Revision of the *Euagathis* species (Hymenoptera: Braconidae: Bassinae) from the Sunda Islands

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The species of the genus *Euagathis* Szépligeti, 1900 (Braconidae: Bassinae (= Agathidinae)) from the Greater and Lesser Sunda Islands (including West Malaysia) are revised and keyed. The subfamily name Bassinae Nees, 1812, is used because it is senior to the commonly used subfamily name Agathidinae Nees, 1814. Twenty-two species are recognized, of which nine are new. The genus *Holcotroticus* Cameron, 1902, is synonymized with *Euagathis* Szépligeti, 1900, and *Euagathis ruficollis* (Cameron, 1902) is a new combination. The following species are synonymized: *Euagathis pilosa* Szépligeti, 1902, and *E. creophora* Cameron, 1905, with *E. clathrata* (Brullé, 1846); *E. rufonigra* Enderlein, 1920, with *E. ruficollis* (Cameron, 1902); *Euagathis variabilis* Enderlein, 1920, *Euagathis v.* var. *tibialis* Enderlein, 1920, *E. v.* var. *melanopleura* Enderlein, 1920, *E. v.* var. *melanogaster* Enderlein, 1920, *E. v.* var. *tonkinensis* Enderlein, 1920, and *E. bipunctata* Enderlein, 1920 with *Agathis forticarinata* (Cameron, 1899); *Euagathis semiflavus* Szépligeti, 1908, *E. horniana* Enderlein, 1920, *E. formosana* Enderlein, 1920, *E. f.* var. *obscurior* Enderlein, 1920, *E. nigrifrons* Enderlein, 1920, *E. tricarinata* Enderlein, 1920, with *E. japonica* Szépligeti, 1902; *E. variabilis* var. *obscuripennis* Enderlein, 1920, *E. v.* var. *dissimilis* Enderlein, 1920, *E. v.* var. *sucarandana* Enderlein, 1920, *Disophrys divisa* Enderlein, 1920, and *E. baltazarae* Bhat & Gupta, 1977, with *E. semifusca* (Brullé, 1846); *E. biroi* Szépligeti, 1902, *E. dubiosus* Turner, 1919, and *E. spilota* Fullaway, 1919, with *E. abbotti* (Ashmead, 1900); *E. quadrifossulata* var. *divisa* Enderlein, 1920, with *Coccygidium concolor* (Szépligeti, 1908). *Euagathis erythrocephala* Cameron, 1905, *E. quadrifossulata* Enderlein, 1920, *E. q.* var. *divisa* Enderlein, 1920, *E. q.* var. *flavipes* Enderlein, 1920, and *Disophrys concolor* Szépligeti, 1908, are transferred to the genus *Coccygidium* Saussure, 1892. *Euagathis insulcata* Enderlein, 1920, *E. i.* var. *rufithorax* Enderlein, 1920, *E. i.* var. *ruficeps* Enderlein, 1920, and *E. i.* var. *nigrescens* Enderlein, 1920, are transferred to the genus *Cremnops* Foerster, 1862. *E. borneoensis* Szépligeti, 1902, is transferred to the genus *Balcemena* Cameron, 1903, and *Euagathis cryptoplebiae* Viereck, 1913 to the genus *Bassus* Fabricius, 1804. Lectotypes are designated of *Agathis semifusca* Brullé, 1846, *A. semiflava* Brullé, 1846, *Euagathis erythrocephala* Cameron, 1905, *E. ruficollis* Cameron, 1905, *E. fuscinotum* Enderlein, 1920, *E. pubescens* Enderlein, 1920, *E. tricarinata* Enderlein, 1920, *E. formosana* Enderlein, 1920, *E. variabilis* Enderlein, 1920, *E. v.* var. *tibialis* Enderlein, 1920, *E. v.* var. *melanopleura* Enderlein, 1920, *E. v.* var. *melanogaster* Enderlein, 1920, *E. bipunctata* Enderlein, 1920, *E. v.* var. *dissimilis* Enderlein, 1920, *E. v.* var. *sucarandana* Enderlein, 1920, *E. v.* var. *obscuripennis* Enderlein, 1920, *E. quadrifossulata* Enderlein, 1920, *E. q.* var. *divisa* Enderlein, 1920, *E. q.* var. *flavipes* Enderlein, 1920, *E. insulcata* Enderlein, 1920, *E. i.* var. *ruficeps* Enderlein, 1920, and *E. i.* var. *rufithorax* Enderlein, 1920.

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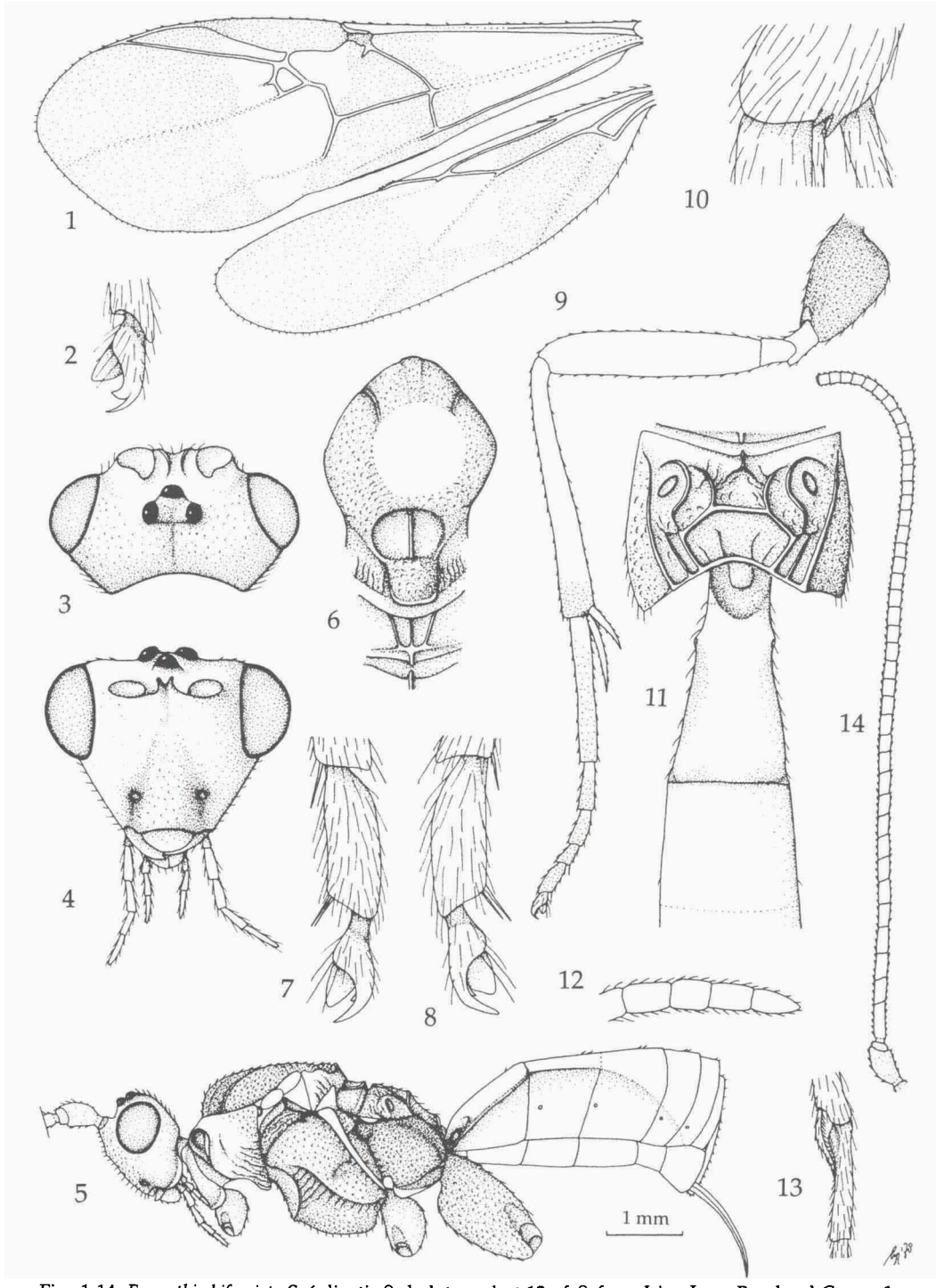


Figs 1-14, *Euagathis bifasciata* Szépligeti, ♀, holotype, but 12 of ♀ from Irian Jaya, Bernhard Camp. 1, wings; 2, inner fore claw; 3, head, dorsal aspect; 4, head, frontal aspect, 5, habitus, lateral aspect; 6, thorax, dorsal aspect; 7, inner hind claw; 8, outer hind claw; 9, hind leg; 10, apex of hind tibia, outer aspect; 11, propodeum, first and second metasomal tergites, dorsal aspect; 12, apex of antenna; 13, fore tibial spur; 14, antenna. 1, 5, 9, 14: 1 × scale-line; 2, 7, 8, 10, 12: 5 ×; 3, 4, 6, 11, 13: 2 ×.

Introduction

The members of the family Braconidae Nees, 1812, of the Greater and Lesser Sunda Islands (Indonesia and East Malaysia) are hardly known and, consequently, no reliable keys to the species are available. In this area, the genus *Euagathis* Szépligeti, 1900, of the subfamily Bassinae Nees, 1812 (= Agathidinae Nees, 1814) is a rather common and conspicuous one. It has a Palaeotropical and SE Palaeartic distribution, with most of the species in the Indo-Australian region. The key to *Euagathis* species published by Bhat & Gupta (1977), proved to be unreliable for the identification of described Sunda species, and in addition several species new to science were discovered; there fore, a new key had to be made. The result of a first attempt to make a reliable key to part of the *Euagathis* species has been published by Simbolotti & van Achterberg (1990) for the species from Sulawesi. The study of the variation of most species is severely hampered by the lack of specimens of most species, so the key presented in this paper is just a start to a better understanding of the diversity of the genus in this area. For convenience, the species from West Malaysia are included because its fauna is very similar to the fauna of Sumatra.

The phylogenetic position of the subfamily Bassinae (= Agathidinae) is near the base of the Helconoid lineage (Quicke & van Achterberg, 1990). The unique combination of length and number of central microtubules of axoneme and mitochondrial derivatives of the mature spermatozoa indicate a position comparatively close to the clyclostome grade (Quicke, 1994). The subfamily as treated by Quicke & van Achterberg (1990) is certainly monophyletic, possessing several autapomorphies, e.g. the shape of its sperm, the presence of a distinct pre-apical bulla in the vein r-m of the fore wing (figs 140, 142), the specialized tergal glands on the sixth and seventh metasomal tergites of the males (Buckingham & Sharkey, 1988), and the extremely narrow and rather long marginal cell of the fore wing (which, in the subtribe Mesocoelina Viereck, 1918, is hardly recognizable; van Achterberg, 1990). Additional apomorphies concern the loss of the occipital carina, and of the vein CU1b of fore wing, and the posteriorly diverging veins m-cu and 1-M of the fore wing (van Achterberg, 1993).

The genus *Euagathis* has been placed in a tribe Disophrini Sharkey, 1992, separated from the tribe Cremnoptini Sharkey, 1992 (= Vipionini sensu van Achterberg, 1993) by Sharkey (1992). The tribe Disophrini is recognized because its members have the ovipositor curved and short (length of its sheath less than half length of metasoma), the hind basitarsus with serrate ventral row of setae, and the tarsal claws are not pectinate. Obviously, its members seem to be specialized for parasitizing more or less exposed hosts (Sharkey, 1992), which agrees with the few hosts known for *Euagathis* species. The biology of most species is unknown, but in general the Bassinae are endoparasites of larvae of Lepidoptera. Some species of the genus *Euagathis* Szépligeti have been reared as larval parasites of Lymantriidae (p. 31), and

Arctiidae (Bhat & Gupta, 1977). The record of a Tortricid (for *E. cryptophlebiae* Viereck, 1913; Shenefelt, 1970) is incorrect because the holotype of *E. cryptophlebiae* belongs to the genus *Bassus* Fabricius. Larvae of Tortricidae are much smaller than those of Lymantriidae and Arctiidae, probably too small for the host larva, and they have a hidden way of life.

Unfortunately, Sharkey's use of the names Agathidinae (incorrectly ascribed to Blanchard, 1845), and Microdini Ashmead, 1900, violates Article 23 of the International Code of Zoological Nomenclature (1985). The name Bassinae (based on Nees' (1812) use of "Bassi"), has priority over Nees' (1814) "Agathides". Also both Bassini Nees, 1812, and Eumicrodini Foerster, 1862, have priority over Sharkey's "Microdini Ashmead, 1900".

For the identification of the subfamily Bassinae (as Agathidinae), see van Achterberg (1990, 1993) and for the terminology used in this paper (except for the stigmal spot), see van Achterberg (1988, 1993). The stigmal spot is a well defined and more or less circular dark brown patch below the parastigma present in many species (Bhat & Gupta, 1977; figs 19-21, 26-28).

Genus **Euagathis** Szépligeti, 1900

Euagathis Szépligeti, (Jan.) 1900: 62; Shenefelt, 1970: 408; Bhat & Gupta, 1977: 183; Chou & Sharkey, 1989: 186; Sharkey, 1992: 441. Type-species (designated by Viereck, 1914): *Euagathis bifasciatus* Szépligeti, 1900 [examined].

Chromomicrodus Ashmead, (July) 1900: 129; Shenefelt, 1970: 409. Type species (by original designation): *Chromomicrodus abbotti* Ashmead, 1900 [examined].

Holcotroticus Cameron, 1902: 41; Shenefelt, 1970: 417; Sharkey, 1992: 441. Type species (by original designation): *Holcotroticus ruficollis* Cameron, 1902 [examined]. **Syn. nov.**

Diagnosis.— Length of fore wing 7-16 mm; head distinctly elongated ventrally, its malar space distinctly longer than basal width of mandible (figs 4, 5); antenna distinctly longer than body, with 42-60 segments, its apex acute and without apical spine (figs 12, 14); labio-maxillary complex not enlarged (fig. 5); area between antennal sockets with a pair of crest-like lamellae (fig. 3); area behind antennal sockets slightly depressed (fig. 3) or flat; frons without lateral carinae (fig. 3), at most with pair of non-carinate elevations; temple in lateral view concave medio-posteriorly (fig. 5); precoxal sulcus present and (largely) crenulate or costate (fig. 5); notauli present (figs 5, 6), but sometimes shallow; scutellum with crest-like elevation subposteriorly (fig. 6); propodeal spiracle large and elliptical (figs 11, 49); propodeum (partly) areolate and costulae usually (largely) present (figs 11, 49, 50); vein M+CU of hind wing shorter than vein 1-M (fig. 1); fore tarsal claw bifurcate, its inner tooth large (fig. 2); all middle and hind tarsal claws similar, with smaller inner tooth (figs 7, 8); fore tibial spur about 0.7 times fore basitarsus, without long glabrous apical spine (fig. 13); length of inner middle spur 0.3-0.6 times middle basitarsus; outer face of middle tibia without submedial pegs, only with 1-3 pegs apically (fig. 10); hind trochantellus with its lower edges rounded, without ventral carinae; hind basitarsus with serrate ventral row of strong setae; first metasomal tergite usually smooth, but may be partly or completely sculptured, without lateral depressions (fig. 39) or depressions slightly developed (fig. 11), but sometimes rather distinctly depressed, its length 1.0-2.7 times its apical width, and laterope present (fig. 5); second and third tergites smooth; second metasomal suture at most slightly impressed dorsally (fig.

11); ovipositor short, gradually narrowed apicad, without teeth and curved downwards (fig. 5); ovipositor sheath subparallel-sided, apically subtruncate, glabrous ventrally, and about as long as apical height of metasoma (fig. 5).

Distribution.— Indo-Australian, SE Palaearctic, Afrotropical.

Biology.— Endoparasites of Lymantriidae and Arctiidae.

Key to species of the genus *Euagathis* from the Sunda Islands

1. Wings and pterostigma (nearly) completely dark brown or blackish (fig. 15); hind femur very slender and coarsely punctate-rugose ventrally (fig. 51); metasoma completely black; hind leg dark brown or black 2
- Wings at least partly subhyaline or yellowish, especially basally (figs 16-38), if exceptionally completely dark brown then basal half of pterostigma yellow; colour of metasoma and hind leg, and shape of hind leg variable 3
2. Metapleuron silvery or pale yellowish velvet-like setose, obscuring underlying sculpture; scutellum saddle-shaped, scarcely convex, its surface rather smooth, and its lateral carinae present (but anteriorly less distinct; figs 42, 43); precoxal sulcus wide, with long and strong crenulae (fig. 44); middle mesoscutal lobe tuberculate in lateral view (fig. 40); notauli scarcely impressed anteriorly; costulae of propodeum very strong (fig. 49) ..... ***E. clathrata*** (Brullé)
- Metapleuron normally setose; scutellum rather convex, punctate, and only subposterior carina present (fig. 47); precoxal sulcus comparatively narrow, with shorter crenulae (fig. 45); middle mesoscutal lobe less protruding dorsally in lateral view (fig. 46); notauli somewhat more impressed anteriorly; costulae of propodeum normal (fig. 50) ..... ***E. ruficollis*** (Cameron)
3. Fore wing distinctly infuscate apically, with colour pattern more or less distinct, nearly always (partly) brightly coloured, and without intermediately coloured areas (figs 15-25, 31-33, 35, 38); *E. japonica* may have the dark parts of fore wing indistinct but has first tergite strongly widened apically (its length less than 1.6 times its apical width: figs 74, 78) **and** vein 1-R1 of fore wing (including its setae) dark brown (fig. 71) 4
- Fore wing completely or largely subhyaline, slightly infuscate or yellowish, stigmal spot may be distinct, but apically at most rather "cloudy" (figs 28, 37), and sometimes (partly) with a yellowish or brownish tinge, and with intermediately coloured areas; if fore wing is rather brightly coloured then without distinctly separated patches except for stigmal spot (figs 29, 30); first tergite usually less widened (figs 113, 143), if strongly widened then vein 1-R1 of fore wing and its setae yellow 15
4. First metasomal tergite strongly widened apically, its length 1.2-1.7 times its apical width (figs 55, 58, 64, 68, 74, 78, 82); head dorsally completely or largely black or only stemmaticum (partly) dark brown, exceptionally completely yellowish; precoxal sulcus moderately to very widely crenulate (cf. fig. 44); fore wing as shown in figs 16, 19, 20, and 23 5

   Note. If the stemmaticum is yellowish, cf. *E. indica* Enderlein (scapus black, wide dark band below parastigma) and *E. maculipennis* (Brullé) (scapus yellowish or brownish and with isolated stigmal spot: figs 88, 89).
- First tergite slightly to moderately widened apically, its length 1.6-2.7 times its apical width (figs 95, 99, 105, 107), if 1.6-1.8 times then stemmaticum yellowsh-brown; head (including stemmaticum) dorsally completely yellowish-brown, but

blackish in *E. bipartita*; precoxal sulcus comparatively narrowly crenulate (figs 106, 108, 109; but moderately wide in *E. bipartita*: fig. 111); fore wing as shown in figs 21, 24, 25, 31-35, and 38 11

5. Scutellum more or less concave medially, distinctly angulate anteriorly because of protruding lamella or carina, subposterior crest strong and connected with complete lateral carinae (figs 54, 57, 60, 61, 62); hind femur coarsely rugose ventrally; stemmaticum black or dark brown, exceptionally only near ocelli; lateral margin of temples in dorsal view more or less concave (fig. 66) 6
- Scutellum convex, anteriorly rounded and only with subposterior crest (figs 80, 81); hind femur more or less coarsely punctate ventrally; colour of stemmaticum variable; lateral margin of temples in dorsal view usually straight or nearly so (figs 79, 84) 9
6. Setae of vein C+SC+R of fore wing yellow; hind tibia yellowish-brown or dark brown basally, its apical half (largely) yellowish-brown; apical half of metasoma and usually hind coxa yellowish-brown; pterostigma yellow or dark brown; (sub)horizontal part of ventral margin of occipital flange long (fig. 56; unknown of *E. elevata*) 7
- Setae of vein C+SC+R of fore wing blackish (except near base of vein); hind tibia pale yellowish basally, and at least its apical half dark brown; apical half of metasoma and hind coxa partly dark brown or blackish; anterior half of pterostigma (except basally) largely infuscate; (sub)horizontal part of ventral margin of occipital flange comparatively short (fig. 53); Sumatra, Kangean Islands ..... ***E. henseni*** spec. nov.
7. Pterostigma dark brown; scutellum slightly concave medially, with some rugae or rugulae (figs 60, 62; lateral margin of temples in dorsal view slightly concave (fig. 66) 8
- Pterostigma yellowish; scutellum deeply concave medially and with strong rugae; lateral margin of temples in dorsal view straight; Java . ***E. vechti*** spec. nov.
8. Head largely yellowish dorsally, at most stemmaticum and middle of frons black(ish); second submarginal cell of fore wing yellowish (fig. 59); Halmahera .... ***E. elevata*** Bhat & Gupta
- Head completely black(ish) dorsally; second submarginal cell of fore wing dark brown (fig. 23); Java ..... ***E. javana*** Szépligeti
9. Antenna unicoloured black, at most some apical segments may be brownish; head in frontal view less elongate; apical third of fore wing usally less intensely dark brown (not of *E. japonica*) 10
- Antenna bicoloured, its apical half yellowish-brown; head in frontal view comparatively long (fig. 65); apical third of fore wing intensely dark brown ..... ***E. tambora*** spec. nov.

   Note. If the length of fore wing is about 13 mm, only the apex of antenna reddish, the stigmal spot of fore wing absent, and the first metasomal tergite 1.8 times its apical width, cf. *E. bipartita* Enderlein.

10. Segments of labial palp normal (fig. 77); middle spurs normal, inner spur 0.6-0.7 times middle basitarsus (fig. 72); second-fourth segments of fore tarsus less robust (figs 75, 76); occipital flange widely protruding posteriad, its ventral margin subhorizontal (fig. 77); apical half of metasoma, hind coxa and femur yellowish-brown; stemmaticum usually dark brown or black ..... ***E. japonica*** Szépligeti

- Segments of labial palp very robust (fig. 85); middle spurs widened, inner spur 0.4 times middle basitarsus (fig. 86); second-fourth segments of fore tarsus very robust (fig. 87); occipital flange less protruding posteriad, its ventral margin oblique (fig. 85); apical half of metasoma, hind coxa and femur dark brown; stemmaticum largely yellowish-brown ..... ***E. serena*** spec. nov.

Note. If scapus, pedicellus and hind coxa are yellowish, cf. *E. maculipennis* (Brullé).

11. Stigmal spot absent (fig. 38), obsolescent (fig. 25), or vaguely differentiated and comparatively small (fig. 21), but may be part of a (less) dark brown patch (fig. 24); apical infuscation of fore wing (more or less) including second submarginal cell (except sometimes in *E. flavominuta*: fig. 38); area below precoxal sulcus finely punctate or punctulate, with interspaces wider than diameter of punctures, but may be densely and coarsely punctate; pterostigma of ♀ usually completely or largely black (figs 21, 24, 25, 38), but basal half may be largely yellowish in *E. semifusca*; hind tibia usually brownish-black; crests between antennal sockets remain further separated from each other 12
- Stigmal spot large and prominent (figs 31-34); apical infuscation of fore wing usually not reaching second submarginal cell (figs 31, 32), if reaching further then the stigmal spot is still discernable from the surrounding infuscation; area below precoxal sulcus densely and coarsely punctate, its interspaces at most about as wide as punctures; pterostigma usually mainly yellow (figs 32-34), but melanistic specimens with (part of) pterostigma dark brown may be common; hind tibia of ♀ (except its apex) usually yellowish-brown (males may have it completely dark brown); crests between antennal sockets closer to each other, especially posteriorly ..... ***E. forticarinata***(Cameron)

12. Length of fore wing of ♀♂ 5.6-8.0 mm; pterostigma of ♀ completely dark brown (fig. 38); antennal segments 40-46; body of ♀ largely pale yellowish-brown 13
- Length of fore wing of ♀ 8.5-14 mm (of ♂ 6.8-11.6 mm); pterostigma partly yellowish basally (♀ of *E. semifusca*; figs 24, 25), or dark brown (♂ of *E. semifusca*; *E. bipartita*); antennal segments 54-55 (unknown of *E. bipartita*); body of ♀ often largely dark yellowish-brown 14

13. Body of ♀ largely pale yellowish-brown, of ♂ at least anterior half of body yellowish; subapical segments of antenna of ♀ robust (cf. fig. 132); first metasomal tergite rather robust (fig. 95), 1.6-1.9 times its apical width; second submarginal cell comparatively robust (fig. 96); metapleuron normally setose; base of hind tibia black; first discal cell sometimes with pale brownish patch (fig. 38) ..... ***E. flavominuta*** spec. nov.
- Body of ♀♂ completely black; subapical segments of antenna of ♀ comparatively slender (fig. 97); first tergite slender (fig. 99), about 2.5 times its apical width; second submarginal cell of fore wing comparatively slender (fig. 98); metapleuron pilose; base of hind tibia narrowly black and subbasally usually with ivory ring; first discal cell without brownish patch (figs 17, 18) ..... ***E. nigrisoma*** spec. nov.

14. Setae of vein C+SC+R of fore wing dark brown; surroundings of vein M+CU1 of fore wing distinctly paler than vein M+CU1; vertex and occiput (and usually also scapus) yellowish-brown; length of hind femur 5.0-6.0 times its width; apex of antenna black; apical half of metasoma of ♀ frequently yellowish, of ♂ often dark brown ..... ***E. semifusca*** (Brullé)

- Setae of vein C+SC+R of fore wing yellow; surroundings of vein M+CU1 of fore wing as yellowish as vein M+CU1; vertex, occiput, and scapus black(ish); length of hind femur 3.6-4.2 times its width (fig. 110); apex of antenna reddish; apical half of metasoma of ♀♂ black ..... ***E. bipartita*** Enderlein

15. Body ivory or pale yellowish, with an extensive black(ish) pattern; hind femur (largely) dark brown, strongly contrasting with pale yellowish hind tibia (only its apex may be infuscate); first metasomal tergite bicoloured: ivory basally, remainder dark brown, except apically; stigmal spot small (figs 26, 27); wing membrane entirely slightly infuscate ..... ***E. eburnea*** spec. nov.
    Note. If hind femur and tarsus pale yellowish, second-fifth metasomal tergites completely dark brown or blackish (♂) and mesosoma densely setose, cf. *Euagathis pallidipes* (Cameron).
- Body yellowish-brown, at most with some parts completely black or dark brown; hind femur usually yellowish-brown, if dark brown, then also hind tibia completely dark brown or black; first tergite unicoloured: yellowish, brown or dark brown; stigmal spot and colour of wing membrane variable 16

16. Basal half of fore wing yellow, or with a distinct yellowish tinge; stigmal spot of fore wing present (figs 29, 30; but may be rather weak or even absent in *E. abbotti*); pterostigma (largely) yellow (but of *E. abbotti* may be largely or completely dark brown 17
    Note. Melanistic *E. abbotti* may be very similar to *E. fuscinotum*, but the latter has segments of apical third of antenna of ♀ submoniliform (fig. 132) and no stigmal spot (which may be exceptionally absent in *E. abbotti*).
- Basal half of fore wing subhyaline or slightly infuscate, without yellowish tinge; stigmal spot of fore wing absent (figs 36, 37); pterostigma (largely) dark brown 20

17. Vein 1-R1 of fore wing dark brown, usually distinctly darker than anterior margin of pterostigma; fore tarsus of ♀ slender (cf. fig. 135); precoxal sulcus narrow; mesoscutum distinctly punctate; scapus usually largely yellowish-brown, but may be completely dark brown in melanistic specimens; hind tarsus and at least apex of hind tibia dark brown; brownish shadow of fore wing extremely vague, obsolescent (fig. 30); length of first metasomal tergite 1.7-2.6 times its apical width ..... ***E. abbotti*** (Ashmead)
    Note. If body is completely, and pterostigma largely, yellowish-brown and first metasomal tergite robust (about 1.3 times as long as wide apically), cf. pale specimen of *E. maculipennis* (Brullé) from India (Bengal).
- Vein 1-R1 of fore wing yellow, similar to anterior margin of pterostigma; fore tarsus of ♀ robust (fig. 125), except of *E. leptocera* (fig. 135); precoxal sulcus wide; mesoscutum punctulate; outer side of scapus largely infuscate; hind tarsus and apex of hind tibia yellowish-brown or rather infuscate; brownish shadow of fore wing comparatively more intense, distinct (fig. 15); length of first tergite 1.3-1.6 times its apical width 18

18. Anteriorly mesoscutum (at base of notauli) with a very deep and large pit anteriorly (fig. 118); transverse subposterior crest of scutellum weakly developed medially (figs 119, 123) ..... ***E. bifoveolata*** spec. nov.
- Mesoscutum without pair of pits anteriorly; transverse subposterior crest of scutellum distinctly developed and protruding medially (figs 124, 127) 19

19. Fore and middle tarsi of ♀ very robust (figs 125, 126); scutellum convex, no distinct lateral carinae and anteriorly rounded or weakly carinate (fig. 124); hind

tarsus yellowish-brown; middle spurs wide basally (fig. 126); hind femur punctate ..... ***E. aurea*** spec. nov.

