

**New Asian Ants of the Tribe Basicerotini, with an On-line Computer Interactive Key to the Twenty-six Known Indo-Australian Species (Hymenoptera : Formicidae : Myrmicinae)**

*Robert W. Taylor*

Australian National Insect Collection, CSIRO Division of Entomology, G.P.O. Box 1700, Canberra 2601, Australia.

*Abstract*

The 24 known Old World species of *Eurhopalothrix* Brown and Kempf and 2 of *Rhopalothrix* Mayr are reviewed. All are Indo-Australian. Nine species are described as new: *Eurhopalothrix browni* (Sabah); *E. chapmani* (Luzon); *E. coronata* (Sumatra, Sarawak, Sabah); *E. dubia* (Sabah); *E. jennya* (Sarawak); *E. omnivaga* (W. Malaysia, Sumatra, Sarawak, Sabah, Sulawesi); *E. platisquama* (W. Malaysia, Sumatra); *E. rothschildi* (Sarawak) and *E. seguensis* (Sarawak). These and the 3 previously described Asian *Eurhopalothrix* species are illustrated and their distributions mapped. *E. philippina* Brown & Kempf is recorded from Luzon. All palaeogean basicerotines are keyed conventionally, and an on line computer interactive key to all is offered on disc.

**Introduction**

The two genera discussed here are members of the myrmicine tribe Basicerotini, which occurs disjunctly in the Indo-Australian area, and in the neotropical and southern nearctic regions (Brown & Kempf 1960; Taylor 1980). Apart from the very different Afrotropical/Oriental genus *Myrmecaria* Saunders, and the related monotypic neotropical genus *Talaridris* Weber, they are the only known myrmicines with 7-segmented antennae. *Eurhopalothrix* Brown & Kempf has triangular mandibles, and those of *Rhopalothrix* Mayr are linear, with remote insertions and an apical cluster of acute teeth.

Nine new south-east Asian species of *Eurhopalothrix* are described. They bring to 12 the tally of species known from areas west of New Guinea. Others previously recorded from this region are *E. heliscata* Wilson & Brown, 1984 [Bukit Timah, Singapore, (01°20'N., 103°46'E.) and Sungei Menyala Forest Reserve, Negeri Sembilan, W. Malaysia] (Figs 19-22, 49), *E. philippina* Brown & Kempf, 1960 (Luzon and Negros Is, Philippines, see below) (Figs 27-29, 51), and *E. procera* (Emery, 1897) (= *Rhopalothrix borneensis* Wheeler, 1919) (widespread, ranging from southern Taiwan and Borneo to the Philippines, Melanesia, N.E. Australia and Samoa) (Figs 35-37, 53). All 12 Asian species are comprehensively illustrated with scanning electron micrographs, and they are included in a key to the workers of all known Old World basicerotines. Known distributions of the new species are mapped, and known sympatric associations graphically summarised (Fig. 1).

The known palaeogean species of *Eurhopalothrix* thus now total 24, including those previously described from Melanesia, Australia and Polynesia. *Rhopalothrix* is also represented in the region by 2 species. The previously described eastern Australian basicerotines include (in addition to *E. procera*): *Eurhopalothrix australis* Brown & Kempf, 1960 (eastern Australia); *E. biroi* (Szabó, 1910) (New Guinea); *E. brevicornis* (Emery, 1897) (New Guinea); *E. caledonica* Brown & Kempf, 1960 (New Caledonia); *E. cinnamea* Taylor, 1970 (New

Britain); *E. emeryi* (Forel, 1912) (Fiji); *E. greensladei* Taylor, 1968 (Solomon Is); *E. hoplites* Taylor, 1980 (New Guinea); *E. insidiatrix* Taylor, 1980 (Fiji); *E. isabellae* (Mann, 1921) (Solomon Is); *E. punctata* (Szabó, 1910) (New Guinea) and *E. szentivanyi* Taylor, 1968 (New Guinea); *Rhopalothrix diadema* Brown & Kempf, 1960 (New Guinea) and *R. orbis* Taylor, 1967 (eastern Australia).

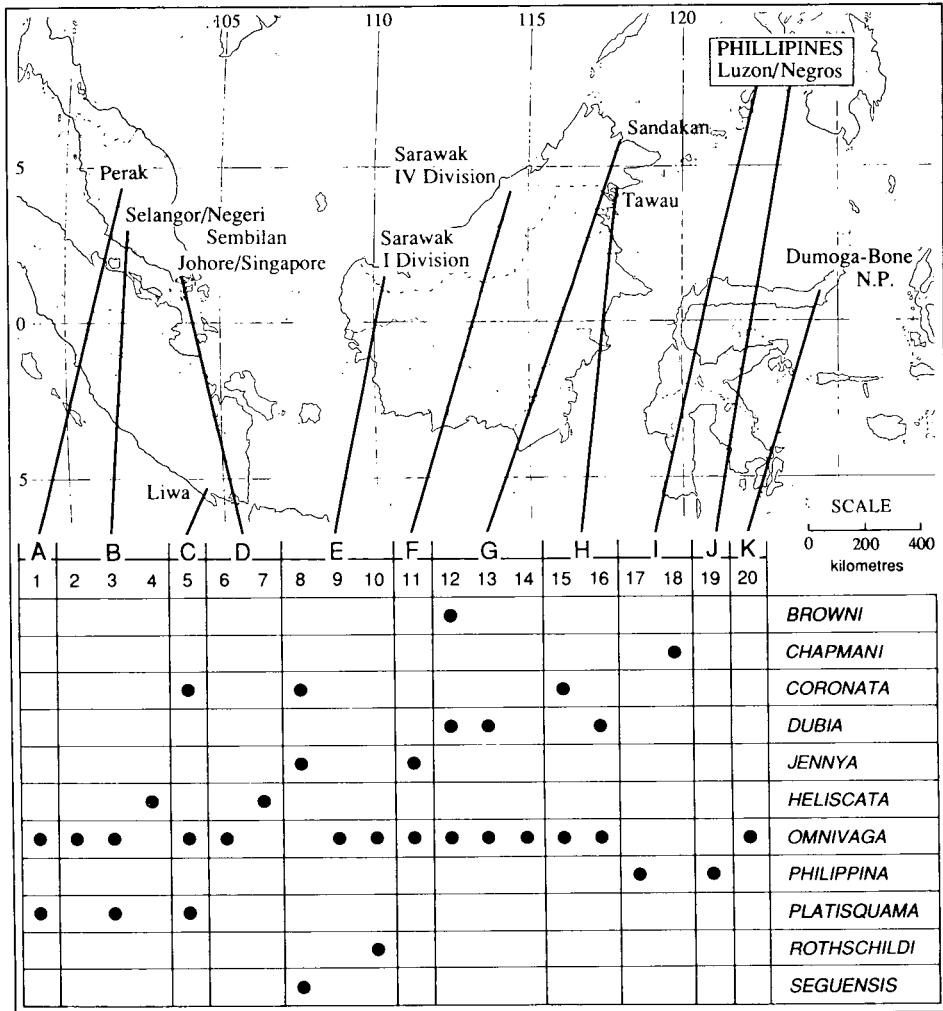


Fig. 1. Summary distribution of southeast Asian *Eurhopalothrix* species, apart from *E. procera*. Localities represented by the numbered columns are: (1) Sungei Simei Falls; (2) near Kuala Kubu Bahru; (3) Ulu Gombak Field Station and vicinity; (4) Sungei Menyala Forest Reserve; (5) Liwa; (6) Gunung Pulai; (7) Bukit Timah Reserve; (8) Kampong Segu; (9) Semengoh Reserve; (10) Mt Santubong; (11) Gunung Mulu Natl Pk; (12) Lungmanis; (13) Sepilok Reserve; (14) Sibuga Forest; (15) Quoin Hill Res. Stn; (16) Umas; (17) Mt Makiling; (18) Quezon City; (19) near Dumaguete; (20) Dumoga-Bone Natl Park.

Sixteen of the 26 named Old-World species have been described since the tribe Basicerotini was established and first monographed by Brown & Kempf (1960).

I have previously published and supplemented a review of the Melanesian and Australian species (Taylor 1968, 1970, 1980). No additional species or significant distributional records are known from these areas.

## Materials and Methods

The descriptions and key published here were prepared with *Delta* system software (Dallwitz 1980; Partridge *et al.* 1988) using a Bondwell (Model 8) portable lap top computer, and the accompanying micrographs were prepared using a JEOL JSM4 scanning electron microscope. For each species, the standard illustrations include a frontal view of the head, a dorsal view of the mesosoma and waist nodes, and a lateral view of the whole animal. All depict holotype specimens. Comparable micrographs have been published previously for *Rhopalothrix orbis* by Taylor & Beaton (1970), for *Eurhopalothrix emeryi*, *E. hoplites*, *E. insidiatrix* and *E. szentivanyi* by Taylor (1980), for *E. heliscata* by Wilson & Brown (1984), and for *E. biroi* (in part) by Hölldobler & Wilson (1986).

The conventions for measurements and indices follow Brown & Kempf (1960) and Taylor (1968). In brief, head length (HL), head width (HW), pronotum width (PW) and postpetiole width are maximum measurable dimensions of the subject structures in square dorsal view; mandibular extension (MI) is the long-axial distance from the level of the anteriormost point of the clypeus to the tip of the closed jaws, in HL measuring position; scape length (SL) is the maximum distance from the apex of the scape to the tip of its basal lobe; Weber's length of the mesosoma (WL) is measured in side view, as the direct line from the anterior face of the pronotum to the inferior propodeal angle, on a plane where both are in microscopic focus. The indices are calculated percentages, as follows:  $CI = HW\%HL$ ,  $MI = MI\%HL$  and  $SI = SL\%HW$ .

## Discussion

### *Collecting Basicerotine Ants*

All but one of the specimens of the new species described here were collected from soil or leaf litter using Berlese funnels, Winkler bags or soil cores. In 5 weeks of collecting in West Malaysia and Borneo in 1968, I took several hundred specimens of 7 species (all of them new to science) using portable, electrically powered Berlese funnels. During that expedition, no specimens at all were collected by hand. Knowledge of the Neotropical and Australasian species is also based largely on mechanically collected specimens. Because of the small size and cryptobiotic nature of these ants, it is very difficult to collect them by hand.

### *Species Distribution and Sympatry*

Several of the species described here are widely distributed, notably *E. omnivaga*, *E. coronata* and *E. philippina* (Fig. 1). Such distributions seem to be frequent among cryptobiotic S.E. Asian ants which inhabit rainforest leaf litter. Further examples are provided by *Dacotinops* (see Taylor 1985), where 3 of the 4 Asian species are known at least from southwestern Sarawak and northeastern Sabah. One of these (*D. concinnus* Taylor), is found also near the southern tip of Borneo, and another (*D. cirrosus* Taylor), in northern peninsular Malaysia. All 4 species are sympatric at Semengoh Forest Reserve, c. 19 km S.W. of Kuching, western Sarawak, the only known collection locality for one of them (*D. wilsoni* Taylor). The other 3 (*D. cirrosus*, *D. concinnus* and *D. solivagus* Taylor) are widely sympatric elsewhere, including localities in Sabah.

Known sympatric associations among the *Eurhopalothrix* species discussed here are summarised in Fig. 1. Judging from the records, *E. omnivaga* is associated in some part of its range with every other known Malaysian species. The other species described here from Malaysia are each known to be directly sympatric with 2 others (including *E. omnivaga*), except for *E. rothschildi*, which has been taken only with *E. omnivaga*.

On the other hand, the 3 apparently closely related species of the *E. platisquama* group are allopatrically distributed: *E. platisquama* in peninsular Malaysia and Sumatra, *E. seguensis* in eastern Sarawak, and *E. dubia* in Sabah.

### *Basicerotine Phylogeny*

Beyond the Indo-Australian area, the tribe Basicerotini is represented in the Neotropical and southern Nearctic realms by several genera and a number of species, including 11 described in *Eurhopalothrix* and 6 in *Rhopalothrix* (Brown & Kempf 1960; Kempf 1962, 1967; Snelling 1968; Brown 1974, 1980a, 1980b). Additional undescribed species are known in *Eurhopalothrix* (R. R. Snelling, personal communication).

For several reasons the tribe seems especially suitable for phylogenetic analysis. Some of its Neotropical genera are bizarre and apparently highly autapomorphic (including *Aspididris* Weber, *Basiceros* Schulz, *Creightonidris* Brown, *Protalaridris* Brown, and *Talaridris*); their relationships are worthy of investigation. In addition the affinities between species currently placed in the 'main line' genera *Octostruma* Forel, *Eurhopalothrix* and *Rhopalothrix*, need clarification. *Aspididris* was considered a synonym of *Basiceros* by Brown (1974). It is possible that the present generic arrangement needs further amendment.

Most interesting in the present context is the fact that *Eurhopalothrix* and *Rhopalothrix* are present on both sides of the South Pacific; that their two major biogeographic components must have been long separated; and that they both, nonetheless, have largely parallel sets of interspecifically varying characters, which range similarly in both groups. Analysis of this variability in these two major biogeographic components, considered together and separately for comparison, could provide information of special phylogenetic interest, and could clarify understanding of possible evolutionary patterns in the light of the major biogeographic separation involved. It appears that there must have been some homoplasy in the separate evolution of the two geographical components in each genus, but some of the patterns of variability are likely to have been established before the taxa were geographically fragmented, in which case substantial evolution of their diverse morphology could have occurred in a single radiation prior to separation, or have been programmed by events which preceded the geographical split.

Other interesting questions involve analysis of the trans-South Pacific geographical links, whether 'northern' or 'gondwanic', especially considering the richness of *Eurhopalothrix* in Papuasias, as opposed to Australia, and the fact that *Rhopalothrix*, with a species each in Australia and New Guinea, is unknown from S.E. Asia.

The matters discussed above can be briefly exemplified by considering the numbers and distribution of the specialised large cephalic hairs of various *Eurhopalothrix* species. The following conditions are present in both trans-Pacific faunas:

(a) The presence of relatively high numbers of specialised cephalic hairs arranged in 3 transverse rows, an anterior transocular series, an intermediate series, and an occipital series (Fig. 8). In the neotropics the following numbers of hairs are known respectively in these ranks: 8:4:8 (*E. gravis* Mann), and 6:4:8 (*E. lenkoi* Kempf, and 3 other species in figs 36–38 of Brown & Kempf; 1960). In the Indo-Australian fauna the combination 10:4:4 is known in *E. australis*, and 8:4:4 in *E. brevicornis*, *E. caledonica* and *E. coronata*. It is notable that an occipital row of 4 hairs (v. 6 or 8) appears to characterise the palaeocean species.

(b) The presence of 4 hairs clustered in a tight square array at the midline near the occipital margin, with or without 1 other pair elsewhere on the head (Figs 13–15). [*E. speciosa* Brown & Kempf and *E. apharagonia* Snelling in the New World; two of the three *E. platisquama*-group species and *E. emeryi* (less distinctly so) in the Old.]

