NOMENCLATURE AND DISTRIBUTION OF SOME AUSTRALASIAN ANTS OF THE MYRMICINAE (HYMENOPTERA: FORMICIDAE)

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Some Australian, New Caledonian, New Guinean, eastern Melanesian and SE Asian species of Myrmecinae are reviewed. A neotype is established for *Calyptomyrmex schraderi* Forel. New synonymies (senior names listed first) include: *Calyptomyrmex beccarii* Emery = *C. schraderi, Cardiocondyla nuda* Mayr = *C. nuda atalanta* Forel, *Dilobocondyla cataulacoidea* (Stitz) = *D. cataulacoidea concolor* Viehmeyer, *Epopostruma quadrispinosa* Forel = *E. quadrispinosa ferruginea* Forel, *Oligomyrmex corniger* Forel = *O. corniger parvicornis* Forel and *Pheidologeton affinis* (Jerdon) = *P. affinis australis* Forel = *P. australis mjobergi* Forel. *Dilobocondyla cataulacoidea fulva* Viehmeyer (Singapore) and *Oligomyrmex corniger sodalis* Emery are raised to species. *Calyptomyrmex beccarii* (= *C. schraderi*), *Dilobocondyla cataulacoidea*, *Oligomyrmex atomus* Emery, *Oligomyrmex crassiusculus* Emery, with 2 others unidentified to species in *Oligomyrmex*, *Rhopalomastix rothneyi* Forel and *Vollenhovia oblonga* Fr.Smith, with 3 others unidentified to species in *Vollenhovia*, are listed for the first time from Australia, *Calyptomyrmex beccarii* from Timor, and *Cataulacus setosus* Fr.Smith, *Rhoptromyrmex wroughtonii* Forel from New Guinea.,*Dilobocondyla*, *Rhopalomastix* and *Vollenhovia* from Australia, *Cataulacus* from mainland New Guinea, and *Calyptomyrmex* from Timor and New Caledonia.

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This paper reviews the status of specific names available for Australian, New Caledonian, and some New Guinean and SE Asian ants of the Myrmicinae. Some species names are synonymised and most previous subspecies are either raised to species or shown to be junior synonyms. A neotype is established for *Calyptomyrmex schraderi* Forel, which is considered a junior synonym of *C. beccarii* Emery. Range extensions are cited for several genera

Type-compared voucher specimens of most relevant species are deposited in the Australian National Insect Collection (ANIC). Several species are now represented there by paralectotypes or syntypes, some of which were generously donated for this project by the Muséum d'Histoire Naturelle, Geneva, or the Naturhistorisches Museum, Basel, Switzerland.

The genera discussed here may be discriminated using my key to the Myrmicinae (Hölldobler and Wilson,1990:56–58).

In several cases undescribed species, or species doubtfully known to have been formally named, are provided with ANIC Ant Species Voucher Numbers, which take the form 'Genus sp.no.N (ANIC)'. These are an interim measure because our ability to expedite the formal naming of taxa cannot keep up with the need to refer to them in scientific discussion. The philosophy is discussed by Taylor (1983:115–117).

Distributions are mostly given using 1° coordinates (Taylor, 1987)(e.g. 12/143 = 12°S, 143°E). All latitudes are south, unless noted. Publication details for species are given in the references cited, in Taylor and Brown (1985), or in Taylor (1987) and are not repeated here. Various collectors are indicated as follows: AC = A. Calder, JEF = J.E. Feehan, PJMG = P.J.M. Greenslade, BBL = B.B. Lowery, GBM = G.B. Monteith, PMR = P.M. Room, RWT = R.W. Taylor. GIT = G.I. Thompson. PSW = P.S. Ward, TAW = T.A. Weir. NP = National Park, SF = State Forest; Australian States and Territories are abbreviated.

Abbreviations for institutions, with the names of cooperating curators, whose help is greatly appreciated, are: ANIC, Australian National Insect Collection, CSIRO, Canberra; BMNH, Natural History Museum, London, U.K. (Barry Bolton); MCSN, Museo Civico di Storia

Naturale 'Giacomo Doria', Genoa, Italy (Dr R. Poggi, Dr V. Raineri); MCZC, Museum of Comparative Zoology, Cambridge, Mass., USA; MHNG, Muséum d'Histoire Naturelle, Geneva, Switzerland (Dr C. Besuchet); NHRS, Swedish Museum of Natural History, Stockholm, (Dr P. Persson); MVMA, Museum of Victoria, Melbourne (Mr K. Walker); NHMB, Naturhistorisches Museum, Basel, Switzerland (Dr M. Brancucci); NHMW, Naturhistorisches Museum, Vienna, Austria (Dr M. Fischer); OXUM, University Museum, Oxford, U.K. (Dr C. O'Toole); QMBA, Queensland Museum, Brisbane (Drs E.C. Dahms and G.B. Monteith); and ZMHB, Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (Dr F. Koch).

SYSTEMATICS

Calyptomyrmex Emery, 1887

At least 8 Australian species are represented in the ANIC. The only available Australia-based name is *C. schraderi* Forel, 1901. The Moluccan and Melanesian *C. beccarii* Emery is recorded from Australia and *schraderi* is designated its junior synonym. *C. beccarii* is undoubtedly indigenous to Australia, and the other 7 species probably endemic. *C. beccarii* is recorded from Timor. The ANIC has specimens of an undescribed species from New Caledonian.

The large proportion of unnamed Australian species is not surprising, considering that Baroni Urbani (1975) raised the number of Oriental/SE Asian species from 2 to 6. Bolton (1981) described 7 sub-Saharan African species additional to the 9 previously named.

DISTRIBUTION

From the tip of Cape York Peninsula along the east coast and Great Dividing Range to near Mackay.

Calyptomyrmex beccarii Emery, 1887

Calyptomyrmex beccarii Emery, 1887, Amboina (Ambon (03/128), Indonesia).

Calyptomyrmex schraderi Forel, 1901:50.

The first record from New Guinea was by Emery (1897). The queen was described from New Guinea by Szabó (1910). *Weberidris* Donisthorpe (Maffin Bay (02/138), West Irian) is a junior synonym of *Calyptomyrmex*, and its type species, *W. rufobrunnea* Donisthorpe, 1948, a synonym of *C. beccarii* (Brown, 1951).

This is the only species of the genus in available collections from northern Melanesia. Specimens in the ANIC are from: Papua New Guinea: Yawsora near Wewak (03/143), Lae (06/147), Lejo and Popondetta (08/148) (PMR, RWT, T.E. Woodward).

Workers from northern Cape York Peninsula provide the first Australian records: Lockerbie (10/142) (6–10 vi 1969, GBM); Iron Range (12°42'S,143°08'E) (nest in rotting log, rain forest, 9–15 vi 1971, RWT & JEF).

C. beccarii was recently taken for the first time on Timor (ANIC) by Donat Agosti: East Timor: Salele, 23 km W of Suai, Suai Kab.(40m, secondary forest on limestone over fossil coral reef, Winkler bag sample, sifted leaf mould, August, 1990).

Specimens in the ANIC from Sarawak and the Philippines which are similar to *C. beccarii*, might indicate that *beccarii* is widespread in the Indo-Australian area, but could be referable to *C. glabrata* Viehmeyer, 1916, which was originally described from Singapore as *C. beccarii* var *glabrata*, and raised to species rank by Baroni Urbani (1975). I have not further investigated *glabrata*, but suspect that it might be a junior synonym of *C. beccarii*.

C. schraderi was described with type locality 'Australia' from an alate queen and a male. The types were destroyed in Hamburg during World War II (Prof O. Krauss, pers. comm.). It seems circumstantially likely that they originated from far northern Cape York peninsula, within the known range of *C. beccarii*. The *schraderi* type description applies readily to available *beccarii* queens, and the two taxa are declared synonyms for that reason. A worker from the Iron Range colony listed above is here designated neotype of *C. schraderi* (ANIC7923).

OTHER AUSTRALIAN SPECIES

Calyptomyrmex sp.no.1 (ANIC): Gap Creek, Mt Cook NP, Mt Webb NP (15/145).

Calyptomyrmex sp.no.2 (ANIC): Cape Tribulation, Mt Sorrow, Noah Creek (16/145).

Calyptomyrmex sp.no.3 (ANIC): 4 km E of Lake Barrine, Crystal Cascade near Cairns, Kuranda (16/145).

Calyptomyrmex sp.no.4 (ANIC): Lake Eacham NP (17/145).

Calyptomyrmex sp.no.5 (ANIC): Graham Range, Mulgrave River Rd (17/145).

Calyptomyrmex sp.no.6 (ANIC): 2 km W of Paluma, 5 km W of Paluma (18/146); Bluewater Range, Finch Hatton Gorge (21/148).

Calyptomyrmex sp.no.7 (ANIC): Cannon Vale (20/148).

These ants are small, cryptic in colour and behaviour, and seldom collected. All specimens are from rain forest, and all are workers, except the sole alate queen of sp.no.4. (which, despite caste differences, is considered specifically dis-

tinct from other series). Most are from Berlese funnel samples of leaf mould.

