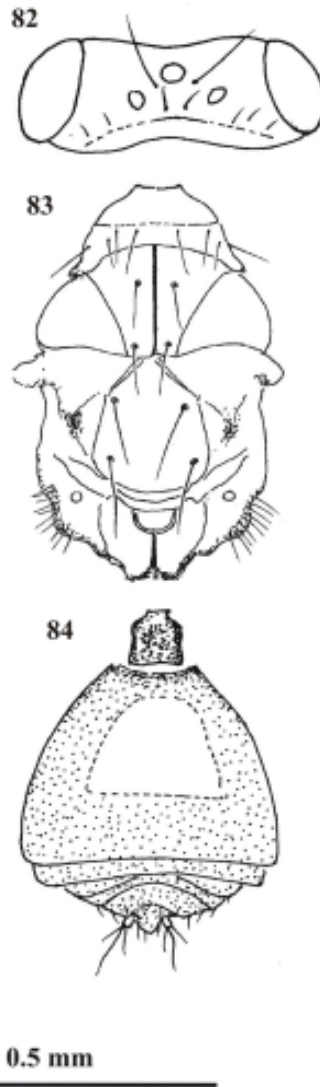
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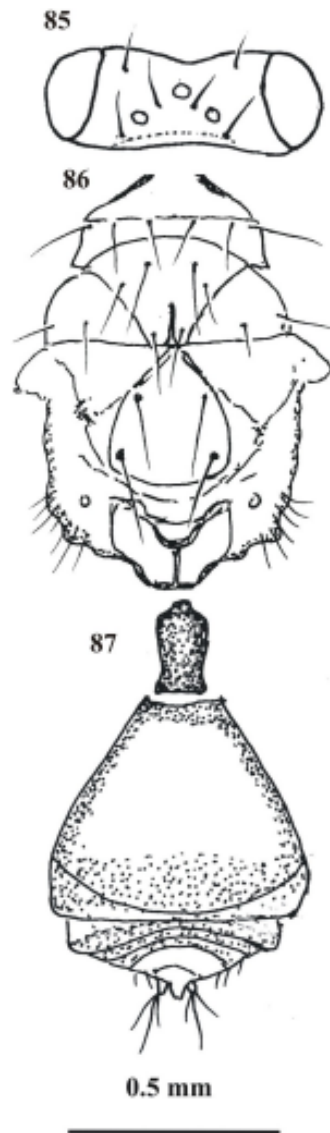
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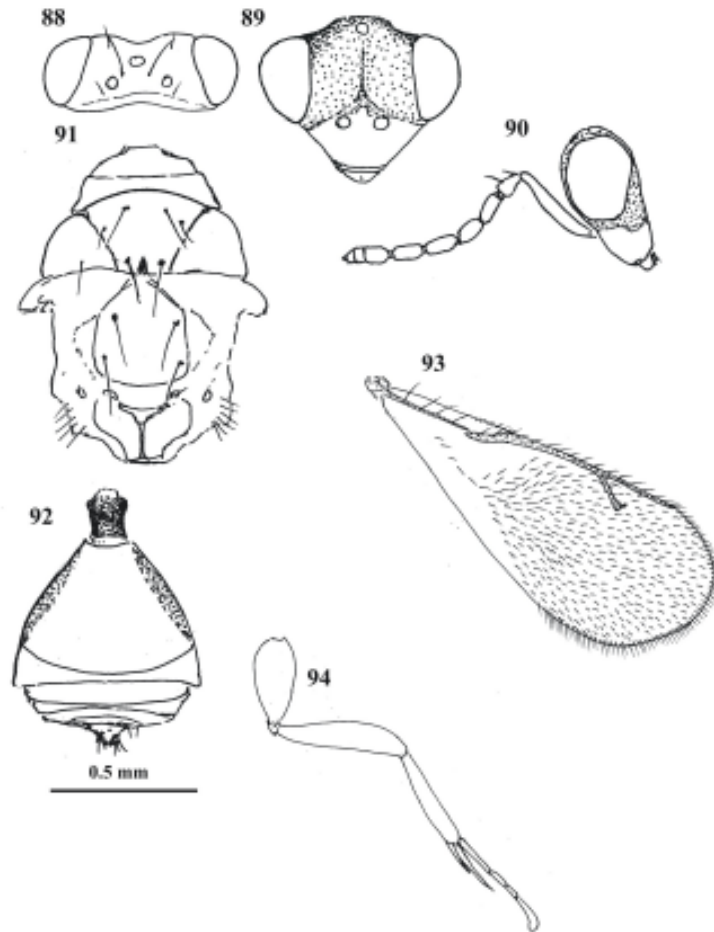
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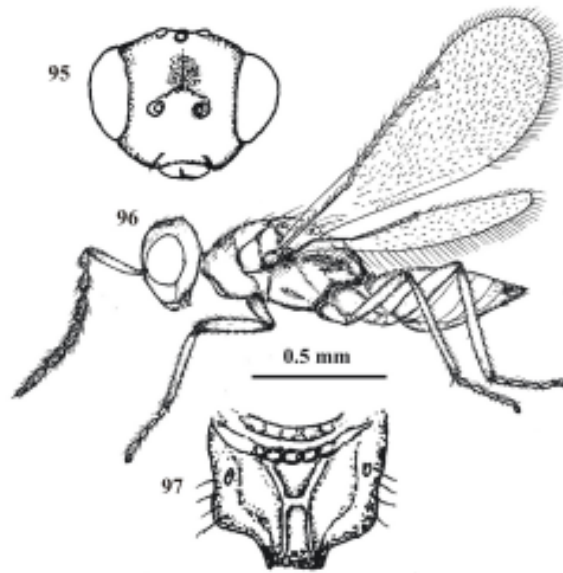