- Fore and middle tarsi of ♀ normal (figs 135, 136); scutellum flat, laterally and anteriorly distinctly carinate (fig. 133); hind tarsus infuscate; middle spurs rather slender basally (fig. 136); hind femur punctate-rugose ..... ***E. leptocera*** Cameron

20. First metasomal tergite slightly or not widened apically, its length 2.1-2.8 times its apical width (figs 138, 143); second submarginal cell of fore wing comparatively large (figs 140, 142); metapleuron and more or less propodeum densely velvet-like setose; basal half of hind tibia whitish or pale yellowish; costulae of propodeum either weak or absent 21

- First tergite distinctly widened apically, its length 1.4-1.9 times its apical width; second submarginal cell of fore wing medium-sized (cf. fig. 116); propodeum comparatively sparsely setose, not velvet-like; basal half of hind tibia largely dark brown; costulae of propodeum strong ..... ***E. fuscinotum*** Enderlein

  Note. If body is completely yellowish, length of fore wing about 11 mm, and segments of apical third of antenna of ♀ not submoniliform, cf *E. abbotti* (Ashmead).

21. Face and mesopleuron blackish; vein SR1 of fore wing sinuate (fig. 140); length of first metasomal tergite about 2.1 times its apical width (fig. 138); scutellum tuberculate protruding in lateral view (fig. 139); first tergite yellowish; prothorax largely dark brown; propodeum (especially laterally) with conspicuously long and dense setosity ..... ***E. nigriceps*** Enderlein

- Face and mesopleuron yellowish-brown; vein SR1 of fore wing straight (fig. 142); length of first tergite 2.7-2.8 times its apical width (fig. 143); scutellum slightly convex in lateral view (fig. 141); first tergite largely or completely dark brown; prothorax yellowish-brown; propodeum with moderately dense and shorter setosity ..... ***E. pubescens*** Enderlein

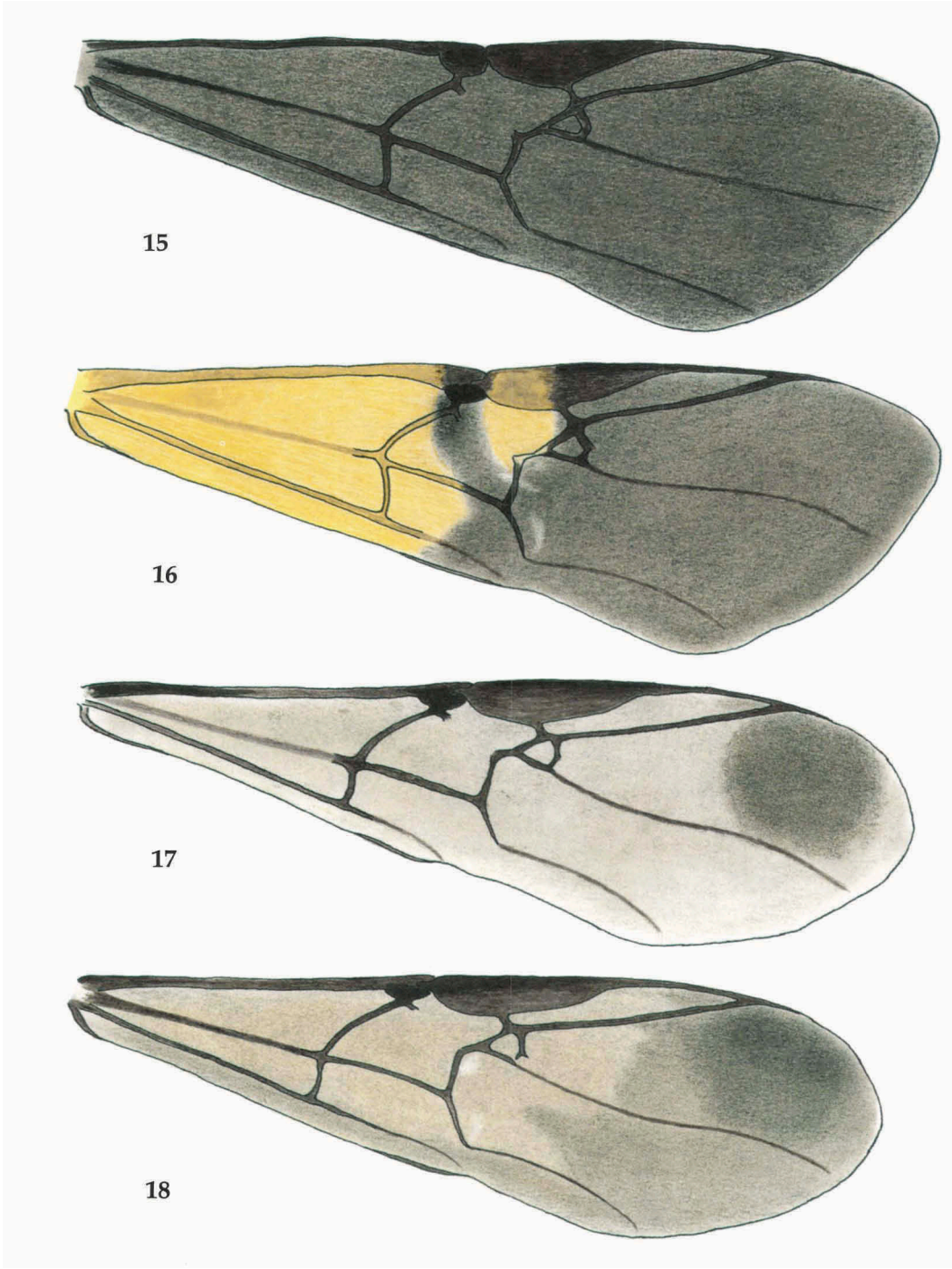
  Note. If basal half of fore wing with yellowish tinge (instead of being subhyaline), the first metasomal tergite completely yellowish-brown (instead of only its apical seventh and remainder blackish), and the hind coxa of ♂ blackish, cf. *E. pallidipes* (Cameron).

Descriptions

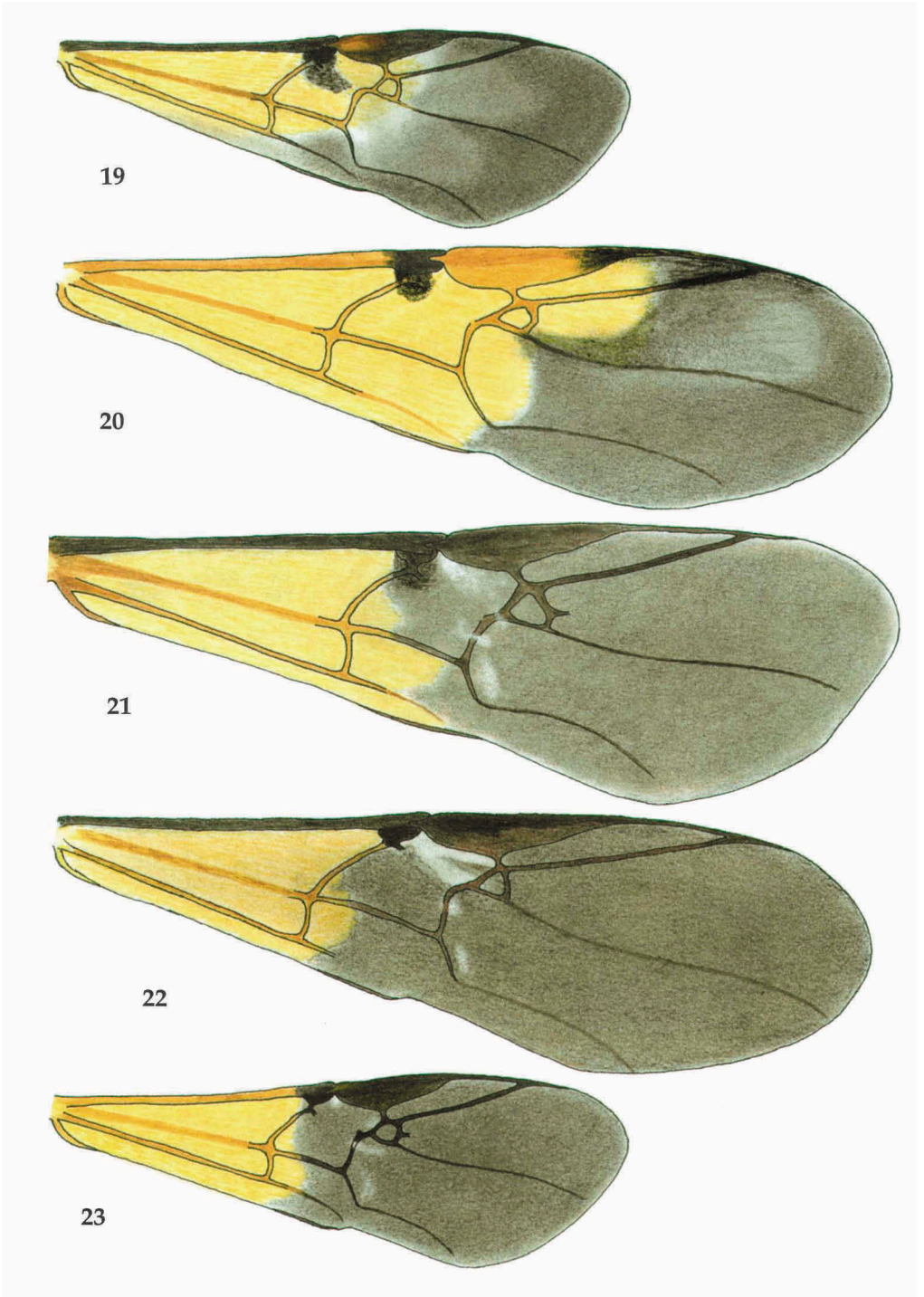
Euagathis abbotti (Ashmead, 1900)
(figs 28, 30, 116)

Chromomicrodus abbotti Ashmead, 1900: 129.
Euagathis abbotti; Shenefelt, 1970: 409; Bhat & Gupta, 1977: 185.
Euagathis biroi Szépligeti, 1902: 67, 1904: 123; Shenefelt, 1970: 410; Bhat & Gupta, 1977: 222. **Syn. nov.**
Euagathis spilota Fullaway, 1919: 50; Shenefelt, 1970: 415 [examined]. **Syn. nov.**
Euagathis dubiosus Turner, 1919: 432. **Syn. nov.**
Euagathis dubiosa; Shenefelt, 1970: 410.

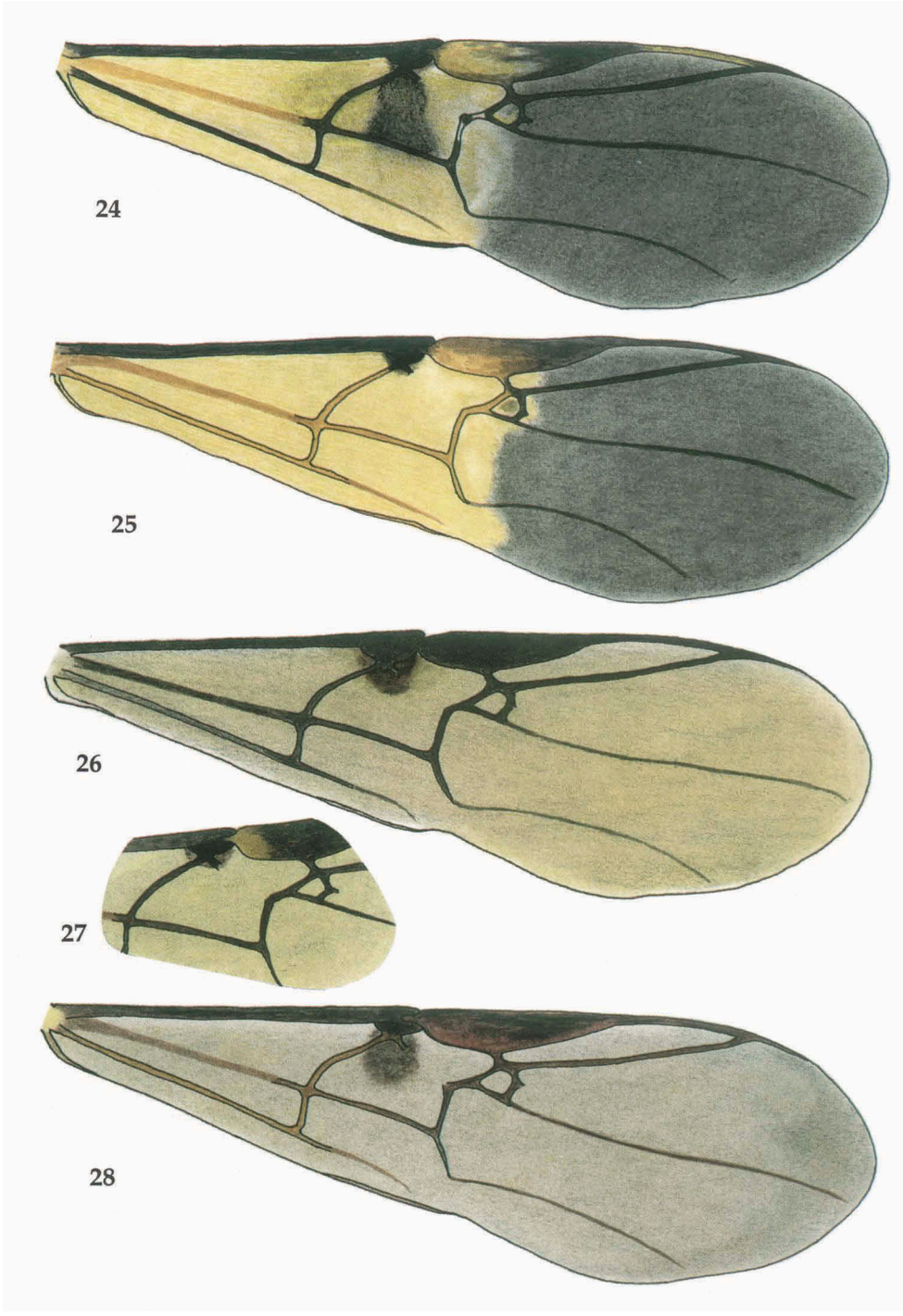
Material.— Holotype of *E. abbotti*, ♀ (USNM), "Siam, Trong Lv, i-ii.1899", "Collector W.L. Abbott", "Type No. 21166 U.S.N.M.", "*Chromomicrodus abbotti* Asm., ♀" (in Ashmead's handwriting); holotype of *E. biroi*, ♂ (TMA), "*biroi*, det. Szépligeti", "[Java], Buitenzorg [= Bogor], Biró, 1898", "*Euagathis Birói* Szépl., 1902, ♂", "Hym. Typ. No 719, Mus. Budapest"; holotype of *E. dubiosus*, ♂, "B.M. Type Hym. 3.c.913", "*Euagathis dubiosus* Turn., Type", "[Vietnam], Haut Mekong, Houei Sai, 6-10.v.1918, R.V. de Salvaza", "Indo-China, R.V. de Salvaza, 1919-25"; 6 ♂♂ (RMNH), "Java, Noesa Kambangan, iii.1911, E. Jacobson"; 1 ♂ (RMNH), "Museum Leiden, [Java], Depok, 12.ix.1936, Dr J v. d. Vecht"; 1 ♂ (RMNH), "W Java, 5-600 m, Djampang Koelan, G. Goeha, xii.1039, M.E. Walsh"; 3 ♂♂ (RMNH), "Museum Leiden, [Java], Pantjar bij Buitenzorg [= near Bogor], 27.ix.1936, Dr J. v. d. Vecht"; 1 ♂



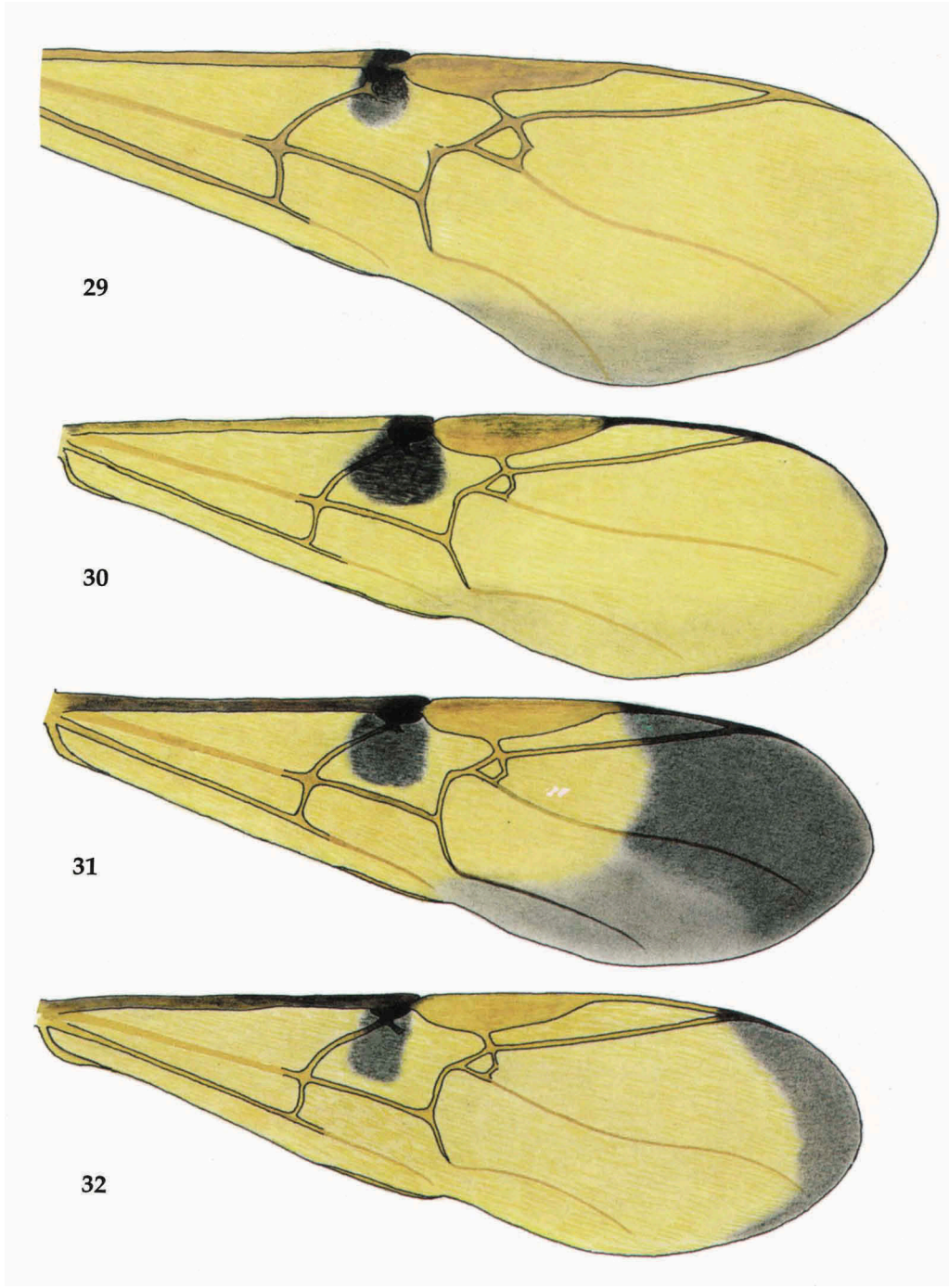
Figs 15-18, colour pattern of fore wing of *Euagathis* spp. 15, *E. clathrata* (Brullé)/*E. ruficollis* (Cameron), ♀; 16, *E. japonica* Szépligeti, ♀; 17, *E. nigrisoma* spec. nov., ♀; 18, id., ♂.



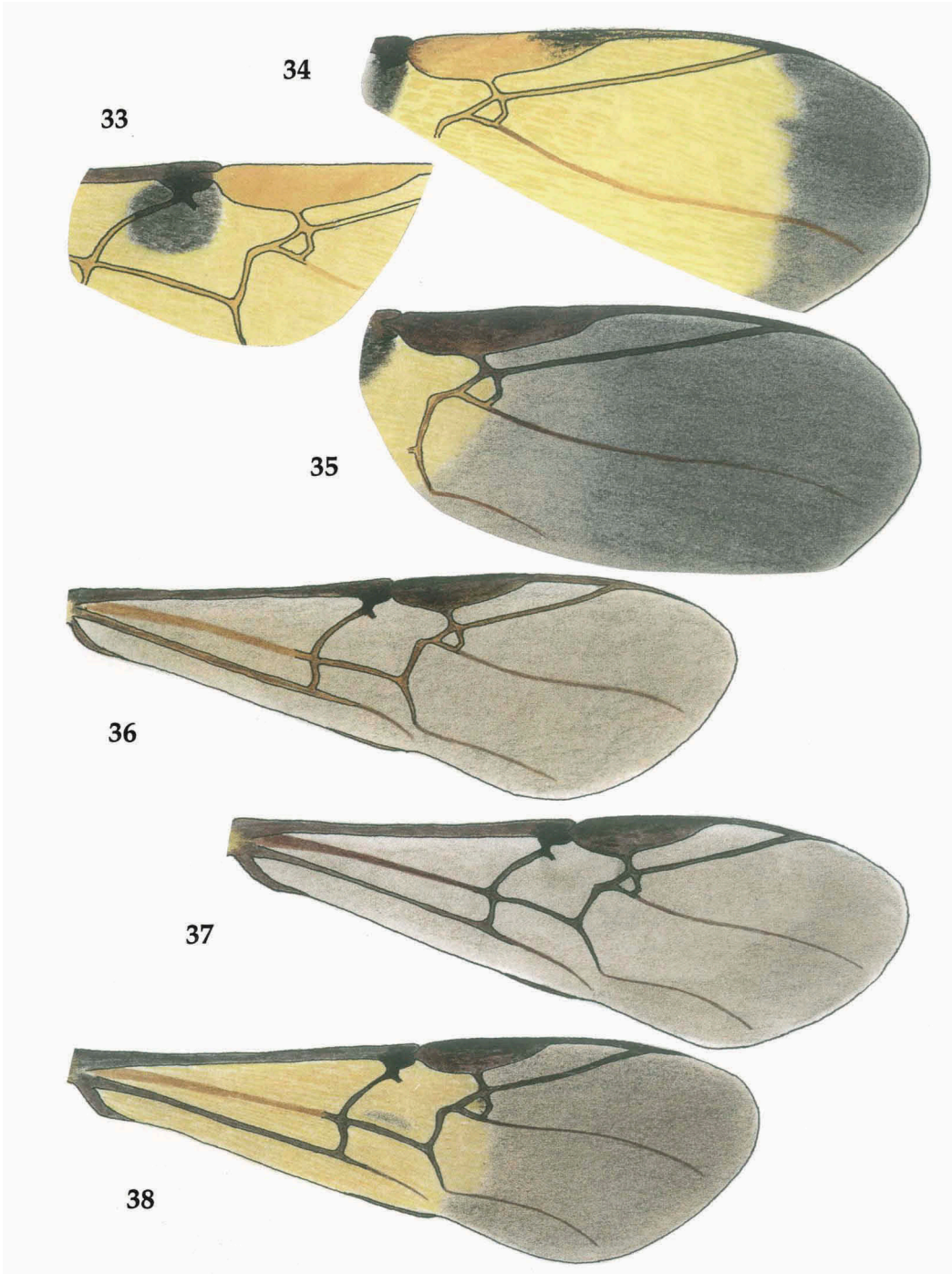
Figs 19-23, colour pattern of fore wing of *Euagathis* spp. 19, *E. henseni* spec. nov., ♀; 20, *E. serena* spec. nov., ♀; 21, *E. semifusca* (Brullé), ♀; 22, *E. bipartita* Enderlein, ♂, Borneo; 23, *E. javana* Szépligeti, ♂.



Figs 24-28, colour pattern of fore wing of *Euagathis* spp. 24, *E. semifusca* (Brullé), ♀ (lectotype of *sucarandana*); 25, id., ♀; 26, *E. eburnea* spec. nov., ♀; 27, id., detail of stigmal spot of a paratype; 28, *E. abbotti* (Ashmead), ♀.



Figs 29-32, colour pattern of fore wing of *Euagathis* spp. 29, *E. aurea* spec. nov., ♀; 30, *E. abbotti* (Ashmead), ♀; 31-32, *E. forticarinata* (Cameron), 31, ♀, and 32, ♂.



Figs 33-38, colour pattern of (parts of) fore wing of *Euagathis* spp. 33-35, *E. forticarinata* (Cameron), 33-34 of ♂ (33, lectotype of var. *bipunctata* Enderlein; 35, ♀, var. *tibialis* Enderlein); 36, *E. fuscinotum* Enderlein, ♀; 37, *E. pubescens* Enderlein, ♂, paralectotype; 38, *E. flavominuta* spec. nov., ♂.

(RMNH), "Museum Leiden, [Java], Tapos, 1936, J. v. d. Vecht"; 1 ♂ (RMNH), "Museum Leiden, [Java], G. Besse, Djampang Wetan, 111.1938, J. v. d. Vecht"; 1 ♂ (RMNH), "W Java, Tjibunar, Teluk Pentjang, 27.xii.1955, A.M.R. Wegner; 1 ♀ (RMNH), id., but 15.xii.1958; 1 ♂ (RMNH), "West Java, 100 m, Dungus Iwul, 17.xii.1952, A.M.R. Wegner"; 1 ♂ (BMNH), "West Java: Mt Gede, 4-5,000 ft, Perliawatte, x.1937"; 1 ♀ (BMNH), "West Java: Bibidjilan, Djampang Tengah, i.1937"; 1 ♀ (BMNH), "West Java: Gunung Halimoen, 4-5,000 ft, xi.1939, K.M. Walsh"; 1 ♂ (BMNH), "West Java: Djampang Wetan, Gunung Besser, xi.1937"; 1 ♂ (BMNH), "East Java: Tengger Highlands, 1,100 m, v.1938, Nongkodjarjar"; 1 ♀ (RMNH), "W Java, Tjibunar, Udjung Kulon, 15.xii.1958, A.M.R. Wegner"; 1 ♂ (RMNH), "Museum Leiden, Dr J.v.d. Vecht, Pantjar bij Buitenzorg, 27.ix.1935"; 1 ♂ (RMNH), "Tjibunar Teluk Pentjang, Udjung Kulon, W. Java, 27.vii.1955, leg. A.M.R. Wegner"; 1 ♀ (BMNH), "West Java, Bibidjilan, Djampang Tengah, i.1937"; 1 ♂ (BMNH), "East Java, Tengger Highlands, 1100 m, v.1938, Nongkodjarjar"; 1 ♂ (BMNH), "West Java, Djampang Wetan, Gunung Besser, xi.1937"; 1 ♂ (BMNH), "West Java, Gunung Halimoen, 4-5000 ft, xi.1939, K.L. Walsh, B.M. 1939-99"; 1 ♂ (BMNH), "West Java, Mt. Gede, 4-5000 ft., Perhawatte, x.1937"; 1 ♂ (ZIL), "Holl. Ost. Ind., Ost Java, i.1891, leg. H. Fruhstorfer, ex coll. C.G. Thomson"; 1 ♀ (RMNH), "Indonesia: W Bali, nr Negara, rainforest above Batuagung, c 550 m, 4-13.xii.1991, Mal. tr. 2, C. v. Achterberg, RMNH'91"; 1 ♀ (BMNH), "Sumatra, Sandaran Agong, Korinchi Lake, 2,450 ft, v.&vi.1914"; 1 ♀+1 ♂ (RMNH), "Sum., Fort de Kock, xi.1913, Edw. Jacobson"; 1 ♂ (RMNH), "Sum., Tananglulu, v.1915, Edw. Jacobson"; 1 ♀ (RMNH), "Indonesia: W Sum., Bukittingi, 1000 m, 0°18'S.100°20', 29.iv.1988, R. Hensen", "CWT [= compared with type] of *spilota*, same but apex of ovipositor sheath pale"; 1 ♀ (BMNH), "Brunei: U. Temburong, Bukit Retak, 1500 m, iv.1981, I. Gauld"; 1 ♂ (BMNH), "N Borneo, Kudat, 18.ix.1927".