(c) The presence of only a single pair of frontal hairs, as in *E. omnivaga* (Figs 24–26). This condition is found in *E. floridana* Brown & Kempf in the Americas, and in several species in the Indo-Australian fauna.

(d) Both faunas include species which entirely lack enlarged, specialised cephalic hairs, including the South American *E. bruchi* (Santschi) and the Papuasian *E. punctata*, and *E. hoplites*.

In addition, various intermediate conditions are known, especially in the Indo-Australian fauna.

Similar considerations apply to other features, including the distribution of specialised pilosity elsewhere on the body, the details of specialisation in the structure of the hairs themselves [a wonderful subject for scanning electron microscopy, see Figs 11–12 (a stereoscopic pair), 33, 34], sculptural details, mandibular structure and dentition, etc.

The species of *Rhopalothrix* show variation similar to that of *Eurhopalothrix*. For example, the Neotropical *R. ciliata* Mayr has 2 rows of transverse enlarged hairs on the frons, with the formula 12:4, but this is clearly derived from 8:4:4. The other neogean species lack enlarged, specialised cephalic hairs. The formulae 8:4:4 and 10:4:4 are repre-



sented in the Australian species (*R. diadema* and *R. orbis*). There are remarkable overall similarities in post-mandibular structure between the last 2 species and *Eurhopalothrix coronata*, such that close relationship between them seems tenable, implying that *Rhopalothrix*, as presently conceived, could be at least biphyletic, with the included palaeogeon and neogeon species separately derived from *Eurhopalothrix*-like ancestry.

**Repositories**

Specimens studied here are from the Australian National Insect Collection, CSIRO, Canberra (ANIC), the British Museum (Natural History), London (BMNH); and the Museum of Comparative Zoology, Cambridge, Mass. USA (MCZC). Abbreviations for other collections in which types have been deposited are:

- BPBM B. P. Bishop Museum, Honolulu, Hawaii, U.S.A.
- LACM Los Angeles County Museum of Natural History
- MHNG Museum d’Histoire Naturelle, Geneva, Switzerland
- MKUB Sarawak Museum, Kuching
- MKUC Masao Kubota collection, Odawara City, Japan

I collected most of the specimens, and am designated RWT in the record lists. Geographical coordinates are given for all listed type localities, and for most other localities at their points of first appearance in the text.

**Interactive Computer Key to the Palaeogeon Basicerotine Ants**

Computer software able to generate an on-line interactive key to all known palaeogeon species of basicerotine ants has been developed as part of this project. Copies of the data base and operating system are offered to applicants on floppy or microfloppy discs suitable for use with personal computers. Details are available from the author.

**Key to the Old-World Species of Tribe Basicerotini (Workers)**

The known queens of Asian *Eurhopalothrix* species run through the key consistently with their workers. They represent *E. dubia*, *E. heliscata*, *E. jennya*, *E. omnivaga* and *E. procera*.

1. Mandibles linear, their insertions remote, so that the masticatory borders cross or engage only near their apices ..... (genus *Rhopalothrix*) ..... 2
  - Mandibles triangular, their whole serially dentate masticatory borders engaging directly at full closure ..... (genus *Eurhopalothrix*) ..... 3
2. Specialised large hairs on cephalic dorsum numbering 16, with 8 in anterior row (super-numerary hairs may occur; Taylor 1970); hairs on disc of first gastral tergite of one size class; mesosomal dorsum with a distinct transverse metanotal impression, the propodeal dorsum a transverse tumosity behind it; propodeal teeth well developed, forming angles of about 90° in side view (*E. Australia*—S.E. Queensland, N.E. New South Wales) ....
  - ..... *R. orbis* Taylor
  - 18 specialised hairs on cephalic dorsum, with 10 in anterior row; hairs of first gastral tergite of 2 size classes; metanotal impression feeble; propodeal dorsum sloping back abruptly towards declivity; propodeal teeth only obtuse vestiges (N.E. New Guinea) .....
    - ..... *R. diadema* Brown & Kempf
- 3(1). S.E. Asian and Philippines species found to the west of New Guinea ..... 4
  - Melanesian, Australian and Pacific species ..... 15
- 4(3). Sides of mesosoma behind pronotum smooth and shining (Fig. 37), essentially unsculptured (widespread in Indo-Pacific area) ..... *E. procera* (Emery)
  - Sides of mesosoma behind pronotum dull, distinctly sculptured, usually with large shallow pit-like ‘thimble punctures’ separated by about 0.5–1 × their average diameter (Figs 10, 29); alternatively (in 1 Philippines species) these surfaces are densely and moderately coarsely punctate-shagreened (Fig. 7) ..... 5
- 5(4). Punctures of frons and most dorsal body surfaces each filled by a flat-surfaced, feather-edged, metallic silvery hair (Figs 30–34); this exceptional ground pilosity often largely contiguous, especially on the frons; eyes relatively large, with about 16–20 facets, maximum diameter close to that of a funicular club (*E. platisquama* group) ..... 6
  - Hairs of ground pilosity not as above, usually very reduced, sparse, or both, never squamous or silvery-metallic; eyes either absent or much smaller, usually with fewer than 10 facets ..... 8

- 6(5). Four erect, narrowly clavate hairs, separated by about their average length, clustered in a square array on the frons, at the midline near the occipital border (Figs 13–15). (Other similar hairs may be present elsewhere on the head) ..... 7  
 A single pair of laterally adjacent hairs in the position described, with another hair close to the occipital border on each side, about midway between the median pair and the posterior occipital angle (Figs 41–43) (Sarawak) ..... *E. seguensis*, sp. nov.
- 7(6). Frons with a single erect hair on each side about mid-way between the posteromedian cluster and the ipsilateral eye (Figs 13–15) (Sabah) ..... *E. dubia*, sp. nov.  
 Frons lacking erect hairs apart from those of the posteromedian cluster (Figs 30–33) (W. Malaysia, Sumatra) ..... *E. platisquama*, sp. nov.
- 8(5). Frons with 6 or more erect, clavate, or ornately specialised large hairs ..... 9  
 Frons with only a single pair of large erect, simple, clavate hairs, situated on its posteromedian sector ..... 10
- 9(8). Enlarged hairs of frons globular, prominent and strikingly creamy-white; 16 in number in 3 transverse rows; the anterior, transocular, row with 8 hairs, the others each with 4; ground pilosity of first gastral tergite prominent, its hairs virtual miniature versions of the enlarged globular hairs which accompany them (Figs 8–12, 46) (Sarawak, Sabah, Sumatra) ..... *E. coronata*, sp. nov.  
 Enlarged cephalic hairs erect, slender, only slightly clavate and relatively inconspicuous, golden-brown in colour; 6 in number, 4 apparently the remnants of a transocular row, and 2 behind them placed near the median occipital border. Ground pilosity of gaster fine and inconspicuous (Figs 16–18, 48) (Sarawak) ..... *E. jennya*, sp. nov.
- 10(8). Posterior occipital angles obsolete, occipital border broadly arched between the lateral occipital angles, which form the lateral extremities of the cranium (Fig. 27) (Philippines) .....  
 ..... *E. philippina* Brown & Kempf  
 Posterior occipital angles well developed, though sometimes very obtuse, the occipital border between them broadly concave (Figs 2, 19) ..... 11
- 11(10). Larger species (HW across lateral occipital angles >1.0 mm) ..... (*E. heliscata* group) ..... 12  
 Smaller species (HW <0.78 mm) ..... 13
- 12(11). Petiolar node in dorsal view distinctly longer than broad; a relatively coarsely sculptured species with prominent ground pilosity on frons, promesonotal dorsum, petiole and postpetiole; pro- and mesonotal sections of promesonotum separated by a more-or-less distinct transverse trough (Figs 19–22, 49) (W. Malaysia) .....  
 ..... *E. heliscata* Wilson & Brown  
 Petiolar node in dorsal view approximately square, its length and breadth subequal; overall less heavily sculptured, with scattered, diffuse, sparse ground pilosity of small fine hairs, not concentrated as described above (Figs 5–7, 23, 45) (Luzon, Philippines) .....  
 ..... *E. chapmani*, sp. nov.
- 13(11). Outer borders of mandibles distinctly concave, basal borders oblique, framing a narrowly transverse triangular gap against the anterior clypeal border when the jaws are closed (Fig. 24); larger species (HW >0.63 mm) (widespread: Perak to Sumatra, Sarawak, Sabah and Sulawesi) ..... *E. omnivaga*, sp. nov.  
 Outer borders of mandibles more-or-less evenly convex; posterior borders closing tightly against clypeus, without an intervening gap (Fig. 2); smaller species (HW <0.59 mm) (northern Borneo) ..... 14
- 14(13). Petiolar node distinctly longer than wide in dorsal view (Fig. 3) (Sabah) .....  
 ..... *E. browni*, sp. nov.  
 Petiolar node distinctly transverse in dorsal view (Fig. 39) (Sarawak) .....  
 ..... *E. rothschildi*, sp. nov.
- 15(3). Mandibles with a broad, low basal tooth, approximately twice as wide at base as the succeeding teeth; erect clavate hairs (except those on gastral apex) restricted to a single pair on verticocipit; HW 0.72–0.89 mm ..... 16  
 Mandibular teeth conical, subequal in size throughout; erect clavate hairs usually not distributed as above; size frequently different ..... 17
- 16(15). Propodeal teeth well developed, supporting broad infra-dental lamellae, a triangular area of propodeal dorsum anterior to their bases distinctly concave and more-or-less clearly set off from the remaining dorsum; colour medium-dark reddish brown (Solomon Is., Ysabel and Vella Lavella) ..... *E. isabellae* (Mann)  
 Propodeal teeth vestigial, surmounting very narrow infra-dental lamellae; propodeal dorsum almost entirely convex, with at most only slight traces of a posteromedian concavity; colour bright golden chestnut-brown (Manus Island) ..... *E. cinnamea* Taylor

- 17(15). Smaller species, HW < 0.75 mm ..... 18  
 Larger species, HW > 0.93 mm ..... 22
- 18(17). Posterior third of head covered thickly with conspicuous, white, orbicular squamiform hairs (including the specialised hairs, which are only weakly differentiated in this species); pilosity of anterior two-thirds of head abruptly reduced to fine, minute vestiges, this area appearing naked by contrast (N.E. New Guinea) ..... *E. biroi* (Szabó)  
 Pilosity of head otherwise; either reduced throughout or without an abrupt difference between anterior and posterior sections; specialised larger hairs, when present on dorsum of head, strongly differentiated and more-or-less clavate ..... 19
- 19(18). Specialised erect hairs of head absent (N.E. New Guinea) ..... *E. punctata* (Szabó)  
 Specialised erect hairs of head, when complement is complete, numbering 16–18, arranged in 3 transverse rows ..... 20
- 20(19). Larger species (WL > 0.65 mm); dorsal face of propodeum with an angular impression or 'step' at its midlength (New Caledonia) ..... *E. caledonica* Brown & Kempf  
 Smaller species (WL < 0.65 mm); dorsal face of propodeum forming an evenly concave slope ..... 21
- 21(20). Very small species (WL < 0.52 mm); clypeus divided by a transversely arched carina; head with 16 large erect hairs, with 8 in the anterior row (New Guinea, New Britain, Guadalcanal) ..... *E. brevicornis* (Emery)  
 Slightly larger species (WL > 0.52 mm); head with 18 or more large erect hairs, with 10 in the anterior row (apparently anomalous specimens have been reported with 11 or 12 hairs in the anterior row; Taylor 1970) (eastern Queensland and New South Wales, S. at least to lat. 30°) ..... *E. australis* Brown & Kempf
- 22(17). Mandibles broadly triangular, their posterior borders closing directly against the clypeal border, outer borders usually convex, feebly concave in 1 species ..... 23  
 Mandibles narrowed, posterior borders oblique, so that a large semicircular space is left between them and the anterior clypeal border at full closure, outer borders distinctly concave (N. New Guinea) ..... *E. szentivanyi* Taylor
- 23(22). Posterior angles of occipital lobes in full-face view very distinctly acute; head, mesosoma and nodes coarsely rugose; posterior sides of mesosoma covered with coarse diagonal costation; first gastral tergite, except for a narrow median strip, uniformly covered with conspicuous, subreclinate, squamiform hairs (larger hairs differentiated in queens, but not in workers); HW > 1.33 mm (Fiji Is) ..... 24  
 Posterior occipital angles slightly obtuse or at most very feebly acute; body variously sculptured, but never so extensively rugose; posterior sides of mesosoma nearly smooth, at most feebly punctate or shagreened, and usually more-or-less shining; first gastral tergite with ground pilosity minute, sparsely and unevenly distributed, or obsolete, 1 or more pairs of erect clavate hairs often present on its disc; HW only rarely exceeding 1.30 mm ..... 25
- 24(23). Frons rugose, the individual rugae more-or-less straight, transverse posteriorly, and longitudinal above the eyes, but diverging on each side posteriorly, to form a triangular figure around the centre of the head; a strong transverse series of rugae on and behind the nuchal collar ..... *E. emeryi* (Forel)  
 Frons coarsely rugo-reticulate; virtually no straight rugae either on head or nuchal collar; the frontal rugae so dense and strong that the spaces between them are pit-like ..... *E. insidiatrix* Taylor
- 25(23). CI of holotype 102; specialised erect hairs lacking except on the leading edges of scapes and at gastral apex; mesosomal profile a more-or-less evenly convex arc ..... *E. hoplites* Taylor  
 CI 106–114; a pair of erect specialised hairs at least on the verticoccpit and pronotum; mesosomal profile biconvex ..... 26
- 26(25). Ventral profile of petiole finely serrate; first gastral tergite with up to 8 erect clavate hairs arranged in 2 longitudinal rows; head and promesonotum with similarly intense sculpturing (widespread, ranging from Asia to Samoa and N. Queensland) .... *E. procera* (Emery)  
 Ventral profile of petiole without serrations; first gastral tergite without erect clavate hairs; head smooth, with scattered medium punctures, contrasting strongly with the coarsely rugo-reticulate promesonotum (Guadalcanal, Solomon Is) ..... *E. greensladei* Taylor

## Descriptions of New Species

### Shared Attributes

The species described below share a number of attributes, which are itemised here to

avoid repetition in individual descriptions. Alternative conditions are represented in other Indo-Australian species. Two classes are recognised:

*Class A* attributes are present in all 9 species; they include:

- (1) Mandibular teeth conical, similar throughout in size and shape, the basal member of each series much like the others, not expanded or blade-like.
- (2) Frons lacking pronounced bilateral tumosities between or behind the levels of the eyes (or their usual position if they are lacking), its widest part more-or-less evenly arched-convex when viewed tangentially from behind, with at most only traces of tumose swellings.
- (3) Posterior occipital angles either approximately right-angled or distinctly obtuse, always exceeding 80° in frontal view.
- (4) Promesonotal dorsum barely raised, if at all, above the propodeal dorsum, its dorsal outline in side view much less than semicircular.
- (5) Propodeal dorsum a more-or-less even, posteriorly directed slope.
- (6) Sculpturation rather uniform throughout.
- (7) Sides of mesosoma sculptured similarly to its dorsum, often more finely so, and lacking extensive smooth shining areas.
- (8) Ground pilosity of posterior third of face generally similar to that of anterior  $\frac{2}{3}$ .
- (9) The colour in all species is dull medium or reddish-brown, with the specialised enlarged hairs and ground pilosity light in colour, ranging from creamy-white to golden-brown, depending on the species.

