

New myrmicine ant genera from the Oriental Region (Hymenoptera: Formicidae)

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Abstract. Four new myrmicine ant genera are described from the Oriental Region. *Vombisidris* **gen.n.** (twelve species) is predominantly an arboreal genus that ranges from India to Queensland, with the majority of species in Malaysia and Indonesia. *Rotastruma* **gen.n.** (two species) is known from China, Singapore, and East Malaysia and is also arboreal. *Tetheamyрма* **gen.n.** is monotypic and known only from a single leaf litter sample from East Malaysia. The three species of *Kartidris* **gen.n.** are terrestrial and have been found in mountainous areas in southern China, Thailand and India.

Introduction

The four new genera described here belong to the ant subfamily Myrmicinae and come from the Oriental region, an area with an enormous and little understood diversity of myrmicine ants. Two of the genera, *Vombisidris* and *Rotastruma*, are mostly or entirely subarboreal to arboreal. Tree-fogging, a specialized sampling technique whose value has only recently become fully appreciated, is to a large extent responsible for our knowledge of *Vombisidris*. Like most other arboreal ant genera the biologies of *Vombisidris* and *Rotastruma* remain unknown, but their numbers always appear to be low. Whether this is because they find it hard to compete with other arboreal genera, or have very specialized lifeways, is also unknown. The twelve species of *Vombisidris* range from eastern India to Queensland, Australia, with most occurring in Malaysia and Indonesia. *Rotastruma* is currently known from southern China, Singapore, and Sarawak in East Malaysia. These two genera are referred to the tribe Leptothoracini, a large and diverse group with a predominantly holarctic distribution.

Tetheamyрма was recovered from a single leaf-litter sample taken in Sabah, East Malaysia.

It belongs to the *Stenammina*–*Rogeria*-group of genera and is particularly interesting as it represents the third evolutionary lineage to develop spongiform tissue on the waist segments and gaster. Other myrmicines with such tissue include the unrelated tribe Dacetini (see e.g. Brown, 1962; Bolton, 1983; and their included references), and the isolated and peculiar genus *Dacatinops* (Taylor, 1985).

Finally *Kartidris*, a member of the *Pheidole*–*Messor*–*Aphaenogaster*-group of genera, is known from three species collected in mountainous areas of southern China, India and Thailand; one species from each of these countries. Members of this genus are terrestrial but their biologies remain uninvestigated.

As a general rule I do not favour the publication of isolated descriptions of new taxa, that is, taxa described out of the context of some broader study. The general rule must be broken here, reluctantly, as these genus-level names need to be made available for inclusion in other studies and in the new general catalogue of ants which is currently in preparation.

Standard measurements and abbreviations of museum titles are as defined in Bolton (1983).

***Vombisidris* gen.n.** (Figs 1–11)

Diagnosis of worker. Monomorphic terrestrial to arboreal myrmicine ants with the following

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combination of characters.

1. Palp formula 5, 3.

2. Mandible short-triangular, the masticatory margin with 5 teeth, uniquely arranged. The large apical tooth is followed by two smaller teeth (third smaller than second), then a long diastema and two small basal teeth. Length of diastema is at least equal to length of margin occupied by the apical group of three teeth (Figs 2, 11).

3. Anterior clypeal margin lacking an isolated median seta; instead with a pair of setae that straddle the midpoint.

4. Median portion of clypeus broad posteriorly, broadly inserted between the frontal lobes.

5. Frontal lobes narrow, each lobe distinctly narrower than the portion of the clypeus which is inserted between them.

6. Torulus concealed by frontal lobes in full-face view, not freely projecting.

7. Frontal carinae and antennal scrobes absent.

8. Eyes of moderate size, at or slightly in front of the midlength of the sides of the head.

9. Antennae 12-segmented, with a strongly defined 3-segmented apical club.

10. Sides of head usually with a strong sinuate subocular groove (Figs 1, 3–6, 8–10); groove incomplete in two species (Fig. 7) (see second lug of key couplet 1).

11. Alitrunk elongate and low in profile; promesonotum not domed-convex; propodeum bispinose.

12. Propodeal spiracle high on side, at about midlength of sclerite, distinctly separated from the small metapleural gland bulla.

13. Metapleural lobes present, small and rounded.

14. Metasternal process absent.

15. Tibial spurs absent from middle and hind legs.

16. Petiole pedunculate, the spiracle located from very close to the alitrunk articulation to just behind the midlength of the peduncle.

17. Postpetiolar sternite reduced, small in profile.

18. First gastral tergite strongly overlapping the sternite; sternite with a laterobasal angular junction with the tergite or strongly overlapped throughout.

19. Sting functional, strong and simple.

20. Cuticle thick and armoured, sculpture

variable. Pilosity present, moderately dense, the individual hairs usually short and often blunted. Scapes with long outstanding (erect to suberect) hairs at least on the leading edge.

Female. As worker but with ocelli and full complement of flight sclerites; winged when virgin. Females known only in *bilongrudi*, *renatae*, and *australis*, see Taylor (1989).

Male. Unknown.

Type-species: *Vombisidris philax* sp.n.