Holotype of *E. biroi*, ♂, length of body 9.5 mm, of fore wing 11.0 mm.

Head.— Antennal segments 55 (of specimens from Noesa Kambangan; antenna of holotype missing); length of maxillary palp 0.6 times height of head; length of eye in dorsal view 1.5 times temple; OOL:diameter of ocellus:POL = 12:5:6; face minutely punctate, with median, small frontal tubercle; lamellae between antennal sockets strong, subparallel; occipital flange large, its ventral margin oblique.

Mesosoma.— Length of mesosoma 1.4 times its height; pronotal side punctulate, somewhat polished, and posterior crenulation largely reduced, almost absent; subpronope wide, deep; epomia single; mesoscutum densely and minutely punctate, medioposteriorly depressed, with deep and distinct notauli; scutellum convex, oval, with posterior crest distinct; mesopleuron minutely punctate (also sparsely below precoxal sulcus), precoxal sulcus narrow, distinctly crenulated but somewhat vaguely anteriorly; metapleuron punctate; propodeum coarsely areolate, with complete costulae.

Wings.— Fore wing: second submarginal cell rather small, pentagonal (fig. 116); r:3-SR:SR1 = 5:3:80; 2-SR:3-SR:r-m = 11:3:8. Hind wing: M+CU:1-M = 25:60.

Legs.— Length of hind femur, tibia and basitarsus 5.0, 9.2 and 4.4 times their width, respectively; length of outer and inner spur of middle tibia 0.7 and 0.4 times middle basitarsus, respectively; length of outer and inner spur of hind tibia 0.6 and 0.4 times hind basitarsus, respectively; fore tarsus slender.

Metasoma.— Slender, smooth; length of first tergite 2.0 times its apical width.

Colour.— Yellowish-brown; antenna, mesoscutum and apex of abdomen dark-brown; vertex somewhat brownish; side of mesoscutum yellowish-brown; metapleuron and propodeum dark yellowish-brown; hind coxae and legs dark yellowish-brown to dark-brown; fore wing (fig. 28) largely subhyaline with brownish tinge, very faintly infuscate apically; border between hyaline and infuscate parts hardly defined; veins and pterostigma largely dark yellowish-brown; stigmal spot medium-sized, often with scarcely defined border; hind wing entirely subhyaline.

Variation.— Very variable in colour: the body varies from completely yellowish-

brown (♀, typical) to largely dark brown (♂, "var. *biroi*"). Surprisingly, also the size of the stigmal spot varies greatly: it may be medium-sized, small (figs 28, 30) to completely absent. Melanistic specimens occur frequently, having scapus, mesoscutum, whole hind leg and first-fourth metasomal tergites dorsally black(ish). The mesosoma and the head dorsally may be largely or completely infuscate or dark brown. The types of *E. biroi* and of *E. dubiosus* are melanistic males, but the type of *E. biroi* is darker than the type of *E. dubiosus*; the latter has vein 1-M of fore wing largely yellowish. Some females are melanistic (especially the one from Bali), with the hind tibia (largely) and tarsus dark brown, with the metasoma dorsally and part of pterostigma infuscate. Second submarginal cell of fore wing with or without stump-like ramellus. Length of fore wing 7.5-11.0 mm; length of first metasomal tergite 1.7-2.6 times its apical width; length of hind femur 5.0-6.2 times its width; length of ovipositor sheath 0.13-0.15 times fore wing. The holotype of *E. abbotti* is completely yellowish (but has legs missing except part of hind leg), with vein 1-R1 of fore wing and part of pterostigma anteriorly dark brown, and length of first metasomal tergite 1.8 times its apical width.

Distribution.— Indonesia (Bali, Java, Sumatra), Brunei, Malaysia (East Malaysia: Sabah), and Thailand.

Euagathis aurea spec. nov.
(figs 29, 124-131)

Euagathis leptocerus; Bhat & Gupta, 1977: 195-196, fig. 28a.

Material.— Holotype, ♀ (RMNH), "Malaya, Selangor Ampang Reservoir K. L., 17-19.iii & 10.iv.1963, M.A. Lieftinck"; 1 ♀ (BMNH), "N Borneo, Bettonan, nr Sandakan, 17.viii.1927"; 1 ♀ (BMNH), "Malaya, Kuala Lumpur, nr L. Gardens, coll. H.M. Pendlebury, 15.xii.1937".

Holotype, ♀, length of body 9.4 mm, of fore wing 9.7 mm.

Head.— Antennal segments 58; length of third antennal segment 1.2 times fourth segment; length of third, fourth and penultimate segment 2.3, 1.9 and 1.2 times their width, respectively; length of maxillary palp 0.8 times height of head; length of eye in dorsal view 1.8 times temple; OOL:diameter of ocellus:POL = 20:7:8; face moderately transverse in frontal view, its surface minutely punctate; length of malar space 0.6 times height of eye (fig. 129); vertex smooth, polished; lamellae between antennal sockets parallel; occipital flange large, horizontal part of ventral margin medium-sized.

Mesosoma.— Length of mesosoma 1.6 times its height; pronotal side punctulate, polished, and ventral-posterior crenulation distinct; epomia single, subpronope wide and deep; mesoscutum punctulate, polished, without subposterior depression, notauli moderately impressed and smooth; scutellum convex, punctate, anteriorly slightly angulate and rather rounded, with moderate depression subposteriorly, short carina dividing medially such depression, and subposterior crest strong (fig. 124), side of mesoscutum largely punctulate above precoxal depression, minutely punctate below it; depression of precoxal sulcus wide, distinct, with long and robust crenulae (fig. 130; metapleuron minutely punctate; areolation of propodeum coarse, costulae complete.

Wings.— Fore wing: second submarginal cell subpentagonal, with small stump-like ramellus (fig. 128); r:3-SR:SR1 = 6:7:75; SR1 slightly bent; 2-SR:3-SR:r-m = 10:5:10.

Hind wing: M+CU :1-M = 23:56.

Legs.— Length of hind femur, tibia and basitarsus 4.4, 7.5 and 7.3 times their width, respectively; outer and inner spurs of middle tibia strongly widened (fig. 126), length of both 0.4 times middle basitarsus; length of outer and inner spur of hind tibia 0.3 and 0.6 times hind basitarsus, respectively (fig. 131); hind femur moderately punctate.

Metasoma.— Rather stout and smooth; length of first tergite 1.5 times its apical width; length of ovipositor sheath 0.08 times fore wing.

Colour.— Bright yellow; scapus yellowish-brown with brownish spot on its inner side, flagellum dark-brown; fore wing largely bright golden-yellow, with soft infuscation restricted to postero-apical part of second discal and subdiscal cells; stigmal spot medium-sized and rather narrow (fig. 29); veins (except dark apex of vein C+SC+R) and pterostigma entirely yellow; border between yellow and shadowed parts of the wing undefined; hind wing yellowish, apically faintly infuscate.

Variation.— Length of fore wing 9.7-10.0 mm; length of first tergite 1.4-1.5 times its apical width; length of hind basitarsus 6.8-7.3 times its width.

Distribution.— Malaysia (West Malaysia; East Malaysia: Sabah).

Euagathis bifoveolata spec. nov.
(figs 118-123)

Material.— Holotype, ♂ (RMNH), "Sumatra E. C., Pematang Siantar, 30.xii.[19]32, R.I. Nel", "Naga Hoeta Estate, 1,750 feet", "201".

Holotype, ♂, length of body 9.8 mm, of fore wing 10.6 mm.

Head.— Antennal segments 54; length of third antennal segment 1.2 times fourth segment; length of third, and fourth segment 3.3 and 3.1 times their width, respectively; length of maxillary palp 0.7 times height of head; length of eye in dorsal view 1.5 times temple; OOL:diameter of ocellus:POL = 15:6:6; face minutely punctate, vertex smooth, polished; lamellae between antennal sockets high, converging posteriorly; occipital flange large, its ventral margin long, horizontal.

Mesosoma.— Length of mesosoma 1.5 times its height; pronotal side punctulate, with posterior crenulation somewhat indistinct; subpronope wide, deep; epomia single, mesoscutum smooth, polished, flat posteriorly; notauli weakly impressed, anteriorly originating in a round, deep pit (fig. 118); scutellum rather finely punctate, scarcely convex, with posterior crest evenly curved, rather weak (figs 119, 123); mesopleuron punctulate above precoxal sulcus, below it rather sparsely (but distinctly) punctate; depression of precoxal sulcus distinct and rather wide (especially anteriorly: fig. 120), crenulae strong, rather long and somewhat shorter posteriorly, but thinner and longer anteriorly, metapleuron finely punctate; propodeum distinctly areolate.

Wings.— Fore wing: r:3-SR:SR1 = 6:5:60; 2-SR:3-SR:r-m = 8:5:8. Hind wing: M+CU:1-M = 25:41.

Legs.— Length of hind femur, tibia and basitarsus 4.7, 7.1 and 8.0 times their width, respectively; length of outer and inner spur of middle tibia 0.2 and 0.4 times middle basitarsus, respectively (fig. 122); length of outer and inner spur of hind tibia 0.3 and 0.5 times hind basitarsus, respectively; fore tarsus moderately robust (fig. 121).

Metasoma.— Rather stout, smooth; length of first tergite 1.3 times its apical width.

Colour.— Yellow; outer side of scapus with some infuscation and remainder yellowish-brown, flagellum dark-brown; fore wing as of *E. aurea*, with vein 1-R1, its setae, and pterostigma completely yellow.

Distribution.— Indonesia (Sumatra).

Note.— Since tthe description was made, the metasoma and most of the antennae of the holotype has been lost during transport from Italy to The Netherlands.

Euagathis bipartita Enderlein, 1920
(figs 22, 110-112, 114)

Euagathis bipartita Enderlein, 1920: 179; Shenefelt, 1970: 409; Bhat & Gupta, 1977: 220.

Material.— Holotype, ♀ (PAN), "Sumba, Grelak", "*Euagathis bipartita* Enderl., ♀, Type, Dr Enderlein, det. 1919 ", "Museum Polonicum Warszawa 12/45"; ♂ (BMNH), "N Borneo, Bettonan, nr Sandakan, 7.vii.1937", "Ex F. M. S. Museum B. M. 1955-354".

Holotype, ♀, length of body 12.8 mm, of fore wing 13.5 mm.

Head.— Antennae incomplete; length of third antennal segment 1.5 times fourth segment; length of third and fourth antennal segment 2.5 and 1.6 times their width, respectively; length of maxillary palp 0.9 times height of head; length of eye in dorsal view 3.1 times temple; OOL:diameter of ocellus:POL = 10:3:4; face minutely punctate, elongate (fig. 114); frons polished; vertex smooth; antennal segments rather stout; lamellae between antennal sockets converging posteriorly, space between crests narrow (fig. 114).

Mesosoma.— Length of mesosoma 1.5 times its height; pronotal side smooth, with distinct narrow crenulation posteriorly; subpronope deep and epomia double; mesoscutum distinctly punctate and medio-posteriorly depressed; middle lobe of mesoscutum with pair of shallow grooves anteriorly; notauli deep and entirely smooth; scutellum rounded anteriorly convex, oval-shape, distinctly punctate, and posterior crest distinct; mesopleuron largely punctate above precoxal sulcus, coarsely punctate below it; precoxal sulcus moderately wide (fig. 111); metapleuron rugulose-punctate; propodeum coarsely areolate.

Wings.— Fore wing: second submarginal cell subpentagonal (fig. 110); r:3-SR: SR1 = 5:5:65; SR1 straight; 2-SR:3-SR:r-m = 12:5:10. Hind wing: M+CU:1-M = 25:48.

Legs.— Length of hind femur (fig. 112), tibia and basitarsus 3.6, 6.8 and 5.2 times their width, respectively; length of outer and inner spur of middle tibia 0.4 and 0.5 times middle basitarsus, respectively; length of outer and inner spur of hind tibia 0.3 and 0.6 times hind basitarsus, respectively.

Metasoma.— Rather slender and smooth; length of first tergite 1.8 times its apical width; length of ovipositor sheath 0.06 times fore wing.

Colour.— Yellowish-brown; antenna (but apically reddish), vertex, occiput, apex of metasoma, hind tibia and tarsus dark brown or blackish; basal 0.4 of fore wing bright yellow (with vein M+CU1 similarly coloured as surroundings of vein), remainder deeply infuscate and without stigmal spot (fig. 22); border between yellow and infuscate parts well defined; pterostigma largely dark brown.

Variation.— The specimen from Borneo (Sabah) seems to be a melanistic specimen of *E. bipartita*; because of lack of additional specimens it is difficult to recognize the limits of variation of this species. It has the lateral carina of scutellum strong, propo-

deum partly smooth and most carinae weakly developed, antenna incomplete, with 44 segments, length of fore wing 12.0 mm, length of hind femur 4.2 times its width, hind femur coarsely rugose ventrally, and comparatively dark. It has the body dark brown, but pronotum laterally, posterior part of mesoscutum, scutellum, propodeum and metasoma laterally, dark yellowish-brown; head, middle lobe and anterior half of lateral mesoscutal lobe and metasoma dorsally, blackish; antenna, mesopleuron, hind leg dark-brown, middle and fore legs yellowish-brown.

Distribution.— Indonesia (Sumba), Malaysia (East Malaysia: Sabah).

Euagathis clathrata (Brullé, 1846) comb. nov.
(figs 15, 30-44, 49)

Agathis clathrata Brullé, 1846: 487; Shenefelt, 1970: 326; Bhat & Gupta, 1977: 101; Casolari & Casolari Moreno, 1980: 62.
Euagathis pilosus Szépligeti, 1902: 69. **Syn. nov.**
Euagathis pilosa; Enderlein, 1920: 181; Shenefelt, 1970: 413; Bhat & Gupta, 1977: 191-192, figs 26b, 27g.
Enagathis creophora Cameron, 1905: 111. **Syn. nov.**
Euagathis creophora; Shenefelt, 1970: 410; Bhat & Gupta, 1977: 191 (synonymy with *E. pilosa*).

Material.— Holotype of *A. clathrata*, ♂ (SCT), "♂", from box 39/17 and with CvA's holotype label; holotype of *E. creophora*, ♀ (BMNH), "Type", "B.M. Type Hym. 3.c.916", "*Euagathis creophora* Cam. Type, Borneo", "134", "[Sarawak], Kuching, 22.v.1903", "P. Cameron, Coll. 1914-10"; holotype of *E. pilosa*, ♀ (TMA), "Borneo, leg.?", "*pilosus*, det. Szépligeti", "Lectotypus ♀ *Euagathis pilosus*, 1902 % des. Papp, 1967", "Hym. Typ. No. 725, Mus. Budapest"; 1 ♀ (RMNH), "W. Java, Teluk Peutjang, Udjung Kulon, 27.vii.1955, A.M.R. Wegner"; 1 ♂ (RMNH), "W Java, Tdjg-Alang², Udjung Kulon, 10.vii.1955, A.M.R. Wegner"; 1 ♀ (RMNH), id., but 22.vii.1955; 2 ♂♂ (RMNH), "[Java], Moeara Angke, Batavia, iv.1908, E. Jacobson", "E. Jacobson coll. et ded. 1908/n63", "*Euagathis pilosa* m." (in Szépligeti's handwriting); 1 ♀ (RMNH), "Museum Leiden, [Java], G. Malang, ii.1938, J. v.d. Vecht"; 1 ♀ (RMNH), "W Java, Djamhang Tengah, ii.[19]35"; 1 ♂ (RMNH), "W Java, Gng Gonggang, ix.[19]38"; 1 ♂ (RMNH), "[Indonesia], Samarinda"; 1 ♂ (RMNH), "Mus. Leiden, [Java], Gn. Salak, 17.v.1936, F. Dupont"; 1 ♂ (RMNH), "(NO Sumatra), Tandjong Morawa, Serdang, Dr D.B. Hagen"; 1 ♂ (RMNH), "O Borneo, Pelawan, leg. Walsh"; 2 ♂♂ (RMNH), "Borneo's Zd kust [= southcoast of Borneo], Stauding[er]"; 1 ? (RMNH), "Borneo, Muller"; 1 ♀ (TMA), "Kalimantan"; 1 ♀ (RMNH), "[Indonesia], Ma Lw, xi.[18]77"; 1 ♀ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia, Long Bayor, c 1040 m, 30.xi. 1987, ladang, C. v. Achterberg, RMNH'87; 1 ♀ (RMNH), "Malaya, Selangor, Klang area, Batu Tiga, 7.vii.1963, M.A. Lieftinck"; 1 ♂ (RMNH), "Malaya, Selangor, Templer Park, K. L. 12-13 mi, 21. iii.1963, M.A. Lieftinck".

Redescribed from ♀ from Long Pa Sia (Sabah, Borneo), length of body 9.6 mm, of fore wing 12.3 mm.

Head.— Antennal segments 56; length of third antennal segment 1.1 times fourth segment; length of third, fourth and penultimate antennal segment 2.5, 2.2 and 1.2 times their width, respectively; length of maxillary palp 0.8 times height of head; length of eye in dorsal view 1.5 times temple; OOL:diameter of ocellus:POL = 20:8:5; face elongate in frontal view, and punctulate; occipital flange large, its ventral margin horizontal; vertex smooth, polished; lamellae between antennal sockets converging posteriorly.

Mesosoma.— Length of mesosoma 1.5 times its height; side of pronotum smooth, polished, postero-ventral crenulation distinct; subpronope moderately large, deep, and epomia single; mesoscutum rather flat posteriorly, sparsely and finely punctate, its middle lobe distinctly protruding (fig. 40) in lateral profile; notauli on disc largely absent, smooth; scutellum (figs 42, 43) largely smooth between sparse punctures,

saddle-shaped, slightly convex anteriorly, with subposterior depression strong and wide, (its surface varies from smooth to rugulose-punctate), all edges distinctly carinate (in some specimens carinae are somewhat irregular and anteriorly indistinct); a short, median ruga may be present or absent (figs 42, 43); mesopleuron above precoxal sulcus mostly smooth, polished, with some punctation posteriorly; mesosternum and area below precoxal sulcus coarsely and densely punctate; precoxal sulcus long and wide, strongly crenulate (fig. 44); metapleuron very densely pilose, with silvery or yellowish silky appearence; areolation of propodeum strong.

Wings.— Fore wing: second submarginal cell subtriangular, without ramellus; r:3-SR:SR1 = 4:3:56; 2-SR:3-SR:r-m = 9:3:7; SR1 slightly bent. Hind wing: M+CU:1-M = 20:41.

Legs.— Length of hind femur, tibia and basitarsus 6.2, 11.7 and 8.3 times their width, respectively; length of outer and inner spur of middle tibia 0.4 and 0.6 times middle basitarsus, respectively (fig. 41); length of outer and inner spur of hind tibia 0.3 and 0.6 times their basitarsus.

Metasoma.— Smooth, including first tergite; length of first tergite 1.8 times its apical width; length of ovipositor sheath 0.17 times fore wing.

Colour.— Black; scapus, head (but setosity blackish) and thorax (but metathorax and mesopleuron postero-ventrally, infuscate) reddish-brown to yellowish-brown; antenna (except largely reddish scapus and scapus) and wings dark brown; propodeum, middle and hind legs, and metasoma black; fore leg yellowish-brown; tegulae infuscate; fore wing (fig. 15) completely blackish, without stigmal spot; veins completely dark brown; hind wing entirely infuscate.

Variation.— Antennal segments of ♀ 52-56; middle leg may be (partly) brown; notauli shallowly impressed on mesoscutal disc or largely absent; first metasomal tergite may be extensively (rather superficially) sculptured (fig. 39) to completely smooth (fig. 25); second submarginal cell sometimes with stump-like ramellus.

Distribution.— Indonesia (Java, Sumatra, Kalimantan), and Malaysia (East Malaysia: Sabah; West Malaysia).

Euagathis eburnea spec. nov.
(figs 26, 27, 113, 115, 117)

Material.— Holotype, ♀ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia (West), c 1050 m, 1-14.iv. 1987, Mal. trap 3, C. van Achterberg, RMNH'87". Paratypes (19 ♀♀+ 30 ♂♂; RMNH, BMNH, PRC, MZB, CNC, USNM): 1 ♀+10 ♂♂, topotypic, from same trap; 7 ♀♀+7♂♂, topotypic, but c 1010 m, Malaise trap 1; 3 ♀♀+2 ♂♂, topotypic, but c 1020 m, Malaise trap 2; 1 ♀+4 ♂♂, topotypic, but near Long Pa Sia (East), c 1000 m, 1-13.iv.1987, Malaise trap 4; 1 ♀, id., but Malaise trap 5; 2 ♀♀+1 ♂, id., but 25.xi.-7.xii.1987; 1 ♂, id., but near Long Pa Sia (West), c 1025 m, 1-13.iv.1987, Malaise trap 6; 1 ♀, id., but c 1200 m, 2-14.iv.1987, Malaise trap 7; 2 ♀♀, id., but c 1010 m, 25.xi.-8.xii.1987, Malaise trap 1b; 1 ♂ (RMNH), Malaysia, SE Sabah, nr Danum Valley Field C., c 150 m, Mal. trap 1b, 25.xi.-8.xii.1987, C. v. Achterberg, RMNH'87" ; 1 ♂ (RMNH), "Malaysia, SW Sabah, along Ritan river", "Malaysia, SW Sabah, nr Long Pa Sia, c. 1000 m, at light, 7.iv.1987, J. Huisman, C. v. Achterberg, J.v. Tol"; 1 ♂ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia, c. 1000 m, 6.iv.1987, C. v. Achterberg, RMNH"; 1 ♂ (RMNH), "Malaysia, SW Sabah, Long Pa Sia-Long Miau, 27.xi.1987, c 1000 m, C. v. Achterberg, RMNH'87"; 1 ♂ (RMNH), "Malaysia, SW Sabah, Long Pa Sia, nr Sg Malabit, c 1300 m, C. v. Achterberg, RMNH'87"; 1 ♀ (RMNH), "Sum[atra], Tandj. Andelas, v.1914, Edw. Jacobson".

Holotype, ♀, length of body 11.7 mm, of fore wing 10.8 mm.

Head.— Antennal segments 55; length of third antennal segment 1.3 times fourth segment; length of third, fourth and penultimate segment 2.7, 2.0 and 0.8 times their width, respectively; length of maxillary palp 0.8 times height of head; length of eye

in dorsal view 1.3 times temple; OOL:diameter of ocellus:POL = 18:8:10; face punctate and vertex punctulate; lamellae between antennal sockets subparallel, strong; occipital flange large, its ventral margin oblique.

Mesosoma.— Length of mesosoma 1.3 times its height; side of pronotum punctulate, with posterior crenulation short and weak; subpronope deep, moderately wide; epomia single; mesoscutum densely punctate, medio-posteriorly depressed, its middle lobe with pair of shallow grooves anteriorly; notauli deep, distinct; scutellum (fig. 115) convex, densely punctate, rounded anteriorly, oval to saddle-shaped, no lateral carina, subposterior crest medium-sized (fig. 115); mesopleuron below precoxal sulcus densely (but rather superficially) punctate and rather pilose, above sulcus sparsely punctate; precoxal sulcus moderately wide, deep and distinct posteriorly, somewhat shallower anteriorly, and crenulae medium-sized, robust, anteriorly long; metapleuron punctate, with distinct pilosity; propodeum coarsely areolate, with costulae interrupted.

Wings.— Fore wing: second submarginal cell pentagonal, rather wide, with short ramellus; r:3-SR:SR1 = 5:4:65; 2-SR:3-SR:r-m = 8:4:9. Hind wing: M+CU:1-M = 19:54.

Legs.— Length of hind femur, tibia and basitarsus 5.8, 8.9 and 9.8 times their width, respectively; length of outer and inner spur of middle tibia 0.4 and 0.6 times their basitarsus, respectively, slender; length of outer and inner spur of hind tibia 0.3 and 0.4 times hind basitarsus, respectively; fore tarsus rather slender.

Metasoma.— Slender, smooth; length of first tergite 2.1 times its apical width; length of ovipositor sheath 0.13 times fore wing.

Colour.— Ivory; antenna, vertex (except near eyes), temples dorsally, occiput, area between antennal sockets, side of pronotum largely, mesoscutum, scutellum, mesosternum and mesopleuron largely, propodeum dorsally (except antero-laterally and postero-medially), apical half of first metasomal tergite (except apically), third-fifth tergites (except posteriorly), large patch on outer side of hind coxa, hind femur (except dorsal stripe), apex of hind tibia narrowly, hind tarsus, small patch on hypopygium latero-basally, and ovipositor sheath (except for its ivory apex) dark brown or blackish; second tergite brown dorsally; wing membrane evenly slightly infuscate and with a yellowish tinge; vein C+SC+R, parastigma, and apical third and posterior margin of pterostigma blackish (as setae), remaining veins brown; remainder of pterostigma fuzzy yellowish; stigmal spot medium-sized (fig. 26).

Variation.— One specimen from Sabah (♂), and one from Sumatra (♀) have the parts of the body, which are usually ivory, pale yellowish-brown. Length of fore wing 9.0-11.0 mm; length of first metasomal tergite 1.8-2.1 times its apical width; stigmal spot small to medium-sized (figs 26, 27); pterostigma largely yellowish, only basally yellowish and remainder dark brown (♀), or largely or completely blackish (♂); subposterior crest of scutellum may be rather strongly developed (fig. 117). The males are very similar to the females.

Distribution.— Indonesia (Sumatra), Malaysia (East Malaysia: Sabah).

Notes.— Resembles *Agathis pallidipes* Cameron, 1980, but the latter has the hind leg (except its coxa) pale yellowish, the pale parts of body are fuzzy brownish, the first tergite completely brownish, the second-fourth metasomal tergites completely black, the mesopleuron weakly punctate, and the second submarginal cell of fore wing triangular. Closely related to *E. abbotti*; melanistic specimens of the latter species are very similar and may be separated from *E. eburnea* by the colour pattern

(e.g. whole first tergite dark brown and pale parts yellowish-brown), the colour of the hind tibia (completely blackish), and the larger stigmal spot.

Euagathis elevata Bhat & Gupta, 1977
(figs 59, 60)

Euagathis elevatus Bhat & Gupta, 1977: 198; Simbolotti & van Achterberg, 1990: 10, figs 71, 72.

Material.— Holotype, ♀ (CNC), "Halmahera I., 500 m, Tolewang, x.1951, Wegener", "Holotype, *Euagathis elevatus* Bhat & Gupta 1975", "Holotype *Euagathis elevatus*, C.N.C. No 15622", "*elevatus* K6".

Holotype, ♀, length of fore wing 8.5 mm, of body 8.0 mm.

Head.— Antennal segments 43, length of third segment 1.3 times fourth segment, length of third, fourth and penultimate segments 2.8, 2.1 and 1.6 times their width, respectively; length of maxillary palp about 0.7 times height of head; length of eye in dorsal view 1.6 times temple; OOL:diameter of ocellus:POL = 7:3:3; face finely punctate; vertex punctulate; area behind antennal sockets not depressed, black patch rectangular, extending from stemmaticum to antennal sockets; occipital flange large.

Mesosoma.— Length of mesosoma 1.4 times its height; pronotal sides punctate, with slight crenulation anteriorly below subpronope; subpronope deep and epomia double; area above precoxal sulcus finely punctate, and coarsely punctate below it; precoxal sulcus with short and narrow crenulae; mesoscutum punctulate, moderately tuberculate, and not depressed medio-posteriorly; notauli distinct with microcrenulae in their posterior part; scutellum slightly concave, rugulose, with posterior depression and anterior edges angulate (fig. 60), distinct carinae present all around its edges and medio-posteriorly.

Wing.— Fore wing: second submarginal cell quadrangular; r:3-SR:SR1 = 3:3:39; SR1 straight; 2-SR:3-SR:r-m = 6:3:6; cu-a interstitial. Hind wing: M+CU:1-M = 19:28.