*Class B* attributes are found in most of the new species, unless otherwise indicated in the relevant descriptions. They include:

- (1) Outer mandibular borders in frontal view partly straight or concave, not entirely convex.
- (2) Posterior borders of mandibles closing directly against the clypeus, without an intervening gap.
- (3) Face of clypeus between frontal lobes more-or-less planar, without a transverse ridge.
- (4) Mesosomal profile a continuous curve, not interrupted at the promesonotal/propodeal junction by a notch or step in the level of the outline.
- (5) Metanotal groove lacking, either as an incised line or as a distinctly delimited trench.
- (6) Head, mesosomal dorsum, nodes and gaster coarsely and closely punctate (with sculpturation of the type sometimes referred to as 'thimble-like').

Several species (which constitute the group of *E. platisquama*) have ground pilosity of remarkable large, squamous, silvery hairs, with tessellated, feather-down-like margins (Figs 33, 34). These are densely arrayed on the frons and other dorsal body surfaces (Figs 30–32). These hairs are unlike any described previously for basicerotine ants, which are notable for their frequently aberrant, even eccentric pilosity (Hölldobler & Wilson 1986).

*E. browni*, sp. nov.

(Figs 2–4, 44)

*Type Locality*

**Malaysia: Sabah:** *Lungmanis, mile 45* (Labuk Rd, ex Sandakan) (05°52'N., 118°04'E.).

*Distribution, Type Deposition*

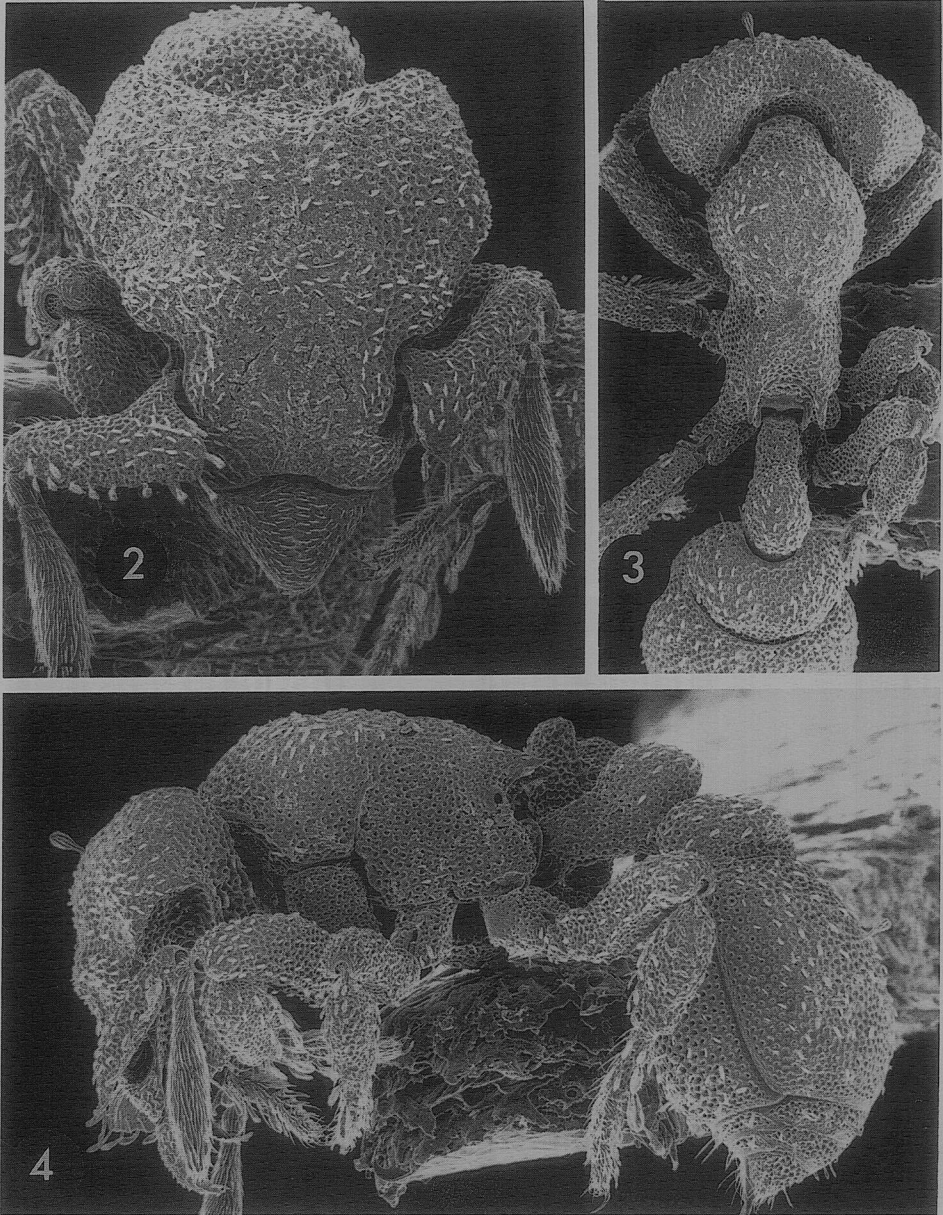
Known only from the unique worker holotype, collected from berlesate, rainforest leaf mould (RWT acc 68.502, 12–13.vi.1968). In ANIC (type No. 7775); the specimen gold-palladium coated for SEM study.

Named for Professor W. L. Brown Jr, of Cornell University.

*Worker*

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (mm): HL 0.50; HW 0.53; CI 106; ML 0.12; MI 24; SL 0.29; SI 55; PW 0.29; WL 0.56. Eyes either lacking or imperceptibly minute.

Face of clypeus between frontal lobes divided by an almost vestigial low, transverse welt. Frons spanned by a slightly arched, shallowly depressed groove emanating on each side at about the normal position of the eye; bordered anteriorly by a conspicuous transverse welt. Occipital border broadly and distinctly emarginate (its outline comparatively somewhat 'V' shaped; not an even arc); occipital angles approximately right angular. Mesosomal profile almost a continuous curve, but interrupted at the promesonotal/propodeal junction by a minute, very feebly indented notch. Metanotal groove weakly incised dorsally as a distinct trench which more-or-less severs the surrounding sculpture. Petiolar node in dorsal view distinctly longer than wide. Specialised enlarged hairs lacking on promesonotum, petiole and postpetiole, represented only by one pair on the frons (one hair has been lost from the holotype); the remaining hair clavate, expanded to about  $\frac{1}{3}$  its maximum height, well



Figs 2-4. *Eurhopalothrix browni*, holotype worker, standard views, see description for dimensions.

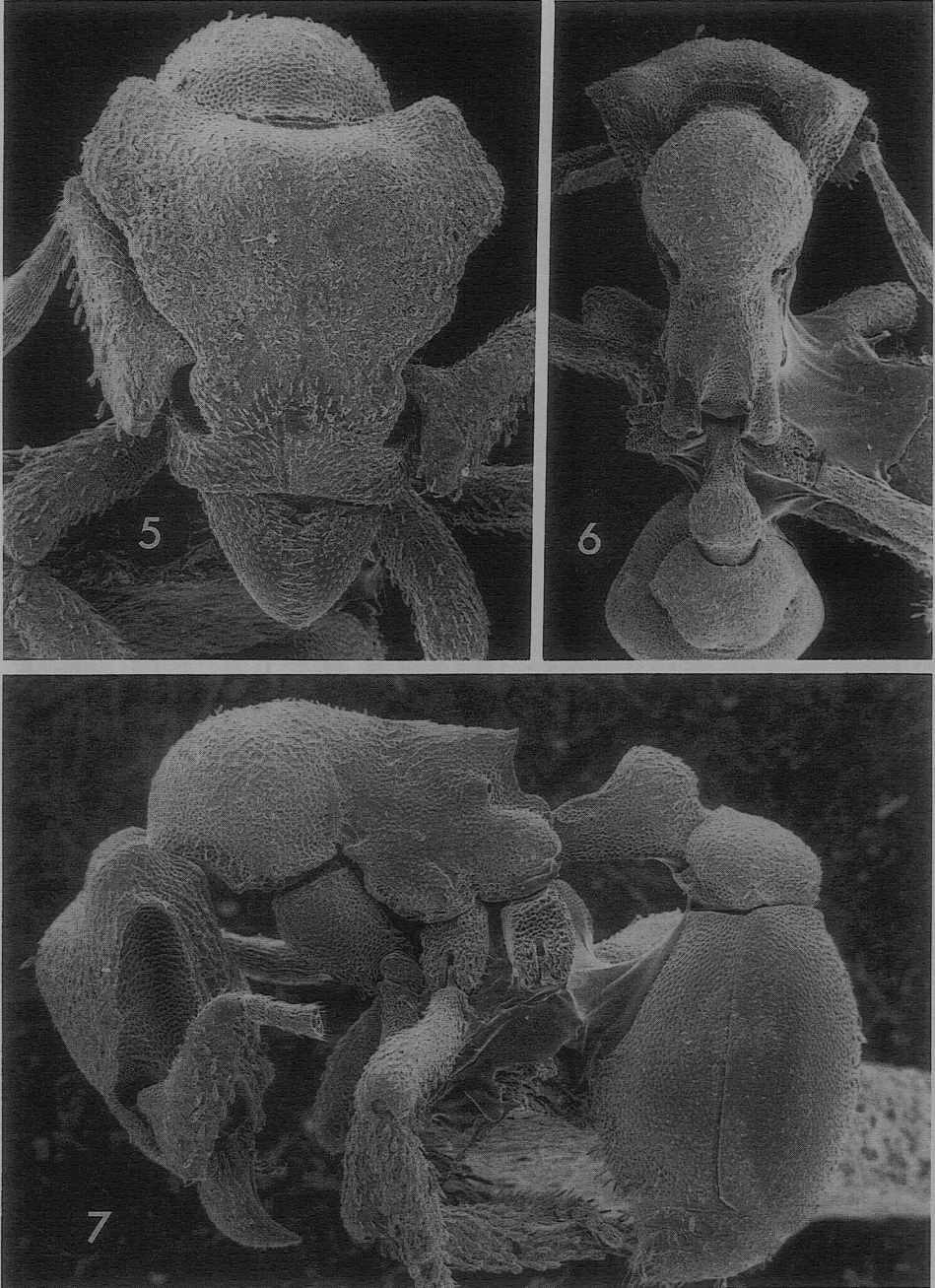
differentiated from the minute ground pilosity. Several such hairs at least are probably normally present on the dorsal surface of first gastral tergite, where the holotype has a single, unpaired, club-shaped mediolateral hair. Ground pilosity minute, scattered, moderately prominent on gastral dorsum.

*E. chapmani*, sp. nov.

(Figs 5-7, 23, 45)

*Type Locality*

**Philippines: Luzon: Ateneo De Manila, Quezon City (14°38'N., 121°02'E.).**



Figs 5-7. *Eurhopalothrix chapmani*, holotype worker, standard views, see description for dimensions.



*Distribution, Type Deposition*

Known only from the unique worker holotype, collected from the base of a rotten pole in a bamboo thicket (B. B. Lowery, 8.vii.1978). In ANIC (type No. 7776); the specimen gold-palladium coated for SEM study.

Named for the late American Philippines teacher and myrmecologist James W. Chapman.

*Worker*

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (mm): HL 1.01; HW 1.05; CI 104; ML 0.29; MI 29; SL 0.64; SI 62; PW 0.61; WL 1.21. Outer mandibular borders in frontal view broadly and more-or-less evenly convex. Eyes rather small, with 6–8 facets. Posterior occipital angles approximately 90°. Promesonotal profile almost straight, very shallowly and broadly depressed about the mesonotal/propodeal junction. Propodeal dorsum only slightly depressed posteriorly between the bases of the teeth.

A single pair of specialised erect hairs (one of which has been lost by the holotype) bilaterally near the midline on posterior part of frons, the hairs small and only slightly clubbed. Similar hairs on last 3 exposed gastral sternites, and posteromedially on first tergite; otherwise lacking. Pubescence reduced, its hairs small and scattered, except on posterior part of frons, occipital lobes, and dorsa of pronotum, petiole and postpetiole.

Resembling *E. heliscata* Wilson & Brown, 1984; with the following salient differences:

(1) Sculpturation finer and less strongly delimited, as follows:

Mandibles coarsely punctate with shining interspaces, somewhat rugose at their bases. Head, mesosoma and nodes moderately finely punctate-shagreened (unlike other species described here), sculpturing less sharply defined elsewhere on mesosomal dorsum, and especially on waist nodes; frons and pronotal dorsum tending to be more rugulose, though very finely so; gastral dorsum slightly more finely sculptured than elsewhere.

(2) Generally less 'craggy' in appearance (compare Figs 5–7 with 19–21). Surfaces of frons and occipital lobes smoothly rounded, where in *E. heliscata* the frons has a transverse anterior tumosity behind the broadly depressed fronto-clypeal suture, relatively strong swellings under each of the two enlarged cephalic hairs, and the apices of the frontal lobes are somewhat more abruptly swollen anteriorly. Postpetiolar dorsum almost entirely convexly curved, with a relatively featureless surface, where in *E. heliscata* its disc is more-or-less flattened anteromedially, and somewhat depressed behind the slightly raised rim-like anterior edge; the posterior portion of the dorsum is bitumose when viewed obliquely along the long-axis of the body, with a shallowly depressed median channel running back from the anteromedian section.

(3) Pronotal dorsum a transversely even arch, where in *E. heliscata* it is distinctly bitumose in transverse profile.

(4) Petiolar node in dorsal view about as long as wide, v. distinctly longer than wide in *E. heliscata*.

*E. chapmani* seems to be close to *E. heliscata* as implied above, and both species are probably related to *E. procera* (compare Figs 5–7, 19–21, and 35–37).

*E. coronata*, sp. nov.