Cardiocondyla Emery, 1869

The widespread tramps *C. nuda* (Mayr) and *C. wroughtonii* (Forel) have been recorded from mainland Australia (Taylor, 1987). *C. nuda nereis* Wheeler, originally described from Norfolk Island (29/168), was synonymised under *C. emeryi* Forel by Bolton (1982), constituting the first report of that vagrant species from Australian territory. *C. nuda atalanta* Forel, 1915: 75, (Kimberley district (17/127), WA, 2 syntypes, MHNG) is considered here to be a junior synonym of *C. nuda*. I have not examined types of *C. nuda*. My concept of that species follows Wilson and Taylor (1967), after due consideration of ANIC specimens from Australia, Melanesia, and Polynesia. This synonymy is proposed with reservation, since *C. nuda*, as presently conceived (e.g., by Wilson and Taylor, 1967) seems to comprise a complex of several species. Resolution of nomenclature and synonymy is beyond the scope of this study.

Several apparently Melanesia-based species from Arnhem Land, NT, or northern Cape York Peninsula(ANIC) are under investigation.

Cardiocondyla is not known from New Caledonia, despite extensive collecting there .

Cataulacus Fr.Smith, 1853
Cataulacus setosus Fr.Smith, 1860

Cataulacus setosus Fr.Smith, 1860:114, pl.1, fig.7, worker; type locality: Batchian (Batjan, 00/127), Indonesia.

Cautalacus is arboreal, palaeotropical and represented in the Afrotropical, Malagasy and Oriental regions. It was reviewed by Bolton (1974). The most easterly records were of *C. setosus* from Mindanao, Philippines, Batjan in the Moluccas and Waigeo Island (00S/130) west of the Vogelkop, New Guinea (Bolton, 1974). *C. setosus* is here recorded further east on New Guinea at Lumi (02°38'S,142°02'E), Torricelli Mountains: 400–500m, strays on rain forest vegetation (4–13 Aug. 1984, R.J. Kohout) (ANIC, QMBC).

Dilobocondyla Santschi, 1910
Dilobocondyla cataulacoidea (Stitz, 1911)
(Figs 1–4)

Podomyrma (*Mesomyrma*) *cataulacoidea* Stitz, 1911: 364, figs 10–12, worker; type locality: Kaiser-Wilhelmsland, New Guinea.

Dilobocondyla catalaucoidea (sic!) var. *concolor* Viehmeyer, 1914:40, worker; type locality: Sattelberg (near Finschafen, 06/147), PNG.

I compared the holotype worker of *D. cataulacoidea concolor* with 2 syntype workers (one headless) of *D. cataulacoidea* (ZMHB). Differences between these nominal taxa are consistent with Viehmeyer's diagnosis of *concolor*, and possibly indicate that the latter is a good sibling species. I think this unlikely, however, and consider these specimens conspecific. Gastral sculpture of the *cataulacoidea* types is distinct from that of the *concolor* holotype and from other ANIC specimens of *D. cataulacoidea*. All specimens have an anterior band of fine, somewhat irregular longitudinal striation on the first gastral tergite. In the *cataulacoidea* types remaining surfaces of the sclerite are finely shagreened and opaque, while in other specimens these areas are smooth and highly reflective (Fig. 4). Intensity of the anterior gastral striation varies somewhat, but the striae are relatively less well developed in the *cataulacoidea* types, and especially weak near the mid-line. Such differences would not support separate specific status in the related *Podomyrma*. If two species are found to be represented here, all specimens I have seen, except the *cataulacoidea* types, would be referable to *D. concolor*.

Melanesian material in the ANIC is from Papua New Guinea: Lae (06/147), Bulolo (07/146), Kokoda (08/147), Popondetta and Girua (both 08/148); (BBL, PMR, RWT).

Dilobocondyla is recorded here for the first time from Australia. Specimens have been collected in northern areas of Cape York Peninsula, as follows: Lockerbie Scrub (10/142) (a single worker, 19–22 iv 1977, GBM)(Figs 1–4); 9km NE of Mt Tozer, 12°43'S,143°17'E (4 workers collected by pyrethrum fogging of vines, rain forest edge, 5–10 July 1986, TAW & AC). (ANIC and QMBA).

Dilobocondyla fulva Viehmeyer, 1916 based on a worker from Singapore (4 syntypes examined, 2 workers, 2 queens (1 alate); all NHMB) is a separate species, abundantly distinct from *D. cataulacoidea*. A type-compared voucher from Singapore is in the ANIC. *Dilobocondyla* is not known from New Caledonia.

Epopostruma Forel, 1895

Epopostruma is endemic to Australia. *E. frosti* (W.L. Brown, 1948) with type locality, 'N. (= Neu) Mecklenburg', SA, comes from present-

day Gomersal (34/138), renamed from the German during World War I.

Epopostruma monstrosa Viehmeyer, 1925

The holotype (Trial Bay (30/153), NSW (ZM HB)) is damaged and incomplete (postpetiole, detached gaster and several legs mounted on a rectangular card), with a red 'Type' label, another (autograph) reading *'Epopostruma monstrosa* Viehm', and no locality labels. W.L. Brown (1952) considered it to be a *Mesostruma*, but unrecognisable to species. Review of *Epopostruma* specimens in the ANIC shows, however, that the type can be matched sufficiently by intact specimens to justify use of its name. Compared to other species the postpetiole has distinctive shape, lateral armament and sculpture, and the base of the first gastral tergite is smooth and shining with unusual, nearly effaced traces of incised vermiculate microsculpture. Type-compared vouchers are from NSW: 8km SW of Jamberoo (34/150) (7 Oct 1976, PSW), and other material from NSW: near Mt Nullum (28/153), and Vic.: Werribee Gorge (37/144), Queenstown, near Hurstbridge (37/145) (all leg. BBL).

Epopostruma quadrispinosa Forel, 1895

Epopostruma quadrispinosa Forel, 1895: 422.
Epopostruma quadrispinosa ferruginea Forel, 1910: 51.

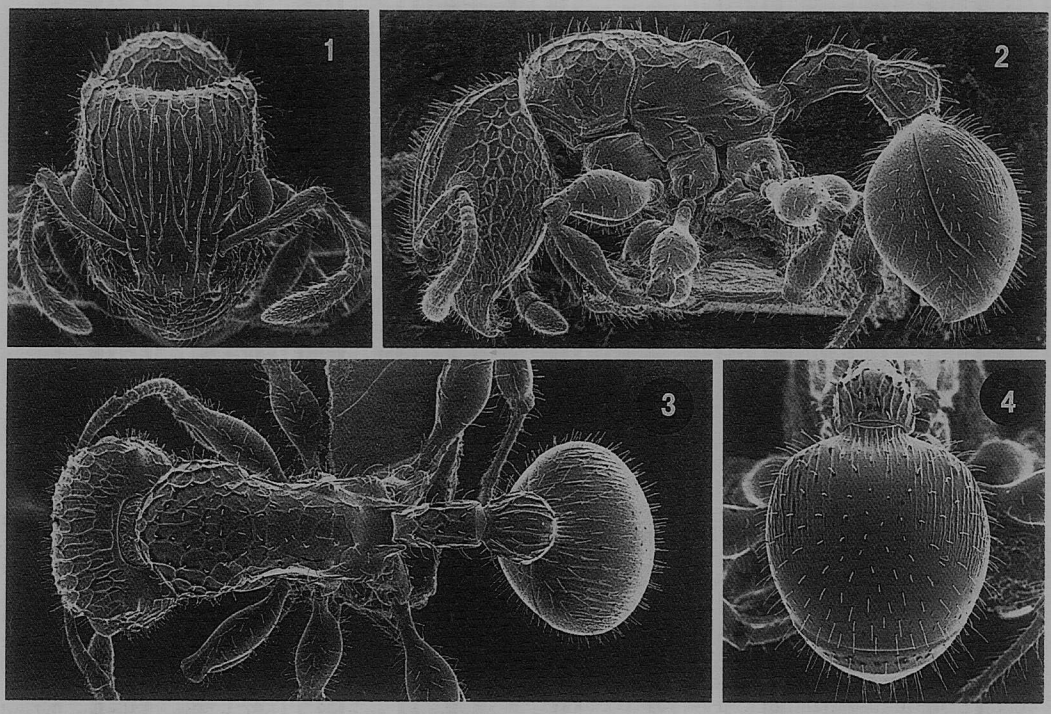
The worker holotype of *E. quadrispinosa* (Mackay (21/149), (MHNG)) matches a voucher from Myall Lakes (32/152), NSW (19 6 1977, C. Lentfer), except that the microsculpture separating the foveate punctures of the frons, mesosomal dorsum and nodes is slightly less distinctly incised. The conspecificity of these specimens seems assured. Two workers and a dealate queen from a nest at Kanangra Walls NP (34/150), NSW (2 12 1977, BBL) are identified as *E. quadrispinosa*. The workers have foveae of the mesosomal dorsum densely packed, so that the centre of the promesonotal section lacks a median afoveate strip, though one is present in the other specimens discussed above. Also, their postpetioles are more transverse, and the petiole of each has a pair of minute, but distinct, acute dorsolateral denticles. The latter are presumably homologous with slight, obtuse angles in the same positions on the holotype and Myall Lakes specimens. The Kanangra Walls queen, is considered conspecific with the holotype queen of *E. quadrispinosa ferruginea* (Type locality NSW (MHNG)), securing the above synonymy.