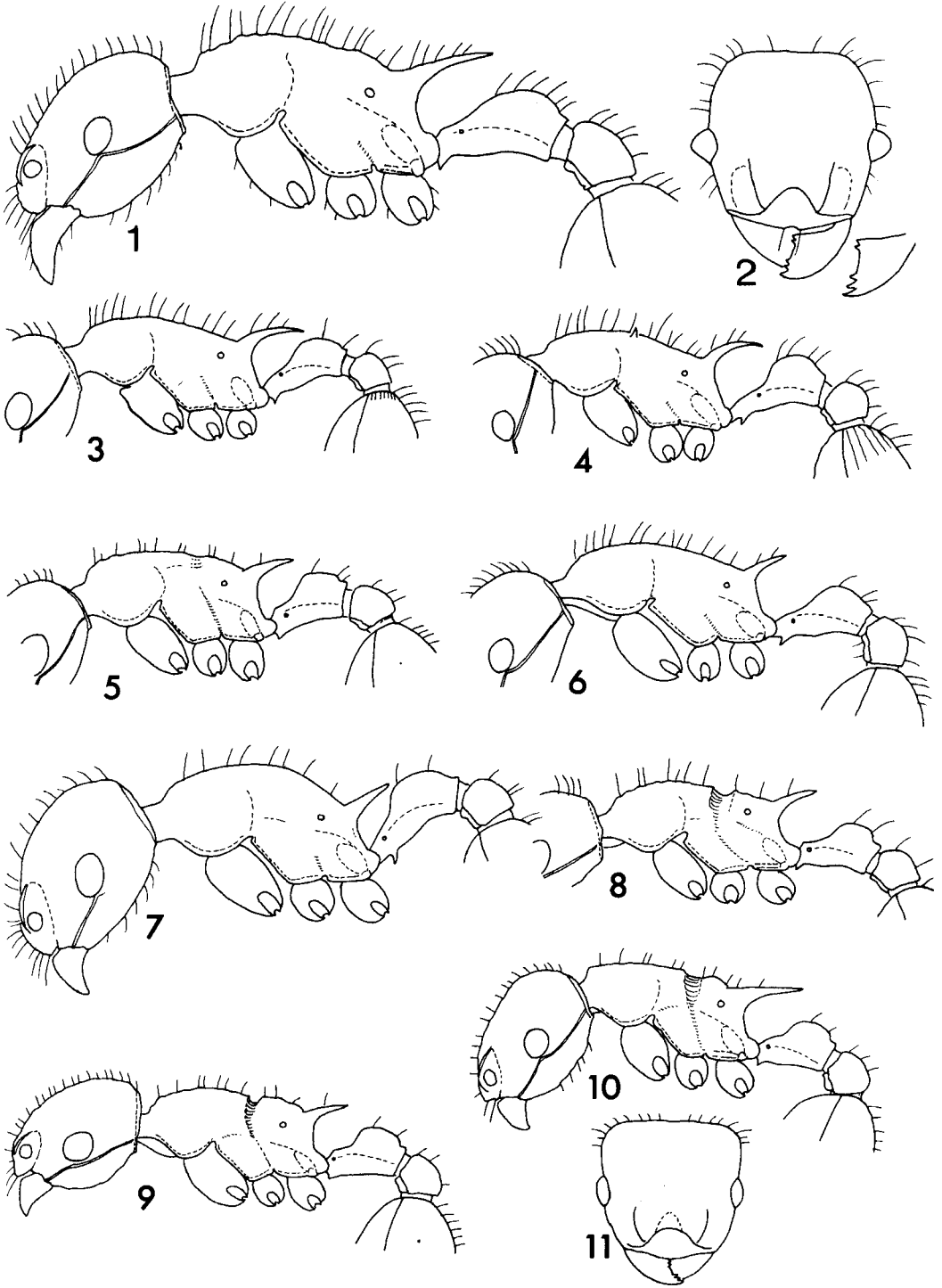
Notes

Character 2, the form of dentition, is autapomorphic and unique in the Myrmicinae. This character alone will instantly diagnose *Vombisidris* and separate it from all other genera in the subfamily. The genus belongs in tribe Leptothoracini, as that taxon is currently understood. Leptothoracini is, however, a very nebulous tribe whose constituents and real limits are not clearly known, and is in need of analysis on a world-wide basis.

Key to workers

- 1 Subocular groove incomplete or absent; at most the groove running from the mandibular insertion to the anteroventral margin of the eye, never continued beyond the eye to the lateroccipital margin (Fig. 7) 2
 - Subocular groove complete; the groove running from the mandibular insertion to the anteroventral margin of the eye, then passing through a shallow angle and continuing along the side to the lateroccipital margin (Figs 1, 3–6, 8–10) 3
- 2 Subocular groove present from mandibular insertion to eye. Mesonotum without teeth. Dorsum of head without a rugoreticulum. Propodeal dorsum strongly sloping downward posteriorly so that the spines appear attached very low (Fig. 7). Petiolar spiracle closer to base of peduncle than to node. SI < 90. Legs short; length of hind tibia less than length of petiole and < SL; hind femur length < HL. (Papua New Guinea) ... *acherdos*
 - Subocular groove entirely absent. Mesonotum with a pair of short acute dorsolaterally directed teeth. Dorsum of head with a rugoreticulum. Propodeal dorsum almost straight, the spines attached high. Petiolar spiracle closer to node than to base of peduncle. SI 100 or more. Legs long; length of hind tibia greater than length of

- petiole and $>SL$; hind femur length $>HL$. (Papua New Guinea) *bilongrudi*
- 3 Legs relatively long; maximum length of hind femur $>HW$. Antennal scapes relatively long, SI 81–93; if $SI < 85$ then the metanotal groove in profile is completely absent. Petiolar spiracle located at or behind the midlength of the peduncle (Figs 1, 3, 4) 4
- Legs relatively short; maximum length of hind femur $<HW$. Antennal scapes relatively short, SI 69–81; if SI approaches 81 then the metanotal groove in profile is a conspicuous broad deep trench. Petiolar spiracle located in front of the midlength of the peduncle (Figs 5, 6, 8–10) ... 7
- 4 Large black species: $HW > 0.80$, $SL > 0.75$, $PW > 0.60$. Mesonotum unarmed, in dorsal view the sides not projecting laterally as a pair of triangular prominences, without a pair of short vertical teeth (Fig. 1). Eyes in full-face view short and strongly prominent, dome-like (Fig. 2). (East Malaysia: Sabah) *regina*
- Smaller species, either entirely yellow or yellow with a brown gaster; $HW < 0.80$, $SL < 0.75$, $PW < 0.60$. Mesonotum armed, either the sides in dorsal view projecting laterally as a pair of triangular prominences, or with a pair of short vertical teeth. Eyes not prominent and dome-like in full-face view 5
- 5 First gastral tergite heavily sculptured; basigastral costulae long and coarse, longer than the postpetiolar dorsum; elsewhere basal two-thirds of first gastral tergite longitudinally rugulose with punctulate to shagreenate interspaces. Dorsum of mesonotum at each side with a short vertical sharp tooth (Fig. 4). (Indonesia: Sulawesi) *philax*
- First gastral tergite glassy smooth or at most with very faint superficial reticular patterning. Basigastral costulae extremely short, restricted to area immediately behind postpetiole and much shorter than the postpetiolar dorsum. Dorsum of mesonotum with sides angulate in dorsal view but without vertical teeth (Fig. 3) 6
- 6 Propodeal declivity reticulate-punctate. Head and alitrunk yellow, gaster brown. (Australia: Queensland) *renateae*
- Propodeal declivity with 3–4 fine transverse rugulae between the spines and the petiolar foramen. Entirely yellow, the gaster paler than the head and alitrunk. (Indonesia: Sulawesi) *nahet*
- 7 With alitrunk in profile the metanotal groove forming a very conspicuous broad deep indentation in the dorsal outline (Figs 8–10) 8
- With alitrunk in profile the metanotal groove entirely lacking or at most forming an inconspicuous shallow depression in the dorsal outline (Figs 5, 6) 10
- 8 Spaces between basigastral costulae finely and densely sculptured so that an opaque transverse arc is present on the first gastral tergite immediately behind the postpetiole. Eyes relatively small, $0.22 \times HW$ (Fig. 11). Hairs on first gastral tergite short thick and abruptly truncated apically. Propodeal spines long (Fig. 10). (Brunei) *xylochos*
- Spaces between basigastral costulae smooth and unsculptured or the costulae minute; without an opaque transverse arc on the first gastral tergite immediately behind the postpetiole. Eyes relatively large, $0.27–0.29 \times HW$. Hairs on first gastral tergite elongate and slender, blunted but not abruptly truncated apically. Propodeal spines shorter (Figs 8, 9) 9
- 9 With head in full-face view the sides immediately behind the eyes diverging posteriorly (as in Fig. 11). Scapes shorter, SI 71. First gastral tergite finely superficially reticulate. Peduncle of petiole relatively short (Fig. 9). (Indonesia: Sulawesi) *lochme*
- With head in full-face view the sides immediately behind the eyes approximately parallel. Scapes longer, SI 81. First gastral tergite almost completely smooth. Peduncle of petiole relatively long (Fig. 8). (East Malaysia: Sarawak) .. *dryas*
- 10 Propodeal dorsum abruptly downcurved after about one-third of its length, so that in profile the spines appear to be set very low down. Propodeal spiracle on same level as spine or slightly above. (Australia: Queensland) *australis*
- Propodeal dorsum convex to sloping but not abruptly downcurved; the spines set high. Propodeal spiracle below level of spine (Figs 5, 6) 11
- 11 Longest hairs on dorsal alitrunk short stout and truncated apically. SI 69. Maximum diameter of eye $0.27 \times HW$. Entirely yellow species. Alitrunk in dorsal view with sides of mesonotum broadly but shallowly triangular and prominent. Anterior face of petiole node meeting dorsum in a blunt angle (Fig. 5). (East Malaysia: Sarawak) *harpeza*
- Longest hairs on dorsal alitrunk elongate, fine and tapering apically. SI 76. Maximum diameter of eye $0.23 \times HW$. Head and alitrunk brown, gaster lighter brown. Alitrunk in dorsal view with sides of mesonotum extremely shallowly convex, not prominent. Anterior face of petiole node



