common in Perth gardens. *Melophorus wheeleri* Forel is found from the Pilbara down to the gold fields, and into the wheatbelt at least as far west as Kellerberrin. Workers from Jiggalong Station have been collected in the process of carrying seeds of *Lepidium phlebopetalum* (Brassicaceae). Two minor workers collected near Yalgoo, just outside of the SWBP, are aberrant in that they have scattered erect setae on the dorsum of the mesosoma (otherwise lacking in minor workers of *M. wheeleri* I have seen), and one has six teeth on one of the mandibles, rather than the customary seven or more. These may represent another species in the *M. wheeleri* complex, as other *M. wheeleri* minor workers in the Curtin Ant Collection are very uniform in appearance. *Melophorus wheeleri* complex sp. JDM 1077 is known from the far east and north-east of the SWBP. The main stronghold of this species appears to be the Eremaean zone.

The *Melophorus bruneus* complex falls within the *turneri* group, and shares a common mandibular conformation. As with many *M. turneri* populations, in minor workers, particularly, the cuticle tends to be shagreenate and may be dull. *Melophorus bruneus* complex sp. JDM 520 is found throughout WA, including parts of the metropolitan area. Inspection of the antennae is needed to distinguish hirsute *M. turneri* from *M. bruneus* sp. JDM 520. *Melophorus bruneus* complex sp. JDM 600 is also very similar to *M. turneri*, but lacks semi-erect setae on the hind tibiae. Minor workers only of this mainly eremaean species have been collected; these being taken as far west as Westonia. This species appears to be very close to *M. bruneus*, based on the holotype in ANIC (a major worker).

Melophorus ANIC sp. 3, *Melophorus* sp. JDM 176 and *Melophorus* sp. JDM 500 are three small to minute species. The workers are very similar in structure and appearance. Minor workers are glabrous, but major workers usually have some erect setae, these being modified in major workers of *Melophorus* sp. JDM 176. *Melophorus* sp. JDM 500 has thus far only been found within a few kilometres of the coast, on white, sandy soil, between Perth and Shark Bay. Both major and minor workers have a mesonotum that is paler than the surrounding mesosoma, sometimes being white and translucent. In major workers the mesonotum tends to be bulbous. The body colour varies from yellow to brown. *Melophorus* ANIC sp. 3 varies in respect of the mesosoma, which is of an even, yellow colour, and the mesonotum, which is less pronounced in major workers. The head of the minor worker is also slightly more rounded than that of *Melophorus* sp. JDM 500. This ant is abundant in the wetter south-west corner of the State, including urban areas. Both of these species are virtually unsculptured, whereas *Melophorus* sp. JDM 176 has distinct, superficial microsculpture, most notably on the lower mesopleuron (i.e. the katepisternum) and propodeum. In lighter-coloured forms of *Melophorus* sp. JDM 176 the orange colour is of a slightly deeper hue than in *Melophorus* ANIC sp. 3, and this colour form is mostly found in the drier wheatbelt and mallee country north-east, east and south-east of Perth. Brown and reddish-brown morphs of *Melophorus* sp. JDM 176 are abundant in the northern sandplains. The major worker of the two species can be distinguished by the type of pilosity on its pronotum: in *Melophorus* sp. ANIC 3 the standing setae are fine and longer than the eye width, while the setae in *Melophorus* sp. JDM 176 are shorter than the eye width, and stout. The above three taxa constitute the bulk of the small to minute *Melophorus* pitfall-trapped, mainly in the form of minor workers, in Curtin research projects in both dry and wetter areas of the SWBP.

In many parts of the state, minuscule minor workers with a morphology resembling that of *Melophorus* ANIC sp. 3 have been collected. These ants, however, are darker in colour, and resemble *Plagiolepis lucidula* Wheeler. In some goldfields populations the metanotal groove is very weakly impressed, but in other populations this groove is more deeply impressed. The propodeum ranges from smoothly rounded and scarcely raised above the mesonotum (seen in outline) to distinctly raised with an abrupt angle separating the dorsal from the declivitous faces. Thus far major workers have not been associated with this ant, despite the ubiquitous nature of the minor workers, and an assessment of its taxonomic status in relation to *Melophorus* ANIC sp. 3 is therefore difficult. The minor workers, however, can be separated from minor workers of *Melophorus* sp. JDM 176 by their generally smaller size and smooth, shiny cuticle.