Mayriella Forel 1902

The type, *M. abstinens* Forel, 1902, was described from Mackay (21/149). Subsequently named Australian taxa are *M. overbecki* Viehmeyer, 1925 (Trial Bay (30/153), NSW), which was considered a junior synonym of *M. abstinens* by Wheeler (1935); *M. spinosior* Wheeler, 1935 (Cairns District (16/145), Qld); and *abstinens* subspecies *hackeri* Wheeler, 1935 (Brisbane; 27/153) and *venustula* Wheeler, 1935 (Mt. Tamborine); 27/153). Records of *M. abstinens* include Arthurs Seat (38/144), Vic (Wilson, 1957), and SA (Greenslade, 1979). *M. abstinens* is an established introduced species at Auckland, NZ (Taylor, 1961).

I consider Australian *Mayriella* intractable at species level, and cannot understand Wheeler's (1935) classification using his types, MCZC specimens, and extensive ANIC material. Wheeler's species are not clearly discriminated, and the descriptions, figures and key are inadequate. The genus could include anything from a single variable species to 3 or more sibling species. I suspect the former, but hesitate to synonymise available names under *abstinens*, because ANIC holdings display so much (generally between-sample) variation in size, propodeal spination and intensity of sculpture and colour, and because some series include winged or dealate queens, while others have specimens which could be ergatoid queens. The aggregate name *M. (abstinens)* may be used for Australian specimens. For ease of indexing *M. hackeri* and *M. venustula* should be species, rather than subspecies. These procedures partly follow Article 6 of the ICZN (3rd edn, 1985).

M. (abstinens) is represented in the ANIC and QMBA collections from Qld: 14 km W by N of Hope Vale Mission (15/144); Gap Creek, Mt Cook NP, Mt Webb NP, Shiptons Flat (15/145); Alexandra Bay, Black Mountain Rd, Kuranda, Mt Lewis, Thornton Range (16/145); 1.6 km SW of Yungaburra, Gadgarra, Lake Eacham NP, McNamee Creek, Mt Haig, Mt Nomico, Pingin Hill near Innisfail, Tully Falls NP (17/145); 40 mile Scrub (18/144); Gayundah Creek and Missionary Bay on Hinchinbrook Island (18/146); Seaforth (20/148); Eungella, Eungella NP (21/148); Kroombit Tops (24/151); Cooloola (26/153); Bald Knob, Imbil, Kenilworth, Traveston (26/152); Burpengary, Camp Mt, Mt Mee SF, Somerset Dam, Boombana NP, Goodna, Miala NP, Mt Coot-tha, Mt Nebo, Reedy Creek (27/152); Brisbane, Joalah NP, Tamborine Mountain (27/153); Cunninghams Gap (28/152); Lamington NP near Binna Burra Lodge (28/153); from NSW: 15 km E of Legume, 20 km N of Urbenville (28/152); 15 km E of Lismore, Blue Knob Mountain, Mt Warning, Murwillumbah, Tomewin (28/153);



FIGS 1–4 *Dilobocondyla cataulacoidea* Stitz, worker (Lockerbie Scrub (10/142), Qld); standard views. Head width (across eyes) 1.03 mm; gastral width 0.99 mm; Weber's length of mesosoma 1.29 mm.

Dorrigo NP, Macksville, Tuckers Knob (30/152); Bruxner Park (30/153); Oxley Highway 72 km W of Wauchope (31/151); Eccleston (32/151); 10 mi S of Mangrove Mountain, Burns Bay, Jerusalem Bay, Lane Cove, Ourimba SF, Riverview College, St Ives (33/151); Foxground, Gerroa, Kanangra Boyd NP, Minnamurra Falls, Mt Keira, Mt Saddleback (34/150); Tallaganda SF (35/149); Clyde River at Castle Flat, Pigeon House Range (35/150); from the ACT: Brindabella Ranges at Blundells Creek Rd, Lees Spring, Mt Gingera, Oororal Valley, Picadilly Circus (35/148); Black Mountain, Mt Majura, Yarralumla (35/149); from Vic.: Mt Buffalo (36/146); Queenstown, Warburton (37/145); Mt Oberon (39/146); from SA: Christensen Park, Sevenhill (33/138); South Para (34/138); West Bay Kangaroo Island (35/136); Belair, Bridgewater, Englebrook, Maclaren Flat (35/138). The high elevations of records from the ACT and Vicorian alps imply that *M.* (*abstinens*) might be expected to occur in Tasmania.

Most northern samples are labelled 'rainforest', sometimes with qualification (e.g. 'swampy', 'relict', 'gallery'). Others, especially from more southern localities, are from 'medium sclerophyll', 'wet sclerophyll', or subalpine woodland or forest. Nest series are from soil between stones, or under covering fallen wood or stones.

The only species from outside Australia is *M. transfuga* Baroni Urbani (1977), from western Bhutan. The ANIC has specimens provisionally assigned to this species, from Singapore: Nee Soon; West Malaysia: Penang; Ulu Gombak; Upper Gombak Valley; Western Sarawak: Kampong Segu; Semengoh; Sabah: Sepilok; Umas Umas. Most were collected from rainforest berlesates. *Mayriella* is not known from New Caledonia.

Mesostruma W.L. Brown, 1948

Mesostruma is endemic to Australia being known in Qld, NSW, Vic. and SA (Taylor, 1973). Four species are now listed from WA.

New ANIC records of *Mesostruma* are:

M. browni Taylor (previous records in Taylor, 1962, 1973) Qld: Cania Gorge NP (24/150) (rain forest, 10 Oct. 1984, I.D. Naumann); Mt Coot-tha (27/152) (ex leaf litter, 11–20 iii 1971, GBM); Curtis Farm, Canungra (28/153) (stick brushings, rain forest, 31 Mar. 1979, GBM). NSW: Kiwarrak SF, Taree (31/152) (iv 1975, T. Kingston); 37 km WSW of Coramba (30/153) (28 vi 76, W. Allen); Dharug NP (33/151) (10 9 76, BBL).

M. eccentrica Taylor (previous records in Taylor, 1973): SA: Kangaroo Island (35/136): 5 mi S Rocky

River (Sept 1972, PJMG); Ravine des Casoars (11 1 73, PJMG). WA (unless otherwise attributed all were collected at honey baits set at night on tree trunks by BBL on various August dates in 1983, 1984 and 1986): Eneabba (29/115) (including sites 14–34km E of the town), mallee and dry sclerophyll; 10km S of New Norcia (30/116), dry sclerophyll; Pithara (30/116) (dry sclerophyll, on *Eucalyptus* trunk, early morning, 21 Sept. 1988, B.E. Heterick; BEH collection); Wongan Hills (30/116), dry sclerophyll; Moore River (160 km S of Eneabba) at highway 1 (31/116), tall gums; Westdale (32/116) (dry sclerophyll, in litter at base of *Eucalyptus* tree, 1987, M. Jacobs; BEH collection); Narrogin (32/117), mallee, dry sclerophyll; Hopetoun (33/120), mallee.

M. exolympica Taylor (previous records in Taylor, 1973): SA: Alligator Gorge (32/138) (5 6 74, PJMG); Mt Remarkable (32/138) (29 4 73, PJMG); The Bluff (33/139) (20 7 73, PJMG); South Para (34/138) (1975–77, B. Hutson); Belair (35/138) (1973, PJMG); Belair NP (35/138) (dry sclerophyll, 8 10 72, BBL); Bridgewater (35/138) (1975–77, B. Hutson); Englebrook (35/138) (20 10 73, C.A. Kirkby).

M. laevigata W.L. Brown (previous records in Taylor, 1972): SA: Penong (31/133) (on mallee, early morning, 4 viii 1984, BBL); 1km W of Poochera (32/134) (nocturnal strays, mallee, 12 July 1990, B. Heterick); Mt Remarkable (32/138) (24 4 73, PJMG); 10 km E of Melrose (32/138) (5 6 74, PJMG); 5km E of Blyth (33/138) (limestone ridge, mallee, 8 June 1983, BBL). WA (all leg. BBL, collected at honey baits on tree trunks, at night): Narrogin (32/117), dry sclerophyll; Balladonia (32/123), dry sclerophyll.

***Mesostruma* sp.no.1** (ANIC). 2 damaged specimens from WA: Geraldton (28/114) (22 5 1963, C. Mercovich). They have apparently teratological mesosomal anomalies; additional specimens are needed to describe this species.