Figs 1–11. *Vombisidris* species, workers, 1, body profile of *regina*; 2, head of *regina*; 3–10, body profiles of: 3, *nahet*; 4, *philax*; 5, *harpeza*; 6, *occidua*; 7, *acherdos*; 8, *dryas*; 9, *lochme*; 10, *xylochos*; 11, head of *xylochos*.

meeting dorsum through a broad smooth curve (Fig. 6), (India) *occidua*

Species-groups of *Vombisidris*

V. bilongrudi-group. Subocular groove incomplete or absent. Includes *bilongrudi*, *acherdos*.

V. philax-group. Subocular groove complete. Legs and antennae relatively long (key couplet 3). Propodeal spines long and downcurved. Metanotal groove vestigial to absent. Includes *philax*, *nahet*, *renateae*, *regina*.

V. dryas-group. Subocular groove complete. Legs and antennae relatively short (key couplet 3). Propodeal spines short to long but not usually downcurved. Metanotal groove broad and strongly impressed in profile, trench-like. Includes *dryas*, *lochme*, *xylochos*.

V. australis-group. Subocular groove complete. Legs and antennae relatively short. Metanotal groove vestigial to absent. A convenience-group to hold species not fitting any of the above groups. Includes *australis*, *harpeza*, *occidua*.

bilongrudi-group

Vombisidris acherdos sp.n. (Fig. 7)

Holotype worker. TL 4.2, HL 1.00, HW 0.87, CI 87, SL 0.74, SI 85, PW 0.64, AL 1.18. Maximum diameter of eye 0.23 (0.26 × HW) and with 14 ommatidia in the longest row. Mandibles unsculptured. Sculpture of head capsule feeble, consisting of scattered short longitudinal rugulae dorsally; no rugoreticulum. Weak ground-sculpture present above the eye but head capsule otherwise mostly smooth. Subocular groove incomplete, running only from base of mandible to anterior angle of eye. Dorsal alitrunk evenly convex in profile, the propodeum sloping steeply so that the spines appear to be set low down. Mesonotum unarmed. Metanotal groove absent. Dorsal alitrunk with fine superficial sculpture only. Petiole shape as in Fig. 7. Base of first gastral tergite unsculptured. Pilosity sparse and fine everywhere, the hairs acute; only one pair present on the sloping portion of the propodeal dorsum. Colour uniform dark brown.

Paratype worker. TL 4.4, HL 1.00, HW 0.85,

CI 85, SL 0.74, SI 87, PW 0.64, AL 1.18. Maximum diameter of eye 0.24 (0.28 × HW). As holotype but slightly lighter in shade.

Holotype worker, PAPUA NEW GUINEA: 6 km NE Kundiawa, 5.59S, 144.56E, 19.vi.1980, 2000 m, no.4498, on low vegetation, montane forest (*P. S. Ward*) (BMNH).

Paratype, one worker with same data as holotype (MCZ).

Vombisidris bilongrudi (Taylor) comb.n.

Leptothorax bilongrudi Taylor, 1989: 605, Figs 1–3. *Holotype worker* and *paratype workers* and *females*, PAPUA NEW GUINEA: West Sepik Prov., Victor Emmanuel Range, 5.07S, 141.38E, near Telefomin, 1550 m, 17–19.viii.1984, no. 305 (*R.J. Kohout*). [Paratype worker in BMNH examined.]

philax-group

Vombisidris nahet sp.n. (Fig. 3)

Holotype worker. TL 4.1, HL 0.82, HW 0.68, CI 83, SL 0.62, SI 91, PW 0.55, AL 1.02. Maximum diameter of eye 0.19 (0.28 × HW) and with 10 ommatidia in the longest row. Cephalic dorsum with a rugoreticulum everywhere. Subocular groove complete. Sides of head weakly convergent behind eyes. Alitrunk long and low, reticulate-rugose everywhere. Sides of mesonotum obtusely angular in dorsal view. Propodeal spines very long and strongly arched along their length. Metanotal groove absent. Peduncle of petiole long, the spiracle approximately at the midlength. Petiole and postpetiole reticulate-rugulose. First gastral tergite glassy smooth except for a band of short basigastral costulae immediately behind the postpetiole. All dorsal surfaces of body with dense standing pilosity. Colour yellow, the gaster paler than the head and alitrunk.