Legs.— Length of hind femur, tibia and basitarsus 3.4, 7.2 and 7.8 times their width, respectively; length of outer and inner spurs of middle tibia 0.4 and 0.6 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.4 and 0.6 times hind basitarsus, respectively.

Metasoma.— Smooth; length of first tergite 1.4 times its apical width; ovipositor sheath rather wide, its length 0.08 times fore wing.

Colour.— Yellowish-brown; apical 0.4 of fore wing dark brown (with apical two-thirds of marginal cell infuscate), and remainder yellowish; stigmal spot rather small (fig. 59) and brownish; pterostigma dark brown; apical 0.1 of hind wing dark grey, remainder whitish-yellow; antenna (including scapus) black; head and body largely yellowish-brown, except black pattern near stemmaticum, and distinct infuscation of hind tarsi and basal third of hind tibia.

Distribution.— Indonesia (Halmahera).

Euagathis flavominuta spec. nov.
(figs 38, 95, 96)

Material.— Holotype, ♀ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia (East), c 1000 m, 1-13.iv.1987, Mal. trap 5, C. v. Achterberg, RMNH'87". Paratypes (9 ♀♀); 2 ♀♀ (RMNH), topotypic, one with same date, one with 25.xi-7.xii.1987; 2 ♀♀ (RMNH), topotypic but Long Pa Sia (West), c 1050 m, 25.xi.-8.xii.1987, Malaise trap 3; 3 ♀♀ (RMNH, FRC),"Malaysia: SE Sabah, nr Danum Valley Field C., c 150

m, Mal. trap 1b, 215.xi.-8.xii.1987, C. v. Achterberg, RMNH'87"; 1 ♀ (BMNH), "Sarawak: 4th div., Gn. Mulu, RGS. Exp., 17.ix-23.x.1977, D. Hollis BM.77-543"; 1 ♀ (BMNH), " Brunei: Ulu Temburong, 16-22.ii.1982, M.C. Day". Non-paratypes: 2 ♂♂ (BMNH, RMNH), "Malaya, Selangor, F.M.S., 15th Mt Kanching, P Res., 5.vii.1924".

Holotype, ♀, length of body 6.7 mm, of fore wing 6.2 mm.

Head.— Antennal segments 40, rather moniliform (cf. fig. 132); length of third antennal segment 1.1 times fourth segment; length of third, fourth and penultimate segment 2.7, 2.5 and 0.9 times their width, respectively; length of maxillary palp 0.8 times height of head; length of eye in dorsal view 2.4 times temple; OOL:diameter of ocellus:POL = 8:5:4; lamellae between antennal sockets distinctly converging posteriorly; occipital flange large, its ventral margin distinctly oblique. Morphology of head as of *E. semifusca* (Brullé).

Mesosoma.— As of *E. semifusca*, except for its shape: of *E. flavominuta* somewhat more elongate, its length equal to 1.4 times its height (mesosoma of *E. semifusca*: 1.3 times).

Wings.— Fore wing: second submarginal cell subquadrate or pentagonal, rather robust (fig. 96); r:3-SR:SR1 = 6:3:77; 2-SR:3-SR:r-m = 11:5:12. Hind wing: M+CU:1-M = 28:80.

Legs.— Length of hind femur, tibia and basitarsus 5.2, 9.2 and 9.3 times their width, respectively; length of outer and inner spur of middle tibia 0.4 and 0.6 times middle basitarsus, respectively; length of outer and inner spur of hind tibia 0.3 and 0.5 times hind basitarsus, respectively.

Metasoma.— Slender; length of first tergite 1.7 times its apical width (fig. 95); length of ovipositor sheath 0.12 times fore wing.

Colour.— Pale yellowish-brown; scapus and pedicellus yellowish-brown, but scapus with dark brown streak on outer side; remainder of antenna, pterostigma, hind tibia and tarsus dark brown; apical 0.4 of fore wing infuscate, infuscation includes second submarginal cell; remainder of wing pale yellowish; stigmal spot absent or very vague (fig. 38); first discal cell with a brownish triangular-oblong spot posteriorly, as in *E. semifusca*, but smaller; apical third of hind wing infuscate, remainder yellowish-hyaline.

Variation.— Antennal segments of ♀ 40-44; length of fore wing 5.6-7.6 mm; length of first tergite 1.6-1.9 times its apical width; pterostigma may be narrowly yellowish antero-basally. The males are strongly melanistic (and therefore excluded from the type series), but most likely belong to *E. flavominuta*; the scapus, pedicellus, propodeum, metanotum, part of mesopleuron, metasoma and hind leg are dark brown.

Distribution.— Malaysia (East Malaysia: Sabah, Sarawak; ?West Malaysia).

Euagathis forticarinata (Cameron, 1899)
(figs 31-35, 90-94)

Agathis forticarinata Cameron, 1899: 86-87; van Achterberg & O'Toole, 1993: 18 (lectotype designation).
Euagathis forticarinata; Shenefelt, 1970: 411; Bhat & Gupta, 1977: 216-218, figs 26c, 28c, 29e, 31g; Simbolotti & van Achterberg, 1990: 12-14.
Agathis peronata Cameron, 1899: 89-91; van Achterberg & O'Toole, 1993: 31 (synonymy with *E. forticarinata*).
Euagathis peronata; Shenefelt, 1970: 413; Bhat & Gupta, 1977: 218-219.
Agathis lepcha Cameron, 1907a: 113.

Euagathis lepcha; Shenefelt, 1970: 411; Dover, 1925: 40 (synonymy); Bhat & Gupta, 1977: 217.
Euagathis pallida Fullaway, 1919: 51; Baltazar, 1966: 218; Shenefelt, 1970: 413; Simbolotti & van Achterberg, 1990: 12 (synonymy with *E. forticarinata*).
Euagathis variabilis Enderlein, 1920: 175; Shenefelt, 1970: 415; Bhat & Gupta, 1977: 231-232, fig. 29f. **Syn. nov.**
Euagathis variabilis var. *tibialis* Enderlein, 1920: 176; Shenefelt, 1970: 416. **Syn. nov.**
Euagathis variabilis var. *melanogaster* Enderlein, 1920: 177; Shenefelt, 1970: 415. **Syn. nov.**
Euagathis variabilis var. *melanopleura* Enderlein, 1920: 177; Shenefelt, 1970: 415. **Syn. nov.**
Euagathis variabilis var. *tonkinensis* Enderlein, 1920: 176; Shenefelt, 1970: 416. **Syn. nov.**
Euagathis variabilis var. *sucarandana* Enderlein, 1920: 176 (♂, not lectotype ♀); Shenefelt, 1970: 416.
Euagathis bipunctata Enderlein, 1920: 179-180; Shenefelt, 1970: 410. **Syn. nov.**

Material.— Holotype of *E. forticarinata*, ♀ (OUM), "*Agathis forticarinata* Cam., Type, Khasia [India]", "675"; 2 ♀♀ (RMNH), "Museum Leiden, [Java], Dramaga, Buitenzorg, 1.xii.1936, Dr J. v. d. Vecht"; 1 ♂ (RMNH), "Museum Leiden, [Java], Tjiboeral, 18.x.1936, Dr J. v. d. Vecht";1 ♂ (RMNH), "Java, Wijnkoopsbaai, xi., Grelak" ; 1 ♂ (BMNH), "West Java: Tjimerang Mt. Djampang, xi.1937"; 2 ♂♂, (BMNH), "West Java: Gunung Malang, 3-4000 ft., i.1938, K.M.Walsh, B.M. 1938-99"; 3 ♂♂ (BMNH), "West Java: Gunung Malang, 3-4000 ft., xi.1937, K.M. Walsh, B.M. 1938-99"; 1 ♂♂ (BMNH), "West Java: Djampang Mts., Tjikarang, xi.1937"; 1 ♂ (BMNH), "West Java: Gunung Halimoen, 4-5000 ft., xi.1937, K.L. Walsh, B.M. 1939-99; 1 ♂ (BMNH), "West Java: Salatri, i.1938, K.M. Walsh, B.M. 1938-99"; 1 ♂ (BMNH), "West Java: Tjitalahab, VIII, Mt. Djampang, ix.1937"; 2 ♂♂, (BMNH), "West Java: Gunung Malang, 3-4000 ft., x.1937, K.M. Walsh, B.M. 1938 -99"; 1 ♀+1 ♂ (BMNH), "West Java: Djampang Mts., Tijkarang, xi.1937"; 2 ♂♂ (BMNH), "West Java: Radjamandula, 1200 ft., Djampang Wetan, xi.1937"; 1 ♂ (BMNH), "West Java: Gunung Malang, 3-4000 ft, i.1948, K.M. Walsh, B.M. 1938-99"; 1 ♂ (BMNH), "West Java: Djampang Mts., Tjigaeha, i.1938"; 1 ♂ (BMNH), "West Java, ix. 1937, K.M. Walsh, B.M. 1938-99"; 2 ♂♂, (BMNH), "West Java: Salatri, 1938, K.M. Walsh, B. M. 1938-99"; 1 ♀ (RMNH), "W Java, Bibidjilan, Djampang Tingah, iii.[19]35"; 1 ♂ (RMNH), "Java, Mount Salak, 640 m, 4.vi.1926, L.G.E. Kalshoven"; 1 ♀ (RMNH), "Museum Leiden, Indonesia, W Java, Mt Salak, 106°46'E-6°40'S, 24.v.1972, J. Krikken, no 3, 780-830 m", "swept from low plants", "cult. area/plantations/forest relics"; 1 ♂+ 1 ? (RMNH), "[Java], Baoeng, vii.1935, 350 m, [Betrem]"; 1 ♂ (RMNH), "Museum Leiden, W Java, Soekaboemi, G. Malang, i.1940, leg. Oeko"; 1 ♂ (RMNH), "Museum Leiden, [Java], G. Bentang, ii.1938, J. v. d. Vecht"; 1 ♂ (OUM), "Java occident., Mons Gede, 4000 [ft], viii.1893, H. Fruhstorfer"; 1 ♀ (RMNH), "Indonesia: Sumbawa, N of Pancasila, nr Gn. Tambora, c 500 m, 1.x.1993, Y. v. Nierop, RMNH'93"; lectotype of *E. variabilis* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis variabilis* Enderl., ♀, det. transcr."; 1 ♂+16 ♀♀ (PAN), paralectotypes, topotypic; lectotype of *E. variabilis* var. *tibialis* here designated, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis variabilis* var. *tibialis* Enderl., ♂, Dr Enderlein, det. 1917"; 9 ♂♂+2 ♀♀ (PAN), paralectotypes, topotypic; lectotype of *E. variabilis* var. *melanopleura* here designated, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis variabilis* var. *melanopleura* Enderl., ♂, Dr Enderlein, det. 1919"; 1 ♂ (PAN), paralectotype, topotypic; lectotype of *E. variabilis* var. *melanogaster* here designated, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis variabilis* var. *melanogaster* Enderl., ♂, Dr Enderlein, det. 1919"; 20 ♂♂ (PAN), paralectotypes, topotypic; lectotype of *E. bipunctata* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Co-Type", "*Euagathis bipunctata* Enderl., ♀, Dr Enderlein, det. 1919"; 1 ♀ (PAN), paralectotype, topotypic, with "Type" label, but the lectotype is preferred because it fits better the original description; holotype of *E. variabilis* var. *tonkinensis*, ♂ (PAN), "Tonkin, Than-Moi, vi-vii., H. Fruhstorfer", "Type", "*Euagathis variabilis* var. *tonkinensis* Enderl., ♂, Dr Enderlein, det. 1919"; 37 ♂♂+21 ♀♀+12 ? (RMNH), "Sumatra, Deli, Medan"; 2 ♂♂ (RMNH), "Sumatra, Occident., Mr van Lansberge"; 1 ♀ (RMNH), "[Indonesia], Ar. Bk., v.[18]77"; 1 ♀ (RMNH), "NO Sumatra, Serdang, Tandjong Morawa, Dr B. Hagen"; 1 ♀ (RMNH), "Museum Leiden, Indonesia, NE Sumatra, 1-9. viii.1982, L. Kobus"; 1 ♀ (RMNH), "Ambarawa, 1870, Ludeking"; 1 ♀ (RMNH), "[Indonesia], Sid., vii.[18]77"; 2 ♂♂ (BMNH), "Malaysia, Selangor, Pansoon, Ulu Langat, x.1979, I. Gauld"; 1 ♂ (RMNH), "Malaya, Kuala Lumpur, nr. L Gardens, coll. Pendlebury, 14.ix.1934"; 1 ♂ (BMNH), id., but 28.iii.1936; 1 ♂ (BMNH), id., but 29.ix.1936. For material from Sulawesi, see Simbolotti & van Achterberg (1990).

Holotype, ♀, length of fore wing 8 mm, of body 7.4 mm.

Head.— Antennal segments 54, length of third segment 1.1 times fourth segment, length of third, fourth and penultimate segments 3.3, 3.0 and 1.2 times their width, respectively; length of maxillary palp 0.8 times height of head; length of eye in dorsal

view 2.6 times temple; OOL:diameter of ocellus:POL = 7:2:3; face rather convex, and finely punctate, vertex punctulate; depression behind antennal sockets very shallow; occipital flange comparatively narrow.

Mesosoma.— Length of mesosoma 1.3 times its height; pronotal sides sparsely punctate with posterior distinct crenulation; subpronope deep and epomia single; mesopleuron above precoxal sulcus punctate, coarsely punctate below it; crenulae of precoxal sulcus short and narrow; mesoscutum punctate, without (or with shallow) depression medio-posteriorly, middle lobe with two longitudinal depressions anteriorly (fig. 93); notauli with distinct crenulation posteriorly, which is much stronger towards confluence of notauli (fig. 93); scutellum punctate, rather convex, its anterior edges rounded (fig. 91), with a carina and a rather narrow depression posteriorly, and without anterior or lateral carinae, its subposterior crest strong (fig. 92); metapleuron punctate; propodeum areolated, but very sparsely so posteriorly.

Wings.— Fore wing: r:3-SR:SR1 = 6:5:72; SR1 straight; 2-SR:3-SR:r-m = 10:5:9; Hind wing: M+CU:1-M = 14:26.

Legs.— Length of hind femur, tibia and basitarsus 5.6, 8.3 and 9.5 times their width, respectively; length of outer and inner spurs of middle (and hind) tibia 0.4 and 0.6 times their respective basitarsi.

Metasoma.— Smooth; length of first tergite 1.8 times its apical width; ovipositor sheath slender, and its length 0.09 times fore wing.

Colour.— Yellowish-brown; antennae brown; scapus, face and mesosoma (dorsally) dark yellowish-brown; mesosoma latero-ventrally and metasoma yellowish-brown; base of tibia and all tarsi dark reddish-brown; apical 0.45 of marginal cell infuscate, remainder bright-yellow; second submarginal cell quadrangular; stigmal spot usually large, and posteriorly almost touching 2-CU1 (fig. 31); apical seventh of hind wing infuscate, remainder yellowish-hyaline.

Variation.— Sculpture of mesoscutum and scutellum very variable, posteriorly mesoscutum may be smooth to strongly obliquely rugose, and scutellum may be strongly punctate, with lamelliform carina anteriorly, and scutellum may be comparatively angulate anteriorly, but intermediates occur. Body colouration in *E. forticarinata* appears to be very variable; it ranges from predominantly yellowish-brown to yellow, dark reddish-brown and brown; especially remarkable is the variability in the colour of hind legs (and to a lesser degree also of the metasoma): the brown (or dark brown) pigmentation may extend to half of the tibia and the tarsus to the entire tibia and tarsus or even the whole hind leg. We have seen extremely melanistic males from West Malaysia which have also the scapus and the mesosoma nearly completely dark brown, or only pronotum and scutellar sulcus yellowish. The scutellum of males is also variable: the anterior carina may be entirely absent, partially present, or entirely present. Colour pattern of wing varies considerably as shown in figs 31-35. The lectotype of *E. variabilis* has 51 antennal segments, length of fore wing 6.6 mm, length of first metasomal tergite 1.9 times its apical width, the notaulic area smooth posteriorly, the apex of hind tibia, and tarsus dark brown. The lectotype of *E. variabilis* var. *tibialis* has the pterostigma dark brown, the fore wing more extensively darkened and the scutellum comparatively strongly sculptured. The lectotype of *E. bipunctata* has length of first metasomal tergite 1.7 times its apical width and stigmal spot rounded. The lectotypes of *E. variablilis* var. *melanopleura* and var. *melanogaster* concern melanistic males, the latter with apical 0.6 of fore wing largely

dark brown, including pterostigma.

Distribution.— India, Nepal, Vietnam, Malaysia (West Malaysia) and Indonesia (Sumbawa, Java, Sumatra, Sulawesi). Not (yet) known from Borneo. The only *Euagathis* species known to be common near human settlements, in disturbed vegetation.

Euagathis fuscinotum Enderlein, 1920
(figs 36, 132)

Euagathis fuscinotum Enderlein, 1920: 174; Shenefelt, 1970: 411; Bhat & Gupta, 1977: 221.

Material.— Lectotype here designated, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Co-Typus", "Mus. Zool. Polonicum Warszawa, 12/45", "*Euagathis fuscinotum* End., det. Dr Enderlein"; 8 ♂♂ paralectotypes (PAN), topotypic; 1 ♂ (RMNH), "Sum., Balun, Bad. Bov. [= Badang Highlands], vi.1914, Edw. Jacobson"; 2 ♂♂ (RMNH), "(NO Sumatra), Serdang, Tandjong Morawa, Dr B. Hagen"; 1 ♂ (RMNH), "[Sumatra], Serdang, Tobameer, Dr B. Hagen"; 1 ♂ (RMNH), "[Sumatra], Serdang tot Tobameer, Dr B. Hagen"; 1 ♂ (RMNH), "Indonesia: N Sumatra, Bukit Lawang, nr Bohorok river, c 200 m, rainforest, 3-5.iii.1994, C. v. Achterberg, RMNH'94"; 1 ♂ (RMNH), "Z Borneo, G. Selong, Tanggarang, 5.iii.[19]37, 30 m., leg. Walsh"; 1 ♂ (RMNH), "Pelawan, O Borneo, leg. Walsh"; 16 ♂♂ (RMNH), "Museum Leiden, Java, Gedeh, Tapos, 700 m, 14-19.ii.1933, J. v. [d.] Vecht"; 1 ♂ (RMNH), "Java, Gng Gedeh, Tapos, xi.[19]33, [J. v. d. Vecht]"; 1 ♂ (RMNH), "Museum Leiden, [Java], G. Tjangkoedang, Djampang Wetan, xi.1938, J. v. d. Vecht"; 2 ♂♂ (RMNH), "Museum Leiden, [Java], G. Malang, Djampang Wetan, ii.1938, J. v. d. Vecht"; 1 ♂ (RMNH), "Java occ., Panggerango, 1000 m, Tjidaroea Z., 11.i.[19]31, Lieftinck"; 1 ♀ (BMNH), "West Java: Mt Gede, 4-5000 ft, Perliawatte, x.1937"; 1 ♀ (BMNH), "West Java: Djampang Mts., Tjigaeha, ii.1938", "K.M. Walsh, B.M. 1938-99"; 1 ♀ (RMNH), "Museum Leiden, G. Malang, iii.1938, J. v. d. Vecht".

Lectotype, ♂, length of body about 8 mm, of fore wing 11 mm.

Head.— Antenna of lectotype incomplete (antennal segments 43-49 in other specimens, segments of apical third of antenna of ♀ submonoliform: fig. 132); length of third antennal segment 1.1 times fourth segment; length of third and fourth segment 3.0 and 2.6 times their width, respectively; length of maxillary palp 0.7 times height of head; length of eye in dorsal view 1.3 times temple; OOL:diameter of ocellus:POL = 15:8:6; face punctate, somewhat elongate in frontal view; vertex shiny; frons polished and weakly depressed; lamellae between antennal sockets strong, rather converging posteriorly; occipital flange rather large, its ventral margin oblique; frons usually with a small tubercle medially.

Mesosoma.— Length of mesosoma 1.3 times its height; pronotal side minutely punctate, its posterior crenulation extremely thin; subpronope wide, deep; epomia single; mesoscutum distinctly punctate and medio-posteriorly depressed; middle lobe of mesoscutum with pair of shallow grooves medio-anteriorly; notauli smooth and deeply impressed; scutellum punctate, oval-shape and moderately convex, with subposterior crest and subposterior depression; mesopleuron punctulate to punctate; depression of precoxal sulcus narrow, deep, but anteriorly almost fading out, its crenulae regular, short; metapleuron punctate; propodeum coarsely areolate.

Wings.— Fore wing: second submarginal cell subpentagonal; r:3-SR:SR1 = 7:4:80; 2-SR:3-SR:r-m = 9:5:7. Hind wing: M+CU:1-M = 30:55.

Legs.— Length of hind femur, tibia and basitarsus 5.8, 9.4 and 10.8 times their width, respectively; length of outer and inner spurs of middle tibia 0.5 and 0.6 times their basitarsus, respectively; length of outer and inner spurs of hind tibia 0.3 and 0.6 times hind basitarsus, respectively.

Metasoma.— Slender, smooth, distinctly convex near level of spiracles; length of first tergite 1.9 times its apical width.

Colour.— Largely yellowish-brown to dark yellowish-brown; antenna, hind leg, and apex of metasoma black(ish); head dorsally (except near eyes) and mesoscutum dark brown; mesosternum and mesopleuron infuscate; fore wing (fig. 36) entirely subhyaline, without distinct infuscation and stigmal spot; venation and pterostigma dark yellowish-brown; hind wing subhyaline.

Variation.— Length of fore wing 6.7-8.7 mm; length of first metasomal tergite 1.4-1.9 times its apical width; fore and middle tarsi of ♀ slender. Specimens from Borneo are usually larger than specimens from Java or Sumatra; body blackish-brown in specimens from Java. Specimens from Borneo: antenna, vertex, frons, occiput, antennal sockets, mesoscutum, metasoma (largely), dark brown; pronotal side, side of mesoscutum and hind leg, brown; remainder of body dark yellowish-brown. Specimens from Java: antenna, occiput, vertex, frons, antennal sockets, thorax, hind leg and metasoma dorsally, black or blackish-brown; face, fore and middle legs, side of metasoma, pale yellowish-brown; second submarginal cell of fore wing with long or short (specimens from Borneo) ramellus, or without ramellus at all (usually specimens from Java).

Distribution.— Indonesia (Java, Sumatra, Borneo).

Note.— May be very similar to melanistic *E. abbotti*, but *E. fuscinotum* has no stigmal spot, and the segments of apical third of antenna of ♀ are robust, submoniliform (fig. 132).

Euagathis henseni spec. nov.
(figs 19, 52-55)

Material.— Holotype, ♀ (RMNH), "Indonesia: W Sumatra, Padang-panjang, 800 m, 0°30'S, 100°26'E, 1.v.1988, R. Hensen". Paratypes (2 ♀♀+ 1 ?): 1 ♀ (RMHN), topotypic, same date; 1 ♀+ 1 ? (RMHN), "Kangean eilanden", "Gng Tinggi, c 400 m, ii.[19]36, leg. Walsh".

Holotype, ♀, length of body 7.1 mm, of fore wing 7.8 mm.

Head.— Antennal segments 44, length of third segment 1.2 times fourth segment, length of third, fourth and penultimate segments 2.6, 2.1, and 1.5 times their width, respectively; length of maxillary palp about 0.7 times height of head; length of eye in dorsal view 1.6 times temple; OOL:diameter of ocellus:POL = 7:3:3; face and vertex punctulate; lamella between antennal sockets distinctly converging posteriorly; occipital flange large, its ventral margin largely oblique, with comparatively short horizontal part (fig. 53).

Mesosoma.— Length of mesosoma 1.5 times its height; pronotal sides punctate, slightly crenulate anteriorly; subpronope deep and epomia double; area above precoxal sulcus finely punctate, and moderately punctate below it; precoxal sulcus with short and coarse crenulae; mesoscutum sparsely and finely punctate, its lobes distinctly convex, and weakly depressed medio-posteriorly; notauli distinct with microcrenulae anteriorly; scutellum distinctly concave medially, largely smooth, anterior edge lamelliform angulate (fig. 54), lateral carinae and medio-posterior crest strong.

Wings.— Fore wing: second submarginal cell robust, quadrangular (fig. 19); SR1 straight; r:3-SR:SR1 = 4:5:58; 2-SR:3-SR:r-m = 8:5:11; ramellus absent. Hind wing; M+CU:1-M = 19:31.

Legs.— Length of hind femur, tibia and basitarsus 3.6, 6.5 and 7.4 times their width, respectively; length of outer and inner spurs of middle tibia 0.4 and 0.6 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.4 and 0.6 times hind basitarsus, respectively; hind femur coarsely and densely rugose-punctate.

Metasoma.— Smooth; length of first tergite (fig. 55) 1.3 times its apical width; ovipositor sheath rather slender, its length 0.08 times fore wing.

Colour.— Yellowish-brown; antenna, stemmaticum, third metasomal segment, 4th-7th tergites largely, and ovipositor sheath, black; outer side of hind coxa largely, trochanter and trochantellus largely, basal third of hind femur, apical two-thirds of hind tibia and hind tarsus, dark brown; hind spurs brown; basal third of hind tibia rather pale yellowish; setae of veins C+SC+R of fore wing blackish (except basally); veins yellowish, but vein 1-R1 and apical half of vein SR1 brown; basal third and posterior half of pterostigma yellow; remainder of pterostigma dark brown; vein C+SC+R largely dark yellowish-brown; parastigma, and apex of C+SC+R dark brown: apical third of fore wing distinctly dark brown, with a slightly infuscated area between apical infuscated part and yellowish basal part, reaching anterior half of marginal cell, not enclosing second submarginal cell, posteriorly somewhat extended basad; stigmal spot elongate, medium-sized and somewhat bent towards second submarginal cell (fig. 19); apical two-fifths of hind wing dark brown and remainder yellowish-hyaline.

Variation.— Paratype from Sumatra and one from Kangean Islands have the hind leg (except pale basal ring of hind tibia) and third metasomal tergite blackish; metasoma ventrally partly dark brown; mesosternum and middle lobe of mesoscutum anteriorly infuscate; black area of stemmaticum somewhat more enlarged; pair of oblique submedial carinae of scutellum more developed than in holotype; length of first metasomal tergite 1.4 times its apical width; one paratype from Kangean Islands has first metasomal tergite medially infuscate, remainder of metasoma dorsally, and hypopygium, dark brown; the paratypes from the Kangean Islands have the scutellum less concave medially than in holotype.

Distribution.— Indonesia (Sumatra, Kangean Islands).

Euagathis japonica Szépligeti, 1902
(figs 16, 71-81, 108, 109)

Euagathis japonica Szépligeti, 1902: 68; Shenefelt, 1970: 412.

Euagathis semiflavus Szépligeti, 1908: 228. **Syn. nov.**

Euagathis semiflava; Shenefelt, 1970: 415; Bhat & Gupta, 1977: 199-201, figs 30b, 31l; Chou & Sharkey, 1989: 186-187, figs 37, 71, 104, 137, 169, 201, 233, 269, 204.