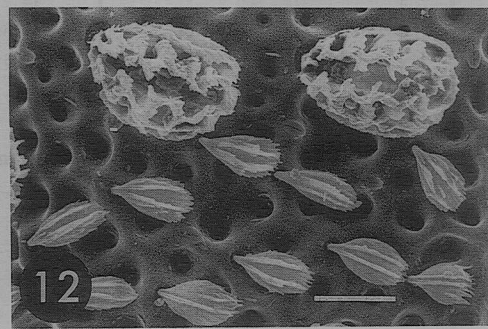
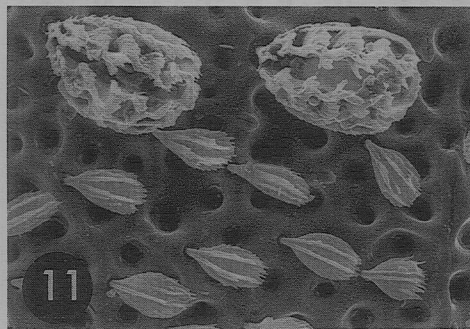
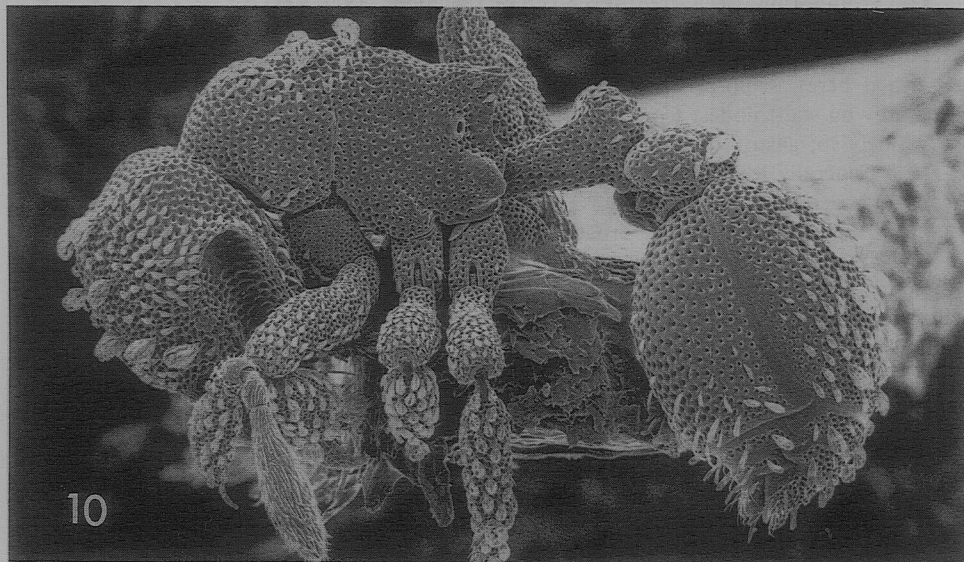
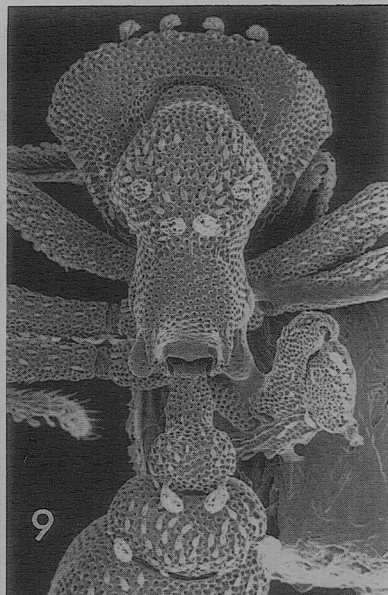
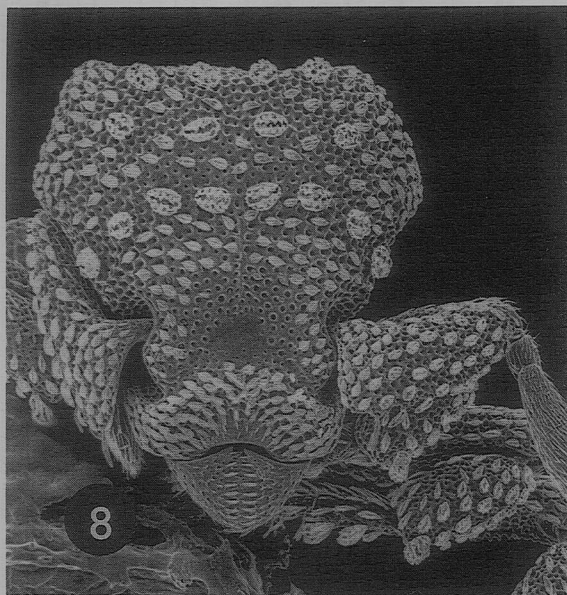
(Figs 8–12, 46)

*Type Locality*

**Malaysia: Sabah:** *Quoin Hill Research Station*, near Tawau (04°16'N., 117°54'E.).

*Distribution, Material Examined*

**Malaysia: Sarawak: First Division:** *Kampong Segu*, near Kuching, 1 paratype worker (RWT acc 68.249, 4.iv.1968); **Sabah:** *Quoin Hill Research Station*, (type locality), 750 ft, holotype worker (RWT acc 68.614, 16–69 vi.1968); **Indonesia: Sumatra: Liwa** (05°04'S., 104°03'E.), 1 paratype worker (M. S. Harvey, 5.ix.1984). All specimens from Berlese funnel or Winkler bag extractions of rainforest leaf mould.



Figs 8–12. *Eurhopalothrix coronata*, holotype worker; 8–10, standard views, see description for dimensions; 11, 12, details of cephalic pilosity (right inner enlarged hairs and adjacent enlarged pubescence)—stereoscopic pair, scale line 20  $\mu$ .

Figs 11, 12. *Eurhopalothrix coronata*, holotype worker, standard views, see description for dimensions.



*Type Deposition*

All types in ANIC (type No. 7777). The holotype gold-palladium coated for SEM study.

*Worker*

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (holotype, mm): HL 0.51; HW 0.50; CI 102; ML 0.09; MI 21; SL 0.30; SI 60; PW 0.25; WL 0.50. Both the paratypes have HW 0.52 mm. Outer mandibular borders more-or-less continuously (feebly) convex in frontal view. Face of clypeus between frontal lobes divided by a relatively very distinct, obtuse, transversely arched ridge. Eyes small but distinct, 4- or 5-faceted. Occipital border broadly but shallowly emarginate, the outline an even arc. Mesosomal profile not a continuous curve, its outline shallowly depressed at the promesonotal/propodeal junction; mesometanotal suture, however, represented only as a narrow depression without an incised groove severing the underlying sculpture. Petiolar node in dorsal view distinctly wider than long.

Specialised enlarged hairs well differentiated from those of ground pilosity; each globose, expanded at about half its height, with a relatively thick basal stem. Distributed (when complement is complete) as follows: 16 on frons, in 3 transverse rows. The middle and posterior rows each with 4 hairs, the anterior with 8; 2 pairs on promesonotum (lateral and posterolateral), and a single posterolateral pair each on the petiolar node and post-petiole. About 18 such hairs on dorsum of first gastral tergite, arranged roughly in 4 longitudinal rows of 4, 5, 5 and 4. The accompanying scattered hairs of the ground pilosity relatively large, about  $\frac{1}{3}$  to  $\frac{1}{2}$  the height of the specialised major hairs, and generally of similar structure, but relatively a little less inflated; ground pilosity elsewhere well developed, as illustrated.

*E. dubia*, sp. nov.

(Figs 13–15, 47)

*Type Locality*

**Malaysia: Sabah:** *Umas Umas*, near Tawau (04°16'N., 117°54'E.).

*Distribution, Material Examined*

**Malaysia: Sabah:** *Lungmanis*, mile 45 (Labuk Rd, ex Sandakan), 4 paratype workers (RWT accs 68.475, 502, 12–13.vi.1968); *Sepilok Forest Reserve*, near Sandakan (05°52'N., 118°04'E.), paratype worker (RWT acc 68.451, 12.vi.1968); *Umas Umas* (type locality), holotype, 7 paratype workers, 2 paratype queens (RWT accs 68.626, 627, 12–13.iv.1968). All specimens from Berlese funnel extractions of rainforest leaf mould.

*Type Deposition*

Holotype and paratypes in ANIC (type No. 7778), holotype gold-palladium coated for SEM study. Worker paratypes in BMNH, MCZC, MKUB.

*Worker*

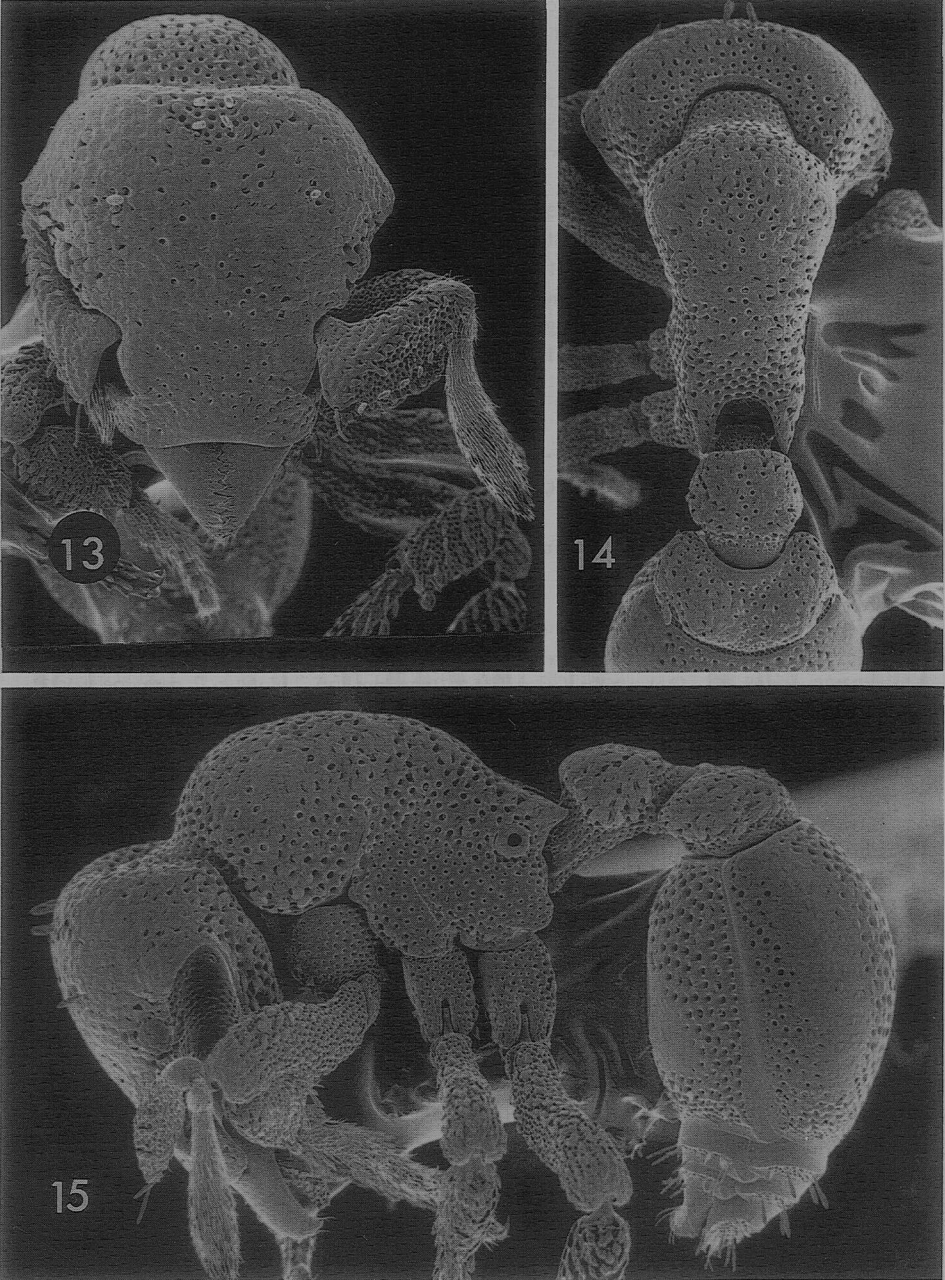
General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (holotype, mm): HL 0.69; HW 0.74; CI 107; ML 0.17; MI 25; SL 0.40; SI 54; PW 0.44; WL 0.78. The smallest (*Umas Umas*) and largest (*Lungmanis*) paratypes have HW 0.73 and 0.85 mm respectively. Occipital border almost straight, transverse [its outline at most minutely curved (usually concave) or sinuate]. Petiolar node in dorsal view essentially square, with its length and breadth subequal, to distinctly but moderately wider than long.

Frons and clypeus almost entirely, and other dorsal body surfaces extensively, covered by a ground pilosity of dense, flattened, thoroughly appressed, squamous, shining silvery hairs, which are almost contiguous and fill or overlap the punctures bearing them. These hairs with feathered margins under SEM examination. Specialised erect hairs also present, well differentiated from those of the ground pilosity. Each clavate, barely expanded, though relatively thick and columnar; distributed (when complement is complete) as follows: 6 on frons: 2 pairs grouped posteromedially at the occipital border in a tight square array (the

hairs spaced by about their average length); the other 2 hairs each midway between this group and the ipsilateral eye. Such hairs lacking on promesonotum and petiolar node, and on dorsum of first gastral tergite; one pair (posterolateral) on postpetiole. Ground pilosity of scapes and legs dense, generally less specialised than on body, though squamous hairs are present on the antennal scapes and humeral knees.