Paratype worker. TL 3.8, HL 0.80, HW 0.66, CI 83, SL 0.60, SI 91, PW 0.53, AL 0.98. Maximum diameter of eye 0.19 (0.29 × HW). as holotype.

Holotype worker, INDONESIA: Sulawesi Utara, G. Mogogonipa, 1000 m, 26.iv–22.v.1985 (*J. Martin*) (BMNH).

Paratype, one worker, INDONESIA: Sulawesi Utara, Dumoga Bone NP, 16–20.iii.1985 (*J. Martin*) (MCZ).

Both specimens were collected from vegetation.

***Vombisidris philax* sp.n.** (Fig. 4)

Holotype worker. TL 3.6, HL 0.82, HW 0.72, CI 88, SL 0.64, SI 89, PW 0.54, AL 1.00. Maximum diameter of eye 0.17 ($0.24 \times$ HW) and with 11 ommatidia in the longest row. Cephalic dorsum with a fine dense rugoreticulum everywhere. Subocular groove complete. Sides of head weakly convergent behind eyes. Alitrunk long and low, reticulate-rugulose everywhere. Lateral edge of mesonotum with a small vertical triangular tooth on each side. Propodeal spines very long and strongly arched along their length. Propodeal declivity with fine transverse rugulae. Metanotal groove absent. Petiolar spiracle slightly behind midlength of peduncle. Petiole and postpetiole reticulate-rugulose. Basal two-thirds of first gastral tergite densely sculptured, with long coarse basigastral costulae, longitudinal rugulae and densely sculptured spaces between the rugular sculpture. All dorsal surfaces of body with dense fine pilosity. Colour uniformly yellow.

Paratype workers. TL 3.4–3.6, HL 0.78–0.80, HW 0.68–0.72, CI 87–90, SL 0.60–0.64, SI 88–90, PW 0.50–0.54, AL 0.96–1.02. Maximum diameter of eye 0.16–0.17 (0.23 – $0.24 \times$ HW) (3 measured). As holotype.

Holotype worker, INDONESIA: Sulawesi Utara, Dumoga Bone NP, fog 5, BMNH plot C, 400 m, 11.ii.1985 (*N. Stork*) (BMNH).

Paratypes, 3 workers with same data as holotype (BMNH; MCZ).

Specimens were obtained by fogging a forest tree with pyrethrum.

***Vombisidris regina* sp.n.** (Figs 1, 2)

Holotype worker. TL 5.0, HL 1.09, HW 0.94, CI 86, SL 0.84, SI 89, PW 0.86, AL 1.34. Maximum diameter of eye 0.21 ($0.22 \times$ HW). Eyes in full-face view short but strongly prominent, dome-like. Cephalic dorsum reticulate-

rugulose everywhere. Sides of head weakly convergent behind eyes. Anterior clypeal margin with a distinct median indentation. Subocular groove complete. Alitrunk reticulate-rugulose everywhere. Propodeal spines long and sharp, elevated but only shallowly curved along their length. Metanotal groove vestigial to absent. Propodeal declivity finely rugulose and superficially punctulate. Mesonotum unarmed, the sides not angular nor prominent in dorsal view. Petiole and postpetiole reticulate-rugulose, the petiolar spiracle approximately at the midlength of the short peduncle. Gaster unsculptured, smooth and shining. All dorsal surfaces of body with numerous hairs. Colour uniformly blackish brown to black.

Paratype workers. TL 4.8–5.6, HL 1.04–1.16, HW 0.88–0.96, CI 83–87, SL 0.80–0.86, SI 87–93, PW 0.64–0.72, AL 1.30–1.42. Maximum diameter of eye 0.20–0.24 (0.21 – $0.24 \times$ HW) (10 measured). As holotype.

Holotype worker, EAST MALAYSIA: Sabah, Mt Kinabalu, 1550–1650 m, 23.v.1987, no. 38 (*Burckhardt & Lobl*) (MHN).

Paratypes, 2 workers with same data but 28.iv.1987, 1540 m, no. 7c; 1 worker with same data but 23.iv.1987, 1550 m, no. 1b; 3 workers with same data but 20.iv.1987, 1500 m, no. 9b; 1 worker with same data but 21.iv.1987, 1550–1650 m, no. 2b; 1 worker with same data but 30.iv.1987, 1500 m, no. 9c; 2 workers with same data but 27.v.1987, no. 36; 3 workers with same data but Pinosuk Plateau, 14–17.iii.1964, 5225 ft (*S. Kueh*) (MHN; BMNH; MCZ).

This conspicuous black species appears to be the only one in the genus which is predominantly or entirely terrestrial in foraging habits. All the 1987 samples recorded above were collected by Winkler Bag technique.

***Vombisidris renateae* (Taylor) comb.n.**

Leptothorax renateae Taylor, 1989: 609, Figs 4–7. Holotype worker and paratype worker, AUSTRALIA: Queensland, 11 km ENE of Mt Tozer (12.43S, 143.18E), 11–16.vii.1986, ANIC no. 1064, rainforest litter (*T. Weir*). Other paratype workers and females, see Taylor, same reference. [Paratype worker examined, BMNH.]

dryas-group

***Vombisidris dryas* sp.n.** (Fig. 8)

Holotype worker. TL 3.8, HL 0.84, HW 0.72, CI 86, SL 0.58, SI 81, PW 0.56, AL 1.02. Maximum diameter of eye 0.21 (0.29 × HW) and with 9–10 ommatidia in the longest row. Mandibles finely shagreenate. Subocular groove complete. Cephalic dorsum finely reticulate-rugose. Sides of head approximately parallel behind eyes. Metanotal groove very broad in dorsal view, markedly impressed in profile. Alitrunk reticulate-rugose, sides of mesonotum angular in dorsal view. Propodeal spines shallowly curved. Petiole and postpetiole with a fine rugoreticulum. Spiracle of petiole very close to articulation with alitrunk. Gaster unsculptured except for extremely short basigastral costulae. All dorsal surfaces of head and body with stout bluntly pointed pilosity. Colour uniformly yellow.

Holotype worker, EAST MALAYSIA: Sarawak, 4th Division, G. Mulu NP, Gn. Mulu trail to camp 3, x.1977, RGS Expd, on tree (*D. Hollis*) (BMNH).

Collected by hand from tree trunk.