***Mesostruma* sp.no.2** (ANIC). This species seems close to *M. turneri* (Forel). Records are: SA: Monarto South (35/139) (Mallee, 23 7 69, C.A. Kirkby); Black Oak Creek, Koonamore (32/139) (litter, 25 7 72, PJMG). WA: 23 km ESE of Cocklebiddy (32/126) (nocturnal stray, tree heath, 25 x 1977, RWT).

***Mesostruma* sp.no.3** (ANIC). Close to *M. browni*, but with a more deeply emarginate occipital border, less obtuse occipital angles, and with the propodeal lamellae less extensive. NSW: Braidwood/Captains Flat Rd junction E of Queanbeyan (35/149) (dry sclerophyll woodland, 8 vi 71, S. Misco). ACT: Black Mountain (35/149) (dry sclerophyll woodland, 19 9 33, T. Greaves). Vic.: Emmett Vale, near Wanganella (55/144) (salt bush, 5 v 73, D. Briese).

These records cover all *Mesostruma* specimens I have seen, except the unique types of *M. loweryi* Taylor (Willaston (34/138), SA), and *M. turneri* (Forel) (Mackay (21/149), Qld).

Metapone Forel, 1911

Australian representation of *Metapone* exceeds published records. Four species have been described (Wheeler, 1919; Taylor, 1987). Eleven putative Australian species are represented in the ANIC or QMBA:

Metapone leae Wheeler, 1919:183: Qld: Tamborine Mountain (27/153) syntype queens.

Metapone tillyardi Wheeler, 1919:187: NSW: Dorrigo (30/152) syntype workers.

Metapone tricolor McAreavey, 1949:4: NSW: Nyngan (31/147) holotype queen.

***Metapone* sp.no.1** (ANIC): Qld: near Lake Barrine (17/145) workers (RWT & JEF).

***Metapone* sp.no.2** (ANIC): Qld: near Kuranda, (16/145) (RWT & JEF) workers.

***Metapone* sp.no.3** (ANIC): Qld: Kuranda (16/145) (F.P. Dodd) queen; near Mossman (16/145) (GBM & GIT) queens; McNamee Creek (17/145) (RWT & JEF) workers, queen.

***Metapone* sp.no.4** (ANIC): Qld: near Mossman (16/145) (GBM & GIT) queen.

***Metapone* sp.no.5** (ANIC): Qld: near Mossman (16/145) (GBM & GIT) queen.

***Metapone* sp.no.6** (ANIC): NSW: Lane Cove (33/151), Sydney (BBL) queen, males.

***Metapone* sp.no.7** (ANIC): NSW: Brooklana (30/152) (A.M Lea) queen; Sunshine Bay, near Batehaven (35/150) (J.A.L. Watson and RWT) workers.

***Metapone* sp.no.8** (ANIC): Tas.: Flinders Island (40/147–148), Bass Strait (J. Calaby) workers.

Despite caste differences between series, the above putative species are considered distinct. The *mjobergi* diagnosis applies to species 1 and 2, and one might be *mjobergi*. Known Australian species could therefore number 10 or 11. Alate queens of species 3, 4 and 5 are sympatric (pitfall traps) along Mossman Bluff Track, 5–10 km W of Mossman (360 and 480m, 1–16 Jan 1989). Most Qld and northern NSW samples are from rain forest, the colonies from rotting logs, and usually associated with termites. Other samples are from areas where rainforest is scarce or absent. The Sunshine Bay series of sp.7 was taken with termites from a rotting section of the trunk of a standing willow (*Salix*) tree at a seaside caravan park. Two species of termites (*Kalotermes*, and *Glyptotermes*, J.A.L. Watson, pers. comm.)were also present. The queen of sp.6 was collected indoors, apparently attracted to light at St Ignatius College, and presumably originating from a nest in the surrounding gardens or local relict rain forest patches. The Lane Cove males were collected nocturnally at light near relict rain forest on the Sydney Harbour foreshore, only a few kms from the heart of the city. *Metapone* has not been previously recorded from Tasmania.

Species 3 has a peculiar proboscis-like, extended clypeus which also occurs in a smaller

Metapone species collected from a termite-mined rotting log in rain forest (now clear-felled), in the Gogol Valley, near Madang (05/145), PNG (20–23 6 1972, RWT).

Eleven *Metapone* species from the rest of the world are: two each from Madagascar and Sri Lanka, and one each from Taiwan, Truck Island (Micronesia), Luzon, Mindanao, Sarawak, Sumatra and New Guinea (Gregg, 1958). ANIC contains undescribed species from New Guinea, New Ireland, New Britain, and San Cristoval, Solomon Islands. *Metapone* is not known from New Caledonia.

Myrmecina Curtis, 1829

The species diversity of *Myrmecina* is not resolved. However, the genus is far more widespread and diverse than implied by the single previous record from Mackay (21/149), the type locality of the sole named continental species, *M. rugosa* Forel, 1902.

The minimum generic distribution of *Myrmecina* in Australia, based on ANIC and QMBA collections, includes the following grid cells:

NT: 11/136, 15/136. Qld: 12/143, 13/143, 15/145, 16/145, 17/145, 17/146, 18/145, 18/146, 19/146, 20/148, 21/148, 21/149, 22/150, 23/150, 24/151, 26/151, 26/152, 27/152, 28/152, 28/153. NSW: 27/152, 28/152, 28/153, 29/152, 30/149, 30/152, 30/153, 31/151, 32/151, 33/145, 33/151, 34/150, 35/150. ACT: 35/148, 35/149.

Marginal localities are Rimbija Island, and Batten Point near Borroloola, NT; Iron Range, N Qld; Hinchinbrook Island, Qld; Hillston, NSW; Black Mountain, ACT and Clyde Mt, NSW. Habitats indicated on labels range from rain forest to dry sclerophyll woodland. High elevation records include summits of Mts Bartle Frere (1622m) and Bellenden Ker (1561m) (both 17/145), the highest in Qld; Isaksson Ridge, at 1050m, in Wiangaree SF (28/153), N NSW, where specimens were taken in *Nothofagus moorei* forest; and Bulls Head, ACT (35/149), probably at over 1500m elevation in alpine woodland. *Myrmecina* probably occurs also at least in southern coastal NSW and eastern Vic. The sole specimen from Hillston (30/149), NSW, I suspect to be mislabelled.

I have briefly reviewed available mounted ANIC material, and estimate at least 8 species, including several mixed lots taken in sympatric association. *M. rugosa* seems to be represented only by its syntypes. *Myrmecina* is not known from New Caledonia.

Some species appear to be significantly variable - if not there must be a rich *Myrmecina* fauna in eastern Australia. The possibility that northern species might be outliers of the diverse New Guinea fauna has not been investigated.

Oligomyrmex Mayr, 1867

Five Australian species (Taylor and Brown, (1985; Taylor, 1987) are reduced here to 3 by the synonymy of *O. corniger parvicornis* with *O. corniger*, and transfer of *O. (Octella) pachycerus* to *Solenopsis*. *O. mjobergi* Forel and *O. norfolkensis* Donisthorpe are probably good species close to *O. corniger*, and *O. corniger sodalis* (New Caledonia) is raised to species rank.

Four Melanesia-based species are recorded from northern Australia: *O. atomus* Emery; a related sibling *Oligomyrmex* sp.no.1 (ANIC); *O. crassiusculus* (Emery); and *Oligomyrmex* sp.no.2 (ANIC).

The key identifies more distinctive Australian species, but not those of the intractable '*corniger* group' (*corniger, mjobergi, norfolkensis* and *sodalis*). Other undescribed Australian *corniger*-group species are in the ANIC, where *Oligomyrmex* is represented from the following grid cells:

NT: 11/133, 12/132, 14/132; Qld: 10/142, 12/143, 13/143, 16/145, 17/145, 17/146, 18/146, 19/146, 19/147, 21/148, 21/149, 22/147, 24/151, 25/153, 26/151, 26/152, 27/152, 27/153, 28/152; NSW: 28/153, 29/152, 30/152, 30/153, 31/151, 32/151, 33/149, 33/150, 33/151, 34/150, 34/151, 35/149, 35/149, 35/150, 36/149, 37/149; Vic.: 38/145; SA: 32/137, 33/138, 34/138, 34/139, 36/139; WA: 32/116.

Because of their small size most ANIC specimens recline in spirit, in tubes sorted to genus, or in generically indexed, serially numbered vials of mixed ants, including many extracted from bulk berlesates. Few series are presently represented by mounted material suitable for critical examination or sorting to species. All of this material has been reviewed in establishing the generic distribution just summarised.

Key to some Australian species (workers)

1. Antennae 9- segmented. ..... 2.

   Antennae 11- segmented. ..... 4.