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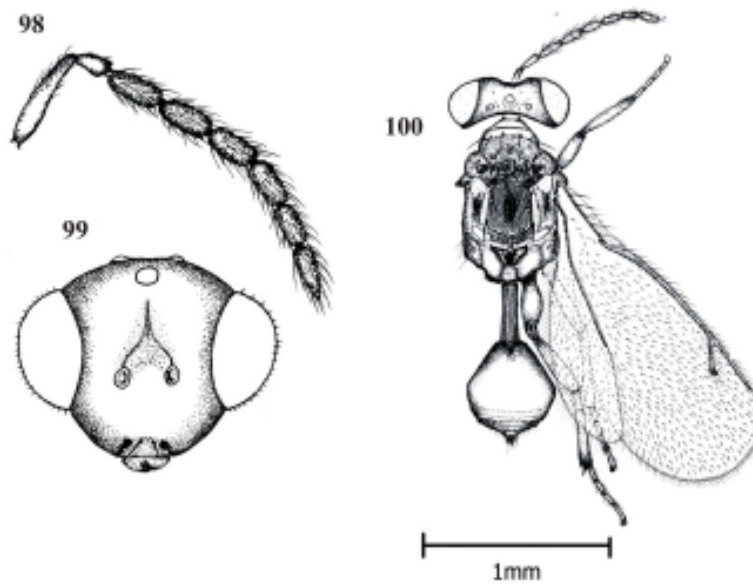
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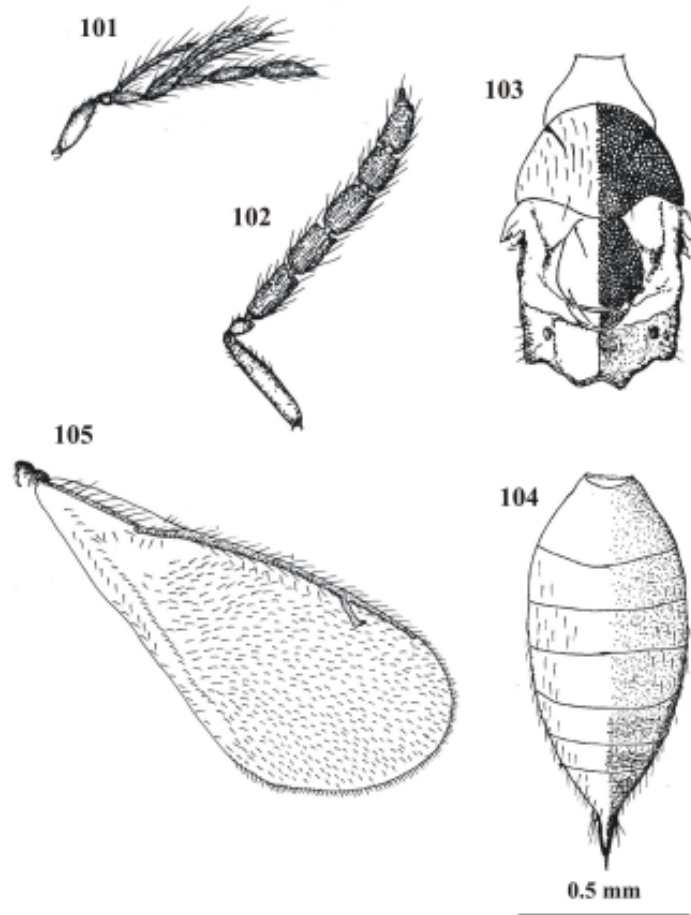
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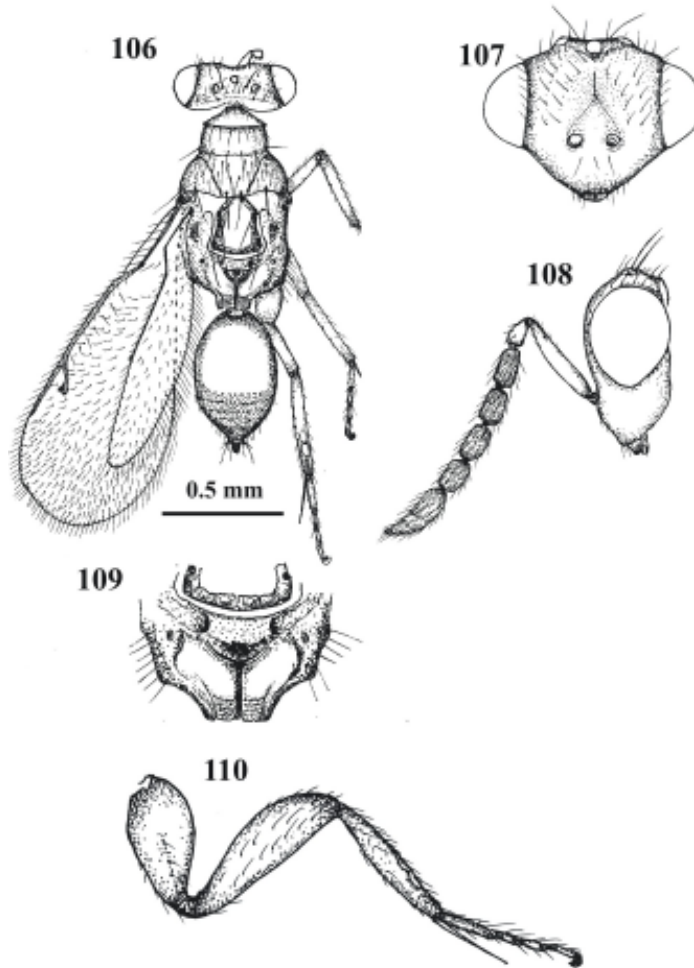