***Vombisidris lochme* sp.n.** (Fig. 9)

Holotype worker. TL 3.5, HL 0.78, HW 0.70, CI 90, SL 0.50, SI 71, PW 0.54, AL 0.98. Maximum diameter of eye 0.19 (0.27 × HW) and with 9–10 ommatidia in the longest row. Cephalic dorsum finely reticulate-rugose. Subocular groove complete. Sides of head divergent behind eyes. Metanotal groove broad in dorsal view, markedly impressed in profile. Alitrunk reticulate-rugose. In dorsal view sides of mesonotum angular, the angles accentuated by a thin cuticular crest on each side. Petiole and postpetiole reticulate-rugose. Spiracle of petiole very close to articulation with alitrunk. Gaster with very short basigastral costulae, the first tergite finely superficially reticulate everywhere. All dorsal surfaces with relatively short blunt pilosity. Colour uniformly yellow.

Holotype worker, INDONESIA: Sulawesi Utara, Dumoga Bone NP, fog 5, 400 m, BMNH plot C, 11.ii.1985 (*N. Stork*) (BMNH).

Collected by pyrethrum fogging of a forest tree.

***Vombisidris xylochos* sp.n.** (Figs 10, 11)

Holotype worker. TL 3.4, HL 0.78, HW 0.74, CI 95, SL 0.52, SI 70, PW 0.56, AL 0.98. Maximum diameter of eye 0.16 (0.22 × HW) and with 10 ommatidia in the longest row. Cephalic dorsum densely reticulate-rugose everywhere. Subocular groove complete. Sides of head divergent behind the eyes. Metanotal groove broad in dorsal view, deeply impressed in profile; outline of propodeal dorsum distinctly humped behind metanotal groove. Alitrunk reticulate-rugose. Sides of mesonotum distinctly angular in dorsal view. Propodeal spines long. Petiole and postpetiole reticulate-rugose. Spiracle of petiole very close to articulation with alitrunk. Basigastral costulae short, spaces between them finely sculptured and opaque; remainder of gaster unsculptured. Hairs present on all dorsal surfaces, short thick and truncated apically. Colour uniformly yellow.

Holotype worker, BRUNEI: Bukit Sulang, nr Lamunin, fogging, 20.viii–10.ix.1982, BM1982-388, no. T17/1 (*N. Stork*) (BMNH).

Species obtained by pyrethrum fogging of forest tree.

australis-group

***Vombisidris australis* (Wheeler) comb.n.**

Leptothorax australis Wheeler, 1934: 60. Syn-type workers, AUSTRALIA: Queensland, Cairns District (*A. M. Lea*) (MCZ). [Not seen.]

Leptothorax australis Wheeler; Taylor, 1989: 607. [Redescription of worker and description of female.]

***Vombisidris harpeza* sp.n.** (Fig. 5)

Holotype worker. TL 3.5, HL 0.80, HW 0.75, CI 94, SL 0.52, SI 69, PW 0.56, AL 1.00. Maximum diameter of eye 0.20 (0.27 × HW) and with 9 ommatidia in the longest row. Cephalic dorsum finely reticulate-rugose everywhere. Subocular groove complete. Sides of head behind eyes approximately parallel. Alitrunk reticulate-rugose, sides of mesonotum broadly angular in dorsal view. Metanotal groove almost obliterated, visible in

dorsal view as a shallow but quite broad impression, only vestigially impressed in profile. Petiole and postpetiole reticulate-rugulose. Petiole spiracle close to articulation with alitrunk. Very short basigastral costulae present. First gastral tergite with vestigial traces of faint superficial reticular patterning. Hairs on all dorsal surfaces short stout and truncated apically. Colour uniformly yellow.

Holotype worker, EAST MALAYSIA: Sarawak, 4th Division, G. Mulu NP, RGS Expd., Long Pala, 20.ix.1977, lowland rain-forest on tree trunk (*B. Bolton*) (BMNH).

The single worker was hand-collected, walking on the bark of a large forest tree.

Vombisidris occidua sp.n. (Fig. 6)

Holotype worker. TL 4.0, HL 0.90, HW 0.79, CI 88, SL 0.60, SI 76, PW 0.58, AL 1.12. Maximum diameter of eye 0.18 (0.23 × HW) and with 11 ommatidia in the longest row. Cephalic dorsum finely reticulate-rugulose everywhere. Subocular groove complete. Sides of head behind eyes feebly convergent posteriorly. Alitrunk reticulate-rugulose, sides of mesonotum shallowly convex in dorsal view, not angular. Metanotal groove absent. Petiole and postpetiole finely reticulate-rugulose, petiole spiracle in front of midlength of peduncle. Basigastral costulae vestigial. First gastral tergite with extremely faint scratch-like superficial patterning on an otherwise smooth surface. Hairs on all dorsal surfaces elongate fine and acute apically. Head and alitrunk dark brown, gaster lighter brown, legs yellow.

Holotype worker, INDIA: 25 km W. of Mudigere, 3.xi.1979 (*J. Noyes*) (BMNH).

The single specimen was swept from low vegetation.

Rotastruma gen.n. (Figs 12–15)

Diagnosis of worker. Monomorphic subarboreal to arboreal myrmicine ants with the following combination of characters.

1. Palp formula 5, 3.
2. Mandible triangular, with 6 teeth which decrease in size from apical to basal.
3. Clypeus with a median longitudinal carina; anterior clypeal margin with a pair of hairs

which straddle the midpoint.

4. Median portion of clypeus broad posteriorly, broadly inserted between the frontal lobes.

5. Frontal lobes narrow, each lobe distinctly narrower than the portion of the clypeus that is inserted between them.

6. Torulus not freely projecting.

7. Frontal carinae very weakly present; antennal scrobes represented only by extremely shallowly depressed areas running above the eyes.

8. Eyes large, situated at or just behind the midlength of the sides.

9. Antennae 12-segmented, the 3 apical segments forming a strongly defined club.

10. Alitrunk low in profile and with a shallowly evenly convex dorsum; promesonotum not domed-convex; metanotal groove absent; propodeum bispinose; sides of alitrunk marginate, especially on mesonotum and propodeum.

11. Propodeal spiracle set low on the side at about the midlength of the sclerite, very close to the dorsalmost point of the metapleural gland bulla.

12. Metapleural lobes present, small and rounded.

13. Metasternal process absent; cuticle between anterior halves of metacoxal cavities depressed.

14. Tibial spurs absent from middle and hind legs.

15. Petiole nodiform, with a short anterior peduncle; petiolar spiracle located at about the midlength of the peduncle.

16. Postpetiolar sternite reduced, small in profile.

17. Sting functional, strong and simple.

18. Cuticle thick and armoured. Pilosity present on all dorsal surfaces of head and body.

Female. As worker but only very slightly larger in size. Ocelli present. Alitrunk with full complement of flight sclerites and certainly winged when virgin.