2. Front of head in minor and major workers with coarse, opaque, granular sculpturation, lacking smooth, shining areas. 3

   Frons of minor and major workers either smooth and shining, or with extensive smooth areas between fine striae. ..... species of the *O. corniger* group

3. Promesonotum of minor workers entirely sculptured, without smooth, shining areas. ... . *Oligomyrmex atomus* Emery

Median disc of promesonotum in minor workers extensively smooth and shining. . . . . *Oligomyrmex* sp.no.1 (ANIC)

4. Major workers lacking fronto-occipital horns. . . . . *Oligomyrmex crassiusculus (Emery)*

Major workers with distinct fronto-occipital horns. . . . . *Oligomyrmex* sp.no.2 (ANIC)

Oligomyrmex atomus Emery, 1900

Oligomyrmex atomus Emery, 1900: 328, pl. 8, fig. 30, worker, soldier from New Guinea: Hansemann Mts, Tamara I., Beliao I.

Oligomyrmex atomus has been used (Mann, 1919; Wilson, 1962; Wilson and Taylor, 1967; Taylor, 1976) for 2 similar species ranging from New Guinea to Samoa. Wilson and Taylor (1967) stated that workers from Fiji and Samoa could be distinguished from New Guinean and Solomon Islands' specimens 'by the following 2 worker characters: promesonotum and mesonotum smoother and more shining in Fiji-Samoan samples; occipital horns of major shorter (c. 0.04 mm long as opposed to 0.05 mm in New Guinea and Solomons specimens)'. They thought this difference perhaps borderline to specific distinctiveness but preferred to consider 'all the populations conspecific'. That conclusion must now be revised.

Two minute *Oligomyrmex* morphotypes satisfying the *atomus* diagnosis are present in ANIC and QMBA from the Claudie River rainforest tract at Iron Range (12/143). They represent the two forms specified by Wilson and Taylor. Being separately deployed in colonies, and intimately sympatric, they must be regarded as distinct species. The majors are virtually indistinguishable, but the minor workers are easily identified by differences in mesosomal sculpture. The more heavily sculptured species is provisionally identified as *O. atomus*, despite difficulties with putative type material of that name (see below), and the other designated *Oligomyrmex* sp.no.1 (ANIC).

I have examined several putative types of *O. atomus (MCSN)* as follows: (1) A major worker, bearing the following labels: (a) 'Hansemann', followed by an illegible word (autograph), (b) 'TYPUS' printed in red on a white tag with a thin red frame, (c) '*Oligomyrmex atomus* Emery' (autograph on a white label); (2) 2 pins labelled 'N. Guinea, Biró' (autograph), without other labels - thus lacking indication of type status. The first of these has 8 minor workers glued in pairs on 4 small rectangular card mounts. They all meet the prescription specified above for *O. atomus*. The second pin has 3 pairs of similarly mounted minor workers. Five of them are sp.no.1 (ANIC), and the other *O. atomus*.

Three original localities were listed by Emery when he described *O. atomus* (see heading above); there are no clear indications regarding the specification of types, or whether a holotype was established; and the relevant specimens are unlikely to be adjacent in the MCSN, where ant collections from separate sources are not fully integrated, and Emery's personal collection is kept separate from that of the museum. Also, some original material, perhaps including a specified *atomus* holotype, was probably returned by Emery to its source, the Hungarian Natural History Museum in Budapest. Confident nomenclature of the 2 species recognised here will require the integration and direct study of the various MCSN holdings, the recognition and assembly of all relevant type or original specimens, wherever they are housed, and, if there is no holotype, the declaration of an *O. atomus* lectotype. These tasks are beyond the present project and application of *atomus* is arbitrary, though probably sustainable when the nomenclature is resolved.

Australian specimens identified here as *O. atomus* are from Qld: Iron Range (12°42'S, 143° 08'E) (ex rotting log, rain forest, 9–15 vi 1971, RWT & JEF).

Those identified as *Oligomyrmex* sp.no.1 (ANIC) are from: NT: Radon Creek near Mt Brockman (12/132) (berlesate, sieved litter, 14 July 1979, GBM); Qld: Bamaga (10/142) (rain forest leaf mould berlesate, 20 v 1953, E.N. Marks); Iron Range (12°42'S,143°08'E) (several series, ex rotting logs, rain forest, 9–15 vi 1971, RWT & JEF).

ANIC specimens from New Guinea include both species. Both are represented also in ANIC holdings from the Solomon Islands of Guadalcanal and Kolombangara (collected and donated by PJMG); *O. atomus* alone from Ysabel and San Cristoval; and *O.* sp.1 from Malaita, Nggela, Rendova and Vella Lavella. Each mounted Solomons sample, incidentally, includes only one of the 2 species. The absence of records of both species from some of the Solomon Islands is probably due to deficiencies in available collections, but this might not be the case for the many series from Rennell and Bellona Islands which I reviewed in 1976. They contain only *O. atomus*. This, with the fact that *Oligomyrmex* sp.1 is known alone from Samoa, supports the hypothesis that these ants represent good species and not mere conspecific morphs.

Oligomyrmex corniger Forel, 1902

Oligomyrmex corniger Forel, 1902: 449
Oligomyrmex corniger parvicornis Forel, 1915: 70. syn.nov.

O. corniger is represented in the MHNG by syntype specimens from various localities. Three major workers pointed on 1 pin, and 3 minors on another, are labelled 'Mackay, Qld, Turner, 14'; a damaged alate queen is from 'Sydney (Froggatt) 76'; and 2 males on one pin have 'Austr. (Froggatt) 112'. All carry red 'Typus' labels, and white data labels hand-written by Forel, each of which includes the species name. The word 'type' appears also on the worker data-labels. The original localities cited by Forel were Mackay (21/149), Qld, Southport (27/153), Qld, and Sydney (33/151), NSW.

O. corniger parvicornis syntypes in the MHNG include (1) 3 major workers on a single pin labelled '122, Herberton, Qld, Mjöberg, Janr. 1913'; (2) two pins from 'Cedar Creek (present-day Ravenshoe), Qld, April 1913 (Mjöberg)', one with 3 minor workers, the other with 2 alate queens; (3) a single male with printed labels 'Malanda; Qld, Mjöberg'. All the preceding have red 'Typus' labels. The ANIC has 2 major workers on 1 pin labelled 'Herberton, Qld (Mjöberg)', with a yellow 'Cotypus' tag (ex MHNG). Herberton, Malanda and Ravenshoe are within a radius of about 15 km in the Evelyn Tableland area of North Qld (17/145). I consider the worker specimens of all these series to be conspecific. To avoid possible future nomenclatural problems a major worker from the Mackay series (MHNG) is designated lectotype of *O. corniger*, and one from 'Cedar Creek' lectotype of *O. corniger parvicornis*. The ANIC *parvicornis* paralectotypes provide Australian paradigms.

Oligomyrmex sodalis Emery, 1914

Oligomyrmex corniger sodalis Emery 1914: 412; type locality New Caledonia.

The ANIC has 3 major and 3 minor worker syntypes mounted on a single pin. They are similar to Australian *O. corniger*, but the majors have the middle section of the mesosomal dorsum substantially more inflated.

Oligomyrmex crassiusculus (Emery, 1900)

Pheidologeton (Aneleus) similis Mayr var *crassiuscula* Emery, 1900: 328, worker; type locality: New Guinea: Friedrich-Wilhelmshafen (present day Madang) (05/145).
Aneleus (Aneleus) similis Mayr var *crassiuscula* Emery, 1922: 214.
Oligomyrmex crassiusculus, Ettershank, 1966: 123.

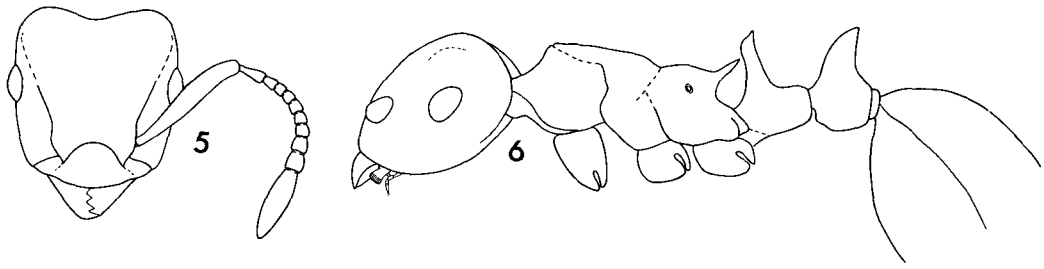
During its period of taxonomic use *Aneleus* Emery, 1900, accommodated various Papuasian species of *Oligomyrmex* habitus but with 11-segmented antennae. They are now assigned to *Oligomyrmex*, following Ettershank (1966), and are indicated in his check-list of its species (Ettershank, 1966: 123). *O. crassiusculus* is further distinguished by the absence of fronto-occipital horns in the major workers. This loss seems to have arisen independently in several lineages of *Oligomyrmex*, and is known as well in otherwise unexceptional species with 8–segmented antennae. *O. crassiusculus* is the only known hornless Australian species. The probability that *crassiusculus* is a junior synonym of *O. similis* Mayr, which was its original nominotypical subspecies, has not been investigated because I have been unable to locate type material of *similis*.