Melophorus sp. JDM 470, as here defined, may be a complex of two species, both apparently close to *Melophorus* sp. JDM 176. Major and minor workers are a little larger than their counterparts within *Melophorus* sp. JDM 176, and are decidedly hairy. This is a mainly northern taxon, which occurs in the upper fringes of the SWBP. Dull little minor workers of *Melophorus* sp. JDM 1180 were recently pitfall-trapped in the Eneabba region in a project associated with Curtin University. The species was not uncommon in the traps, and evidence of its presence in sandplain country in the north of the Swan Coastal Plain botanical district would not be unexpected.

Small size is also characteristic of what is probably a related group of ants. *Melophorus* sp. JDM 230 and *Melophorus* sp. JDM 1063 represent two species in which the posterior sector of the mesonotum is extended as a lobe in the minor workers, so that it overhangs the propodeum

(this feature is less accentuated in major workers, which are known only for *Melophorus* sp. JDM 230). *Melophorus* sp. JDM 230 has thus far been found only in the Perth region, while *Melophorus* JDM 1063 is represented by a single series from a nest near the Billabong Roadhouse, south of Shark Bay and from Barrow Island (in the Pilbara, and thus outside of the SWBP). Apart from the position of the propodeal spiracle, the two taxa are differentiated on the basis of presence or absence of pilosity.

Melophorus sp. JDM 786, known from a single minor worker collected near Southern Cross, and a major and media worker collected east of Hyden on sand-plain, and *Melophorus* sp. JDM 1070, known from minor workers taken from near Billabong Roadhouse and from Kwelkan in the eastern wheatbelt, have only slight differences apart from the pilosity aspect, and the colour pattern is identical. A possible major worker, belonging to the latter species, was collected at Sandford Rock Reserve in the eastern wheatbelt. The higher-level affinities of these and the ants mentioned in the previous paragraph are uncertain, but the appearance of the major workers suggests they probably belong to the *M. turneri* species-group.

Only a few minor worker specimens are known for *Melophorus* sp. JDM 1102. The head of this gracile little ant has a domed vertex, the mesonotum is straight and the femora are long and thin for much of their length. These specimens have been pitfall-trapped in and around the Zuytdorp region, north of Kalbarri. (Media and major workers that could belong to this species have been taken in the Pilbara by DEC workers, but unfortunately have not been able to be associated with workers of the minor subcaste from the same area.)

Melophorus insularis Wheeler is the member of the *M. aeneovirens* species-group found mainly in the wetter, open-woodland regions of the south-west, but it also occurs at least as far north as Shark Bay. In more inland areas, particularly in the northern and central parts of the State, it is replaced by *Melophorus* sp. nr. *aeneovirens* (Lowne). *Melophorus insularis* is extremely common in and around Perth, and in some southern suburbs and in the nearby Darling Range it is the most common *Melophorus* species. The ant is also found on Rottnest Island from where the type material for the taxon was collected. Minor workers of *M. insularis* vary greatly in colour, ranging from light yellow or ochre to almost black. *Melophorus* sp. near *aeneovirens* is a handsome, fast moving orange- or red-and-black ant. *Melophorus* sp. JDM 199 is another large orange or orange-and-black ant that resembles *Melophorus* sp. near *aeneovirens* in the field, but belongs to the northern *M. bagoti* species-group. This species is also found in drier areas, and its range extends at least to the NT. Workers have a very even dorsal profile.