Male. Unknown.

Type-species: *Rotastruma recava* sp.n.

Notes

Rotastruma is a marginal leptothoracine genus. It falls into an assemblage of small and

little-understood genera on the periphery of what is currently understood as tribe Leptothoracini. *Rotastruma* appears to have affinities with the genera *Paratopula* and *Romblonella*, which form part of this marginal group. Little more can be said of this enigmatic small genus until a detailed survey can be made to define with some accuracy where the limits of tribe Leptothoracini really lie.

Key to workers

- 1 With head in full-face view the occipital margin conspicuously concave, the sides of the head convex (Fig. 14). (Singapore; East Malaysia: Sarawak) *recava*
- With head in full-face view the occipital margin more or less transverse, the sides of the head approximately straight (Fig. 15). (China: Guangdong) *stenoceps*

Rotastruma recava sp.n. (Figs 12, 14)

Holotype worker. TL 3.6, HL 0.80, HW 0.69, CI 86, SL 0.56, SI 81, PW 0.48, AL 0.94. Maximum diameter of eye 0.24 (0.35 × HW). Mandibles finely longitudinally striolate. Central strip of dorsum of head with a number of longitudinal costulae which may run the length of the head or may be broken or interrupted. Occipital margin distinctly concave in full-face view, the sides of the head in front of the large eyes convex. Median portion of clypeus with 3 longitudinal carinae. Dorsal alitrunk with predominantly longitudinal sharp rugulae; cross-meshes present, especially on pronotum. Sides of alitrunk marginate, margination sharpest on mesonotum and propodeum. Propodeal spines long, depressed and down-curved along their length. Sides of alitrunk with weak longitudinal rugulae. Petiole and post-petiole rugulose to reticulate-rugulose dorsally. First gastral tergite unsculptured except for sparse short basigastral costulae and feeble superficial reticular patterning. Standing hairs present on all dorsal surfaces, short fine and acutely pointed. Colour yellow, the first gastral tergite with a broad brown band.

Paratype workers. TL 3.6–4.0, HL 0.80–0.84, HW 0.66–0.70, CI 83–86, SL 0.56–0.60, SI 81–86, PW 0.48–0.52, AL 0.94–1.02.

Maximum diameter of eye 0.24–0.26 (0.35–0.37 × HW) (10 measured). As holotype.

Paratype females. TL 3.9–4.0, HL 0.80–0.81, HW 0.69–0.70, CI 85–86, SL 0.54–0.56, SI 78–81, PW 0.56–0.58, AL 1.08–1.12. Maximum diameter of eye 0.26–0.28 (0.37–0.40 × HW) (4 measured). The females are small, only the same size as the workers or slightly larger. Alate when virgin and with a complete complement of flight sclerites. Nests appear to be polygynous as both the Singapore collections noted below contained more than one dealate female.

Holotype worker, EAST MALAYSIA: Sarawak, 4th Division G. Mulu NP, 22.v.1978, mixed dipterocarp forest, on tree (*N. M. Collins*) (BMNH).

Paratypes, 18 workers and 2 females, SINGAPORE: Bukit Timah Forest, 15.iii.1973 (*D. H. Murphy*); 2 workers and 2 females, Bukit Timah, 100 m, 8.iv.1989, no. 10254, ex dead twig, vine, rainforest (*P. S. Ward*) (BMNH; MCZ; MHN).

Rotastruma stenoceps sp.n. (Figs 13, 15)

Holotype worker. TL 3.7, HL 0.82, HW 0.68, CI 83, SL 0.56, SI 82, PW 0.48, AL 0.92. Maximum diameter of eye 0.22 (0.32 × HW). Answering the description of *recava* but lacking its concave occipital margin. Sides of head behind eyes with projecting hairs in *stenoceps* but hairs absent in front of the occipital corners in *recava*. Propodeal spines of *stenoceps* shorter and less downcurved than in *recava*, and its propodeal spiracle closer to the apex of the metapleural gland bulla (compare Figs 12, 13). *Holotype worker*, CHINA: Guangdong, Ding-Hu Mts, 60 km W. of Guangzhou, vi.1983 (*Z. Boucek*) (BMNH).

Tetheamyрма gen.n. (Figs 16, 17)

Diagnosis of worker. Monomorphic terrestrial (leaf litter) myrmicine ants with the following combination of characters.

1. Palp formula 2, 2 (*in situ* count).
2. Mandible triangular, with 6 teeth, the two basal teeth poorly defined.
3. Anterior clypeal margin lacking an isolated median seta, instead with a pair of setae that

straddle the midpoint.

4. Median portion of clypeus narrow posteriorly, narrowly inserted between the frontal lobes.

5. Median portion of clypeus narrowly bicarinate, the carinae arising between the frontal lobes and diverging anteriorly.

6. Frontal lobes broad, each lobe considerably broader than the portion of the clypeus that is inserted between them.

7. Torulus concealed by frontal lobes in full-face view.

8. Frontal carinae and antennal scrobes absent.

9. Small eyes present, situated just in front of the midlength of the sides.

10. Antennae 11-segmented, with a strongly defined 2-segmented apical club.

11. Alitrunk short and compact in profile; promesonotum forming a single even convexity; metanotal groove impressed; propodeal dorsum steeply sloping posteriorly.

12. Propodeum with a pair of short triangular spines which are connected to the narrow rounded metapleural lobes by narrow infra-dental lamellae.

13. Propodeal spiracle conspicuous, low on side and behind midlength of sclerite.

14. Tibial spurs absent from middle and hind legs.

15. Petiole with a short stout anterior peduncle and with a relatively large anteroventral process; petiolar spiracle located at the node.

16. Petiole ventrally (behind the process) and postpetiole ventrally with a clump of loose spongiform material which appears to be composed of densely interwoven or fused pilosity; base of first gastral sternite with a pad of similar spongiform material.

17. Sting functional, simple.

18. Cuticle thick and densely sculptured; pilosity fine and dense everywhere.

Female and male. Unknown.

Type-species: *Tetheamyрма subspongia* sp.n.

Notes

Spongiform material on the waist segments and base of the gaster ventrally was previously known only in the tribe Dacetini and the non-dacetine genus *Dacetinops*. *Tetheamyрма* is not

related to either of these and thus represents a third independent evolution of this feature, whose function remains unknown.