I examined 2 syntype minor workers of *O. crassiusculus* (MCSN), carded separately on 1 pin, with the following labels: (a) N. Guinea Biró, (b) *Aneleus similis* Mayr var *crassiuscula* Emery (both labels hand written), and (c) the printed word 'typus' on red card. Two ANIC major workers and a minor, mounted on a single pin, from Qld: Iron Range (12°42'S, 143°08'E) (rain forest, 9–15 vi 1971, RWT & JEF) match the types, and provide type-compared ANIC vouchers. They are from one of several samples which constitute the only known Australian records of *O. crassiusculus*.

Pheidologeton (Aneleus) minimus of Emery (1900) represents another Melanesian *Oligomyrmex* with 11-segmented antennae, which is not known from Australia (syntypes MCSN: a minor and a major worker separately carded on 1 pin; labels: (a) N. Guinea Biró (autograph), (b) typus (in red on white card with thin red border), (c) *Pheidologeton minimus* Emery (autograph).

Oligomyrmex sp.no.2

I cannot assign to any Melanesian or SE Asian species a further '*Aneleus*' which is known from several series (ANIC) from rotting wood at Iron Range (12°42'S,143°08'E) (rain forest, 9–15 vi 1971, RWT & JEF). This taxon seems close to *O. armatus* Donisthorpe.



Figs 5,6 *Peronomyrmex sp.*, worker (Clohesey River (16/145), Qld), standard views; dimensions unknown.

Peronomyrmex Viehmeyer, 1922
(Figs 5, 6)

Peronomyrmex is represented in collections only by the holotype (ANIC) of *P. overbecki* Viehmeyer (1922: 213; Trial Bay (30/153), NSW) (Taylor, 1970). It was collected by Hans Overbeck while interned during World War I (Musgrave, 1932). Close to *Podo-myrma* Fr.Smith, it might be expected to nest in hollow twigs, or in beetle or other galleries in larger standing timber. Host plant specificity is possible, based upon observations on *Podomyrma*, and nocturnal foraging activity is likely.

Six workers of an apparent second species of *Peronomyrmex* (cf. Figs 5,6 with figs 1–3 of Taylor, 1970) were collected on the Clohesey River (16/145) 'nr Mareeba NQ', on 14 June 1937 by T.G. Greaves. The specimens have been lost, probably while with J.J. McAreavey in the late 1950s or 60s. In 1957 McAreavey loaned some to W.L. Brown jr at the MCZC, who arranged the preparation of illustrations which were later reproduced in an unpublished typescript 'Codex' of the Australian ant fauna by McAreavey, a copy of which is in the ANIC formicid section archives. The specimens were returned to McAreavey (W.L. Brown pers. comm.). Two of the 3 original drawings, the relevant Greaves notebook, and copies of the Brown/McAreavey correspondence are in the ANIC formicid archives. Greaves notebook entry reads '1338/NQ; Genus? Six workers from log in *Casuarina* forest above rain forest'.

Although not backed by voucher specimens this record is significant.

Pheidologeton Mayr, 1862
Pheidologeton affinis (Jerdon), 1851

Oecodoma affinis Jerdon, 1851:110; type locality: India.

Pheidologeton affinis australis Forel, 1915, p.68, worker, queen; type locality: Cedar Creek (present-day Ravenshoe) (17/145), Qld.

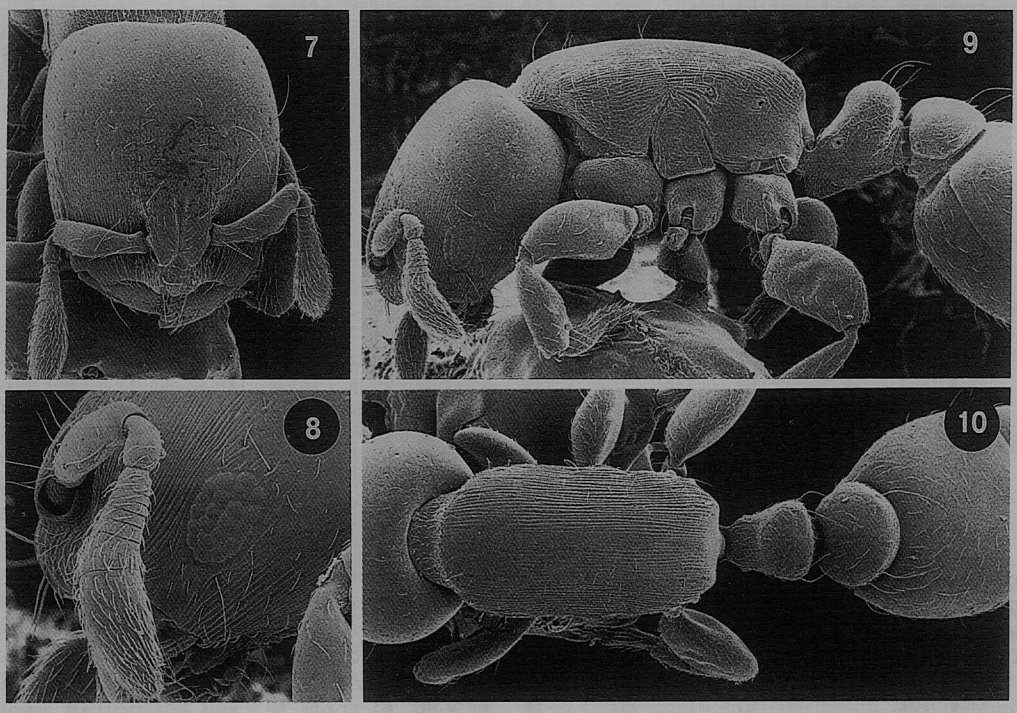
Pheidologeton australis mjobergi Forel, 1918, p.723, queen; type locality: Atherton (17/145), Qld.

New Guinean and Australian *Pheidologeton* I have seen seem to be conspecific. They match Indian, Bornean and Philippines specimens (ANIC) of *P. affinis* (Jerdon). Recognition of the two Australian subspecies synonymised above cannot be justified. The relevant type localities are about 35km apart in the Atherton/Evelyn Tableland, N Qld, and the types are conspecific. I have never taken this species on the Atherton Tableland, and suspect that it is not present there, limited perhaps by the relatively cold winter climate. The Atherton type locality, at least, is probably not precisely attributed.

ANIC and QMBA have material from NT: Darwin at Holmes Jungle (12/130); Baroalba Gorge, Sawcut Gorge (12/132). Torres Strait Islands: Darnley I (09/143); Maer I (09/144); Moa (= Banks) I (10/142). Qld: Lockerbie, Lockerbie Scrub (10/142); Iron Range (12/143); McIlwraith Range (13/143); 3 km NE of Mount Webb, Gap Creek, Mt Finnigan at Moses Creek, Mt Webb NP, Rounded Hill, Shiptons Flat (15/145); Black Mountain Rd, Cairns, Cape Tribulation, Cooper Creek, Kuranda, Mossman Gorge, Pirate Beach, Thornton Range (16/145); Crawfords Lookout, Gordonvale, Koombooloomba, Mareeba, The Boulders Park, Tully, Upper Mulgrave River (17/145); Clump Point, Seymour Range (17/146); Mt Cudmore Range (18/146).

Papua New Guinean samples (ANIC) of *P. affinis* are from at or near the following localities: Mussau I: Talumalas (01/149). New Britain: Komgi (04/151); Yalom (04/152). Mainland Papua New Guinea: Finisterre Range at Gusap River valley (05/146); Tapini (08/146); Kokoda, Tagao Rd (08/147); Girua, Popondetta, Sangara (08/148); Rubulogo Creek 15 mi N of Port Moresby (09/147); Managalase area (09/148); *Pheidologeton* is not known from New Caledonia.

Numbers of minor and major workers of the



FIGS 7–10 *Rhopalomastix rothneyi Forel,* worker (Spear Creek (16/145), Qld); standard views, and detail of antenna and eye (Fig 7). Maximum head width 0.45 mm; eye length 0.08 mm;Weber's length of mesosoma 0.59 mm

larger, Asian species *P. diversus* (Jerdon) were recently intercepted in quarantine at Darwin Airport, NT (in straw packing around cement statue from Indonesia, 1 April 1990, I. Hazelgrove). This species is not known in Australia.

Rhopalomastix Forel, 1900
Rhopalomastix rothneyi Forel, 1900
(Figs 7–10)

This Asia-based species was first reported from Australia without detailed locality records (Taylor and D.R. Brown, 1985). They are: Qld: Spear Creek (16°42'S,145°23'E) near Mount Molloy (c.600m, complex sclerophyll vine forest, 3–10 Nov 1975, V.E. Davies and R. Raven); Graham Range (17°17'S,145°57'E) (20m, rain forest, berlesate, stick brushing, 9 April 1979, GBM); 14 km. WSW of Yeppoon (23°11'S,150°37'E) (males collected at light, open *Eucalyptus* forest, PSW, 8 1 89). Samples are in QMBA and ANIC.