Euagathis horniana Enderlein, 1920: 180; Shenefelt, 1970: 411; Bhat & Gupta, 1977: 199 (as synonym of *E. semiflava*); Chou & Sharkey, 1989: 186. **Syn. nov.**

Euagathis formosana Enderlein, 1920: 178-179; Shenefelt, 1970: 411; Bhat & Gupta, 1977: 199 (as synonym of *E. semiflava*); Chou & Sharkey, 1989: 186. **Syn. nov.**

Euagathis formosana var. *obscurior* Enderlein, 1920: 179; Bhat & Gupta, 1977: 199 (as synonym of *E. semiflava*); Chou & Sharkey, 1989: 186. **Syn. nov.**

Euagathis nigrifrons Enderlein, 1920: 180; Shenefelt, 1970: 413; Bhat & Gupta, 1977: 199 (as synonym of *E. semiflava* Szépligeti); Chou & Sharkey, 1989: 186. **Syn. nov.**

Euagathis tricarinata Enderlein, 1920: 178; Shenefelt, 1970: 415; Bhat & Gupta, 1977: 199 (as synonym of *E. semiflava* Szépligeti); Chou & Sharkey, 1989: 186. **Syn. nov.**

Material.— Holotype of *E. semiflava* ♀ (TMA), "Java, Semarang, 1905, E. Jacobson", "Holotypus *Euagathis semiflavus*, ♀, Szépl. 1908, det. Papp", "*Euagathis semiflavus*", "Hym. Typ. no. 722, Museum Budapest"; 1 ♀ (RMNH), "Java, Pelawa, tangkep 18.ix.1936, L.G.E. Kalshoven", "tangkep di gola[2] klampis makan poetihnja"; 1 ♀ (RMNH), "W Java, Udjung Kulon, Tjigeunteur, 16.vii.1955, A.M.R. Wegner"; 2 ♀♀ (BMNH, RMNH), "West Java: Radjamandula, 1200 ft, Djampang Wetan, xi.1937", "K.M. Walsh, B.M. 1938-99"; 1 ♀ (OUM), "Java occident., Mons Gede, 4000 [ft], viii.1893, H. Fruhstorfer"; 1 ♀, holotype of *E. nigrifrons* (PAN), "Sumatra, Liangagas, Dohrn", "Type", "*Euagathis nigrifrons* Enderl., ♀, Type, Dr Enderlein, det. 1919 ♀"; 1 ♀+ 2 ♂♂+ 1 ? (RMNH, BMNH), "Sumatra, Medan, Deli"; ♀, lectotype of *E. tricarinata* here designated (PAN), "Sikkim, Darjeeling, H.H. Rolle, Berlin, SW11", "Co-Typus", "*Euagathis tricarinata* Enderl., ♀, Type, Dr Enderlein, det. 1919"; 1 ♀ paralectotype (PAN), topotypic, (fits the original description less accurately than the lectotype); 1 ♀ (RMNH), "Malaya, Kuala Lumpur, 9.vii.1922"; 1 ♀ (BMNH), id., but 5.viii.1928; 2 ♀♀ (BMNH), "Malay Penins., Pahang, F.M.S., Jaramtut Bt Balai, 19.iii.1927"; 1 ♀ (BMNH), "Malaya, Kuala Lumpur, Belukar, 11.iii.1929"; 1 ♂ (BMNH), "[Burma], Tenasserim, Dawnat, 1500 feet, xi.[18]98, Bingham coll."; ♀, lectotype of *Euagathis formosana* here designated (PAN) "Formosoa, Takao, 2.xii.[19]07, H. Sauter, S.", "Type", "*Euagathis formosana* Enderl., ♀, Type, Dr Enderlein, det. 1919"; 2 ♀♀ (PAN), paralectotypes, one from Takao, and one from Korroton; 1 ♂, holotype of *Euagathis formosana* var. *obscurior* (PAN) "Formosa, Korroton, 8.ix.[19]07, H. Sauter, S.", "Type", "*Euagathis formosana* var. *obscurior* Enderl., ♂, Type, Dr Enderlein, det. 1919"; 1 ♀+ 1 ♂ (RMNH), "[China], Ningpo [= Ningbo], Felder"; ♀, lectotype of *E. japonica* (TMA), "Japan, leg. Xanthus", "Japonia", "305, 12", "*japonicus* det. Szépligeti", "Lectotypus *Euagathis japonica* Szépli., 1902, ♀ % des. J. Papp, 1967", "Hym. Typ. No. 718, Mus. Budapest".

Redescription after ♀ from Java (Pelawa), length of body 10.8 mm, of fore wing 10.5 mm.

Head.— Antennal segments 57; length of third antennal segment 1.1 times fourth segment; length of third, fourth and penultimate segment 2.7, 2.5 times and 1.3 times, respectively; length of maxillary palp 0.6 times height of head; length of eye in dorsal view 2.3 times temple; lateral margin of temple slightly concave in dorsal view (fig. 77); OOL:diameter of ocellus:POL = 10:5:5; face finely punctate and moderately transverse in frontal view; occipital flange wide, its ventral margin horizontal (fig. 77); lamellae between antennal sockets subparallel.

Mesosoma.— Length of mesosoma 1.4 times its height; side of pronotum punctulate, strongly crenulate posteriorly; subpronope wide and deep; epomia single; mesoscutum finely punctate, without posterior depression; notauli smooth, rather shallow; scutellum (fig. 81) convex, coarsely punctate, with strong crest subposteriorly, and with short transverse carina medio-posteriorly; mesopleural area punctulate above precoxal sulcus, rather coarsely and moderately punctate below precoxal sulcus; precoxal sulcus moderately wide (fig. 109), long, its crenulae robust, regular; metapleuron punctate and normally setose; propodeum very coarsely areolate, costulae complete.

Wings.— Fore wing: second submarginal cell quadrangular, but acute anteriorly, without 3-SR, with stump-like ramellus (figs 71, 73); r:SR1 = 5:58; SR1 straight; 2-SR:r-m = 10:9. Hind wing: M+CU:1- M = 20:43.

Legs.— Length of hind femur, tibia and basitarsus 4.2, 6.6 and 7.8 times their width, respectively; length of outer and inner spurs of middle tibia 0.4 and 0.6 times middle basitarsus, respectively, slender (fig. 72); length of outer and inner spurs of hind tibia 0.4 and 0.6 times their basitarsus, respectively; third segment of fore tarsus moderately robust (fig. 76); hind femur superficially densely punctate.

Metasoma.— Smooth, moderately stout; length of first tergite 1.2 times its apical width, strongly widened apically (fig. 78); length of ovipositor sheath 0.08 times fore wing.

Colour.— Yellowish-brown; antenna (including scapus) and hind tarsus, occiput, vertex, frons (including antennal sockets), and face near antennal sockets, and two triangular spots just below frontal edge of antennal sockets, black(ish); apex of hind tibia, third and following metasomal tergites more or less infuscate; slightly more than apical half of fore wing infuscate, infuscation rather evenly, but interrupted below basal half of pterostigma by a more or less circular yellow area (fig. 71); basal half of the wing entirely yellowish and border between yellow and infuscated parts distinct; stigmal spot not discernable in infuscated area below parastigma (fig. 16), although infuscation below parastigma slightly more intense; veins of apical half of fore wing dark brown; veins of basal half of fore wing yellow; basal half of pterostigma and C+SC+R (except apically) yellow, apical half of pterostigma dark brown; about apical half of hind wing infuscate, and remainder yellowish-subhyaline.

Variation.— Antennal segments of ♀ 56-57, length of fore wing 8.5-10.5 mm; length of first metasomal tergite 1.2-1.7 times its apical width (of Indonesian specimens usually 1.2-1.3 times); length of inner spur of middle tibia 0.6-0.7 times middle basitarsus. Head pigmentation and colour pattern of fore wing is quite variable in this species: extention of blackish patch on vertex varies from very small to quite large to include temples and about upper half of head; in one specimen the head is entirely yellowish-brown; infuscated band departing from pterostigma and connected to apical infuscation may be narrow distally, up to almost isolated dark spot hardly separated from remainder of infuscation (specimens from West Malaysia and Burma). The specimen from Burma (Tenasserim) has the scutellum more oval, with deeper subposterior depression and without short, transverse, medio-posterior carina (fig. 80). The lectotype of *E. formosana* has basal 0.4 of marginal cell of fore wing yellowish, and apical half of pterostigma yellowish (but in one paralectotype largely dark brown). The lectotype of *E. tricarinata* has length of the first metasomal tergite 1.4 times its apical width, the scutellum wide, moderately (but sparsely) punctate, and without lateral carinae, and the precoxal sulcus with most of its crenulae long. The holotype of *E. nigrifrons* has length of fore wing 10.7 mm, length of first tergite 1.4 times its apical width, the apex of hind tibia dark brown and second submarginal cell with a distinct ramellus. Lectotype of *E. japonica* has length of fore wing 11.1 mm, and length of first metasomal tergite 1.5 times it s apical width (fig. 74). The melanistic male from Ningbo (China) has the wing membrane nearly completely dark brown, but vein C+SC+R of fore wing and basal 0.7 of pterostigma are yellow.

Note.— Holotype of *E. semiflava* has head missing.

Distribution.— Indonesia (Java, Sumatra), West Malaysia, Thailand, Burma, Sri Lanka, India, Pakistan, Nepal, China, Taiwan and Japan. A very wide-spread species which seems to be absent from Borneo and more eastern islands.

Euagathis javana Szépligeti, 1902
(figs 23, 61-64)

Euagathis javana Szépligeti, 1902: 68; Shenefelt, 1970: 412; Bhat & Gupta, 1977: 219-220.

Material.— Holotype, ♂ (TMA), "Java", "65/277", "Holotypus ♂ *Euagathis javana* Szépl. 1902, det. Papp 1967", "Hym. Typ., No. 724, Mus. Budapest"; 1 ♀ (RMNH), "[Java], Inst. v. Plantenziekten,

hospar. *Euproctis* cf. *min.*, Bogor, 8.vii.1932, Dr S. v.d. Goot"; 1 ♀ (RMNH), "[Java], Batavia [= Jakarta], xi.1907, E. Jacobson"; 1 ♀ (RMNH), id., but vi.1908; ; 1 ♀ (RMNH), "Museum Leiden, Buitenzorg [=Bogor], Tjiapoes, 29.xii.1936, Dr J. v. d. Vecht".

Holotype, ♂, length of body about 7 mm, of fore wing 8.5 mm.

Head.— Antennae and maxillary palp of holotype missing; antennal segment of reared specimen 43; length of third antennal segment 1.1 times fourth antennal segment; length of third and fourth segment 2.5 and 2.2 times their width, respectively; length of eye in dorsal view 1.8 times temple; OOL:diameter of ocellus:POL = 15:5: 10; face punctate, slightly elongate in frontal view; vertex shiny, punctulate; occipital flange very wide, (sub)horizontal part of ventral margin long; crests between antennal socket less converging posteriad than of *E. vechti*.

Mesosoma.— Length of mesosoma 1.3 times its height; pronotal side punctate, posterior crenulation weak but distinct; subpronope moderately large, epomia double; mesoscutum punctate, medio-posteriorly moderately depressed, middle lobe with pair of shallow grooves medio-anteriorly; notauli deep, distinctly crenulate; scutellum shallowly concave, with some coarse rugae, anteriorly angulate, lamelliform, with posterior crest and lateral carinae strong (fig. 61); mesopleuron punctate above precoxal sulcus, coarsely punctate below it; precoxal sulcus long, moderately wide, with robust crenulae regularly spaced all along its length; metapleuron coarsely punctate; propodeum coarsely areolate.

Wings.— Fore wing: second submarginal cell quadrangular, with rather long ramellus; r:3-SR:SR1 = 6:7:88; 2-SR:3-SR:r-m = 11:7:10. Hind wing: M+CU:1-M = 40:60.

Legs.— Length of hind femur (fig. 63), tibia and basitarsus 3.6, 5.6 and 11.6 times their width, respectively; length of outer and inner spurs of middle tibia 0.6 and 0.4 times their basitarsus, respectively; length of outer and inner spurs of hind tibia 0.5 and 0.3 times hind basitarsus, respectively.

Metasoma.— Short and smooth; first tergite flat, its length 1.1 times its apical width; length of ovipositor sheath (specimens in RMNH) 0.1 times fore wing.

Colour.— Yellowish-brown; antennae, vertex, occiput and frons largely brownish; mesoscutum blackish-brown; apex of metasoma brownish; fore and middle legs yellowish-brown; hind tarsus and apex of tibia brownish, remainder of hind leg, yellowish-brown; about apical half of fore wing homogeneous infuscate, without stigmal spot (fig. 23); remainder of wing yellow, border between infuscate and yellow parts distinct; veins in dark area dark yellowish-brown, yellow elsewhere; pterostigma dark brown and C+SC+R yellow; apical third of hind wing slightly infuscate, remainder subhyaline.

Variation.— Ramellus of second submarginal cell of fore wing varies from medium-sized to absent; mesoscutum yellowish-brown, dark brown or black; one female has occipital flange comparatively large, but ventral margin less oblique. Vertex, occiput, frons laterally and face laterally may be black(ish), while remainder (i.e. face medially, clypeus and genae) of head is yellowish-brown.

Distribution.— Indonesia (Java).

Note.— Reared from *Euproctis* cf. *minor* Snellen (Lymantriidae).

Euagathis leptocera Cameron, 1907
(figs 133-137)

Euagathis leptocerus Cameron, 1907b: 229; Shenefelt, 1970: 142.

Material.— Holotype, ♀ (BMNH), "Type", "B.M. Type Hym. 3.c.915", "*Euagathis leptocerus* Cam., Type, Borneo", "[Sarawak], Kuching, 22.iii.1900", "A.13", "Cameron Coll. 1909-182".

Holotype, ♀, length of body 10.1 mm, of fore wing 12.5 mm.

Head.— Antenna incomplete, remaining segments 46; length of third antennal segment 1.3 times fourth segment; length of third and fourth segment 2.9 and 2.2 times their width, respectively; length of maxillary palp 0.8 times height of head; length of eye in dorsal view 1.8 times temple; frons distinctly concave in front of stemmaticum; OOL:diameter of ocellus:POL = 18:7:7; face transverse in frontal view, its surface finely punctate; vertex smooth, polished; lamellae between antennal sockets strong, (sub)parallel (fig. 134); occipital flange large, horizontal part of its ventral margin long; head slightly more robust than of *E. aurea*, length of malar space 0.5 times height of eye.

Mesosoma.— Length of mesosoma 1.5 times its height; pronotal side punctulate, ventral-posterior crenulation indistinct; epomia single, subpronope wide and deep; mesoscutum rather sparsely and finely punctate, polished, without subposterior depression, notauli moderately impressed and largely smooth; scutellum flat, punctate, coarsely punctate anteriorly, distinctly angulate anteriorly, with strong crest subposteriorly, and lateral carinae present (fig. 133); side of mesoscutum distinctly punctate; mesopleuron above precoxal depression sparsely punctate, below it coarsely punctate, interspaces about equal to diameter of punctures; precoxal sulcus wide, complete, with rather long and coarse crenulae; metapleuron distinctly punctate, but sparsely dorsally; areolation of propodeum strong, but costulae incomplete.

Wings.— Fore wing: second submarginal cell subpentagonal, with stump-like ramellus; r:3-SR:SR1 = 7:3:83; SR1 very slightly bent; 2-SR:3-SR:r-m = 16:3:15. Hind wing: M+CU:1-M = 23:46.

Legs.— Length of hind femur, tibia and basitarsus 4.7, 9.0 and 8.0 times their width, respectively; outer and inner spurs of middle tibia normal, slender basally (fig. 136), its lengths 0.4 and 0.6 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.4 and 0.6 times hind basitarsus, respectively (fig. 139); fore and middle tarsi normal (figs 135, 136); hind femur densely punctate-rugose.

Metasoma.— Rather stout and smooth; length of first tergite 1.6 times its apical width; length of ovipositor sheath 0.06 times fore wing.

Colour.— Rather dark yellowish-brown; pedicellus and scapus (but with dark brown streak on its outer side) yellowish-brown; remainder of antenna dark-brown; hind tarsus and apex of hind tibia narrowly, infuscate; fore wing largely rather bright golden-yellow, with soft infuscation restricted to posterior part of second discal cell and distal part of second subdiscal cell; stigmal spot medium-sized; venation and pterostigma entirely yellow (including vein 1-R1 and its setae); border between yellow and shadowed parts of wing undefined (cf. fig. 29); hind wing yellowish, but apically faintly infuscate.

Distribution.— Malaysia (East Malaysia: Sarawak).

Euagathis nigriceps Enderlein, 1920
(figs 138-140)

Euagathis nigriceps Enderlein, 1920: 175; Shenefelt, 1970: 413; Bhat & Gupta, 1977: 208-209.

Material.— Holotype, ♀ (PAN), "[West Malaysia], Perak", "*Euagathis nigriceps* Enderl., type, ♀, det. Dr Enderlein", "Museum Zool. Polonicum, Warszawa", "14/45".

Holotype, ♀, length of body 8.5 mm, of fore wing 11 mm.

Head.— Missing. According to original description with strong lamellae between antennal sockets.

Mesosoma.— Length of mesosoma 1.5 times its height; pronotal side largely smooth, with posterior crenulation extremely thin; epomia double and subpronope deep; mesoscutum pilose, with distinct punctation; notauli distinct, with moderate microcrenulation; scutellum (fig. 139) strongly convex, pilose, tuberculate in lateral view, with subposterior depression shallow and subposterior crest rather weak, thin; entire mesopleural area sparsely pilose, its surface shiny with scattered punctures above precoxal sulcus, and very densely punctated below precoxal sulcus; precoxal sulcus moderately wide, with crenulae short and closely spaced; metapleuron moderately punctate, pubescent, with some rugulosity posteriorly; propodeum weakly areolate, with distinct pubescence.

Wings.— Fore wing: second submarginal cell subpentagonal and comparatively large (fig. 140); r:3-SR:SR1 = 4:5:50; SR1 distinctly curved (fig. 140); 2-SR:3-SR:r-m = 7:5:6. Hind wing: M+CU:1-M = 18:38.

Legs.— Length of hind femur, tibia and basitarsus 5.0, 7.8 and 5.5 times their width, respectively; length of outer and inner spurs of middle and hind tibiae 0.5 and 0.7 times middle and hind basitarsi, respectively.

Metasoma.— Long, slender; length of first tergite 2.0 times its apical width (fig. 138); length of ovipositor sheath 0.1 times fore wing.

Colour.— Blackish-brown; pronotal side, propodeum and metapleuron dark yellowish-brown; mesoscutum, mesopleuron, hind femur and apical half of hind tibia dark brown; fore and middle leg, basal half of tibia, and tarsi, yellowish-brown; hind coxae yellowish-brown, with a horse shoe-shaped dark brown spot; wings (fig. 39) entirely subhyaline, fore wing without stigmal spot; veins (including vein C+SC+R), and pterostigma dark brown. According to the original description head and antenna completely black (except yellowish palpi).

Distribution.— Malaysia (West Malaysia).

Euagathis nigrisoma spec. nov.
(figs 17, 18, 97-101)

Material.— Holotype, ♀ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia (East), 1000 m, 1-13.iv.1987, Mal. trap 5, C. v. Achterberg, RMNH 87". Paratypes (4 ♂♂): 1 ♂ (RMNH), "N. Borneo Exp., Sabah, Interior Zone, 05°11'N, 115°59'E, 16 km NE of Tenom Agricult. Res. Station, along Sg. Pegalan, 200 m", "river bank, open area, at light, 23.xi.1987, J. Huisman & R. de Jong"; 1 ♂ (RMNH), "W Java, Djampang Tengah, iv.[19]35"; 1 ♂ (RMNH), "Museum Leiden, [Java], G. Bentang, iii.1938, J. v. d. Vecht"; 1 ♂ (RMNH), "Museum Leiden, [Java], Tjiangsana, Djampang Tengah, xi.1938, J. v. d. Vecht".

Holotype, ♀, length of body 7.3 mm, of fore wing 7.8 mm.

Head.— Antennal segments 46; length of third antennal segment 1.4 times fourth segment; length of third, fourth and penultimate segment 2.5, 1.8 and 1.3 times their width, respectively (fig. 97); length of maxillary palp 0.8 times height of head; length of eye in dorsal view 1.5 times temple; OOL:diameter of ocellus:POL = 11:5:7; face punctate, rather pilose, comparatively transverse in frontal view and narrowing at genal level; vertex usually punctulate; occipital flange very large, its ventral margin strongly oblique (fig. 100); lamellae between antennal sockets parallel.

Mesosoma.— Length of mesosoma 1.5 times its height; pronope present; pronotal side punctulate, with postero-ventral crenulae long, distinct; subpronope medium-sized, deep; epomia single; mesoscutum punctulate and medio-posteriorly depressed, middle lobe with two short, parallel grooves medio-anteriorly; notauli deep, with minute, irregular crenulae; scutellum (fig. 101) punctate, moderately convex and posteriorly depressed, distinctly saddle-shaped, with lateral carinae complete, but rather indistinct anteriorly; mesopleuron pilose, distinctly punctate below precoxal sulcus and densely punctulate above it; precoxal sulcus posteriorly narrow, with short and robust crenulae, wider and shallower anteriorly, with thin and long crenulae anteriorly; metapleuron punctate, with whitish, distinct pilosity, rather velvet-like; propodeum moderately areolate and densely pilose, especially around spiracles.

Wings.— Fore wing: second submarginal cell slightly pentagonal, comparatively narrow, and with short ramellus (fig. 98); r:3-SR:SR1 = 7:3:70; SR1 slightly bent; 2-SR:3-SR:r-m = 8:3:10. Hind wing: M+CU:1-M = 25:62.

Legs.— Length of hind femur, tibia and basitarsus 5.6, 8.0 and 6.8 times their width, respectively; length of outer and inner spurs of middle tibia 0.3 and 0.6 times middle basitarsus, respectively; length of outer and inner spurs of hind basitarsus 0.4 and 0.6 times their basitarsus, respectively.

Metasoma.— Very slender, smooth; first tergite somewhat humped subbasally, its length 2.6 times its apical width (fig. 99); length of ovipositor sheath 0.09 times fore wing.

Colour.— Black; palpi, tegulae, middle and fore legs, pale yellowish-brown; hind leg black, but hind tibia with an ivory band subbasally; basal half of metasoma ventrally, epipleura of first and second tergites, posterior margin of third and following tergites narrowly, ivory; apical third of fore wing slightly infuscate, and remainder subhyaline; stigmal spot absent (fig. 17); apical third of hind wing slightly infuscate and remainder subhyaline.

Variation.— Length of fore wing 8.7-8.2 mm; ivory subbasal band of hind tibia may be (largely) absent; second submarginal cell of fore wing with or without very short ramellus. Male paratype from Sabah: length of third antennal segment 1.2 times fourth segment; length of third, fourth and penultimate antennal segments 2.2, 2.6 and 1.6 times their width, respectively; length of maxillary palp 0.6 times height of head; length of eye in dorsal view 1.3 times temple; OOL:diameter of ocellus:POL = 16:5:9; length of mesosoma 2.0 times its height; fore wing: r:3-SR:SR1 = 7:6:70; hind wing: M+CU:1-M = 25:58; length of hind femur, tibia and basitarsus 5.9, 7.8 and 7.2 times their width, respectively; length of outer and inner spur, both of middle and hind tibiae, 0.3 and 0.6 times their basitarsus, respectively; length of first metasomal tergite 2.4 times its apical width; about apical third of fore wing infuscate, with infuscation more intense than in female, forming a large nearly round spot in the third submarginal cell (fig. 18).

Distribution.— Malaysia (East Malaysia: Sabah), and Indonesia (Java).

Euagathis pubescens Enderlein, 1920
(figs 37, 141-143)

Euagathis pubescens Enderlein, 1920: 174-175; Shenefelt, 1970: 414; Bhat & Gupta, 1977: 207-208 (redescription).

Material.— Lectotype here designated, ♀ (PAN), "Sumatra, Liangagas, Dohrn", "Type", "*Euagathis pubescens* Enderl., ♀, Type, Dr Enderlein, det. 1919"; 1 ♂ (PAN), paralectotype from Soekaranda, Sumatra.

This species is very similar to *Euagathis fuscinotum* Enderlein, differing from the latter species as indicated in the key by the shape of the first metasomal tergite (fig. 143), the slender second submarginal cell of fore wing (figs 37, 142), the more pilose metapleuron, the weaker costulae of the propodeum and the pale basal half of the hind tibia.

Also very similar to *Agathis pallidipes* Cameron, 1908, from Sarawak (if compared with its original description). The latter has the hind tarsus yellowish, and the hind coxa blackish.

Distribution.— Indonesia (Sumatra).

Euagathis ruficollis (Cameron, 1902) comb. nov.
(figs 15, 45-48, 50, 51)

Holcotroticus ruficollis Cameron, 1902: 41; Shenefelt, 1970: 417; Bhat & Gupta, 1977: 295.
Euagathis rufonigra Enderlein, 1920: 181; Shenefelt, 1970: 414; Bhat & Gupta, 1977: 192-193, figs 28f, 30a, 31j. **Syn. nov.**

Material.— Holotype of *E. ruficollis*, ♂ (BMNH), "Serawak, 1897, R. Shelford", "*Holcotroticus ruficollis* Cam., Type, Serawak" (in Cameron's handwriting), "Type", "B.M. Type Hym. 3.c.428", "Brit. Mus. 1931-156"; 1 ♀ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia (East), c. 1000 m, 1-13.iv.1987, Mal. trap 4, RMNH'87, C. v. Achterberg"; 1 ♀ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia (West), c 1010 m, 1-14.iv.1987, Mal. trap 1, RMNH, 1987, C. v. Achterberg"; 2 ♀♀ (RMNH), id., but 1020 m, Mal. trap 2; 2 ♂♂+ 1 ? (RMNH), "O Borneo, Pelawan, leg. Walsh"; 1 ♀, (BMNH), "N Borneo, Bettonan, nr. Sandakan, 4.viii.1927"; 1 ♀ (OUM), "Mt Marapok, Dent. Province, Br. North Borneo (collector G.)", "Fr. V. d. Poll, Pres. 1911, G.A.J. Rothney"; lectotype of *E. rufonigra* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Co-Typus", "*Euagathis rufonigra* Enderl., ♀, Dr Enderlein, det. 1919"; 8 ♂♂+6 ♀♀ paralectotypes of *E. rufonigra* (PAN), topotypic; 1 ♂ (RMNH), "Sumatra, Medan, Deli"; 1 ♂ (RMNH), "Museum Leiden, [Java], G. Roesa, Djampang Wetan, xi.1938, J. v. d. Vecht"; 1 ♀ (RMNH), id, but G. Malang, ii.1938; 1 ♀ (RMNH), id., but G. Besser, iii.1938; 1 ♀ (RMNH), "W Java, Djambang Tengoh, ii.1935"; 1 ♂ (RMNH), Museum Leiden, W Java, Djasinga, 100 m, 18.vii.1937, J. v. d. Vecht"; 1 ♀ (RMNH), "W Java, Lengkong, 28.iii.1971, G. v. Vreden"; 1 ♂ (RMNH), "Indonesia: W Bali, nr Negara, rainforest above Batuagung, c 550 m, 12-13.xii.1991, C. v. Achterberg, RMNH'91"; 1 ♀ (RMNH), id., but 4-6.xii.1991; 1 ♀ (RMNH), id., but c 575 m, 4-13.xii.1991, Malaise trap 1.

Redescribed after ♀ from Sabah (Long Pa Sia, trap 1), length of body 10.8 mm, of fore wing 13.0 mm.

Head.— Antennal segments 53; length of third antennal segment 1.3 times fourth segment; length of third, fourth and penultimate segment 3.6, 2.7 and 1.2 times their width, respectively, length of maxillary palp 0.7 times height of head; length of eye in dorsal view 1.5 times temple; OOL:diameter of ocellus:POL = 22:9:6; face elongate in frontal view, finely punctate; occipital flange large, its ventral margin horizontal; vertex very sparsely punctulate; lamellae between antennal sockets converging posteriorly.

Mesosoma.— Length of mesosoma 1.5 times its height; pronotal side punctulate,

with two or three distinct crenulae postero-ventrally; subpronope moderately large and rather deep; epomia single; mesoscutum very scarcely punctured and without medio-posterior depression, middle lobe somewhat rounded in lateral profile, less protruding(fig. 46); notauli smooth, moderately impressed anteriorly, on disc shallow; scutellum (fig. 47) convex, distinctly punctate, rather oval-shaped, only with evenly curved crest subposteriorly; mesopleuron below precoxal sulcus strongly punctate and precoxal sulcus comparatively narrow (fig. 45), distinctly impressed, with short and strong crenulae; metapleuron distinctly punctate; propodeum coarsely areolate, costulae weak or incomplete (fig. 50).

Wings.— Fore wing: second submarginal cell subtriangular; r:3-SR:SR1 = 10:4: 122; SR1 slightly bent; 2-SR:3-SR:r-m = 24:4:18. Hind wing: M+CU:1-M = 25:57.

Legs.— Length of hind femur, tibia and basitarsus 6.9, 10.3 and 8.3 times their width, respectively; hind femur coarsely and densely rugose-punctate (fig. 51); length of outer and inner spurs of middle tibia 0.4 and 0.8 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.30 and 0.55 times their basitarsus, respectively.

Metasoma.— Smooth, slender; first tergite somewhat humped basally, its length 2.0 times its apical width; length of ovipositor sheath 0.07 times fore wing.