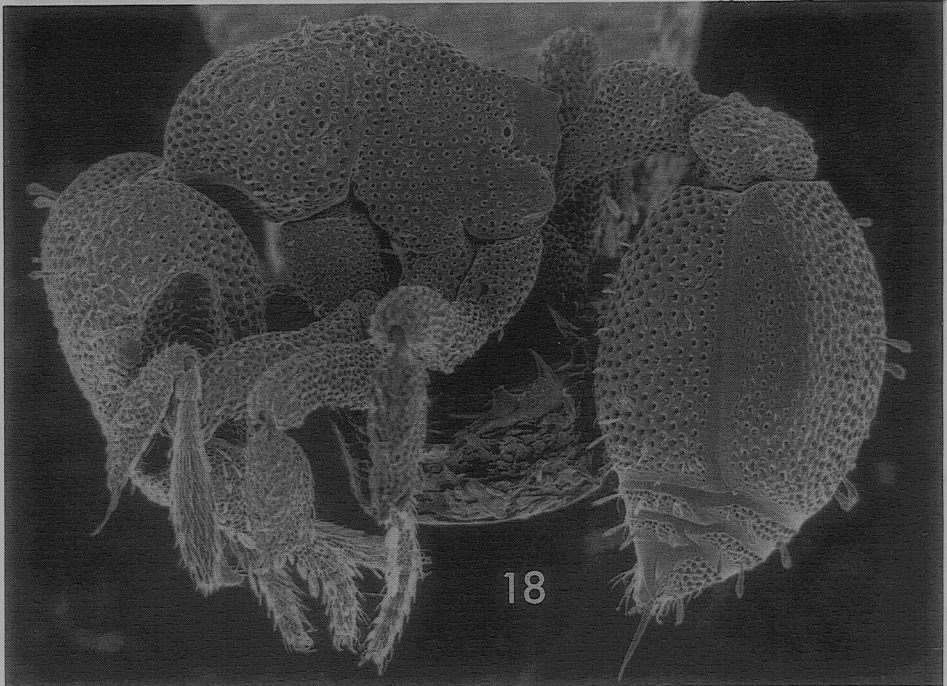
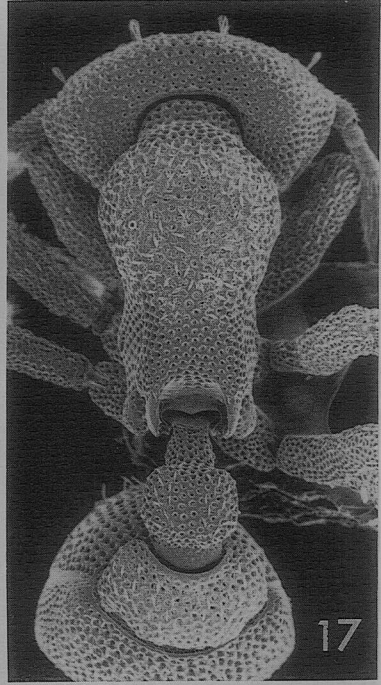
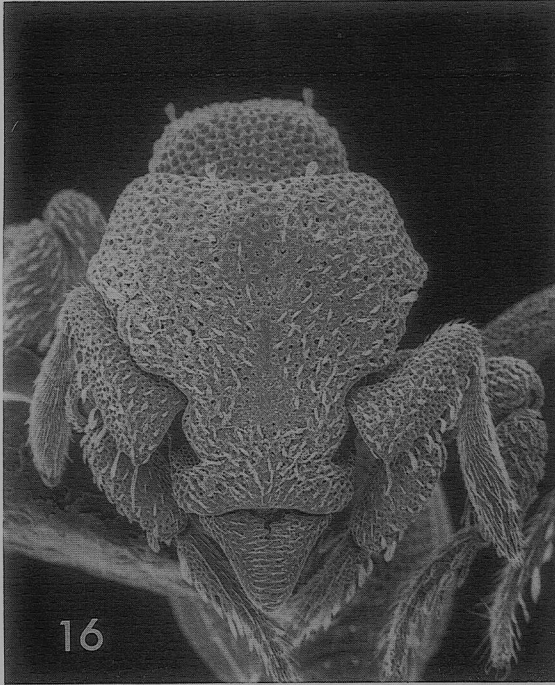
### Queen

General features as in the worker, with the usual differences of full alate sexuality. Specialised hairs of head and postpetiole as in worker. Additional such hairs (maximum



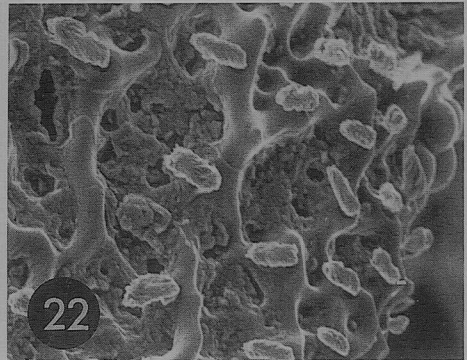
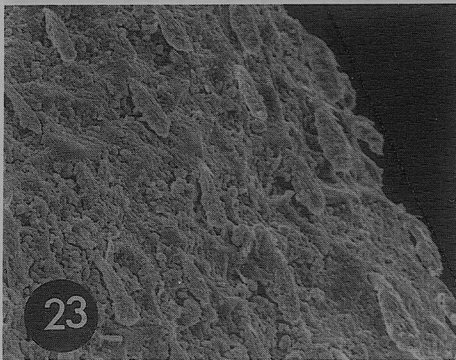
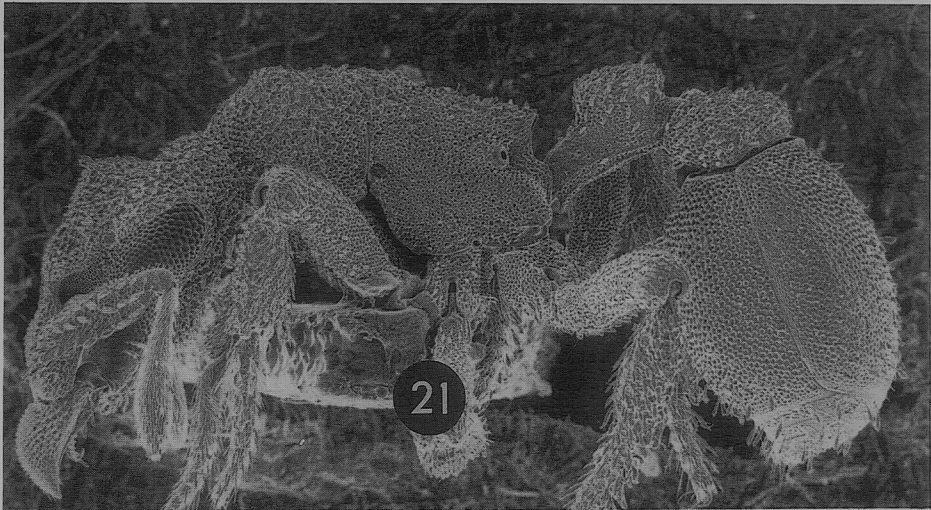
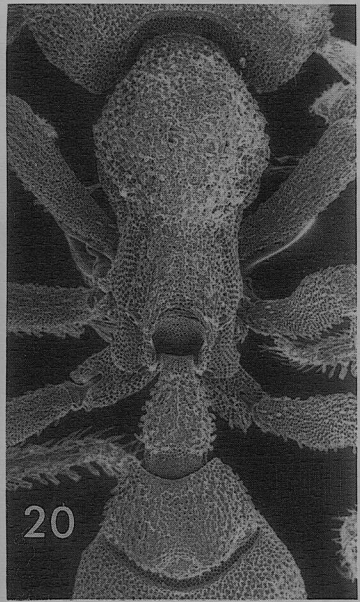
Figs 13–15. *Eurhopalothrix dubia*, holotype worker, standard views, see description for dimensions.

known complement; apart from those at the gastral apex) as follows: 2 pairs (relatively slender), well separated, on anterior disc of scutum; thicker hairs on each side on postero-lateral extremities of scutum, and on disc of scutellum; 8 slender hairs in 2 longitudinal rows on first gastral tergite.



Figs 16–18. *Eurhopalothrix jennyia*, holotype worker, standard views, see description for dimensions.





Figs 19–23. *Eurhopalothrix heliscata* Wilson & Brown, paratype worker (Sungei Menyala Forest Reserve, Negeri Sembilan, W. Malaysia; ANIC); 19–21, standard views, HW 1.11 mm; PW 0.59 mm; WL 1.20 mm; 22, details of cephalic sculpturing, near left eye (visible at right), scale line 20  $\mu$ . 23, *Eurhopalothrix chapmani* holotype worker, details of sculpturing near apex of left occipital lobe, scale as for Fig. 22.

*E. jennya*, sp. nov.

(Figs 16–18, 48)

*Type Locality***Malaysia: Sarawak: First Division: Kampong Segu**, 20 miles S.W. of Kuching (01°33'N., 110°20'E.).*Distribution, Material Examined*

**Malaysia: Sarawak: Forest Division: Kampong Segu**, holotype, 15 paratype workers, 2 paratype queens (RWT accs 68.289, 291, 292, 4.vi.1968); **Fourth Division: Gunong Mulu National Park**, near Marudi (04°15'N., 114°19'E.), 21 paratype workers (P. Hammond, J. E. Marshall, v–viii.1978); (*Long Palau*), 4 paratype workers (B. Bolton, 2.ix.1977). All samples from lowland rainforest, usually from leaf litter berlesates.

Named for my friend Jenny Rothschild, formerly of Semengoh Research Station, near Kuching, Sarawak. The name should be considered a noun in apposition.

*Type Deposition*

Holotype and most paratypes in ANIC (type No. 7779); holotype gold-palladium coated for SEM study. Paratypes in BMNH, LACM, MCZC, MKUB, MKUC.

*Worker*

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (mm): HL 0.57; HW 0.61; CI 106; ML 0.16; MI 28; SL 0.33; SI 54; PW 0.37; WL 0.66. The Kampong Segu paratypes have HW 0.59–0.63, and those for Gunong Mulu 0.58–0.63. Eyes minute, with 4 to 6 facets. Occipital border broadly, distinctly, but relatively shallowly emarginate. Petiolar node in dorsal view essentially square, its length and breadth subequal.

Specialised enlarged hairs well differentiated from those of the ground pilosity. Each clavate, expanded to about  $\frac{1}{4}$  its height. Distributed (when complement is complete) as follows: 3 pairs on frons, where the hairs are well dispersed; 4 frame a large transverse, posteromedian rectangle (the posterior pair dividing the occipital border approximately into thirds), with one on each side immediately behind the eye. In effect the head has 2 transverse rows, the anterior of 4 hairs, the posterior of 2, with the latter each aligned longitudinally with one of the median anterior hairs. Promesonotum with an erect dorso-lateral hair on each side, at about its mid length (one or both of these hairs is frequently missing from specimens). One pair (posterolateral) on petiolar node (missing from holotype), and 6 on dorsal surface of first gastral tergite, arranged in 2 longitudinal rows of 3 [one K. Segu paratype has a 4th hair (? supernumerary) on one side]. None of the type workers has posterolateral erect hairs on the postpetiole, similar to those of the queen (see below). Slight impressions in the appropriate positions imply that these have been present, but were lost in all specimens examined. The equivalent postpetiolar hairs in other species seem to be more deciduous than those in other positions. Ground pilosity of minute scattered hairs is moderately dense on all dorsal body surfaces, scapes and legs.

*Queen*

General features as in the worker, with the usual differences of full alate sexuality. Specialised hairs of head and petiole as in worker. Additional such hairs on the 2 available specimens (apart from those at the gastral apex) as follows: 1 pair at posteromedian border of pronotum; 2 pairs (relatively short and slender) in 2 longitudinal rows on disc of scutum; 2 pairs placed respectively laterally and posterolaterally on margin of scutum; a pair laterally on scutellum; and a posterolateral pair on postpetiole. Twelve hairs are scattered on the first gastral tergum, loosely arranged in 4 longitudinal rows.

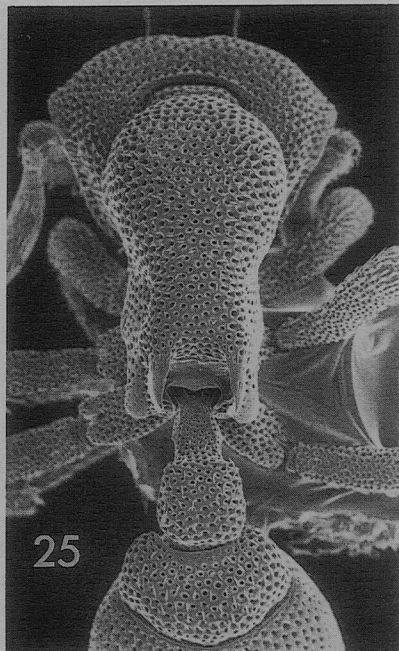
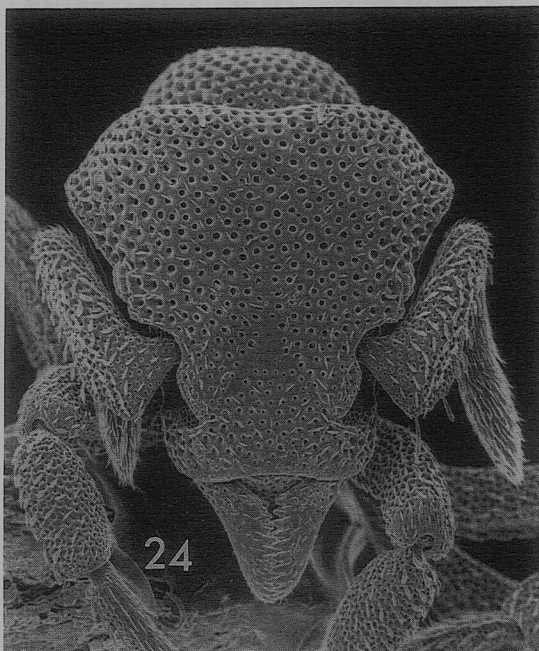
*E. omnivaga*, sp. nov.

(Figs 24–26, 50)

*Type Locality***W. Malaysia: Selangor: Ulu Gombak Field Station**, near Kula Lumpur (03°08'N., 101°42'E.).

*Distribution, Material Examined*

**W. Malaysia: Perak:** *Cameron Highlands* (Sungei Simei Falls), 11 worker paratypes, 1 queen paratype (T. Jaccoud & P. Marcuard, 25–28.iii.1977); **Selangor:** *Ulu Gombak Field Station* (type locality), holotype 16 worker paratypes, 2 queen paratypes (RWT accs 68.785, 788, 848–9, 851, 11–14.vii.1968); 3 worker paratypes (B. Bolton, 7.x.72); *Upper Gombak Valley*, worker paratype (D. H. Murphy, 9.ii.1967); 1500 ft, 7 worker paratypes (RWT acc 68.848, 13.vii.1968; 10 km E. of



**Figs 24–26.** *Eurhopalothrix omnivaga*, holotype worker, standard views, see description for dimensions.

*Kuala Kubu Bahru* (03°35'N., 101°37'E.), worker paratype (D. H. Murphy, v.1955); **West Johore: Gunong Pulai**, near Johore Bahru (01°29'N., 103°44'E.) (D. H. Murphy, 17.iii.1963); **Sarawak: First Division: Semengoh Nature Reserve**, near Kuching (01°33'N., 110°20'E.), numerous worker paratypes, 2 queen paratypes, (RWT accs 68.202, 259–262, 778–80, 784, various dates between 28.v. and 20.vi.1968); *Mt Santubong*, near Kuching, 1800 ft, 2 worker paratypes (G. H. L. Rothschild, 5.vi.68); **Fourth Division: Gunong Mulu National Park (Long Palau)**, 3 worker paratypes (B. Bolton, 18.x.77); **Sabah: Lungmanis, mile 45** (Labuk Rd, ex Sandakan), paratype worker (RWT acc 68.476, 12–13.vi.1968); *Sepilok Forest Reserve*, near Sandakan, 7 paratype workers, 1 paratype queen (RWT acc 68.451, 12.vi.1968); *Sibuga*, near Sandakan, 1 worker paratype, 1 queen paratype (RWT acc 68.378, 9.vi.1968); *Umas Umas*, near Tawau, 7 paratype workers, paratype queen (RWT accs 68.626, 627, 12–13.vi.1968); *Quoin Hill Research Station*, near Tawau, 750 ft, 36 worker paratypes, queen paratype (RWT accs 68.613–7, 619–621, 16–19.vi.1968). **Indonesia: Sumatra: Liwa**, 9 paratype workers (M. S. Harvey, 5.ix.1984); **Sulawesi: Dumoga-Bone National Park** (00°33'N., 123°59'E.), c. 200 m (M. Horak, 4.iii.1985); *Ranu River*, 3 worker paratypes (M. Grandell, 4.iii.1985). All specimens from Berlese funnel extractions of rainforest leaf litter or mould.

#### Type Deposition

Holotype and most paratypes in ANIC (type No. 7780); holotype gold-palladium coated for SEM study. Worker paratypes in BMNH, BPBM, LACM, MHNG, MKUB, MKUC.