Melophorus mjobergi Forel and *Melophorus* sp. JDM 784 have a similar appearance and may be related. *Melophorus* sp. JDM 784, however, has scattered, short, thickened setae, whereas the erect setae on *M. mjobergi* are plentiful, long and thin. Both have abundant pubescence on all body surfaces. *Melophorus mjobergi* was described from Broome, in the Kimberley region. The fact that this species can also be found within 200 km of Perth, suggests that it has a broad distribution throughout mainland Australia. *Melophorus mjobergi* has been collected generally throughout the SWBP. *Melophorus* sp. JDM 784 has been collected in open woodland at Dryandra, but is more commonly encountered in arid and semi-arid localities. This species forages on tree-trunks as well as on the ground; the Dryandra specimens being collected in an intercept trap set on a Wandoo trunk. Minor workers of *Melophorus mjobergi* complex sp. 1121 differ from *M. mjobergi* in the more rounded pronotum and mesonotum, although the single known major worker of this species cannot easily be separated from majors of *M. mjobergi*. Specimens of this species have been collected only at Westonia within the SWBP, with another minor worker being taken at Queen Victoria Spring, outside of the SWBP. Another, larger species, *Melophorus* sp. JDM 1105, collected only at Nerren Nerren Stn. (just outside of the NE boundary of the SWBP) may be related to the preceding taxa.

The remaining seven *Melophorus* species found in the SWBP have an unmistakeable *facies* that implies specialist habits. All are uncommon in the Province, and are known, at the most, from a small handful of specimens. *Melophorus potteri* McAreavey was described from Victoria, where these ants are known to prey on termites (McAreavey 1947). Records from the SWBP have come from Eneabba, Kellerberrin and West Arthur in the central wheatbelt, but the ant appears to be more common north of the SWBP. These ants are rather stocky and compact, and have an exceptionally large propodeal spiracle. Another species in this group, *Melophorus potteri* group sp. JDM 1032, is known in the SWBP from a series from Kwelkan, in the Eastern wheatbelt. This *Melophorus*, which has very characteristic mandibles, is illustrated in Figure 15f in Greenslade's 1979 handbook on the ants of South Australia. A third species in this group, *Melophorus potteri* group sp. JDM 1082, mostly occurs outside of the SWBP, but one specimen has been collected on the eastern fringe of the Province, near Warrachupin. The bizarre *Melophorus majeri* Agosti is known thus far only from a couple of records from heathland near the south coast of WA (Agosti 1997) and, more recently, from Eneabba. The one known nest was made directly into white

sand. Minor workers of *M. majeri* are the only *Melophorus* with propodeal spines, and the dorsal and lateral surfaces of their flattened mesosomas are delimited by carinae. The minors also have very elongate heads and antennal scapes. *Melophorus* sp. JDM 613 is notable in that the sole known worker, a small minor, appears to belong to the aberrant *M. fulvihirtus* group of species that is otherwise unknown in the SWBP. The worker was pitfall trapped at Boddington, 130 km south-east of Perth. This ant is stocky and strongly shagreenate in appearance, and the mesosoma is covered with short, blunt, bristly setae.

Melophorus JDM 788 and *Melophorus* JDM 787 are represented by line drawings (figures 15a and d, respectively) in Greenslade's (1979) book on South Australian ants. Material collected in WA pertaining to the former species consists of a few minor workers, one of which was hand-collected on Mambemarra Hill, on the outskirts of Geraldton. The minor worker strongly resembles a medium-sized *Iridomyrmex*, and this species may have a biology associated with that genus. Elsewhere, this ant is known to occur in the Pilbara and goldfields. *Melophorus* JDM 787 is a tree forager, and the odd, flattened shape may be an adaptation to hiding under bark on smooth-barked eucalypts in order to evade predators. (n.b. Greenslade (1979) offers an alternative explanation that the adaptation relates to foraging for food under bark, but the two ideas are not mutually exclusive.) In the SWBP this ant is known from the eastern and north-eastern wheatbelt.

Myrmecorhynchus

One species, Myrmecorhynchus emeryi *André.*

Myrmecorhynchus emeryi André is the only WA representative of this genus. The species is very occasionally collected on or near the south coast of WA and in the eastern wheatbelt. The only material in the Curtin Ant Collection was taken from Mt Lindesay, near Denmark. In the SWBP this genus is most likely to be confused with *Notoncus*, but the projecting central anterior margin of the clypeus is rectangular in *Myrmecorhynchus* and convex or sinuate in WA *Notoncus* species. These ants are most commonly collected from vegetation (Greenslade 1979).