Tetheamyрма belongs in the *Rogeria*-*Stenammas*-group of genera, based on the structure of the mandibles and clypeus, and the form of the alitrunk. It is isolated among these, however, by its combination of 11-segmented antennae with a 2-segmented club, and the presence of spongiform material on the waist and gaster.

***Tetheamyрма subspongia* sp.n.** (Figs 16, 17)

Holotype worker. TL 2.3, HL 0.55, HW 0.51, CI 92, SL 0.32, SI 63, PW 0.36, AL 0.66. Maximum diameter of eye 0.08 (0.16 × HW), the eye with only about 10 ommatidia in total. Mandibles smooth. Head capsule everywhere extremely finely and densely sharply reticulate-rugose and with dense short soft curved pilosity. Promesonotum sculptured as head. Sloping propodeal dorsum sculptured to level of spines but declivity thereafter smooth and shining. Petiole and postpetiole both much broader than long in dorsal view and more finely sculptured than the promesonotum. Gaster smooth and shining between conspicuous pits from which hairs arise. All dorsal surfaces of alitrunk, waist and gaster with dense soft curved pilosity except for the propodeum behind its highest point, which lacks hairs. Colour medium brown, the appendages lighter.

Paratype worker. TL 2.2, HL 0.54, HW 0.49, CI 91, SL 0.30, SI 61, PW 0.35, AL 0.62. Maximum diameter of eye 0.07 (0.14 × HW). As holotype.

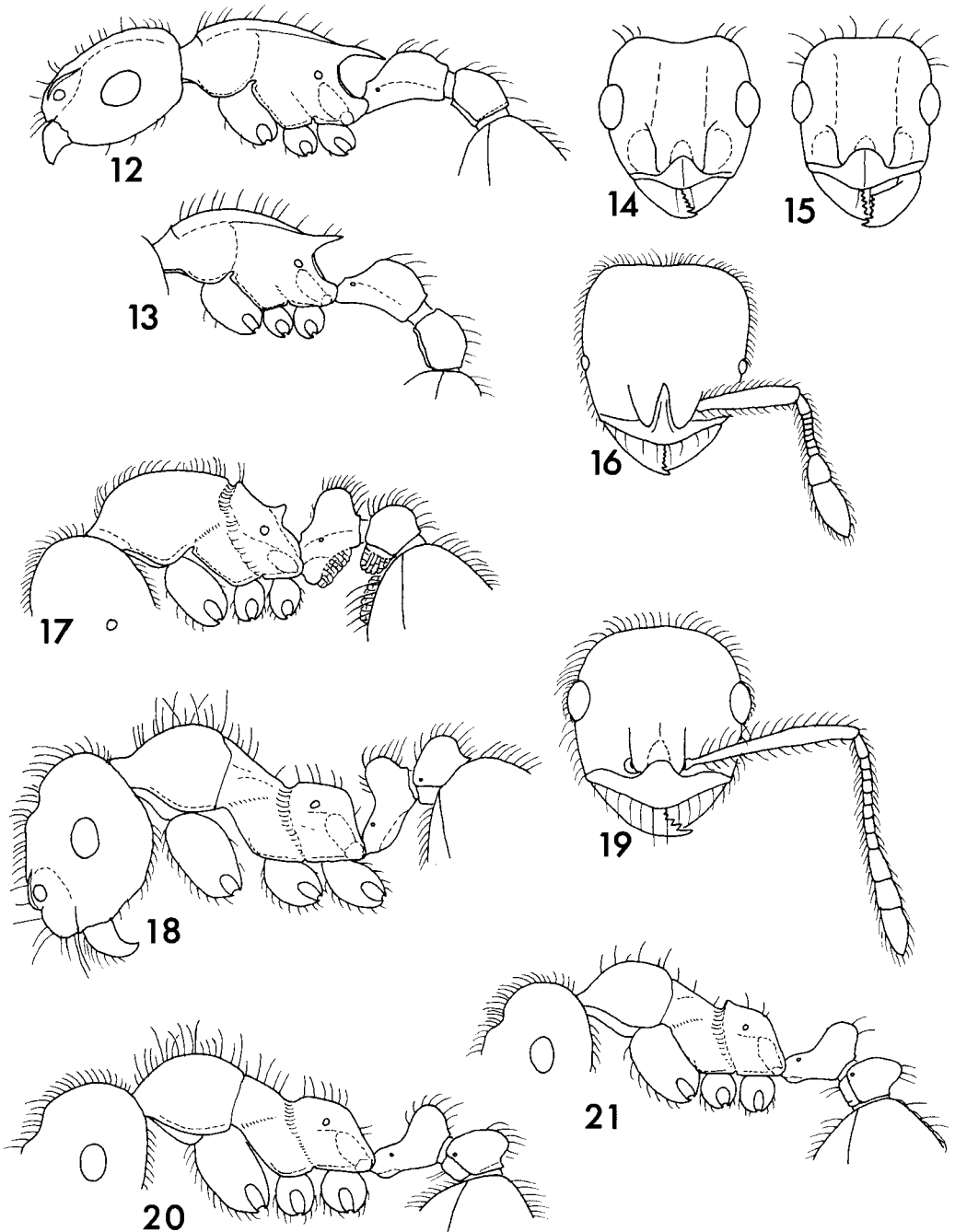
Holotype worker, EAST MALAYSIA: Sabah, Poring Hot Springs, Langanan River, 850 m, 14.v.87, no. 25a (*Lobl & Burckhardt*) (MHN). Paratype, one worker with same data as holotype (BMNH).

The two workers were recovered from a single Winkler Bag sample of forest leaf litter.

***Kartidris* gen.n.** (Figs 18–21)

Diagnosis of worker. Monomorphic terrestrial myrmicine ants with the following combination of characters.

1. Palp formula 4, 3.



Figs 12–21. 12–15, *Rotastruma* species, workers: 12–13, body profile of: 12, *recava*; 13, *stenoceps*; 14–15, head of: 14, *recava*; 15, *stenoceps*; 16–17, *Tetheamyрма subsporgia*, worker: 16, head; 17, body profile; 18–21, *Kartidris* species, workers: 18, body profile of *nyos*; 19, head of *nyos*; 20–21, body profiles of: 20, *galos*; 21, *matertera*.

2. Mandible triangular, usually with 5 sharp teeth which decrease in size from apex to base; sometimes with a denticle following the third tooth, giving a total dental count of 6.