#### Worker

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (mm): HL 0.66; HW 0.71; CI 108; ML 0.21; MI 32; SL 0.42; SI 59; PW 0.44; WL 0.81. Posterior borders of mandibles oblique, framing a narrow, roughly triangular transverse gap against the clypeus when closed. Eyes moderately large, with 6–8 facets. Occipital border broadly, distinctly, but relatively very shallowly emarginate; posterior occipital angles almost obliterated, broadly rounded and very obtuse (about 120°). Petiolar node in dorsal view essentially square, its length and breadth subequal (any bias longitudinal). One pair of specialised enlarged hairs only on frons, each hair clavate, barely expanded, very slender, almost parallel-sided and apically pointed. Such hairs are apparently normally lacking on promesonotum, petiolar node, postpetiole, and dorsum of first gastral tergite; a few large hairs, as usual, at the gastral apex. Ground pilosity almost lacking, except a few small hairs on the postpetiolar dorsum, scapes, tibiae and tarsi, and exceedingly minute hairs in the punctures of the first gastral tergum.

Mainland Malaysian specimens and those from the Kuching area collectively have HW 0.66–0.75; the 3 from Gunong Mulu 0.65–0.70; those from Sabah 0.63–0.68, and specimens from Sulawesi 0.63–0.66. Reduction in average size of *E. omnivaga* workers from west to east thus seems evident. The series from Liwa, Sumatra, has the largest specimens of all with HW 0.73–0.78.

#### Queen

General features as in the worker, with the usual differences of full alate sexuality. Specialised posterior cephalic hairs as in worker. Additional such hairs (maximum known complement; apart from those at the gastral apex) as follows: a single hair above each eye [represented in 4 of 7 specimens (these from Sungei Simei Falls, Quoin Hill and Sepilok), and thus probably easily lost]; those of pronotum, scutum and scutellum as described above for *E. jennya* (and apparently homologous); a single posterolateral pair on postpetiole, apparently homologous with those of other species (although they are lacking on *E. omnivaga* workers); gastral hairs more abundant than in the worker, less-clearly deployed in longitudinal rows (again similar to the condition in *E. jennya*). The mesosomal hairs seem to be easily shed, and most specimens have an incomplete complement.

*E. omnivaga* is sympatric in parts of its range in West Malaysia or Borneo with all 8 other species of Asian *Eurhopalothrix* described here, and with *E. heliscata* (Fig. 1). It is undoubtedly also sympatric in places with *E. procera*, judging from the known records of the latter (Brown & Kempf 1960, fig. 56).

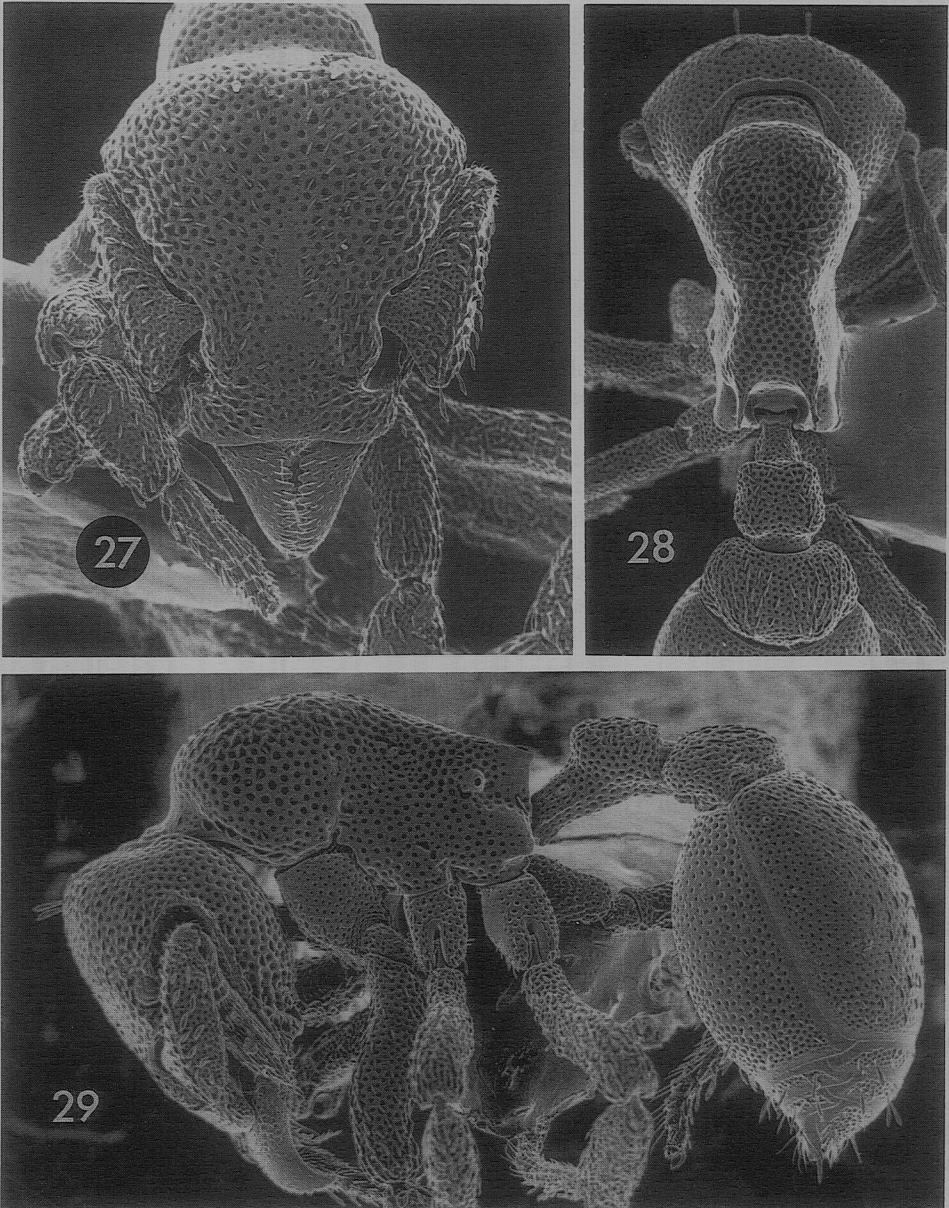


*E. philippina* Brown & Kempf

(Figs 27-29, 51)

*Distribution*

This species was described from near Dumaguete (09°20'N.,123°18'E.), Negros I., Philippines. The following record considerably extends its range: **Philippines: Luzon: Mt Makiling**, c. 150 ft below summit, in litter (R. A. Morse, ii.1965) (specimens in MCZC and ANIC).



Figs 27-29. *Eurhopalothrix philippina* Brown & Kempf, worker (Mt Makiling, Luzon, Philippines (ANIC), standard views, HW 0.65 mm; PW 0.41 mm; WL 0.78 mm.

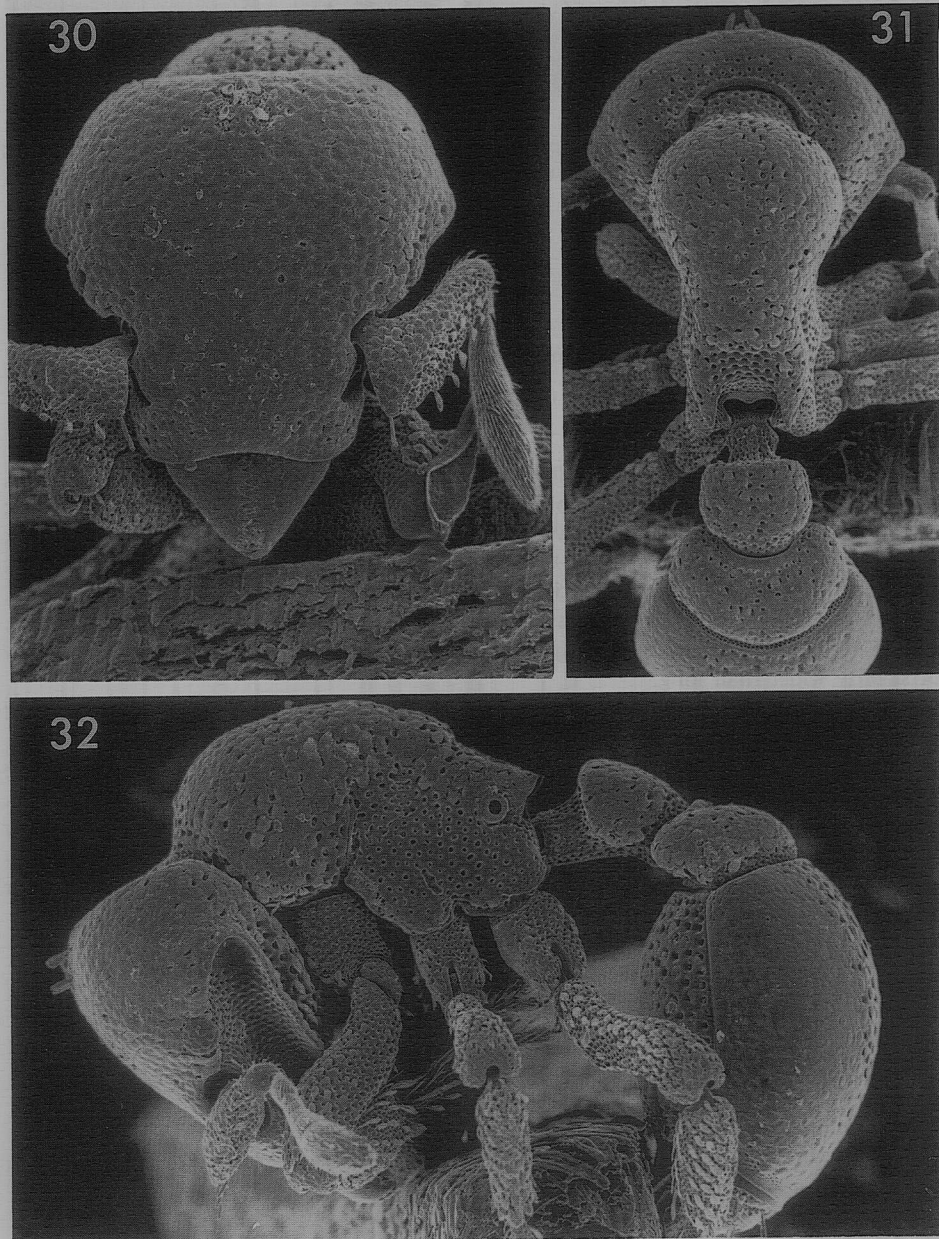


*E. platisquama*, sp. nov.

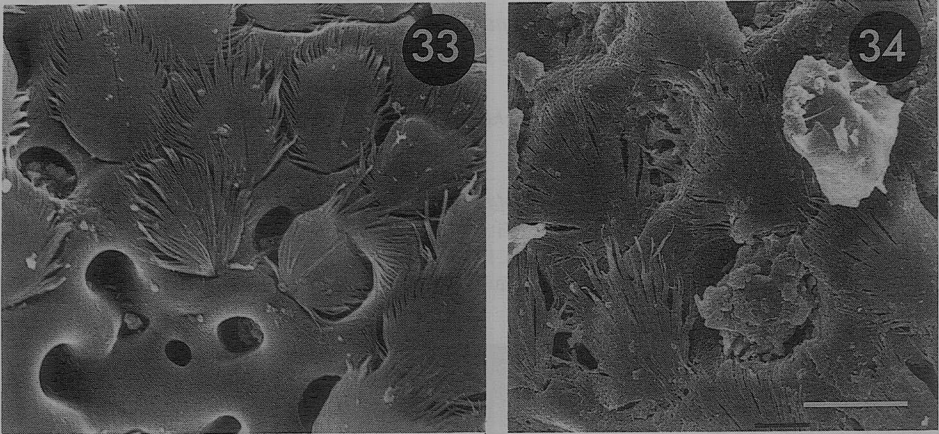
(Figs 30–33, 52)

*Type Locality***W. Malaysia: Pahang/Perak:** *Cameron Highlands* (04°30'N., 101°34'E.).*Distribution, Material Examined*

**W. Malaysia: Selangor:** *Ulu Gombak Field Station*, 3 paratype workers (B. Bolton, 7.x.73); **Pahang/Perak:** *Cameron Highlands* (type locality), 3200 ft, holotype, paratype worker, valley floor, upper dipterocarp forest (D. H. Murphy, 8.viii.1964). **Indonesia: Sumatra: Liwa**, 9 paratype workers (M. S. Harvey, 5.ix.1984). All specimens from Berlese funnel or Winkler bag extractions of leaf rainforest mould.



**Figs 30–32.** *Eurhopalothrix platisquama*, holotype worker, standard views, see description for dimensions.



**Figs 33, 34.** Details of specialised ground pilosity: 33, *Eurhopalothrix platisquama*, side of mesothorax; 34, *Eurhopalothrix seguensis*, side of pronotum; worker holotypes, scale line 20  $\mu$ .

#### *Type Deposition*

Holotype in ANIC (type No. 7781), gold-palladium coated for SEM study. Paratypes in BMNH, MCZC, MKUB.

#### *Worker*

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (mm): HL 0.76; HW 0.85; CI 112; ML 0.19; MI 25; SL 0.43; SI 50; PW 0.49; WL 0.86. The Cameron Highlands and U. Gombak specimens collectively have HW 0.84–0.85, and those from Liwa 0.82–0.86. Eyes relatively large, each with about 20 facets, maximum diameter approaching that of a funicular club. Occipital border almost straight, transverse (its outline at most minutely curved or sinuate). Petiolar node in dorsal view essentially square, its length and breadth subequal to distinctly but slightly wider than long.

Frons and most dorsal body surfaces, sides of pronotum and undersides of head and gaster covered almost entirely by a ground pilosity of dense, flattened, thoroughly appressed, squamous, shining silvery hairs, which are almost contiguous and fill or overlap the punctures bearing them. These hairs with feathered edges under SEM examination. Specialised hairs well differentiated from the enlarged ground pilosity. Each clavate, barely expanded, though somewhat thick and columnar; 2 pairs only on frons, grouped posteromedially in a tight square array (the hairs spaced by about their average length); one pair (posterolateral) on postpetiole (missing from holotype); lacking elsewhere.