Notoncus

1. Posterior pronotum not raised, unarmed; mesonotum without posterior lobe (Figure 374)..... ***N. hickmani* Clark**

   Posterior pronotum raised, with pair of laterally directed denticles; mesonotum with posterior lobe (Figure 375)..... **2**

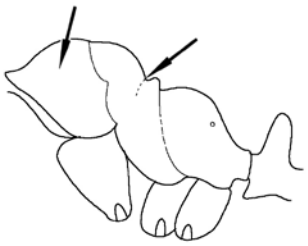

Figure 374

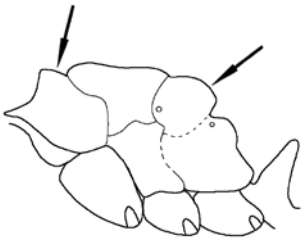

Figure 375

2. Depigmented yellow species, frons of head capsule darker; dorsum of propodeum narrow with pair of small denticles at propodeal angles..... ***Notoncus* sp. JDM 487**

   Brown or reddish-brown species; dorsum of propodeum broad, propodeal angles present or absent, but denticles usually absent..... **3**

3. Mesosoma smooth and shining; gaster lacking pubescence..... ***N. gilberti* Forel**

   Mesosoma sculptured, dull; gaster may be wholly pubescent..... **5**

4. First gastral tergite strongly pubescent amid erect setae, striolae on mesosoma tending to weak and superficial; upper vertex of head smooth and shining (Figure 376)..... ***Notoncus cf. capitatus* Forel**

   First gastral tergite with well scattered appressed setulae only amid erect setae; mesosoma strongly striate; upper vertex of head striolate (Figure 377)..... ***N. enormis* Forel**

Figure 376

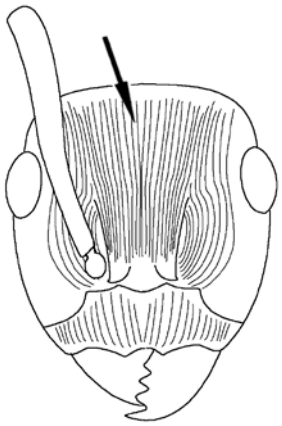

Figure 377

Notoncus is an inconspicuous but not uncommon genus in the SWBP province. Because of the complex profile of their mesosoma, most *Notoncus* species are unlikely to be confused with anything else, though *Myrmecorhynchus* (see above) is somewhat similar to *Notoncus hickmani* Clark in outline. Local species tend to be winter active general foragers.

Notoncus gilberti Forel is abundant in and around Perth, and quite commonly colonises suburban gardens. Here, small granules of soil heaped into amorphous clumps are often the only sign of its presence during the day, as the ant is usually a nocturnal forager. This species has cornicles on the humeral angles, and the metanotum, which is posteriorly lobate, is raised above the level of the propodeum. *Notoncus gilberti* can be found in wetter parts of the south-west, but its more general range also includes NSW and Qld. *Notoncus hickmani* lacks processes on the trunk, and is another common species of the Perth region. This taxon has been recorded from all mainland states except the NT.

The identity of Western Australian *Notoncus* species that are similar to *N. gilberti*, but of a more sculptured appearance, is somewhat confused. There appear to be one or two taxa, depending on the significance of the gastral pubescence. Large specimens of *Notoncus* from the Pilbara (HW = 1.8 mm), with strongly rugose-striate sculpture and sparse gastral pubescence, have been identified as *Notoncus capitatus* Forel, based on type material. However, according to the key contained in Taylor (1992), this species is close to *Notoncus enormis* Szabó. Much smaller specimens of a similar appearance also occur in both the Pilbara and in the SWBP. Ants approximating to the description of *Notoncus capitatus*, according to the published description by Taylor (1992), have strong pubescence on the first gastral tergite. Like the preceding species, these ants appear to have a wide distribution in WA, although not recorded from this State in the published literature. The supposed diagnostic features appear variable, and pending examination of eastern states material I tend to favour Brown's decision to combine the two taxa but retain the key containing Taylor's amendment for the present.