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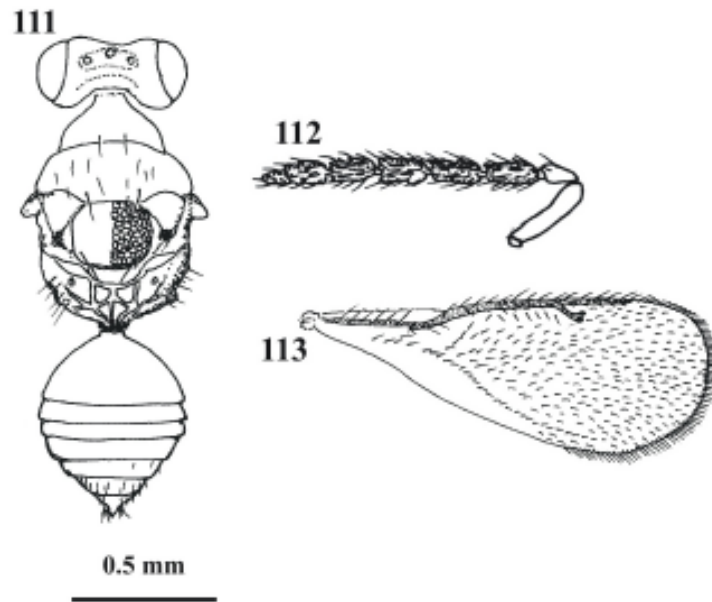
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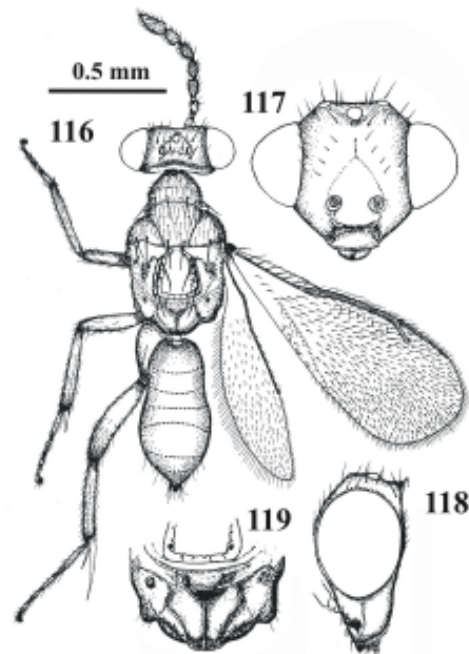
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