#### *E. rothschildi*, sp. nov.

(Figs 38–40, 54)

#### *Type Locality*

**Malaysia: Sarawak: First Division: Mt Santubong** (05°52'N., 118°55'E.), near Kuching.

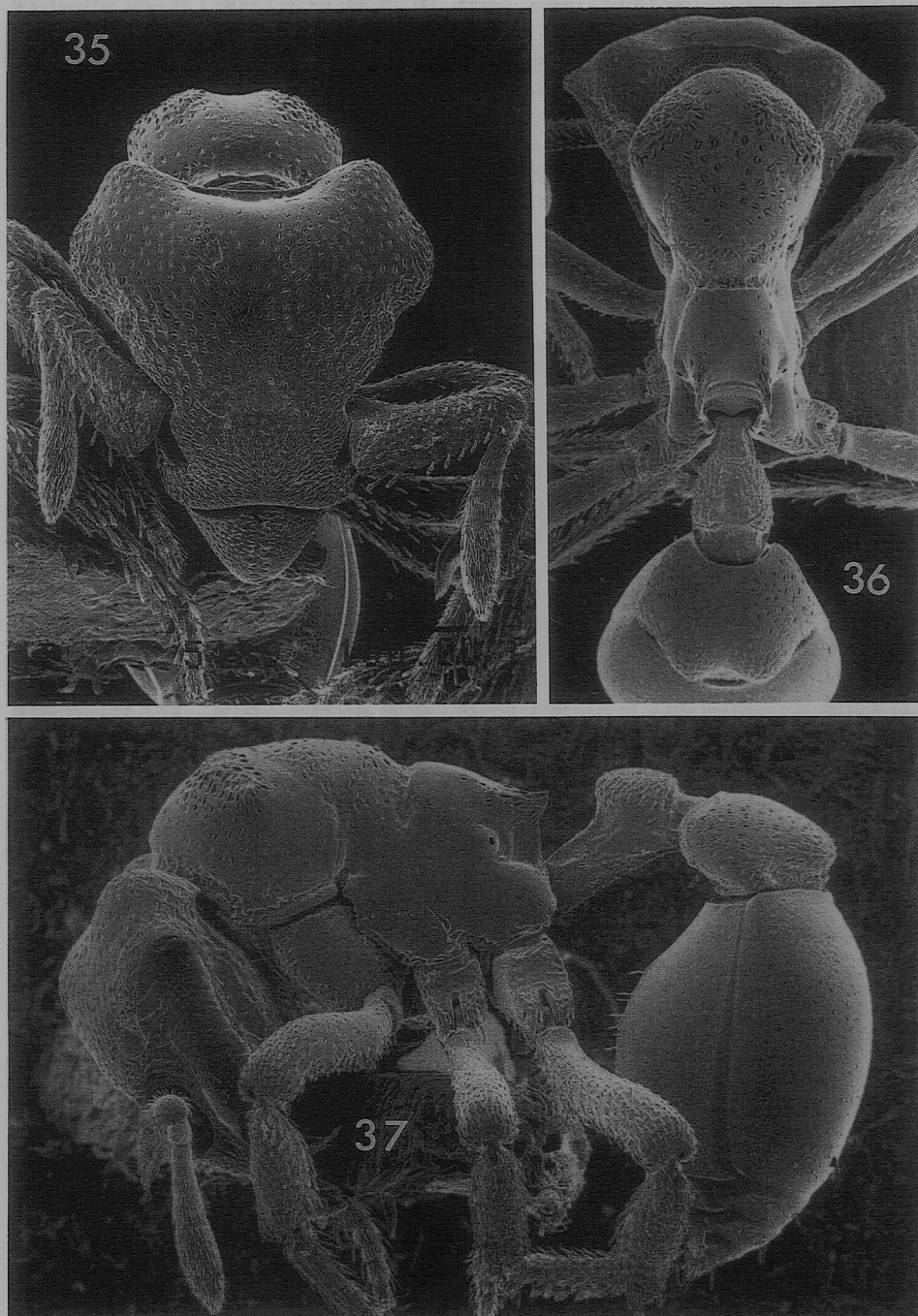
#### *Distribution, Material Examined*

Known only from the unique worker holotype, from a rainforest leaf litter berlesate, at c. 1800 ft (G. H. L. Rothschild), 5.vi.1968; RWT acc 68.294).

#### *Type Deposition*

Holotype in ANIC (type No. 7782); gold-palladium coated for SEM study.

Named for my friend and colleague George Rothschild, formerly Sarawak Government Entomologist.

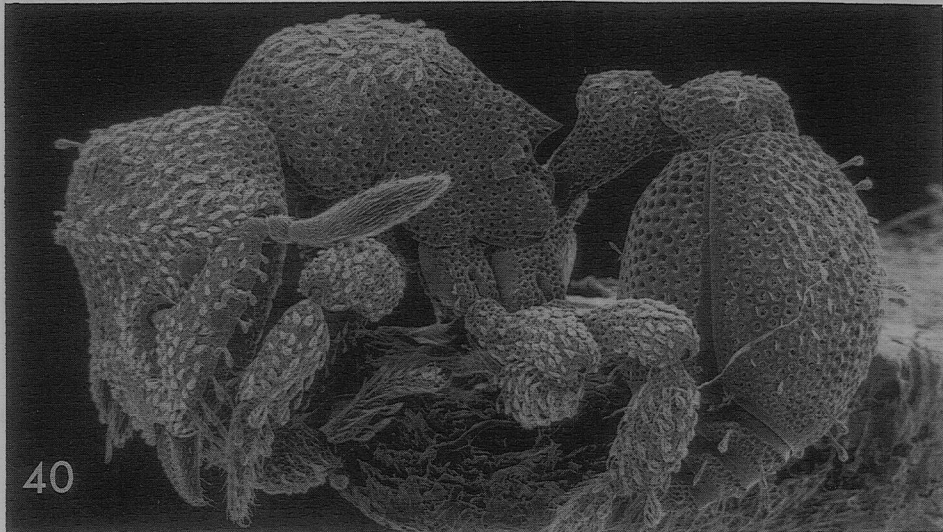
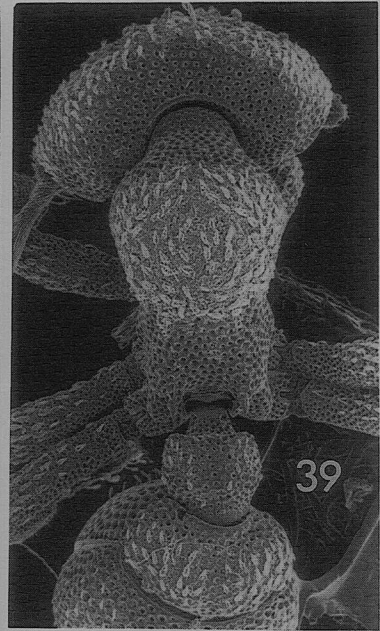
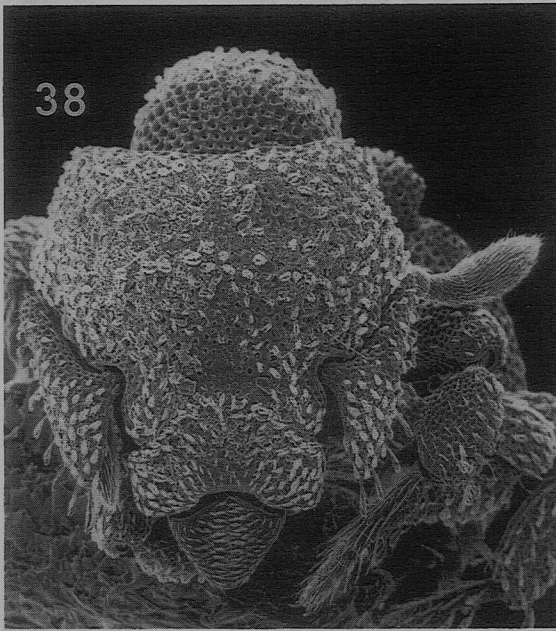


Figs 35–37. *Eurhopalothrix procera*, worker [Yawasora, near Wewak ( $03^{\circ}35'S$ ,  $143^{\circ}35'E$ .), Papua New Guinea], standard views, HW 01.12 mm; PW 0.69 mm; WL 1.28 mm.



*Worker*

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (mm): HL 0.54; HW 0.59; CI 110; ML 0.10; MI 20; SL 0.32; SI 54; PW 0.35; WL 0.57. Outer mandibular borders in frontal view more-or-less continuously (weakly) convex. Face of clypeus between frontal lobes divided by an obtuse, very low, transversely arched ridge; anterior clypeal border relatively deeply emarginate. Frons spanned by a slightly arched, conspicuous, obtuse transverse tumosity or ridge between eyes (Fig. 40). Eyes small but distinct, 5-faceted. Occipital border broadly, distinctly, but shallowly emarginate. Petiolar node in dorsal view distinctly wider than long. One pair of specialised erect hairs on frons (one only extant in the holotype), near midline of occipital border, and 6 in 2 longitudinal rows of 3, on dorsum of first gastral tergite; such hairs otherwise lacking on promesonotum, petiolar node, and postpetiole. The intact cephalic hair clavate, expanded to about  $\frac{1}{4}$  its height; the erect gastral hairs somewhat longer,



Figs 38–40. *Eurhopalothrix rothschildi*, holotype worker, standard views, see description for dimensions.

with almost bulbous tips surmounting slender columnar stems. Ground pilosity moderately well developed, more concentrated on frontal lobes, promesonotal dorsum and postpetiole than elsewhere; a ragged linear band of hairs crosses the frons between the eyes, along the transocular ridge (somewhat encrusted and obscured in the holotype).

*E. seguensis*, sp. nov.

(Figs 34, 41–43, 55)

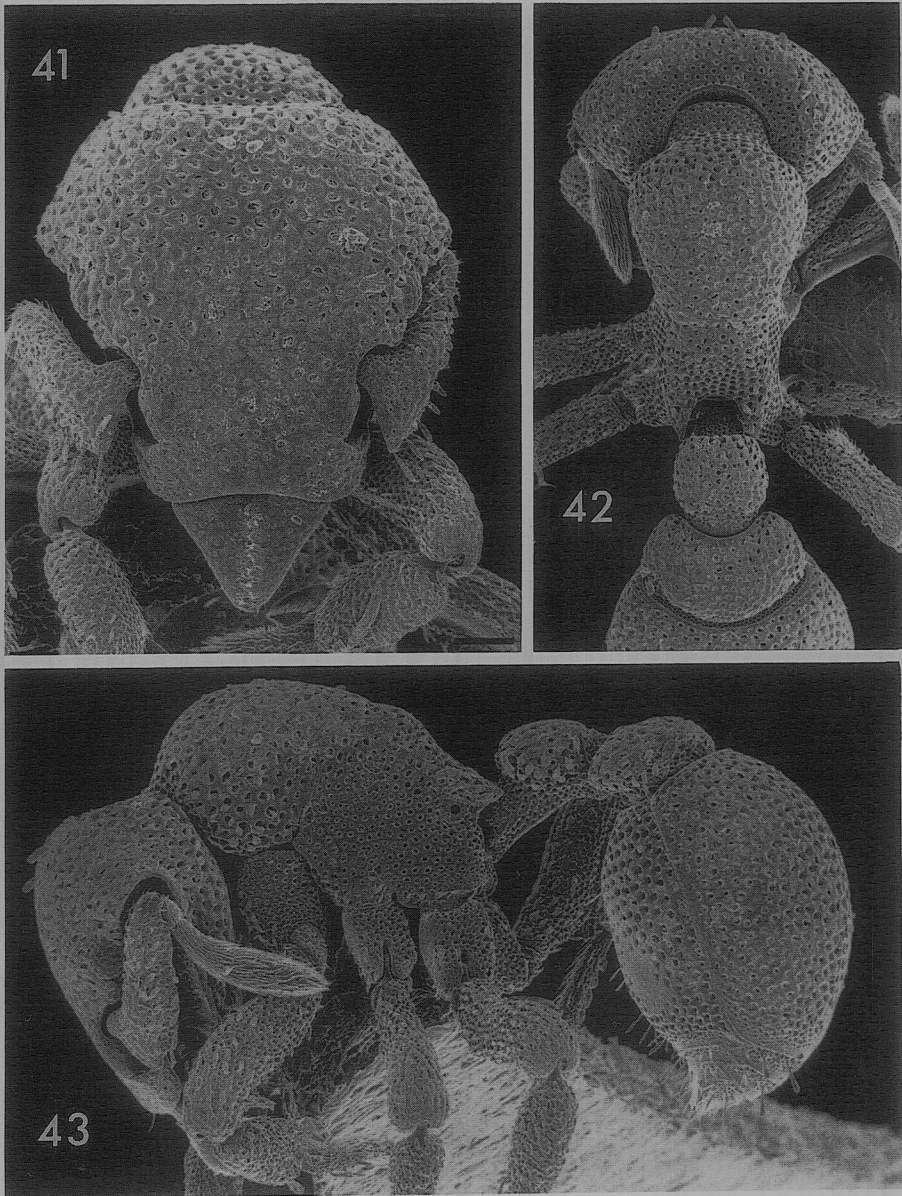
*Type Locality*

**Malaysia: Sarawak: First Division: Kampong Segu**, 20 miles S.W. of Kuching (01°33'N., 110°20'E.).

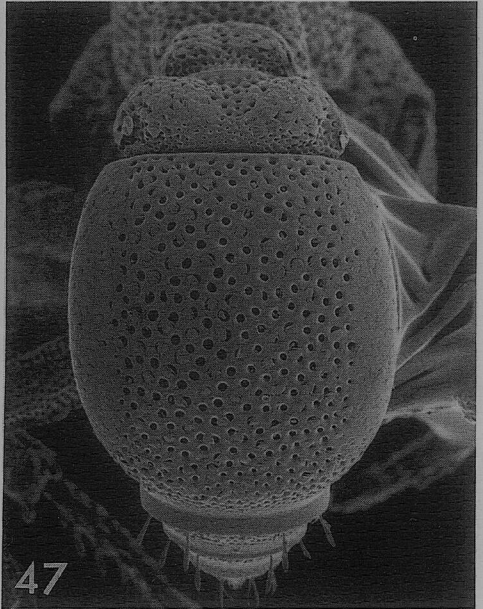
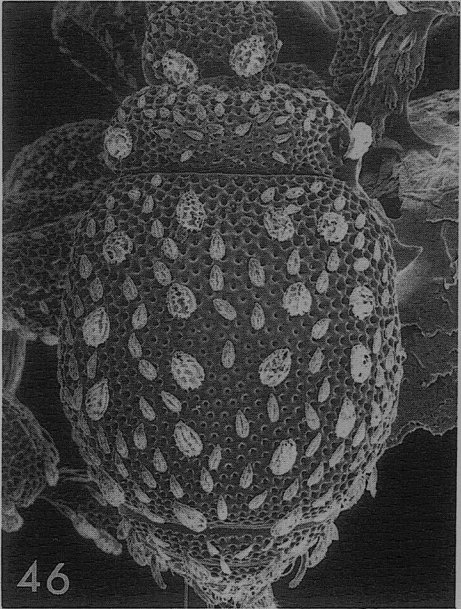
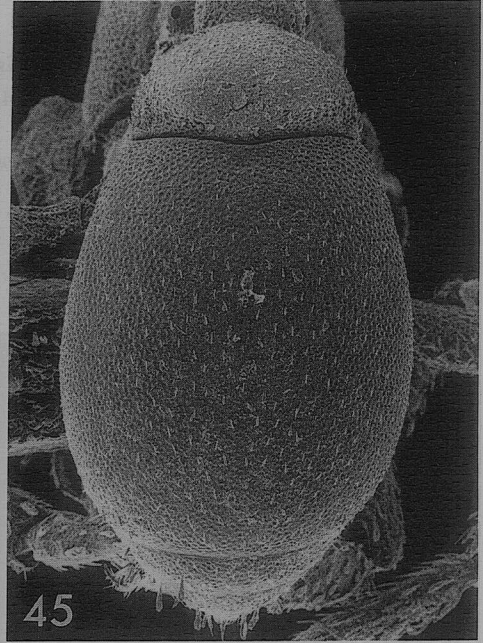
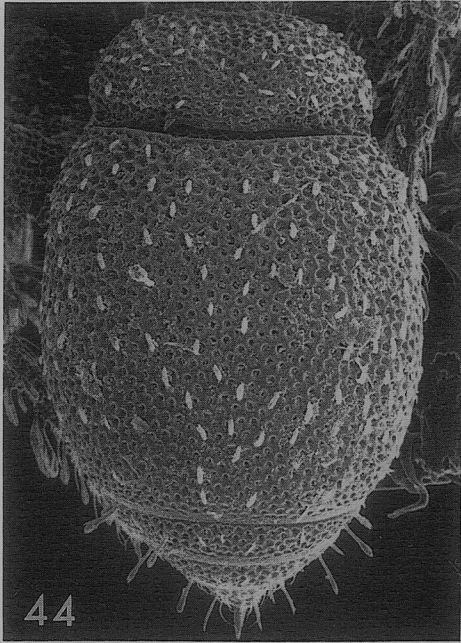
*Distribution, Type Deposition*

Known only from the unique worker holotype, from a rainforest leaf mould berlesate (RWT acc 68.289, 4.vi.1968). In ANIC (type No. 7783); gold-palladium coated for SEM study.