R. rothneyi is the senior of several available SE Asian names listed in Chapman and Capco, (1951). The others are not convincingly distinct. Their status has not been further reviewed in assigning the name *R. rothneyi* to Australian samples. The genus is not known from New Guinea or New Caledonia.

Rhoptromyrmex Mayr, 1901

The two known Australian *Rhoptromyrmex* species, *R. melleus* (Emery, 1897) and *R. wroughtonii* Forel, 1902, have been adequately characterised, illustrated and keyed by Brown (1964) and Bolton (1986), and aspects of their biology discussed.

Keys to Australian species ,
after Brown (1964) and Bolton (1986).

(Workers)

Propodeal spines long, about twice as long as the distance separating the centres of their bases; their length approximating the width of the pronotum. Head and mesosomal dorsum mainly finely and densely reticulate-punctate; longitudinal costulae few or weak. . ..... *Rhoptromyrmex melleus* (Emery)

Propodeal spines much shorter; less than twice as long as the distance separating their

bases; clearly shorter than the width of the pronotum. Head, and usually the mesosomal dorsum, with fine, close longitudinal sculpturing prominent. .....*Rhoptromyrmex wroughtonii* Forel

(Queens)

Ventral process of petiole a low, keel-like convexity.... *Rhoptromyrmex melleus* (Emery)

Ventral process of petiole a massively extended flange..... *Rhoptromyrmex wroughtonii* Forel

(Males)

Dorsum and sides of head entirely with evenly distributed fine, dense sculpturing. ..... *Rhoptromyrmex melleus* (Emery)

Dorsum and sides of head with extensive smooth, shining areas..... .....*Rhoptromyrmex wroughtonii* Forel

Rhoptromyrmex melleus (Emery, 1897)

R. melleus ranges from Sulawesi through New Guinea to northern Cape York Peninsula, where it has been reported only from rain forest at Tozer Gap, Iron Range (12/143) (Brown, 1964). More recent records (ANIC, QMBA) are from Qld: West Claudie River (12/143) (rain forest, 3–10 Dec. 1985, GBM & D. Cook); 14 km W by N of Hopevale Mission (15/144) (a single male, rain forest litter berlesate, 7–10 May 1981, AC & JEF).

Melanesian records additional to those of Brown (1964) are from at or near the following centres: New Britain: Yalom (04/152); Valoka. Mainland Papua New Guinea: Baiyer River Sanctuary, Mingende (05/144); Goroka (06/145); Bupu River near Lae (06/147); Bulolo, McAdam Park near Wau (07/146); Kokoda (08/147); Popondetta, Sangara (08/148); Hombrom Bluff (09/147). Elevations specified on labels range from 2m to 5,200ft.

R. melleus is one of a substantial number of tropical Papuasian ant species (including *Calyptomyrmex beccarii* and the 4 *Vollenhovia* species, discussed below) known in Australia only from the Mid Cape York Peninsula rainforests at Iron Range and/or the McIlwraith Ranges (13/143), and occasionally also from the Tip-of-Peninsula forests (10/142) at Lockerbie and/or Bamaga (which are relatively poorly collected, probably explaining the lack of comparable records). *Dilobocondyla cataulacoidea* is one of the latter group.

Rhoptromyrmex wroughtonii Forel, 1902

This species is more widespread in Asia than *R. melleus*, ranging from southern India to Yunnan and western Szechuan, Hainan, Taiwan, Malay Peninsula, Indonesia, the Philippines, New Guinea and Cape York Peninsula. It was recorded in Australia by Brown (1964) only from Qld: Crawfords Lookout, west of Innisfail (17/145). At that time there were no Melanesian records.

R. wroughtonii is recorded for the first time from New Guinea. Relevant ANIC and QMBA records are: Papua New Guinea: Mingende (05/144) (5,000ft, common in grassland, 11 1 68, BBL); Goroka (06/145) (5,200ft, common in lawns, 10 1 68, BBL); Bulolo (07/146)(2,400ft, edge of pine plantation, 28 12 70, BBL). Qld: Mt Finnigan (15/145), 37 km S of Cooktown, 1050m, berlesate, litter and moss, 21 April 1962, GBM, D. Yeates and D. Cook); 1.5 km NW of Cape Tribulation (16/145) (near sea level, rain forest berlesate, sieved litter, 2 Oct. 1962, GBM, D. Yeates and GIT); Cape Tribulation (16/145) (40m, rain forest berlesate, sieved litter, 13 Oct, 1980, GBM); (berlesate, 21–28 Mar 1984, AC & TEW); Mossman Gorge (16/145) (several series including males and alate queens taken at light, 200ft, 27–29 x 1966, RWT); Noah Head (16/145) (40m, rain forest berlesate, sieved litter, 16 Oct, 1980, GBM).

This species is one of a group of Papuasian ant species in Australia, whose ranges in eastern Qld extend to the Base-of-Peninsula rain forests of the Cooktown/Townsville tract (and sometimes beyond, to about Mackay (21/149) or Rockhampton (23/150), or occasionally further south). *Pheidologeton affinis*, discussed above, is another example.

Some of these species (including *P. affinis*, and probably *R. wroughtonii*) occur across northern Australia in appropriate habitats, including the network of gallery rain forest which follows the streams of Cape York Peninsula, the Top End of the Northern Territory, and the Kimberleys. Some of them are encountered in such habitats not far west of the Atherton and Evelyn Tablelands, which constitute an altitudinal (300m) gap in their distribution. Examples are *Leptogenys diminuta* Fr.Smith (Taylor, 1988), and the Green Weaver Ant, *Oecophylla smaragdina* (Fabricius) (Lokkers, 1986).

The most southern known locality for *R. wroughtonii* is Crawfords Lookout (17°37'S, 145°48'E), at about 320m. The ant fauna of the surrounding rain forest contains a number of Papuasian elements which are found there at approximately their highest local elevations of record, and are apparently absent at higher altitudes only a few km to the west. The same is true of the ant fauna at similar elevations further north along the Black Mountain Road, near Kuranda (16/145), northwest of Cairns. The ant faunas of these sites differ from those of well-known higher altitude Atherton Tableland rain

forests, such as the National Parks at Lake Eacham and Lake Barrine (both at c. 640m), which have poorer ant faunas, generally lacking Papuasian species.

Solenopsis Westwood, 1841
Solenopsis pachycera (Forel, 1915)

Oligomyrmex (Octella) pachycerus Forel, 1915: 69

O. pachycerus was erected as type of monotypic *O. (Octella)*, on the grounds that the holotype had 8-segmented antennae. Examination of the type (Ravenshoe (= Cedar Creek) (17/145), Qld (NHRS)) shows it to be the worker of a small *Solenopsis* species. The specimen has its right antenna 9-segmented (confirmed with SEM), and the left antenna 10-segmented, as is usual in *Solenopsis* (confirmed by light compound microscopy of the detached, funiculus). It is otherwise not unusual, but I cannot match it in ANIC. Most other small *Solenopsis* species from north Qld rainforests have a small supernumery tooth on each side of the anterior clypeal border, adjacent to the ipsilateral tooth of the median pair, and a small erect tooth under the petiolar peduncle. Neither of these features is present in the *S. pachycera* type. Additionally it has somewhat larger propodeal spiracles than specimens of other similarly-sized local *Solenopsis* species, and almost totally lacks the propodeal sculpture seen in some of them. This is the only named eastern Australian *Solenopsis* with a type locality north of Vic.

Vollenhovia Mayr, 1868

Vollenhovia ranges from the Seychelles, Sri Lanka and Burma through E and SE Asia to Taiwan, Korea, Japan, the Philippines and Melanesia (including the Solomon Islands, Fiji, Vanuatu (New Hebrides) and New Caledonia), eastwards to Western Samoa. The Papuasian *V. oblonga* Fr.Smith occurs in NE coastal Qld (Taylor and Brown,1985). '*Vollenhovia turneri*' Forel (1910) (Kuranda (16/145), Qld) was transferred to *Chelaner* by Ettershank (1966), and thence to *Monomorium* by Bolton (1987).

Of c. 60 available names in *Vollenhovia*, 13 have New Guinean types (Ettershank, 1966; Wilson & Taylor, 1967). Museum holdings in Australia suggest several undescribed species in New Guinea and in eastern Melanesia. Emery (1921) distinguished a number of infraspecific taxa and infrasubspecific entities among 21 species. This could imply substantial synonymy among available names. Some species are widespread, and sometimes infraspecifically variable (*V. oblonga* and *Vollenhovia* sp.no.1 (ANIC) below). *Vollenhovia* needs comprehensive taxonomic attention because its affinities are unclear, and few of its species can be identified with confidence.

Vollenhovia oblonga (Fr.Smith, 1860)

Myrmica oblonga Fr.Smith, 1860: 107.
Vollenhovia oblonga Fr.Smith; Emery, 1897: 560.