Colour.— Black; scapus, pedicellus, head, prothorax, mesothorax and metanotum, yellowish-brown to reddish-brown; remainder of antenna, propodeum, metapleuron (largely), metasoma and hind leg, black(ish); middle leg dark brown; fore leg yellowish-brown; setosity of head blackish; wings completely blackish (fig. 15).

Variation.— Antennal segments of ♀ 51-54; length of fore wing 10-13 mm; second submarginal cell of fore wing may be distinctly quadrangular; propodeum largely, and (part of) middle leg in specimens from Java and Bali, yellowish-brown; mesosoma may be completely yellowish-brown; veins of fore wing of specimen from Bali partly yellowish; wing membrane is bright blackish in recently collected specimens, and dark brown in old ones.

Distribution.— Indonesia (Bali, Java, Sumatra, Kalimantan), and Malaysia (East Malaysia: Sabah, Sarawak).

Note.— This *Euagathis ruficollis* (Cameron, 1902) should not be confused with *Euagathis ruficollis* (Cameron, 1899) sensu Bhat & Gupta, 1977! The latter is *Disophrys ruficollis* Cameron, 1899, which now belongs to the genus *Balcemena* Cameron, 1903 (van Achterberg & O'Toole, 1993).

Euagathis semifusca (Brullé, 1846)
(figs 21, 24, 25, 105-107)

Agathis semifusca Brullé, 1846: 490; Shenefelt, 1970: 354.
Euagathis semifusca; Bhat & Gupta, 1977: 230.
Agathis malayana Cameron, 1905: 112; Shenefelt, 1970: 341; Bhat & Gupta, 1977: 230 (synonym of *E. semifusca*).
Disophrys divisa Enderlein, 1920: 189; Shenefelt, 1970: 395; Bhat & Gupta, 1977: 268. **Syn. nov.**
Euagathis variabilis var. *sucarandana* Enderlein, 1920: 176 (♀ ♀, part of ♂ ♂). **Syn. nov.**
Euagathis variabilis var. *sukarandana*; Shenefelt, 1970: 416.
Euagathis variabilis var. *sukaranda*; Bhat & Gupta, 1977: 231.
Euagathis variabilis var. *obscuripennis* Enderlein, 1920: 176; Shenefelt, 1970: 416; Bhat & Gupta, 1977: 231. **Syn. nov.**
Euagathis variabilis var. *dissimilis* Enderlein, 1920: 176; Shenefelt, 1970: 415; Bhat & Gupta, 1977: 231. **Syn. nov.**

Euagathis baltazarae Bhat & Gupta, 1977: 229. **Syn. nov.** Note: in the original description the type depositories are reversed; the paratype from Java is in the USNM collection (and not in Ottawa as stated) and the holotype from Malaysia should be in CNC, Ottawa.

Material.— Lectotype of *A. semifusca* here designated, ♂ (MNHN), "*Agathis semifusca* Brullé", "[? India], Diard et Duvaucel"; 1 ♂ paralectotype of *A. semifusca*, (MNHN), "Diard et Duvaucel"; holotype of *A. malayana*, ♂ (BMNH), "Type", "B.M. Type Hym. 3.c.922", "*Agathis malayana* Cam. Type, Singapore", "Cameron Coll. 1906-138"; holotype of *D. divisa*, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Disophrys divisa* Enderl., ♂, Dr Enderlein, det. 1919"; 1 ♀+ 1♂ (RMNH), "(NO Sumatra), Tandjong Morawa, Serdang, Dr B. Hagen"; lectotype of *E. variabilis* var. *sucarandana* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis variabilis* var. *sucurandana* Enderl., ♂, Dr Enderlein, det. 1919"; 3 ♂♂ (but 2 ♂♂ are not conspecific) + 8 ♀♀ (PAN), paralectotypes, topotypic; lectotype of *E. variabilis* var. *obscuripennis* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type"; 1 ♂ (PAN), paralectotype, topotypic; lectotype of *E. variabilis* var. *dissimilis* here designated, ♂ (only specimen labelled as ♀ is actually a ♂; PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis variabilis* var. *dissimilis* Enderl., ♀, Dr Enderlein, det. 1919"; 45 ♂♂ (PAN), paralectotypes (partly *semifusca* and partly *forticarinata*), topotypic; 1 ♂ (RMNH), "Museum Leiden, NO Sumatra, 350 m, Deli, Sibolangit, 4.i.1955, J. v. d. Vecht"; 9 ♀♀ (RMNH, BMNH, FRC), "Malaysia, S Sabah, nr Danum Valley Field C., W 12, c. 240 m, Mal. trap 12, 24.ii.-18.iii.1987, C. v. Achterberg, RMNH'87"; 1 ♀ (RMNH), id., but W0, c 150 m, Malaise trap 11; 2 ♀♀ (RMNH), id., but W0N1, c 140 m, Malaise trap 13, 24.ii.-24.iii.1987; 2 ♀♀ (RMNH, FRC), id., but W0N0, Malaise trap 5, c 150 m, 19.iii-19.iv.1988; 1 ♀ (RMNH), "Malaysia, SW Sabah, along Ritan river, c. 1150 m, 8-10.iv.1987, C. v. Achterberg, RMNH'87"; 1 ♀ (RMNH), Malaysia, SW Sabah, nr Long Pa Sia, c 1200 m, 7.iv.1987, C. v. Achterberg, RMNH"; 2 ♀♀ (RMNH), "Malaysia, SW Sabah, nr Long Pa Sia (West), c 1020 m, 1-14.iv.1987, Mal. trap 2, C. v. Achterberg, RMNH'87"; 2 ♀♀ (BMNH, RMNH), "Sarawak, 4th div., Gn. Mulu, RGS. Exp., iii.-iv.1978, N.M. Collins"; 1 ♀ (BMNH), id., but vi.-vii.1978; 1 ♀ (BMNH), id., but v.-vi.1978; 1 ♀ (BMNH), id., but iii.1978; 1 ♀ (BMNH), id., but 27.vi-19.vii.1978, H. Vallack; 1 ♀ (BMNH)," B. N Borneo, nr Kinabalu, Kabayaya, 600 m,12.v.1929; 1 ♂ (RMNH), "Museum Leiden, [Indonesia, Java], Gn. Betoeng, 400 m, bij Telok Betoeng, 27.iii.1937, J. v. d. Vecht"; 1 ♂ (RMNH), "[Indonesia], Koetsier, vi.[19]78"; paratype of *E. baltazarae*, ♀, (USNM), "Sarawak, Semengoh For. Res., 15 mi. So. Kuching, 11.ix.1966", "J.F.G. Clarke, Thelma M. Clarke", "Paratype, *Euagathis baltazarae* Bhat & Gupta, 1975".

Holotype, ♂, length of body 10 mm, of fore wing 11.6 mm.

Head.— Antennal segments (of ♂ from Java) 53; length of third antennal segment 1.2 times fourth segment; length of third, fourth and penultimate antennal segment 3.3, 2.8 and 2.2 times their width, respectively; length of maxillary palp 0.8 times height of head; length of eye in dorsal view 2.1 times temple; OOL:diameter of ocellus:POL = 14:6:5; face elongate in frontal view, punctate; vertex punctulate; occipital flange moderately large; lamellae between antennal sockets strong and parallel.

Mesosoma.— Length of mesosoma 1.4 times its height; side of pronotum punctulate, posterior crenulation thin and distinctly long; subpronope deep, moderately wide; epomia single; mesoscutum punctate, medio-posteriorly depressed, middle lobe with shallow longitudinal depression anteriorly; notauli well impressed, entirely smooth; scutellum punctate and convex, rather ovoid, subposteriorly with modest depression and near subposterior crest irregularly micro-crenulate (fig. 104); mesopleural area above the precoxal sulcus very sparsely punctate, below precoxal sulcus distinctly punctate; precoxal sulcus (fig. 106) well impressed, but rather narrow; metapleuron punctate; propodeum coarsely areolate.

Wings.— Fore wing: second submarginal cell pentagonal, with long ramellus (lectotype and paralectotype of *E. semifusca*); r:3-SR:SR1 = 8:9:95; SR1 somewhat bent; 2-SR:3-SR:r-m = 12:9:11. Hind wing: M+CU:1- M = 40:70.

Legs.— Length of hind femur, tibia and basitarsus 5.2, 7.2 and 4.1 times their

width, respectively; length of outer and inner spurs of middle tibia 0.3 and 0.5 times their basitarsus, respectively; length of outer and inner spurs of hind tibia 0.4 and 0.6 times hind basitarsus, respectively.

Metasoma.— Slender and smooth; length of first tergite 1.9 times its apical width (fig. 107).

Colour of male.— Yellowish-brown; antenna, apex of metasoma, hind tibia and tarsus, dark brown; apical half of fore wing infuscate, infuscation rather homogeneous, although with a rather whitish transparent area just below pterostigma; remainder of wing yellow, border between yellow and infuscate parts well defined; stigmal spot present but rather small and progressively fading out (fig. 21), posteriorly mingling with remaining infuscation of wing; veins and pterostigma largely dark yellowish-brown; about apical half hind of wing infuscate, remainder yellowish-hyaline.

Variation.— Length of fore wing 6.8-11.6 mm; first discal cell of fore wing often with vague infuscation posteriorly; stigmal spot faint and medium-sized to minute or absent (figs 21, 24, 25); pterostigma (nearly) completely dark brown. Male paratype of *E. semifusca*: length of third, fourth and penultimate antennal segments 3.0, 2.5 and 2.3 times their width, respectively; length of maxillary palp 0.9 times height of head; OOL:diameter of ocellus:POL = 14:6:5. Fore wing: 2-SR:3-SR:r-m = 12:5:13; r:3-SR:SR1 = 9:5:89. Hind wing: M+CU:1-M = 30:65. Length of hind femur and tibia 5.2 and 8.8 times their width, respectively; length of outer and inner spur of hind tibia 0.4 and 0.6 times hind basitarsus, respectively. Length of first tergite 1.8-1.9 times its apical width; holotype of *A. malayana* has scapus brownish with a dark brown streak on its outer side and the area below precoxal sulcus finely and less densely punctate than most other males of *E. semifusca*; the punctation of this area varies in other specimens from coarse to rather fine and may be very dense. Second submarginal cell of fore wing with long ramellus, with stump-like ramellus, or with no ramellus. The specimens similar to the lectotype of *E. sucurandana* have somewhat less than the apical half of fore wing (figs 24, 25) strongly infuscate, infuscation usually including second submarginal cell; remainder of wing yellowish, but posterior half of first discal cell with a rather oblong infuscated spot, its size is rather variable; border between yellow and infuscate parts of the wing well defined; stigmal spot present, but may be extremely reduced; veins largely dark brown; basal part of pterostigma, to a variable extent, usually yellow; the infuscate spot of the first discal cell of fore wing is rather frequently obsolescent or even absent (fig. 25): when absent, then venation adjacent to the cell is yellow. In one male from Sumatra the apical infuscation of fore wing covers only apical third of wing and it remains quite removed from the second submarginal cell. Occasionally the pterostigma is completely dark brown or infuscate. The lectotype of *E. sucurandana* has the scapus comparatively large, the stigmal spot reaches vein 2-CU1 of fore wing, the antenna consists of 55 segments, length of fore wing 9.4 mm, the apical half of pterostigma is largely dark brown, the second submarginal cell of fore wing with dark spot medially (and reaching apical infuscation), the crests between antennal sockets closer to each other than in *E. forticarinata*, and with a faint patch near vein 2-CU1. Lectotype of *E. variabilis dissimilis* has the whole hind tibia dark brown. The type of *A. malayana* has no ramellus, length of fore wing about 7 mm and shape of second submarginal cell of fore wing normal for the genus. The type of *E. divisa* is also comparatively small

(length of fore wing 6.8 mm), has the shape of second submarginal cell of fore wing somewhat aberrant, and the pterostigma is completely dark brown. The paratype of *E. baltazarae* has length of fore wing 9 mm, length of hind femur 5.3 times its maximum width, length of first metasomal tergite 1.8 times its apical width, the stigmal spot indistinct, only apical 0.45 of fore wing dark brown, the lateral carinae of scutellum obsolescent, and the discal cell of fore wing with distinct separate elongate brownish patch.

Notes.— The traditionally recognized *E. semifusca* are all males, which are partly (Javanese specimens) to strongly melanistic (West Malaysian specimens). The stigmal spot is rather developed (but its borders are vague), the occipital flange is somewhat less developed, and the area below the precoxal sulcus is usually more strongly sculptured than that of females. The females ("*E. sucurandana*") are less sculptured (but some are intermediate) and paler (but also in this respect intermediates occur). The hind tibia is usually completely blackish, but in the specimens from Sarawak the base of the hind tibia (and exceptionally nearly the complete tibia) are yellowish.

Distribution.— ?India, Singapore, Malaysia (West Malaysia (Bhat & Gupta, 1977); East Malaysia: Sarawak, Sabah), Indonesia (Java, Sumatra).

Euagathis serena spec. nov.
(figs 20, 82-87)

Material.— Holotype, ♀ (BMNH), "[West Malaysia], Pahang, F.M.S., Cameron Highlands, Tanah Rata, 4800-5000 ft, 16.vii.1938"; "Ex F.M.S. Museum, B.M. 1955-354".

Holotype, ♀, length of body 8.5 mm, of fore wing 8.3 mm.

Head.— Antennal segments 58; length of third antennal segment 1.3 times fourth segment; length of third, fourth and penultimate segment 3.0, 2.4 and 1.4 times their width, respectively; length of maxillary palp 0.6 times height of head, labial palp segments very robust (fig. 85); length of eye in dorsal view 1.6 times temple (fig. 84); lateral margin of temple only slightly concave in dorsal view (fig. 84); OOL:diameter of ocellus:POL = 11:4:5; face moderately transverse in frontal view, densely punctate; vertex punctulate; lamellae between antennal sockets subparallel; occipital flange rather wide, ventral margin rounded (fig. 85).

Mesosoma.— Length of mesosoma 1.4 times its height; pronotal side largely smooth, narrowly crenulate posteriorly; subpronope rather wide, deep; epomia single; mesoscutum sparsely punctate, without medio-posterior depression; notauli distinct, smooth; scutellum oval, rather convex and finely and evenly punctate, anterior edge rounded (without indication of carina), subposterior crest rather weak compared to related species; mesopleuron punctulate above precoxal sulcus, rather coarsely, and partly also densely, punctate below it; precoxal sulcus moderately wide, long, with equally long crenulae, robust, regular; metapleuron finely punctate dorsally, denser and coarser punctate ventrally; propodeum very coarsely areolate, costulae weak medially.

Wings.— Fore wing: second submarginal cell nearly triagonal, without ramellus (fig. 83); r:3-SR:SR1 = 12:1:138; SR1 straight; 2-SR:3-SR:r-m = 19:1:17. Hind wing: M+CU:1-M = 20:47.

Legs.— Length of hind femur, tibia and basitarsus 4.5, 6.8 and 7.9 times their

width, respectively; length of outer and inner spurs of middle tibia 0.3 and 0.4 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.4 and 0.6 times hind basitarsus, respectively; third segment of fore tarsus very robust (fig. 87); middle tibial spurs very short and widened basally (fig. 86).

Metasoma.— Stout, smooth; length of first tergite 1.2 times its apical width (fig. 82); length of ovipositor sheath 0.06 times fore wing.

Colour.— Yellowish-brown (including frons and stemmaticum, but somewhat darkened around ocelli); antenna (but two apical segments (dark) brown), second and following tergites, metasoma ventrally, and hind coxa, black; mesopleuron (except dorso-anteriorly), mesosternum, metapleuron, propodeum, first tergite and remainder of hind leg (but basal ring of hind tibia pale yellowish), dark brown; apical third of fore and hind wings infuscate, comparatively vague, infuscation not reaching second discal and subdiscal cells; infuscation somewhat more intense near vein 1-R1; remainder of wing entirely yellow; infuscated and yellow parts of fore wing rather differentiated (fig. 20); veins yellow, only 1-R1, apex of C+SC+R, parastigma and apical quarter of pterostigma dark brown (fig. 83); marginal cell of fore wing and large patch below it largely yellowish; stigmal spot medium-sized, remainder of pterostigma yellow.

Distribution.— Malaysia (West Malaysia).

Notes.— Similar in colour to *E. maculipennis* (Brullé) from India (Bengal), but the latter has e.g. the scapus and first metasomal tergite yellowish-red, and the pterostigma completely yellow. Morphologically nearly identical with *E. aurea* (e.g the widened middle spurs), but *E. aurea* has a longer apical segment of the labial palp (fig. 129 versus fig. 85), vein 1-R1 of fore wing and its setae yellow (both are dark brown in *E. serena*), the wing membrane nearly completely yellow, the scutellum rather angulate anteriorly (fig. 114; rounded in *E. serena*), and the whole hind leg yellowish.

Euagathis tambora spec. nov.
(figs 65-70)

Material.— Holotype, ♀ (RMNH), "Indonesia: Sumbawa, Gn. Tambora, nr Pancasila, 700-800 m, 23.ix.1993, R. de Jong, RMNH'93".

Holotype, ♀, length of body 9.9 mm, of fore wing 9.2 mm.

Head.— Antennal segments 54; length of third antennal segment 1.2 times fourth segment; length of third, fourth and penultimate segment 2.7, 2.2 and 1.2 times their width, respectively; length of maxillary palp 0.7 times height of head; length of eye in dorsal view 1.5 times temple; OOL:diameter of ocellus:POL = 8:4:4; face comparatively long in frontal view, minutely punctate; vertex punctulate; lamellae between antennal sockets subparallel (fig. 65); occipital flange wide, thin, ventral margin evenly curved (fig. 70).

Mesosoma.— Length of mesosoma 1.4 times its height; pronotal side largely smooth, posteriorly narrowly crenulate; subpronope wide, deep, and epomia single; mesoscutum sparsely and moderately punctate, without distinct medio-posterior depression; notauli rather deep and smooth; scutellum oval, rather convex and distinctly punctate, anterior edge slightly angulate but without distinct carina, sub-

posterior crest strong; complete mesopleuron sparsely but distinctly punctate, postero-ventrally punctate-rugose; precoxal sulcus moderately wide, long, with robust crenulae, regular, (anterior crenulae somewhat longer than posterior ones); metapleuron coarsely and densely punctate ventrally, sparsely and finely punctate dorsally; propodeum coarsely areolate, costulae interrupted.

Wings.— Fore wing: second submarginal cell subtriangular, without ramellus; r:3-SR:SR1 = 5:1:65; SR1 straight; 2-SR:3-SR:r-m = 11:1:9. Hind wing: M+CU:1-M = 30:55.

Legs.— Length of hind femur, tibia and basitarsus 4.2, 7.4 and 7.6 times their width, respectively; length of outer and inner spurs of middle tibia 0.45 and 0.70 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.35 and 0.60 times hind basitarsus, respectively; third segment of fore tarsus rather robust (fig. 67).

Metasoma.— Moderately stout, smooth; length of first tergite 1.3 times its apical width (fig. 68); length of ovipositor sheath 0.10 times fore wing.

Colour.— Yellowish-brown; basal half of antenna (but pedicellus and part of scapus brownish dorsally), stemmaticum, frons medially (except patch in front of anterior ocellus), hind tarsus, and ovipositor sheath black(ish); apical half of antenna yellowish brown or brown; apex of hind tibia narrowly infuscate; colour pattern of wings about as of *E. serena* (fig. 20), but pterostigma nearly completely yellowish; apical third of fore and hind wings dark brown, infuscation just touching second submarginal cell of fore wing and remainder of wing membrane yellowish; stigmal spot distinct, rather large; basal half of marginal cell of fore wing yellowish as area below it; veins yellow, but in dark brown areas dark brown; parastigma and apex of vein C+SC+R of fore wing blackish.

Distribution.— Indonesia (Sumbawa).

Euagathis vechti spec. nov.
(figs 56-58)

Material.— Holotype, ♀ (RMNH), "Museum Leiden [Java], Buitenzorg [= Bogor], Tjiapoes, 20.xii. 1936, J. v.d. Vecht". Paratype: 1 ♀ (MNHN), "Java, Buitenzorg, E. Cordier, 17.iv.1908, coll. Contesse de Béarn, Croisière du Nirvana", "Muséum Paris, Coll. C.tesse de Béarn 1908".

Holotype, ♀, length of body 7.7 mm, of fore wing 9.2 mm.

Head.— Both antennae damaged, with 12 segments remaining, length of third segment 1.3 times fourth segment, length of third and fourth segments 2.9 and 2.2 times their width, respectively; length of maxillary palp about 0.7 times height of head; length of eye in dorsal view 1.8 times temple; OOL:diameter of ocellus:POL = 7:3:3; face and vertex punctulate; lamella between antennal sockets converging posteriorly; occipital flange large, its ventral margin straight, with long horizontal part (fig. 56).

Mesosoma.— Length of mesosoma 1.3 times its height; pronotal sides punctate; subpronope deep and epomia double; area above precoxal sulcus finely punctate, and coarsely and rather densely punctate below it; precoxal sulcus with medium-sized and coarse crenulae; mesoscutum sparsely but rather strongly punctate, convex, moderately depressed medio-posteriorly; notauli distinct with micro-crenulae posteriorly; scutellum deeply concave, smooth, with posterior crest and ante-

rior edges angulate (fig. 57), lateral and anterior carinae strong.

Wings.— Fore wing: second submarginal cell robust, quadrangular; SR1 straight; r:3-SR:SR1 = 5:5:76; 2-SR:3-SR:r-m = 11:5:11; ramellus long (right wing) or short (left wing). Hind wing; M+CU:1-M = 30:55.

Legs.— Length of hind femur, tibia and basitarsus 3.4, 6.1 and 7.6 times their width, respectively; length of outer and inner spurs of middle tibia 0.4 and 0.6 times middle basitarsus, respectively, slender; length of outer and inner spurs of hind tibia 0.4 and 0.6 times hind basitarsus, respectively; hind femur coarsely and densely rugose-punctate.

Metasoma.— Smooth; length of first tergite 1.1 times its apical width (fig. 58); ovipositor sheath moderately wide, its length 0.09 times fore wing.

Colour.— Yellowish-brown; scapus, ovipositor sheath and stemmaticum black; pedicellus yellowish; remainder of antenna, apex of hind tibia and hind tarsus, dark brown; setae of vein C+SC+R of fore wing yellow; veins yellowish, but vein 1-R1 and apical half of vein SR1 brown; pterostigma completely yellow; parastigma, apex of C+SC+R dark brown: apical third of fore wing faintly infuscate, only near margin of fore wing slightly darker, remainder of wing yellowish; stigmal spot elongate, medium-sized and somewhat bent towards second submarginal cell; apical third of hind wing only marginally dark brown and remainder yellowish-hyaline.

Distribution.— Indonesia (Java).

Species inquirendae

Agathis pallidipes Cameron, 1908

Agathis pallidipes Cameron, 1908: 693-694; Shenefelt, 1970: 347.
Euagathis pallidipes; Bhat & Gupta, 1977: 100, 206-208.

The holotype of *Agathis pallidipes* Cameron (a male from Borneo (East Malaysia: Sarawak in BMNH, 3.c.921)) has been examined; it is badly damaged, missing its head and legs. It might belong to the genus *Euagathis*, it possesses a triangular second submarginal cell of fore wing, with a distinct ramellus. According to the original description the head is brownish-black dorsally and the frons does not bear carinae. The legs are pale yellow, except for the blackish hind coxa. The mesoscutum, pterostigma, parastigma, veins, and second-fifth metasomal tergites dark brown or blackish; remainder of body rather fuzzy brownish. The mesosoma is densely setose. The wing membrane is slightly and evenly brownish, without stigmal spot. Among the *Euagathis* species treated in this paper the most similar is *E. pubescens* Enderlein; the latter differs by the brownish-black hind tarsus (pale yellowish in *E. pallidipes*) and the yellowish hind coxa (blackish in *E. pallidipes*).

Excluded species

Euagathis borneoensis Szépligeti, 1902

Euagathis borneoensis Szépligeti, 1902: 67; Shenefelt, 1970: 410; Bhat & Gupta, 1977: 195.

Material.— Lectotype, ♀ (TMA), "Borneo, leg. Xánthus", "*borneoensis*, det. Szépligeti", "Lectotypus ♀, *Euagathis borneoensis* Szépl., 1902 % des. Papp. J, 1967", "Hym. Typ. No. 720, Mus. Budapest"; 1 ♀ (RMNH),"W Java, Tjidaon, Udjung Kulon, 2.xii.1958, A.M.R. Wegner"; 1 ♀ (RMNH), "Java, K.E. v. H."; 1 ? (RMNH), "Sum[atra], Sibolga, viii,1913, E. Jacobson".

Belongs to the genus *Balcemena* Cameron, 1903 (**comb. nov.**). In habitus very similar to *E. aurea* spec. nov., but differs by the shape of the first tergite, the deep second metasomal suture, the larger second submarginal cell of fore wing, the more robust head, the largely smooth mesopleuron, and the rather angulate apico-posterior border of the dark area of fore wing.

Distribution.— Indonesia (Java, Sumatra, Kalimantan).

Euagathis cryptophlebiae Viereck, 1913

Euagathis cryptophlebiae Viereck, 1913: 559; Shenefelt, 1970: 410; Bhat & Gupta, 1977: 185.

Material.— Holotype, ♀(USNM), "India, Mysore, Davanhalli", "ex *Cryptophlebia carpophaga*", "30.xi. [19]11", "L.C. Coleman coll.", "Type No. 15284, U.S.N.M.", "!!Parasite on *Cryptophlebia carpophaga* Wlsm., Davanhalli, 30.xi.[19]11", "*Euagathis cryptophlebiae* Vier., Type, ♀".

Belongs to the genus *Bassus* Fabricius, 1804 (**comb. nov.**). It is a nearly completely yellowish species (except for dark antenna, pterostigma and vein 1-R1), with strongly compressed and shortened femora, especially of the hind leg. The first metasomal tergite is robust and coarsely striate, 0.8 times as long as its apical width, second tergite strongly transverse (its basal width 2.7 times its median length), superfically striate and without depression; second metasomal suture shallow and straight, remainder of metasoma smooth; precoxal sulcus absent; mesopleuron sparsely punctate; second submaginal cell of fore wing comparatively high, slender; hind tarsus largely yellowish. Runs in the key to species of the genus *Agathis* s.l. by Bhat & Gupta (1977) to *A. similis* Bhat & Gupta, 1977, from the Philippines, but the latter differs e. g. by the comparatively slender first tergite, the distinctly petiolate second submarginal cell of fore wing, and the brownish hind tarsus.

Distribution.— India.

Euagathis erythrocephala Cameron, 1905

Enagathis erythrocephala Cameron, 1905: 110.
Euagathis erythrocephala Shenefelt, 1970: 411; Bhat & Gupta, 1977: 214.

Material.— Lectotype here designated, ♀ (BMNH), "Type", "[Sarawak], Kuching, 2.i.1903", "135", "P. Cameron, Coll., 1914-10", "*Euagathis erythrocephalus* Cam., Type, Borneo" (in Cameron's handwriting).

Belongs to the genus *Coccygidium* Saussure, 1892 ("*Zelomorpha*"-group; **comb. nov.**). The hind femur is rugose and superficially punctate (not coarsely as in several related species), its length 4.7 times its width; face distinctly punctate with interspaces about as wide as punctures; temples in dorsal view rounded posteriorly, length of eye in dorsal view 2.8 times temple; lamellae between antennal sockets obtuse; frons shallowly concave; notauli shallow; fore tarsus slender; fore tibial spur 0.7 times fore basitarsus; inner middle tibial spur nearly as long as middle basitarsus; length of fore wing 10.1 mm; length of first metasomal tergite 2.0 times its apical width; length of

ovipositor sheath 0.21 times fore wing; propodeum and metapleuron distinctly setose, setae rather long, but not forming a dense cover, and underlying sculpture well visible; wing membrane completely dark brown; pterostigma, vein C+SC+R and other veins blackish; body dark yellowish-brown (including scapus and pedicellus, but flagellum dark brown); propodeum and metapleuron partly infuscate; whole hind leg, metasoma dorsally, fifth sternite and hypopygium blackish; remainder of metasoma yellowish.

Distribution.— East Malaysia (Sarawak).

Euagathis insulcata Enderlein, 1920

Euagathis insulcata Enderlein, 1920: 181-182; Shenefelt, 1970: 412; Bhat & Gupta, 1977: 206.
Euagathis insulcata var. *rufithorax* Enderlein, 1920: 182; Shenefelt, 1970: 412.