Named for the type locality.

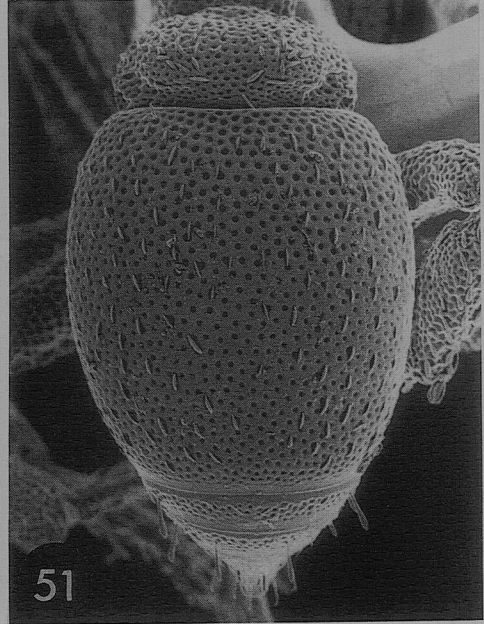
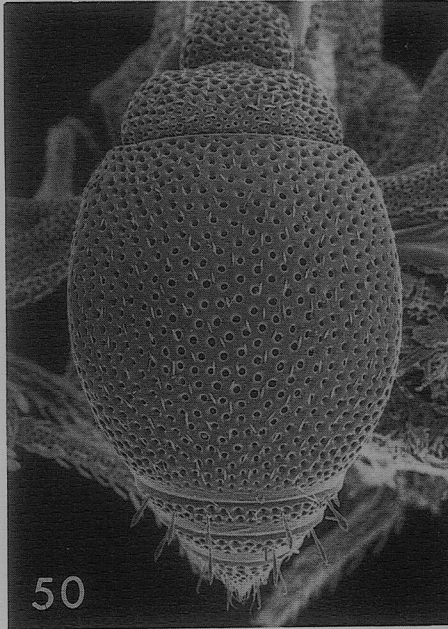
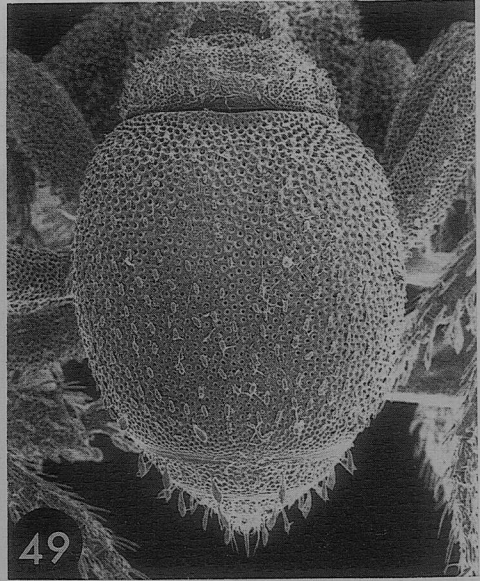
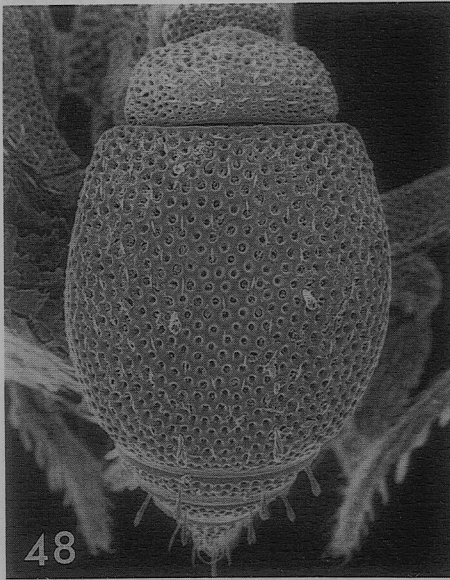


**Figs 41–43.** *Eurhopalothrix seguensis*, holotype worker, standard views, see description for dimensions.



Figs 44–47. *Eurhopalothrix* species, dorsal views of postpetiole and gaster; postpetiole widths (mm) are cited for scale: 44, *E. browni* (0·30); 45, *E. chapmani* (0·53); 46, *E. coronata* (0·30); 47, *E. dubia* (0·43). The specimens are those illustrated above.

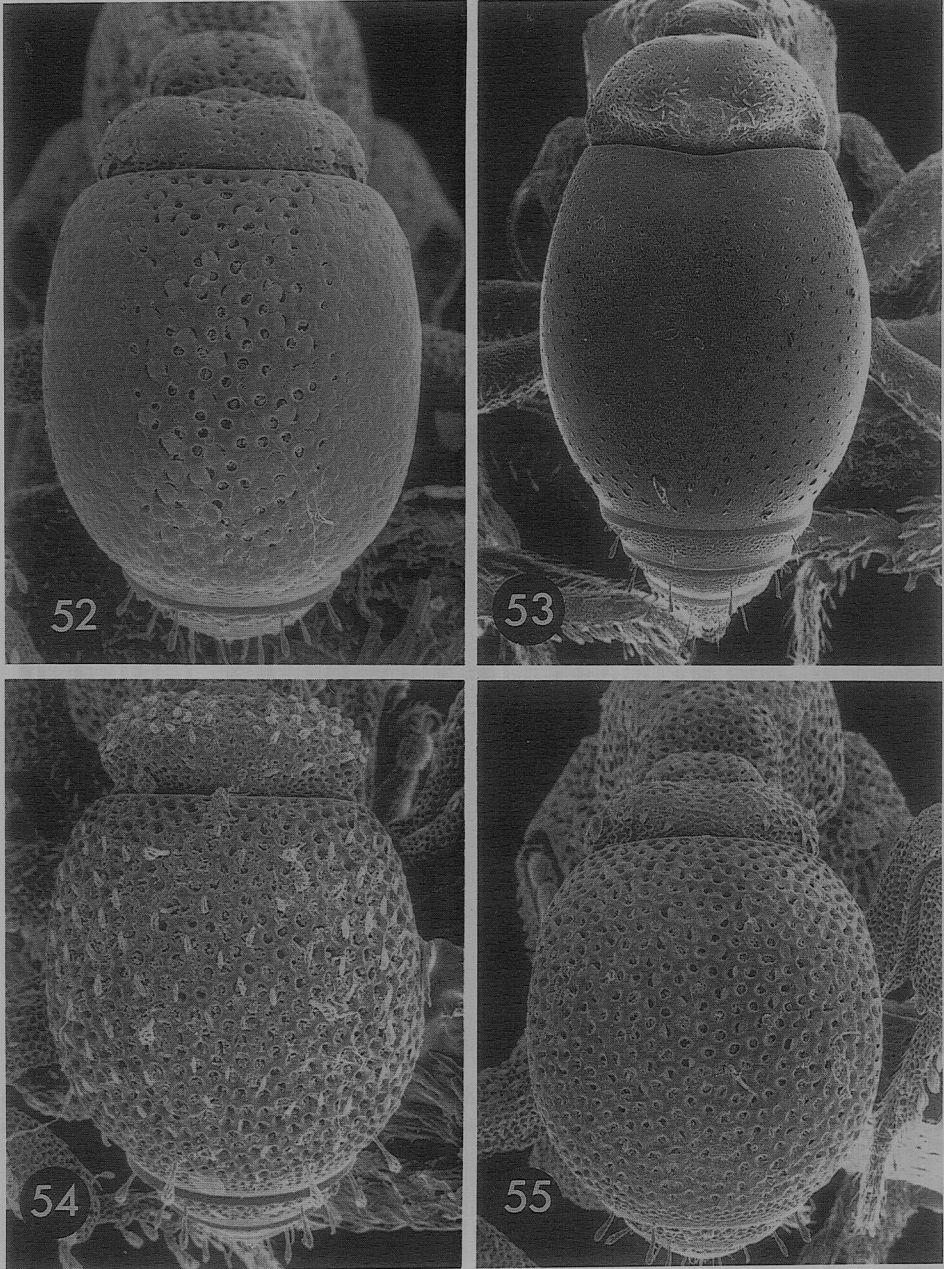




**Figs 48–51.** *Eurhopalothrix* species, dorsal views of postpetiole and gaster; postpetiole widths (mm) are cited for scale: 48, *E. jennya* (0·35); 49, *E. heliscata* (0·52); 50, *E. omnivaga* (0·43); *E. philippina* (0·39). The specimens are those illustrated above.

*Worker*

General features as illustrated. All *Class A* attributes present, with those of *Class B*, unless otherwise indicated. Dimensions (mm): HL 0·71; HW 0·79; CI 112; ML 0·19; MI 27; SL 0·41; SI 52; PW 0·48; WL 0·83. Eyes large, as in *E. platisquama*. Occipital border almost straight, transverse (its outline at most minutely curved or sinuous). Posterior occipital angles obtusely rounded, forming angles of about 130°. Mesosomal profile not a continuous curve, its outline interrupted at the promesonotal/propodeal junction by a minute



**Figs 52–55.** *Eurhopalothrix* species, dorsal views of postpetiole and gaster; postpetiole widths (mm) are cited for scale: 52, *E. platisquama* (0·47); *E. procera* (0·64); *E. rothschildi* (0·35); 55, *E. seguensis* (0·44). The specimens are those illustrated above.



indentation; the mesometanotal suture not incised dorsally to break the surrounding sculpture. Petiolar node in dorsal view essentially square, its length and breadth subequal (bias transverse).

Frons and most dorsal body surfaces with ground pilosity of dense, flattened, appressed, squamous, shining silvery hairs, which are less strongly developed than in *E. platisquama* and *E. dubia*, so as barely to overlap the punctures in which they lie, which remain more clearly visible than in the other species mentioned. Four relatively short specialised hairs on posterior occipital border, the median pair adjacent, the laterals each about midway between them and the posterior occipital angles; the hairs clavate, barely expanded, though somewhat thick and columnar. Erect hairs lacking elsewhere on promesonotum, petiolar node and dorsum of first gastral tergite; one pair (posterolateral) on postpetiole.

### Acknowledgments

The cooperation of Rev. B. B. Lowery SJ, Rudolf Kohout, Dr G. B. Monteith and Barry Bolton is gratefully acknowledged. Sandy Smith drafted Fig. 1. The micrograph plates were prepared with assistance and advice from Colin Beaton, Katherine Pickerd, Elizabeth Brooks and Chris Hunt.

### References

- Brown, W. L. Jr, 1974. A supplement to the revision of the ant genus *Basiceros*. *J. N.Y. Ent. Soc.* **82**, 131–40.
- Brown, W. L. Jr, 1980a. *Protalaridris* genus nov. *Pilot Reg. Zool.* Card No. 36. (31 March 1980.)
- Brown, W. L. Jr, 1980b. *Protalaridris armata* species nov. *Pilot Reg. Zool.* Card No. 37. (31 March, 1980.)
- Brown, W. L. Jr & W. W. Kempf, 1960. A world revision of the ant tribe Basicerotini (Hym. Formicidae). *Studia Ent.* **3**, 161–250.
- Dallwitz, M. J., 1980. A general system for coding taxonomic descriptions. *Taxon*, **29**, 41–61.
- Hölldobler, B. & E. D. Wilson, 1986. Soil-binding pilosity and camouflage in ants of the tribes Basicerotini and Stegomyrmecini (Hymenoptera, Formicidae). *Zoomorphology* **106**, 12–20.
- Kempf, W. W., 1962. Miscellaneous studies on Neotropical ants II. *Studia Ent.* **5**, 1–38.
- Kempf, W. W., 1967. Three new South American ants. *Studia Ent.* **10**, 353–60.
- Partridge, T. R., M. J. Dallwitz & L. Watson, 1988. A primer for the delta system on MS-DOS and VMS, second edition. *CSIRO Aust. Div. Ent. Rep.* **38**, 1–17.
- Snelling, R. R., 1968. A new species of *Eurhopalothrix* from El Salvador. (Hymenoptera : Formicidae). *L.A. Co. Mus. Contrib. Sci.* **154**, 1–4.
- Taylor, R. W., 1968. Notes on the Indo-Australian basicerotine ants (Hymenoptera : Formicidae). *Aust. J. Zool.* **16**, 333–48.
- Taylor, R. W., 1970. Notes on some Australian and Melanesian basicerotine ants (Hymenoptera : Formicidae). *J. Aust. Ent. Soc.* **9**, 49–52.
- Taylor, R. W., 1980. Australian and Melanesian ants of the genus *Eurhopalothrix*—notes and new species (Hymenoptera : Formicidae). *J. Aust. Ent. Soc.* **19**, 229–39.
- Taylor, R. W., 1985. The ants of the Papuasian genus *Dacetinops* (Hymenoptera : Formicidae : Myrmicinae). Pp. 41–67 in: 'Taxonomy, Phylogeny and Zoogeography of Beetles and Ants'. Ed. G. E. Ball. (W. Junk Publishers: Dordrecht.)
- Taylor, R. W. & C. D. Beaton, 1970. Insect systematics and the scanning electron microscope. *Search* **1**(6), 347–8.
- Wilson, E. D. & W. L. Brown, Jr, 1984. Behavior of the cryptobiotic predacious ant *Eurhopalothrix heliscata*, n. sp. (Hymenoptera : Formicidae : Basicerotini). *Insectes Sociaux* **31**, 408–28.