3. Anterior clypeal margin with a row of stout setae, lacking an isolated median seta.

4. Median portion of clypeus broad and biconvex, posteriorly broadly inserted between the frontal lobes.

5. Frontal lobes relatively narrow, each lobe narrower than the portion of the clypeus which is inserted between them.

6. Torulus projecting beyond margin of frontal lobe, visible in full-face view.

7. Frontal carinae and antennal scrobes absent.

8. Eyes of moderate size, positioned behind the midlength of the sides of the head.

9. Antennae 12-segmented, with a conspicuous 3-segmented apical club.

10. Occipital margin convex and vertex with a broad depressed area between the eyes, depression conspicuous in profile.

11. Alitrunk elongate, the pronotum forming a raised dome in profile behind which the mesonotum forms a long gradual slope to the metanotal groove.

12. Metanotal groove impressed; propodeum unarmed and rounded.

13. Propodeal spiracle high on side, located at or just in front of the midlength of the sclerite.

14. Metapleural lobes vestigial to absent.

15. Metapleural gland bulla large but widely separated from the propodeal spiracle.

16. Metasternal process vestigial to absent.

17. Tibial spurs absent from middle and hind legs or at least not distinguishable from the surrounding pilosity.

18. Petiole pedunculate, the spiracle located at or just in front of the midlength of the peduncle.

19. Postpetiolar sternite large and conspicuous.

20. Sting reduced and desclerotized, exertile but subspatulate apically.

21. Cuticle thick and strong, sculpture weak. Pilosity abundant; eyes with projecting short hairs.

Female and male. Unknown.

Type-species: *Kartidris nyos* sp.n.

Notes

Kartidris belongs in the *Pheidole*–*Aphaenogaster*–*Messor*-group of genera, characterized by the high-domed pronotum, elongate sloping mesothorax, anteriorly situated petiolar spiracle, and propodeal spiracle located high on the side and close to the midlength. The mandible of *Kartidris* is specialized by reduction in the number of teeth and the median portion of the clypeus is markedly biconvex.

Key to workers

- 1 Dorsum of head finely and densely reticulate-granular everywhere, the surface opaque. Dark brown slightly larger species, HW 0.85. (China: Hainan I.) *galos*
- Dorsum of head at most with fine superficial reticulation. Yellow to brownish yellow slightly smaller species, HW 0.73–0.84 2
- 2 Dorsal alitrunk densely hairy (Fig. 18). First gastral tergite with all hairs suberect. Outline of propodeum immediately behind metanotal groove raised but rounded, not forming a distinct peak. (India) *nyos*
- Dorsal alitrunk sparsely hairy (Fig. 21). First gastral tergite with many hairs decumbent or subdecumbent. Outline of propodeum immediately behind metanotal groove forming a distinct peak. (Thailand) *matertera*

Kartidris nyos sp.n. (Figs 18, 19)

Holotype worker. TL 4.4, HL 0.96, HW 0.83, CI 86, SL 0.90, SI 108, PW 0.60, AL 1.24. Maximum diameter of eye 0.21 (0.25 × HW) and with 10–11 ommatidia in the longest row. Mandibles finely longitudinally rugulose. Entire cephalic dorsum with only vestigial sculpture, a very feeble superficial reticulation visible. Median portion of clypeus conspicuously biconvex, without longitudinal carinae. Eyes with abundant anteriorly curved short hairs arising between the facets. Dorsal alitrunk virtually smooth except for the propodeum, which shows weak reticulation. Dorsal outline of propodeum rounded immediately behind the metanotal groove. Sides of pronotum shining, almost unsculptured. Mesopleuron densely sculptured, reticulate-punctate with some fine longitudinal

rugulae. Sides of propodeum and metapleuron with sculpture intermediate in density between pronotum and mesopleuron. First gastral tergite with fine superficial shagreening between hair-pits, almost smooth. Pilosity dense on all dorsal surfaces, the hairs erect to suberect everywhere. Scapes and tibiae with numerous suberect to subdecumbent short hairs. Colour light yellowish brown.

Paratype workers. TL 4.2–4.6, HL 0.92–0.98, HW 0.78–0.84, CI 85–88, S 0.86–0.92, SI 108–111, PW 0.59–0.62, AL 1.22–1.34. Maximum diameter of eye 0.20–0.22 (0.25–0.27 × HW) (4 measured). As holotype.

Holotype worker, INDIA: Meghalaya, Khasi Hills, Shillong, 10.v.1975 (R. Mathew) (BMNH).

Paratypes, 5 workers with same data as holotype (BMNH; MCZ).

***Kartidris galos* sp.n. (Fig. 20)**

Holotype worker. TL 4.4, HL 0.97, HW 0.85, CI 88, SL 0.90, SI 106, PW 0.60, AL 1.28. Maximum diameter of eye 0.22 (0.26 × HW). Answering the description given for *nyos* but contrasting as follows.

(i) Cephalic dorsum everywhere finely and densely reticulate-granular, the surface opaque.

(ii) Pronotal dorsum with superficial reticular patterning, less strongly sculptured than head or propodeal dorsum.

(iii) Sides of pronotum glossy but superficially reticulate; mesopleuron and side of propodeum with sculpture of almost equal intensity.

(iv) First gastral tergite with fine superficial reticulation between hair-pits.

(v) Colour uniform dark brown.

Holotype worker, CHINA: Hainan I., Tien Fong Mts, v.1983 (Z. Boucek) (BMNH).

***Kartidris matertera* sp.n. (Fig. 21)**

Holotype worker. TL 3.8, HL 0.86, HW 0.75, CI 87, SL 0.80, SI 107, PW 0.54, AL 1.10. Maximum diameter of eye 0.19 (0.25 × HW). Answering to description given for *nyos* but contrasting as follows.

(i) Eyes with only sparse minute curved hairs arising between the facets.

(ii) Dorsal outline of propodeum rising to a distinct peak immediately behind the metanotal groove.

(iii) Pilosity sparse on all dorsal surfaces (compare Figs 18, 21), many or most hairs on the first gastral tergite subdecumbent to decumbent.

Paratype workers. TL 3.8–4.0, HL 0.84–0.90, HW 0.73–0.78, CI 87–89, SL 0.80–0.86, SI 107–111, PW 0.52–0.55, AL 1.00–1.15. Maximum diameter of eye 0.18–0.20 (0.25–0.26 × HW) (10 measured). As holotype.

Holotype worker, THAILAND: Nong Hoi, 2.viii.1975 (D. Jackson) (BMNH).

Paratypes, 29 workers with same data as holotype (BMNH; MCZ; MHN).

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