Material.— Lectotype of *E. insulcata* here designated, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis insulcata* Enderl., ♂, Dr Enderlein, det. 1919"; 6 ♂♂ paralectotypes (PAN), topotypic; lectotype of *E. insulcata* var. *rufithorax* here designated, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis fuscipennis* Br. var. *rufithorax* Enderl., ♂, Dr Enderlein, det. 1919"; 7 ♂♂ paralectotypes (PAN), topotypic.

Belongs to the genus *Cremnops* Foerster, 1862 (= *Vipio* auct. p.p.) (**comb. nov.**).

Distribution.— Indonesia (Sumatra).

Euagathis insulcata var. *ruficeps* Enderlein, 1920

Euagathis insulcata var. *ruficeps* Enderlein, 1920: 182; Shenefelt, 1970: 412.
Euagathis insulcata var. *nigrescens* Enderlein, 1920: 182; Shenefelt, 1970: 412.

Material.— Lectotype of *E. insulcata* var. *ruficeps* here designated, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis fuscipennis* Br. var. *ruficeps* Enderl., ♂, Dr Enderlein, det. 1919"; 3 ♂♂ paralectotypes (PAN), topotypic; holotype of *E. insulcata* var. *nigrescens*, ♂ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis fuscipennis* Br. var. *nigrescens* Enderl., ♂, Dr Enderlein, det. 1919".

Belongs to the genus *Cremnops* Foerster, 1862 (**comb. nov.**), and *C. ruficeps* is probably not conspecific with *C. insulcata* (Enderlein, 1920).

Distribution.— Only known from the type series from Indonesia (Sumatra).

Euagathis quadrifossulata Enderlein, 1920

Euagathis quadrifossulata Enderlein, 1920: 173; Shenefelt, 1970: 414.
Zelomorpha quadrifossulata; Bhat & Gupta, 1977: 261-263, figs 33d, 33f, 35g, 35h.

Material.— Lectotype of *E. quadrifossulata* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis quadrifossulata* Enderl., ♀, Dr Enderlein, det. 1919"; 151 paralectotypes, ♀♂ (PAN, CNC).

Belongs to the genus *Coccygidium* Saussure, 1892 (= *Zelomorpha* Ashmead, 1900) (**comb. nov.**).

Distribution.— According to Bhat & Gupta (1977) widely distributed: Indonesia (Sumatra), East Malaysia, Singapore, Sri Lanka, India, Nepal, and Philippines.

Euagathis quadrifossulata var. *divisa* Enderlein, 1920

Euagathis quadrifossulata var. *divisa* Enderlein, 1920: 173; Shenefelt, 1970: 414.
Zelomorpha quadrifossulata; Bhat & Gupta, 1977: 261.

Material.— Lectotype of *E. quadrifossulata* var. *divisa* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis quadrifossulata* var. *divisa* Enderl., ♀, Dr Enderlein, det. 1919"; 5 ♂♂ paralectotypes (PAN) from Sumatra and 3 paralectotypes (1 ♂+2♀♀; DEI) from Sri Lanka.

Belongs to the genus *Coccygidium* Saussure (**comb. nov.**), and is a new junior synonym of *C. concolor* (Szépligeti, 1908) **comb. nov.** (= *Disophrys concolor* Szépligeti, 1908).

Distribution.— Widely distributed: the type series is from Indonesia (Sumatra), and Sri Lanka.

Euagathis quadrifossulata var. *flavipes* Enderlein, 1920

Euagathis quadrifossulata var. *flavipes* Enderlein, 1920: 173; Shenefelt, 1970: 414.
Zelomorpha quadrifossulata; Bhat & Gupta, 1977: 261.

Material.— Lectotype of *E. quadrifossulata* var. *flavipes* here designated, ♀ (PAN), "Sumatra, Soekaranda, Dr H. Dohrn S.", "Type", "*Euagathis quadrifossulata* var. *flavipes* Enderl., ♀, Dr Enderlein, det. 1919"; 11 paralectotypes (PAN) from Sumatra, at least two are female, several are damaged and have the metasomata missing.

Belongs to the genus *Coccygidium* Saussure (**comb. nov.**) and it may be a colour variety of *C. quadrifossulatum* (Enderlein). Till this group is revised it seems justified to recognize it as a separate species.

Distribution.— Only known from the type series from Indonesia (Sumatra).

The *Coccygidium* species described by Enderlein (1920) from Sumatra may be separated as follows:

1. Fore tibia spur as long as fore basitarsus; base of pterostigma pale yellowish; first metasomal tergite comparatively slender, its length 1.8-2.3 times its apical width; hind tibia (except its apex) pale yellowish (= *C. divisum* (Enderlein, 1920)) ..... **C. concolor** (Szépligeti)
- Fore tibia spur 0.6-0.7 times fore basitarsus; base of pterostigma dark brown; first tergite less slender; hind tibia yellowish-brown or dark brown; ("*Zelomorpha*"-group) 2
2. Posterior border of pterostigma light brown; pterostigma more slender; hind coxa and femur dark brown; apical half of metasoma largely blackish ..... ***C. quadrifossulatum*** (Enderlein)

   Note. If whole metasoma is black, cf. *C. erythrocephalum* (Cameron).
- Posterior border of pterostigma dark brown; pterostigma robust; hind coxa and femur yellowish-brown; apical half of metasoma yellowish-brown ..... ***C. flavipes*** (Enderlein) stat. nov.

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References

Achterberg, C. van, 1988. Revision of the subfamily Blacinae Foerster (Hymenoptera, Braconidae).— Zool. Verh. Leiden 249: 1-324, figs 1-1250.

Achterberg, C. van, 1990. Revision of the subtribe Mesocoelina Viereck (Hymenoptera: Braconidae).— Zool. Med. Leiden 64: 31-57, figs 1-93.

Achterberg, C. van, 1993. Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Verh., Leiden 283: 1-189, 1-66, photos 1-140, plates 1-102.

Achterberg, C. van, & C. O'Toole, 1993. Annotated catalogue of the types of Braconidae (Hymenoptera) in the Oxford University Museum.— Zool. Verh., Leiden 287: 1-46, fig.1, tables 1-2.

Ashmead, W.H., 1900. Classification of the Ichneumon flies, or the superfamily Ichneumonoidea.— Proc. U. S. natn. Mus. 23: 1-220.

Baltazar, C.R., 1966. A catalogue of Philippine Hymenoptera (with bibliography 1758-1963).— Pacif. Insects Monogr. 8: 1-488.

Bhat, S. & V.K. Gupta, 1977. The subfamily Agathidinae (Hymenoptera, Braconidae) Ichneumonologia Orientalis 6.— Oriental Insects Mon. 6: 1-353, figs 1-37, maps 1-9, tabs. 1-9.

Brullé, A., 1846. Hyménoptères. In: Lepeletier de St. Fargeau, A.L.M., 1846. Histoire naturelle des insects 4: 1-689.— Paris.

Buckingham, G.R. & M.J. Sharkey, 1988. Abdominal exocrine glands in Braconidae (Hymenoptera). In: V.K. Gupta (ed.). Advances in Parasitic Hymenoptera Research: 199-242.— Leiden.

Cameron, P., 1899. Hymenoptera Orientalia, or contribution to aknowledge of the Hymenoptera of the Oriental zoological region. Part 8. The Hymenoptera of Khasia Hills, first paper.— Mem. Manchr. lit. phil. Soc. 43: 1-220.

Cameron, P., 1902. On the Hymenoptera collected by Mr. Robert Shelford at Sarawak, and on the Hymenoptera of the Sarawak Museum.— J. Straits Brch Asiat. Soc. 37: 29-131.

Cameron, P., 1905. A third contribution to the knowledge of the Hymenoptera of Sarawak.— J. Straits Brch Asiat. Soc. 44: 93-168.

Cameron, P., 1907a. On some new genera and species of parasitic Hymenoptera from the Sikkim Himalaya.— Tijdschr. Ent. 50: 71-114.

Cameron, P., 1907b. Two new species of Agathinae (Braconidae) from Borneo.— Entomologist 40: 229-230.

Cameron, P., 1908. Descriptions of new species of Braconidae from Borneo.— Dt. ent. Z. 1908: 687-994.

Casolari, C. & R. Casolari Moreno, 1980. Cataloghi. I - Collezione Imenotterologica di Massimiliano Spinola: 1-165, figs 1-3.— Torino.

Chou, L-Y. & M.J. Sharkey, 1989. The Braconidae (Hymenoptera) of Taiwan. I. Agathidinae.— J. Taiwan Mus. 42: 147-233, figs 1-309.
Dover, C., 1925. Synonymie und neue Fundorte der Braconiden Indiens.— Ent. Mitt. 14: 39-40.
Enderlein, G., 1920. Zur Kenntnis aussereuropäischer Braconiden.—Arch. Naturgesch. (A)84: 51-224, figs 1-11.
Fullaway, D.T., 1919. New genera and species of Braconidae, mostly Malayan.— J. Straits Branch Asiat. Soc. 80: 39-59.
International Code of Zoological Nomenclature (W.D.L. Ride et al., eds), 1985: 1-338.— International Trust for Zoological Nomenclature, London.
Nees von Esenbeck, C.G., 1812. Ichneumonides adsciti, in genera et familias divisi.— Mag. Ges. Naturf. Fr. Berlin 5 [1811]: 3-37.
Nees von Esenbeck, C.G., 1814. Ichneumonides adsciti, in genera et familias divisi.— Mag. Ges. Naturf. Fr. Berlin 6 [1812]: 183-221.
Quicke, D.L.J. & C. van Achterberg, 1990. Phylogeny of the subfamilies of the family Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Verh. Leiden 258: 1-95, figs 1-180.
Quicke, D.L.J., 1994. Phylogenetic and biological transitions in the Braconidae (Hymenoptera: Ichneumonoidea).— Norw. J. Agric. Sc., Suppl. 16: 155-162, fig. 1, table 1.
Sharkey, M.J., 1992. Cladistics and tribal classification of the Agathidinae (Hymenoptera: Braconidae).— J. nat. Hist. 26: 425-447, figs 1-30.
Shenefelt, R.D., 1970. Braconidae 2.— Hym. Cat. (nov. ed.) 6: 307-428.
Simbolotti, G. & C. van Achterberg, 1990. Revision of the *Euagathis* species (Hymenoptera: Braconidae) from Sulawesi.— Zool. Verh. Leiden 256: 1-35, figs 1-86.
Szépligeti, G.V., 1900. Braconiden aus New-Guinea in der Sammlung des Ungarischen National Museums.— Termeszetr. Füz. 23: 49-65.
Szépligeti, G.V., 1902. Tropische Cenocoelioniden und Braconiden ausder Sammlung des Ungarischen National Museums.— Termeszetr. Füz. 25: 39-84.
Szépligeti, G.V., 1904. Hymenoptera. Fam. Braconidae.— Genera Insectorum 22: 1-253.
Szépligeti, G.V., 1908. Jacobson'sche Hymenopteren aus Semarang (Java), Evaniiden, Braconidae und Ichneumoniden.— Notes Leyden Mus. 29: 209-260.
Turner, R.E., 1919. XLII - On Indo-Chinese Hymenoptera collected by R. Vitalis de Salvaza. i. — Ann. Mag. nat. Hist. (9) 3: 425-433.
Viereck, H.L., 1913. Descriptions of ten new genera and twenty-three new species of Ichneumonflies.— Proc. U. S. natn. Mus. 44: 555-568.

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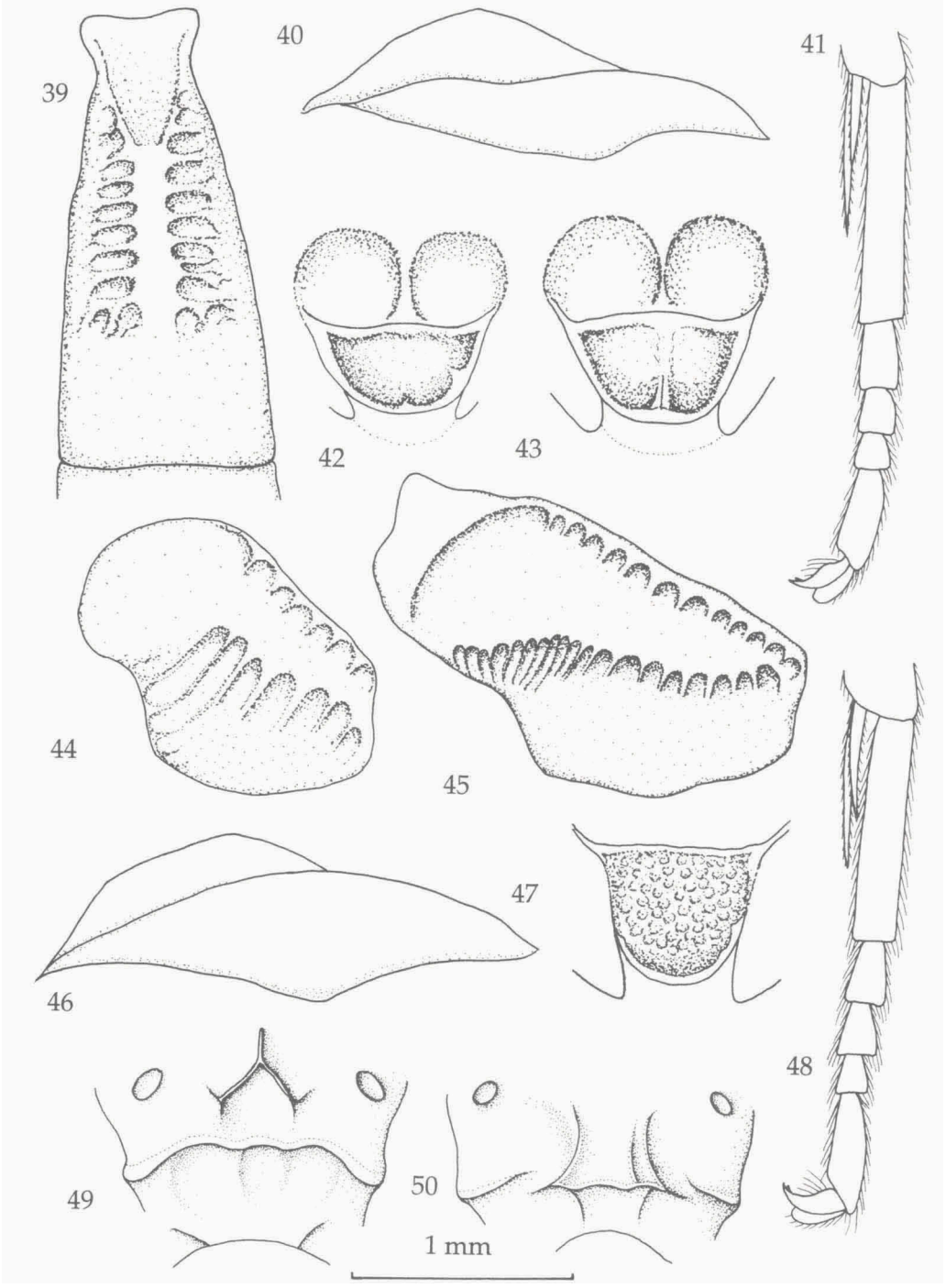


Figs 39-44, 49, *Euagathis clathrata* (Brullé), ♀, Java, Teluk Pentjang, but 41 and 49, Sabah, Long Pa Sia, and 43, ♂, Sumatra, Serdang; figs 45-48, 50, *E. ruficollis* (Cameron), ♀ (but 47 of ♂), Sabah, Long Pa Sia. 31, first metasomal tergite, dorsal aspect; 40, 46, mesoscutum, lateral aspect; 41, 48, middle tarsus, lateral aspect; 42, 43, 47, scutellum, dorsal aspect; 44, 45, mesopleuron; 49, 50, propodeum, dorsal aspect. 39, 41, 48: 1.0 × scale-line; 40, 42-47, 49, 50: 1.4 ×.

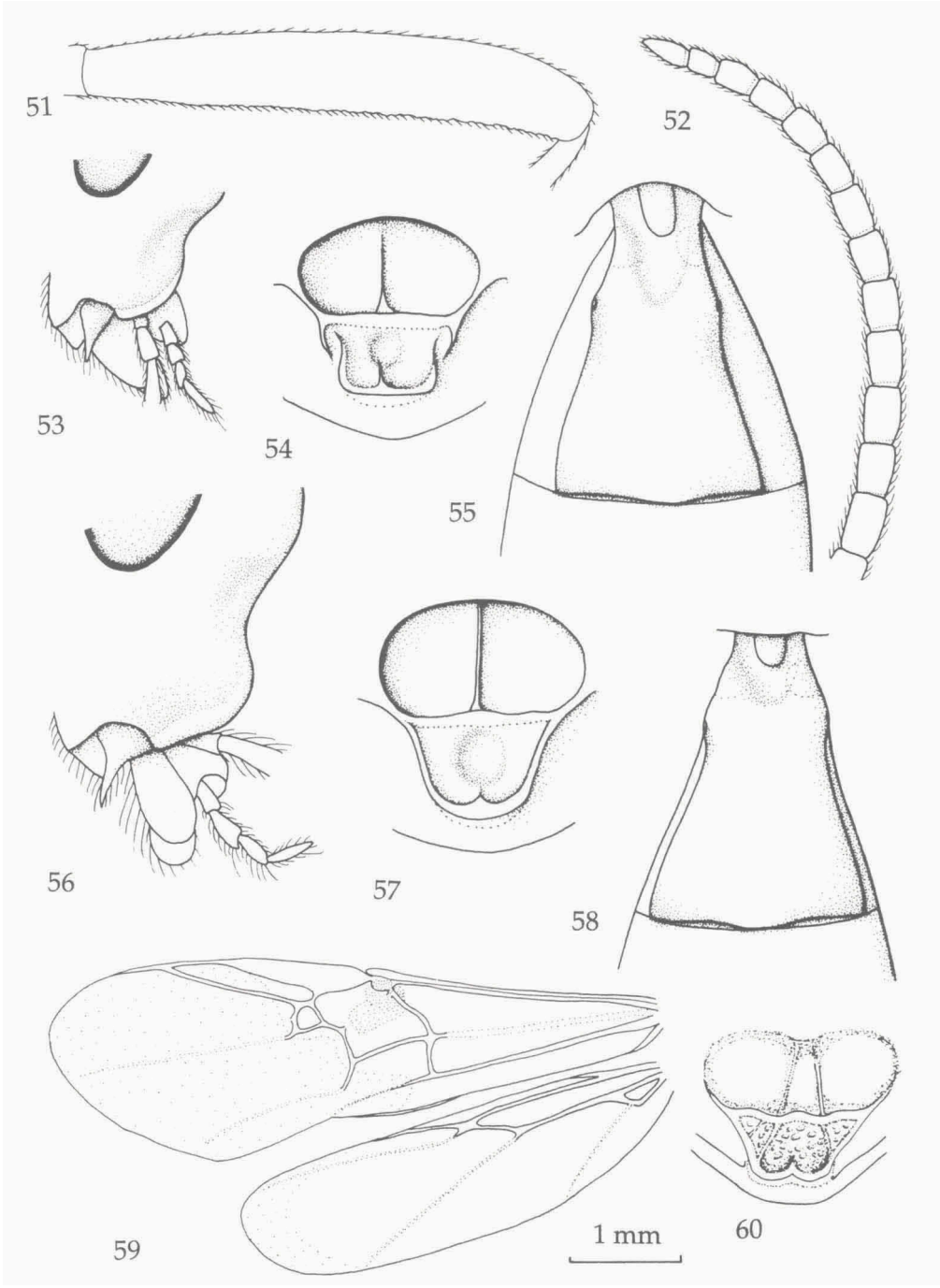
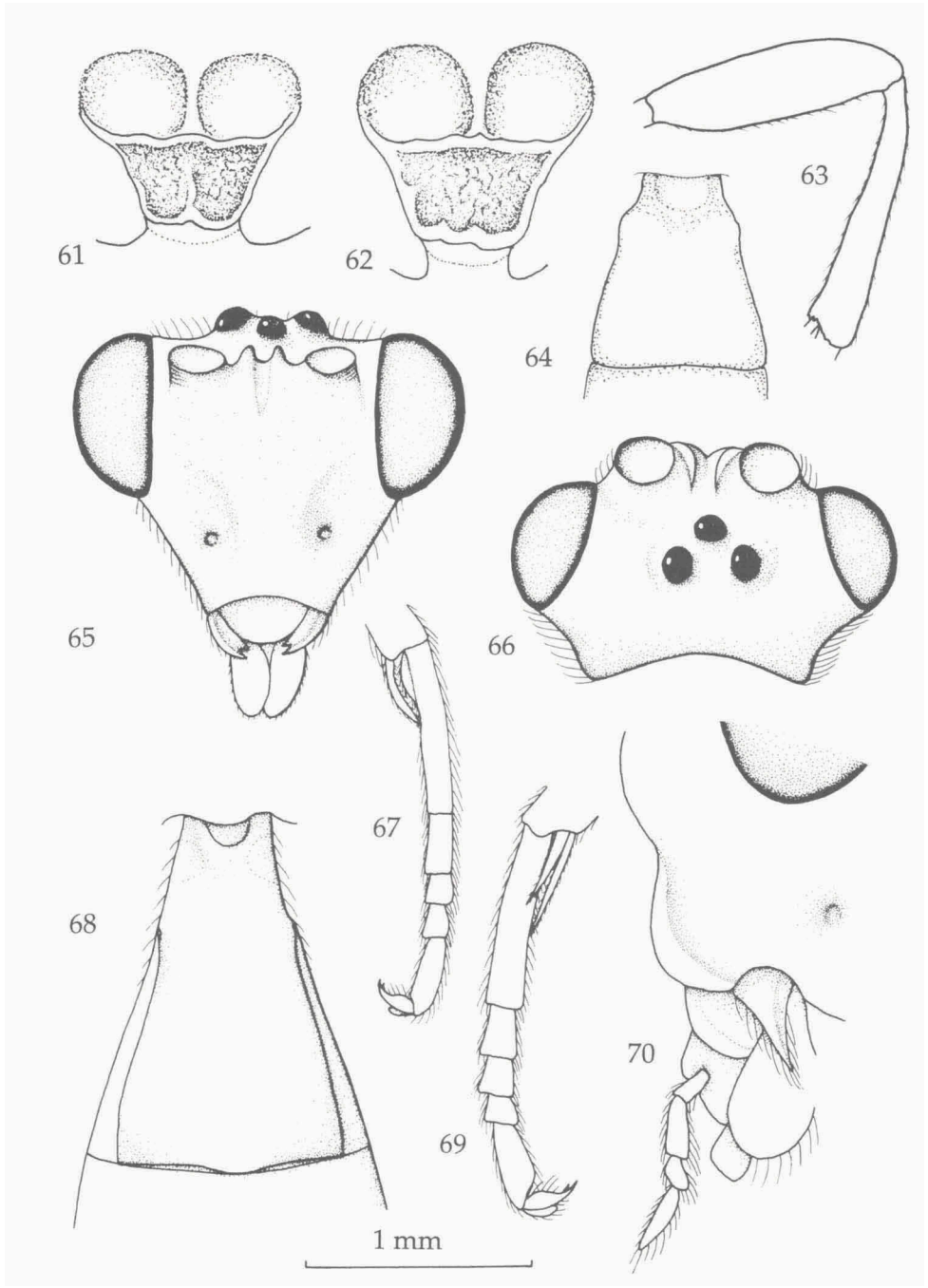
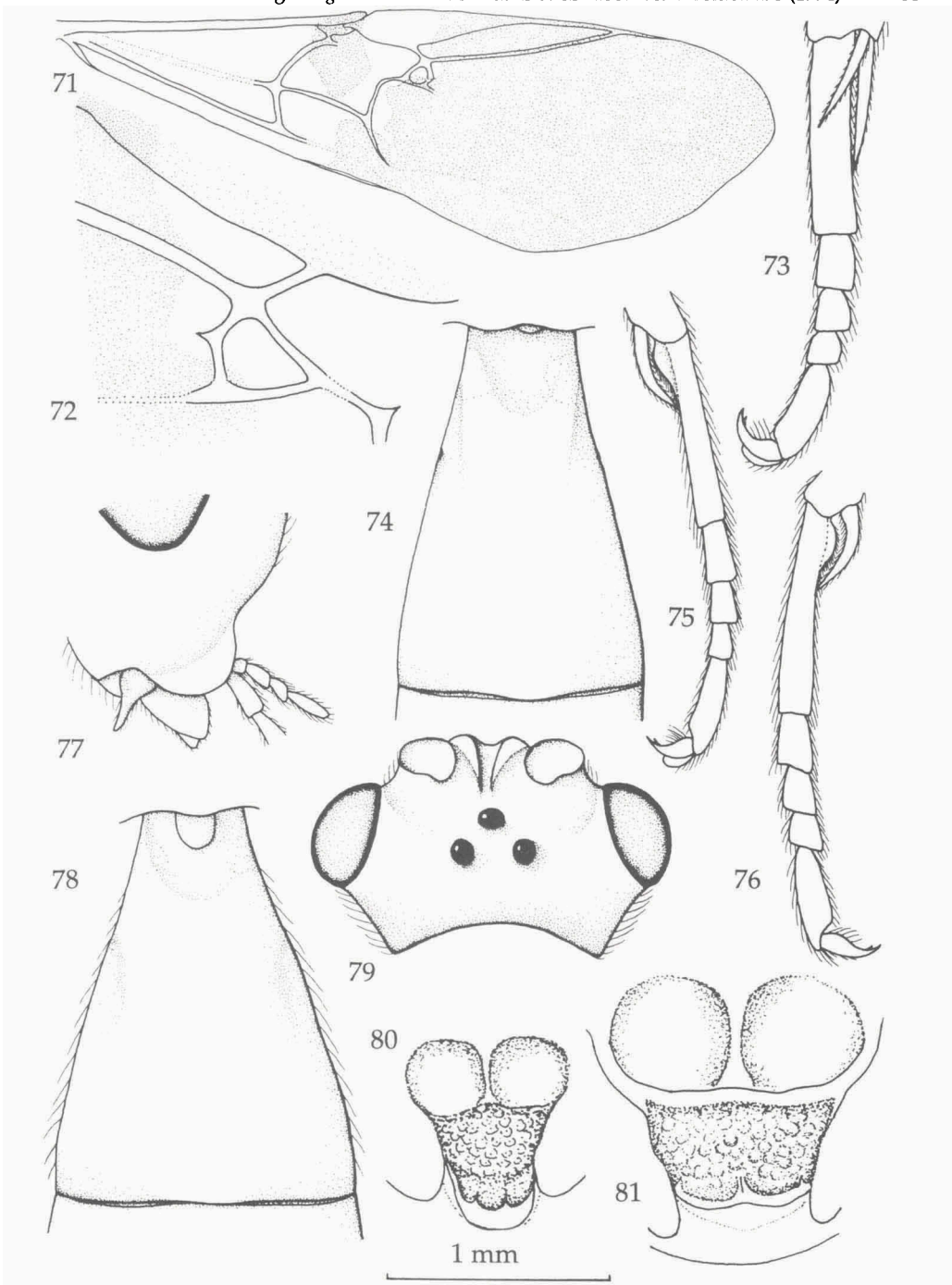


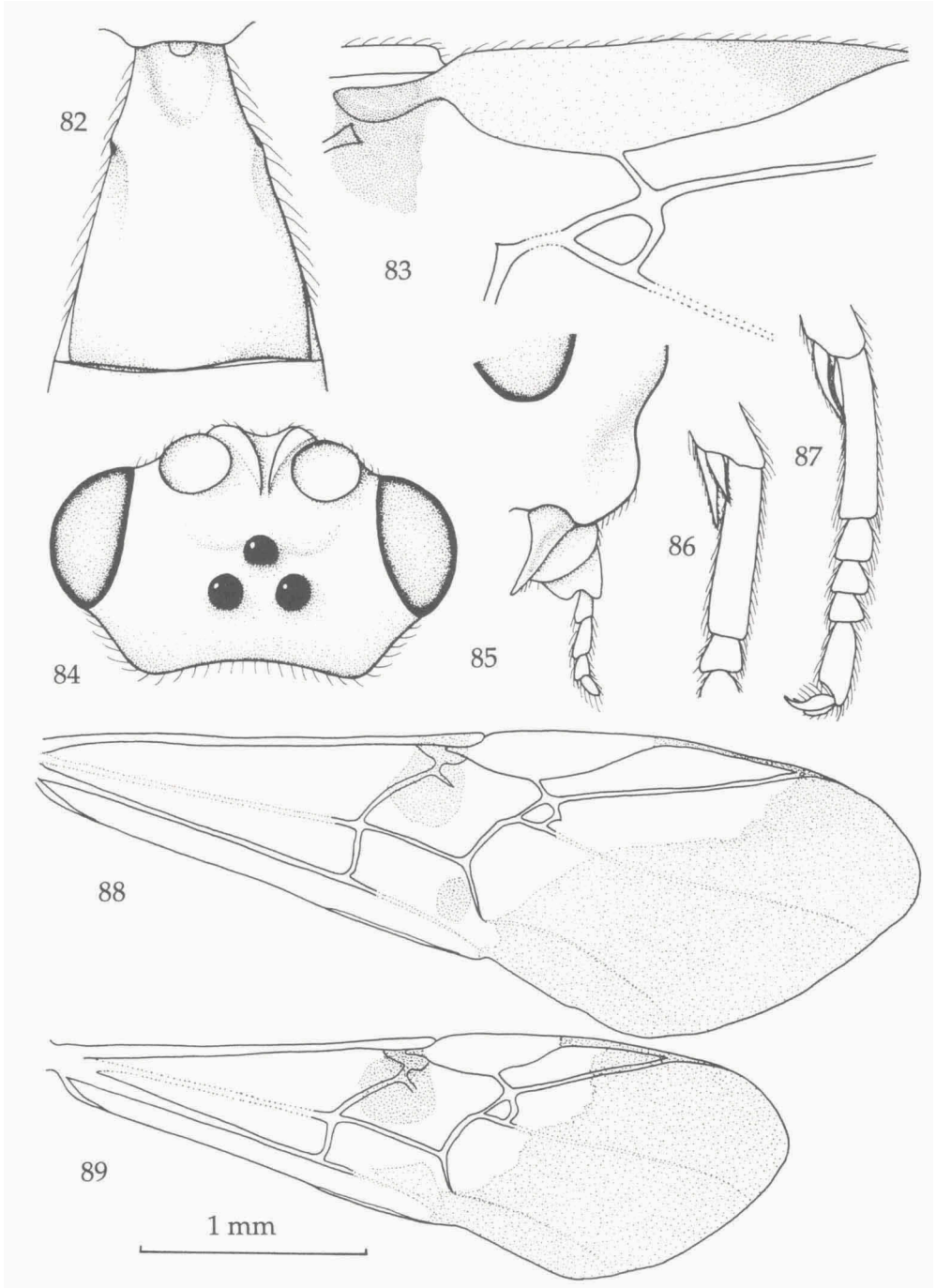
Fig. 51, *Euagathis ruficollis* (Cameron), ♀, Sabah, Long Pa Sia; figs 52-55, *E. henseni* spec. nov., ♀, holotype; figs 56-58, *E. vechti* spec. nov., ♀, holotype; figs 59, 60, *E. elevata* Bhat & Gupta, ♀, holotype. 51, hind femur, lateral aspect; 52, apical quarter of antenna; 53, 56, detail of labial palp and occipital flange, lateral aspect; 54, 57, 60, scutellum, dorsal aspect; 55, 58, first metasomal tergite, dorsal aspect; 59, wings. 51, 59: 1.0 × scale-line; 52, 54-58: 3 ×; 53: 2 ×; 60: 2.4 ×.