Emery (1921) recognised *oblonga* as a widespread polytypic species, which he listed from the Seychelles, Burma, Malacca, Sumatra, Borneo, Mentawai, Sinabang, Batjan, Luzon, New Guinea and New Caledonia. It was reported from Vanuatu by Wilson & Taylor (1967). Emery (1921) distinguished 7 subspecies and 3 infrasubspecies. Most myrmecologists reject subspecies and, assuming that Emery was correct in recognising these forms as conspecific, the relevant names would now be considered synonyms. That is my usage here, though I choose not to formalise the implied synonymies. In Emery's system *V. oblonga pedestris* (Fr. Smith) (type locality: Tondano (01N/125), Sulawesi (= Celebes), Indonesia) was used for material from New Guinea, adjacent islands and New Caledonia.

Australian records of *V. oblonga* (ANIC, QMBA) are all from the rain forest tract surrounding the West Claudie River at Iron Range (12/143) as follows: 11km ENE of Mt Tozer, in dry beetle-excavated log (11–16 July 1986, TAW & AC); Iron Range (12°42'S,143°08'E), several series from nests in rotting logs, or smaller decaying wood on the ground (9–15 vi 1971, RWT & JEF); Lamond Hill (vi 76, Davies and Raven); West Claudie River, pyrethrum knockdown (3–10 Dec. 1985, GBM & D. Cook).

ANIC New Guinea holdings are from Vanimo (02/141), Pes near Aitape (03/142), Gogol Valley near Madang (05/145), Lae (06/147), Wau (07/146), Kokoda (08/147); collectors: BBL, RWT.

Mann (1919) reported *V. oblonga* (as *V. pedestris*) to be 'one of the commonest ants in the Solomons', with records from San Cristoval, Santa Cruz, Malaita and Ysabel Islands. It was listed from Rennell Island by Wilson (1962) and Taylor (1976). The ANIC has much Solomon Islands material (mostly collected and donated by PJMG). The apparently endemic Samoan *V. pacifica* was considered to be 'a peripheral cognate of *oblonga*' (Wilson and Taylor, 1967).

Other Australian *Vollenhovia* species

Three other *Vollenhovia* species are repre-

sented in the ANIC and QMBA from the Iron Range area (12/143). All, like *V. oblonga*, appear to represent Asian and/or New Guinean taxa, rather than the products of radiation in Australia. If so they share the biogeographical history of many of the better-known ant species recorded from rainforest at Iron Range (Taylor, 1972). Appropriate Asian or Melanesian species names, are not at present determinable. These taxa have therefore been assigned ANIC species numbers. They came from the tract of rain forest discussed above under *V. oblonga*. All known Australian *Vollenhovia* species are intimately sympatric. Their diversity contributes to the New Guinean facies of the Iron Range rainforest ant fauna.

The Iron Range and other mid-Cape York Peninsula rainforests, while relatively depauperate in ant species compared to those of Asia and lowland New Guinea (even though very diverse and morphologically varied by Australian standards), are much more closely related myrmecologically to the lowland rain forests of New Guinea than to those of the more southern base-of-Peninsula forests of the Cooktown/Townsville tract (though a few of the Iron Range species are found in low altitude rain forest between Cooktown and Townsville, or even further south - see comments above under *Rhoptromyrmex*). Very few ant species in Australia-based groups are found in rain forest at Iron Range, but they are prominent in the base-of-Peninsula forests at all elevations. Entomologically and otherwise the mid-Peninsula rain forests (and doubtless also the myrmecologically less-well-known tip-of-peninsula rain forest tracts) may be represented as biogeographic enclaves of New Guinea contained within continental Australia (Taylor, 1972). They are, in effect, Melanesian rainforests vicariantly isolated by Torres Strait and Australian savanna. These rainforests are thus of extreme environmental importance, justifying conservation.

The relevant records are:

***Vollenhovia* sp.no.1** (ANIC).Iron Range, 2 series from nests in rotting logs (9–15 vi 1971, RWT & JEF).

***Vollenhovia* sp.no.2** (ANIC). 3km ENE of Mt Tozer, berlesate, flood debris (1–4 July 1986, TAW); 9km ENE of Mt Tozer, berlesate, litter (5–10 July 1986, TAW); 11km ENE of Mt Tozer, in dry beetle-excavated log (11–16 July 1986, TAW & AC); Claudie River, berlesate, leaf mould (20–24 vii 1978, RWT & J.F. Lawrence); Iron Range, several series from nests or foraging in rotting logs, or smaller decaying wood on the ground (9–15 vi 1971, RWT & JEF); West Claudie River, pyrethrum knockdown (3–10 (variously cited on labels) Dec. 1985, GBM & D. Cook).

***Vollenhovia* sp.no.3** (ANIC). 3km ENE of Mt Tozer, berlesate, flood debris (1–4 July 1986, TAW); alate queen, flight intercept trap (28 June – 16 July 1986, TAW); 11km ENE of Mt Tozer, berlesate, litter (11–16 July 1986, TAW).

These species are recognisable among Melanesian and Asian specimens in the ANIC: **sp.no.1**: (1) Papua New Guinea: Hayfield near Maprik (03/143) c.150m; 35 km W of Mt Hagen (05/144) c.2500m; Bulolo (07/146) c.730m; Wau (07/146) c.1,200 and 1,500m; collectors: G. Baker, BBL, RWT. (2) Various specimens collected and donated by PJMG from the following Solomon Islands: Choiseul, Guadalcanal, Malaita, Nggela, and Reef I (Santa Cruz Is). Specimens of the unidentified species listed from Rennell I by Taylor (1976) are identified here as Vollenhovia sp.no.1. (3) Samples from Philippines collections gathered by BBL during August and September, 1978, as follows: Phililppines: Luzon: Mt Makiling; Mindanao: near Malaybalay. Most non-Australian specimens have the median, longitudinally striate sections of the head and promesonotum (see key below) generally less distinctly specified than in Australian material.

sp.no.2: Papua New Guinea: Bulolo (07/146) 1060m (29 xii 1967, BBL), 1220m (xii 1970, BBL); Kokoda Rd, Oivi Creek (08/147) c.150m (8 1 197?, BBL); Solomon Islands: San Cristoval: Kira Kira; Warahita River (PJMG).

sp.no.3:PNG: Bulolo (07/146), 1220m (xii 1970, BBL); Tapini (08/146) 1000–1200m (August 1962, RWT).

It is difficult to sort New Guinea *Vollenhovia* specimens to putative species without detailed study. Sp.no.2 (ANIC) and sp.no.3 (ANIC) are variable, and widely sympatric on New Guinea, as at Iron Range (only those New Guinea series most closely matching Iron Range samples have been listed above).

Key to the Australian species (workers)

1. Propodeal dorsum mesially smooth and shining, essentially unsculptured. ..... 2.

   Propodeal dorsum entirely opaque and non-reflective, distinctly and densely sculptured. 3.

2. Promesonotal dorsum extensively to largely smooth and shining, especially mesially, with only a few elements of superficial to distinct sculpturing, quite unlike the dense, regular sculpturation of the frons. ..... *Vollenhovia oblonga* Fr.Smith

   Promesonotum evenly opaque, with dense sculpturing closely similar to that of the frons - bilaterally densely punctate, with a narrow, very finely longitudinally striate median strip. .... *Vollenhovia* sp.no.1 (ANIC)

3. Propodeum armed posterolaterally with small but distinct subacute denticles. Petiolar dorsum longer than wide, posterodorsally shagreened, the sculpturing with a clear transverse trend. ..... *Vollenhovia* sp.no.2 (ANIC)

Propodeum lacking posterolateral denticles, though the margins of the declivitous face may be (presumably homologously) bilaterally tumose. Petiolar dorsum approximately as wide as long, its posterodorsal section loosely shagreened, without a transverse trend..... . .....*Vollenhovia* sp.no.3 (ANIC)

The New Caledonian *Vollenhovia* fauna

Emery (1914) recorded *V. oblonga* (as *V. oblonga pedestris*), and *V. denticulata* Emery, 1914 from New Caledonia. *V. denticulata* has been reported from Lasema, Fiji, and Espiritu Santo, Vanuatu (Wilson & Taylor (1967). These records and other secondary citations in *Vollenhovia* need checking in light of the taxonomic complexity in the genus revealed by modern collections. ANIC New Caledonian specimens placed as *V. denticulata* are variable, and appear likely to include representatives of several sibling species. The same is true of New Caledonian material similar to *V. oblonga.* Ward (1984) also alluded to the possibility of substantial diversity in New Caledonian *Vollenhovia.*

Vombisidris Bolton, 1991

Australian species discussed by Taylor (1989) as *Leptothorax australis* Wheeler and *L. renateae* Taylor and the New Guinean *L. bilongrudi* Taylor, were assigned to *Vombisidris* by Bolton, 1991. Bolton described 9 new species , mostly from single specimens collected from rainforest vegetation by insecticide fogging. *Vombisidris* thus comprises 1 species from India, 4 from Borneo, 3 from Sulawesi, and 2 each from New Guinea and Cape York Peninsula. *Leptothorax* is not known from Australia.

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