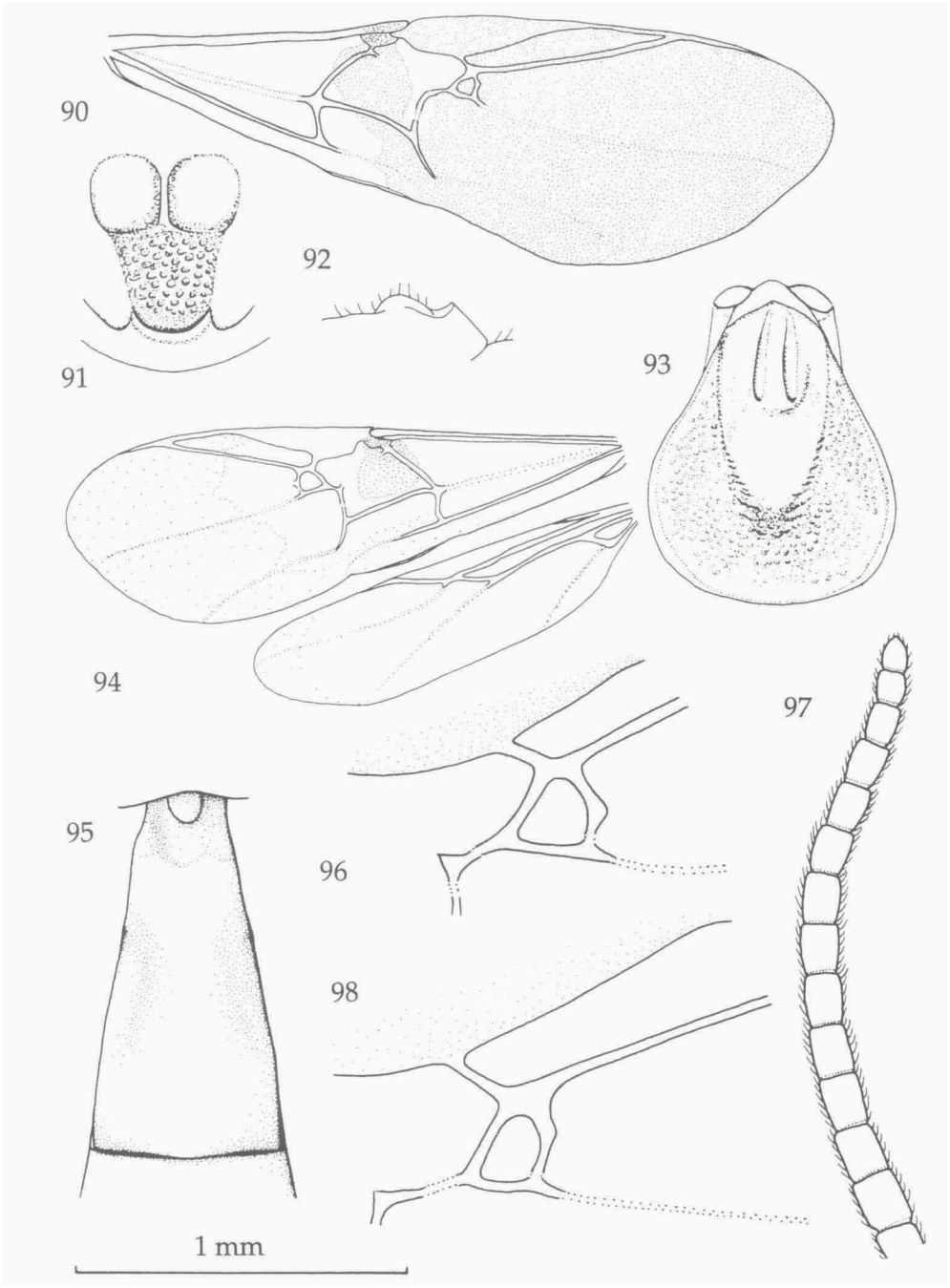
Figs 61-64, *Euagathis javana* Szépligeti, ♀, holotype, but 62 and 64 of ♂, and 63 of ♀, Java, Bogor; figs 65-70, *E. tambora* spec. nov., ♀, holotype. 61, 62, scutellum, dorsal aspect; 63, hind femur and tibia; 64, 68, first metasomal tergite, dorsal aspect; 15, head, frontal aspect; 66, head, dorsal aspect; 67, fore tarsus, lateral aspect; 69, middle tarsus, lateral aspect; 70. detail of labial palp and occipital flange, lateral aspect. 61, 62, 67, 69, 70: 1.4 × scale-line; 63, 64: 0.6 ×; 65, 66, 68: 1.0 ×.



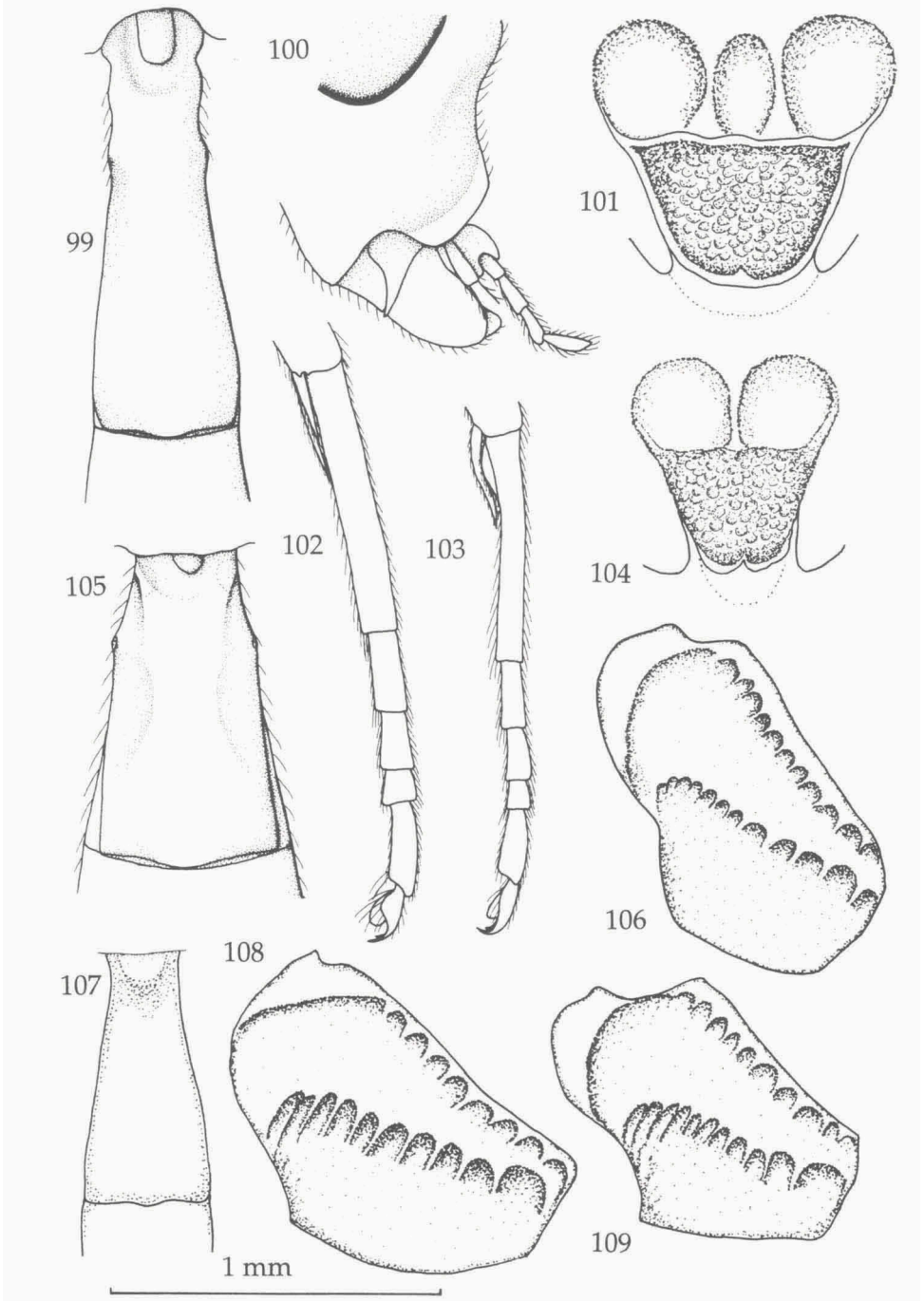
Figs 71-81, *Euagathis japonica* Szépligeti, ♀, lectotype, but 71 of ♀, Malaysia, Kuala Lumpur, 75 of ♂, Sumatra, Medan, 78 of ♀, Java, Pelawa, 80 of ♂, Burma, Tenasserim, and 81 of ♀, holotype of *E. semiflava*. 71, fore wing; 72, middle tarsus, lateral aspect; 73, second submarginal cell of fore wing; 74, 78, first metasomal tergite, dorsal aspect; 75, 76, fore tarsus, lateral aspect; 77, detail of labial palp and occipital flange, lateral aspect; 79, head, dorsal aspect; 80, 81, scutellum, dorsal aspect. 71: 0.3 × scale-line; 72-74, 76-78: 1.0 ×; 75: 1.2 ×; 79: 0.7 ×; 80, 81: 1.4 ×.



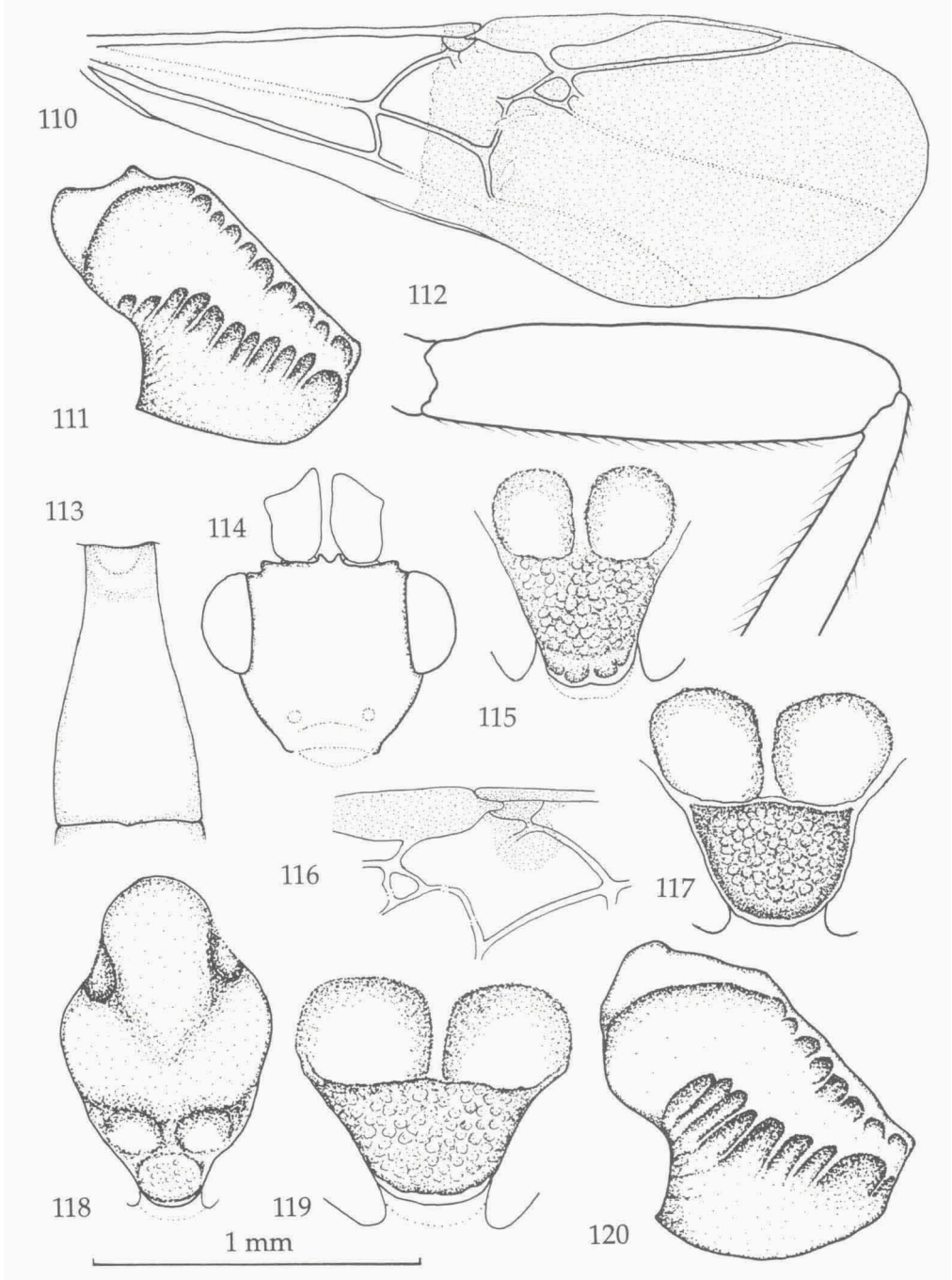
Figs 82-87, *Euagathis serena* spec. nov., ♀, holotype; figs 88, 89, *E. maculipennis* (Brullé), ♂, lectotype, but 89 of paralectotype. 82, first metasomal tergite, dorsal aspect; 83, second submarginal cell of fore wing; 84, head, dorsal aspect; 85, detail of labial palp and occipital flange, lateral aspect; 86, middle spurs and basitarsus, lateral aspect; 87, fore tarsus, lateral aspect; 88, 89, fore wing. 82-87: 1.0 × scale-line; 88, 89: 0.6 ×.



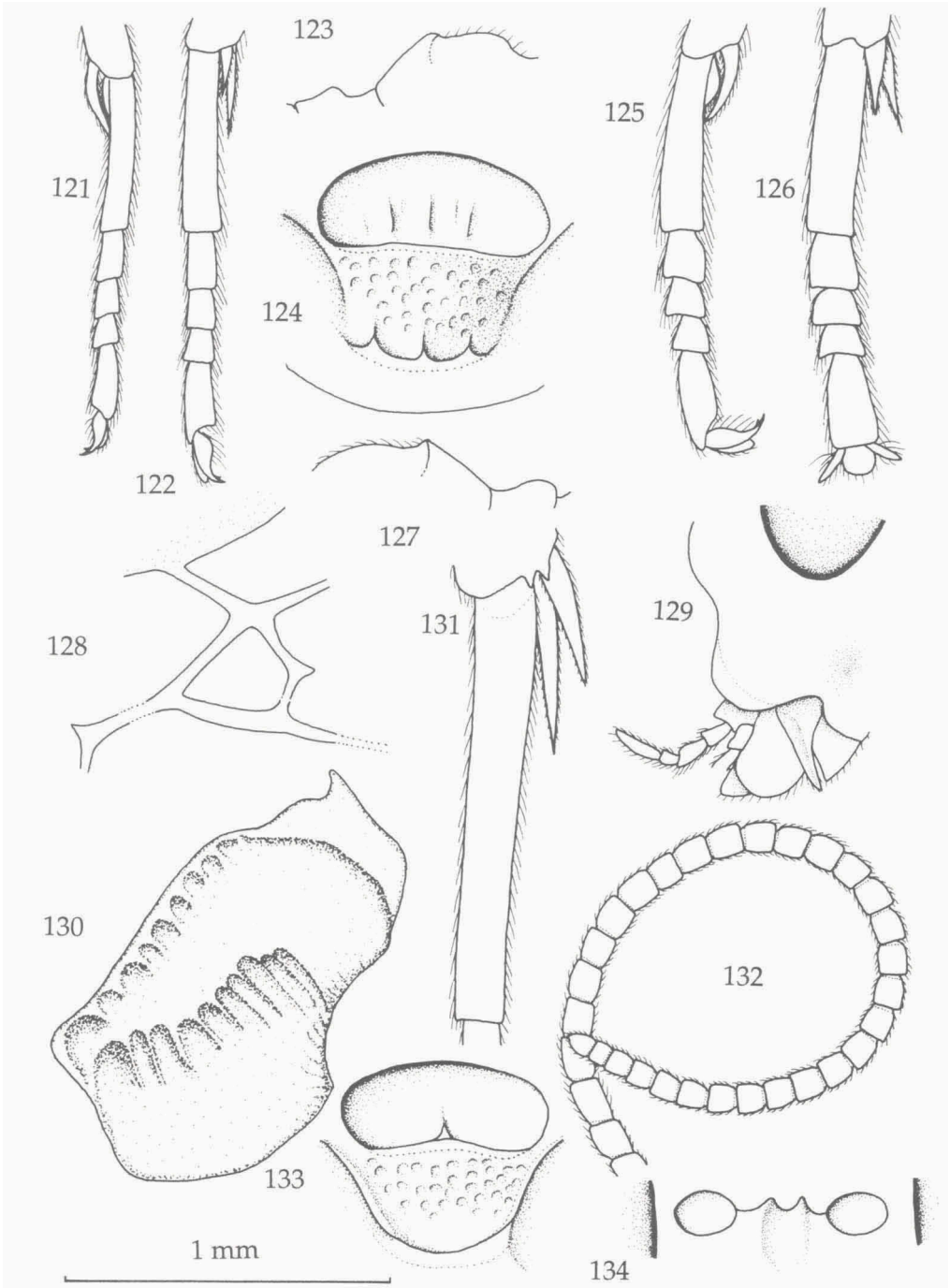
Figs 90-94, *Euagathis forticarinata* (Cameron), ♀, holotype of *E. pallida*, but 90 of ♂, Malaysia, Selangor; figs 95, 96, *E. flavominuta* spec. nov., ♀, holotype; figs 97, 98, *E. nigrisoma* spec. nov., ♀, holotype. 90, fore wing; 91, scutellum, dorsal aspect; 92, scutellum, lateral aspect; 93, mesoscutum, dorsal aspect; 94, wings; 95, first metasomal tergite, dorsal aspect; 96, 98, second submarginal cell of fore wing; 97, apical quarter of antenna. 90: 0.4 × scale-line; 91-93: 1.2 × scale-line; 95-98: 1.0 ×.



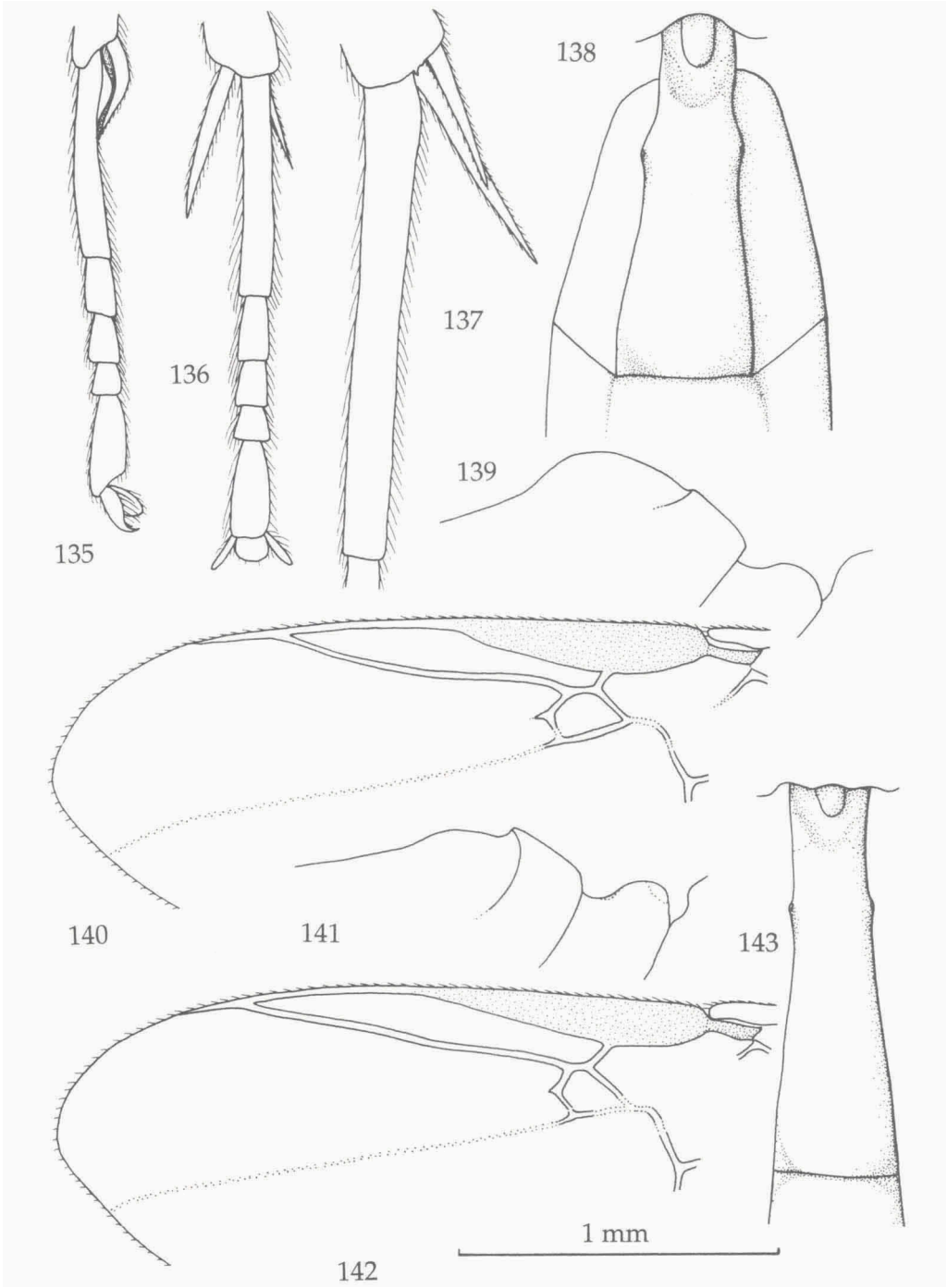
Figs 99-101, *Euagathis nigrisoma* spec. nov., ♀, holotype, but 101 of ♂, paratype; figs 102-107, *E. semifusca* (Brullé), ♂, holotype of *E. dubiosa*, but 104 of ♀, Sabah, Danum Valley, and 106 and 107 of ♂, holotype of *E. semifusca*; figs 108, 109, *E. japonica* Szépligeti, 108 of ♀, holotype of *E. semiflava*, and 109 of ♀ from West Java. 99, 105, 107, first metasomal tergite, dorsal aspect; 100, detail of labial palp and occipital flange, lateral aspect; 101, 104, scutellum, dorsal aspect; 102, middle tarsus, lateral aspect; 103, fore tarsus, lateral aspect; 106, 108, 109, mesopleuron. 99, 100, 104: 1.0 × scale-line; 101: 1.5 ×; 102, 103, 105: 0.7 ×; 106-109: 0.4 ×.



Figs 110-112, 114, *Euagathis bipartita* Enderlein, ♀, holotype; figs 113, 115, 117, *E. eburnea* spec. nov., ♀, holotype, but 117 of paratype; fig. 116, *E. abbotti* (Ashmead), ♂, holotype of *E. biroi*; figs 118-120, *E. bifoveolata* spec. nov., ♂, holotype. 110, fore wing; 111, 120, mesopleuron; 112, hind femur, lateral aspect; 113, first metasomal tergite, dorsal aspect; 114, head, frontal aspect; 115, 117, 119, scutellum, dorsal aspect; 116, second submarginal cell of fore wing; 118, mesoscutum, dorsal aspect. 110, 111, 114, 116: 0.4 × scale-line; 112, 113: 0.8 × scale-line; 115, 117, 118, 120: 1.0 ×; 119: 2.0 ×.



Figs 121-123, *Euagathis bifoveolata* spec. nov., ♂, holotype; figs 124-131, *E. aurea* spec. nov., ♀, holotype; fig. 132, *E. fuscinotum* Enderlein, ♀, Java, Tjigaeha; figs 133, 134, *E. leptocera* Cameron, ♀, holotype. 121, 125, fore tarsus, lateral aspect; 122, middle tarsus, lateral aspect; 123, 127, scutellum, lateral aspect; 124, 133, scutellum, dorsal aspect; 126, middle tarsus, dorsal aspect; 128, second submarginal cell of fore wing; 129, detail of labial palp and occipital flange, lateral aspect; 130, mesopleuron; 131, hind spurs and basitarsus, lateral aspect; 132, apical quarter of antenna; 134, lamellae between antennal sockets, frontal aspect. 121, 122, 125, 126, 128, 129, 131, 132, 134: 0.7 × scale-line; 123, 124, 127, 133: 1.0 ×; 130: 0.4 ×.



Figs 135-137, *Euagathis leptocera* Cameron, ♀, holotype; figs 138-140, *E. nigriceps* Enderlein, ♀, holotype; figs 141-143, *E. pubescens* Enderlein, ♀, lectotype. 135, fore tarsus, lateral aspect; 136, middle tarsus, dorsal aspect; 137, hind spurs and basitarsus, lateral aspect; 138, 143, first metasomal tergite, dorsal aspect; 139, 141, scutellum, lateral aspect; 140, 142, antero-apical part of fore wing. 135-137, 138, 143: 0.7 ×; 139, 141: 1.0 ×; 140, 142: 0.3 ×.

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