Unlike the former *Notoncus* species, which are widespread, the undescribed *Notoncus* sp. JDM 487 appears to be confined to the Swan Coastal Plain. The ant is currently known only from a small area of relictual bushland in Canning Vale not far from the Perth CBD, where recent subdivision threatens local extinction. The only other record of this species in the Curtin Ant Collection is from the Medina-Kwinana area, many years ago, where a couple of workers were pitfall-trapped from (then existing) open woodland. The ANIC, in Canberra, has a solitary pin of three worker specimens collected from Ludlow, on the south-west coast. This is a very pale species somewhat in the general mould of *N. enormis* and *N. gilberti* but with a very narrow propodeal dorsum that terminates in two small denticles. Several nests of *Notoncus* sp. JDM 487 have been found around the roots of *Calytrix flavescens* Cunn.

Opisthopsis

One species, Opisthopsis rufithorax *Emery.*

To the uninitiated observer, *Opisthopsis* species neither look nor behave like ants. The massive compound eyes are evident to the unaided human eye, and the total impression is of a small, wingless wasp. Even more eccentric is *Opisthopsis'* method of progressing in small jerks, earning it the soubriquet in some circles of 'electric', 'robot' or strobe' ant (Andersen 2000). These ants are most common in the tropics and are untroubled by the encroachment of urbanization, indeed may be benefited by it: the author has observed the undignified spectacle of filthy urban rubbish bins being raided by *Opisthopsis* species in Brisbane. The only species of *Opisthopsis* in the SWBP is *Opisthopsis rufithorax* Emery, which has an Australia-wide distribution. Within the SWBP this ant is found mainly east and north of Perth. Workers are rather timid and will rapidly dart to the opposite side of a tree-trunk or drop down on the ground when approached.

Paratrechina

1. Yellowish species; erect, bristly setae on head capsule confined to two pairs on margin of vertex and several pairs straddling midline (*minutula* species-group) **2**

   Brown species; erect, bristly setae well distributed on head capsule **3**

2. Eye elliptical, moderate in size (Eye length < 1/3 head length) (Figure 378); brownish-yellow species..... ***P. minutula*** **(Forel)**

Eye slightly asymmetrical (as in *Iridomyrmex hartmeyeri* group), larger (Eye length ≈ 1/3 head length) (Figure 377); depigmented yellow .....***P. minutula* group sp. JDM 916**

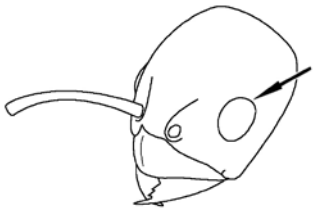

Figure 378

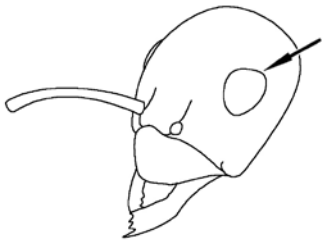

Figure 379

3. Antennal scapes very long, exceeding vertex of head capsule by 2/3 their length (Figure 380); eye large (eye length ≥ 1/3 length of head capsule) (introduced to SWBP)..... ..... ***P. longicornis* (Latreille)**

Antennal scapes much shorter, exceeding vertex of head capsule by ≤ 1/2 their length (Figure 381); eye smaller (eye length ≤ 1/4 length of head capsule) (introduced to SWBP)..... **4**

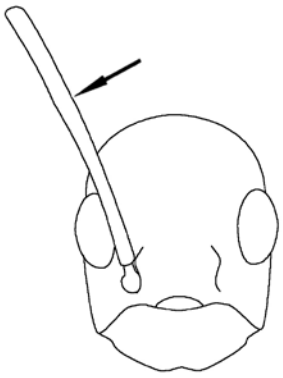

Figure 380

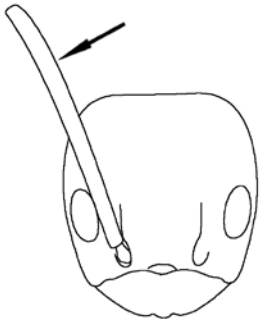

Figure 381

4. Mesopleuron lacking distinct pubescence, appressed setae, if present, very few in number (Figure 382) .... ***P. braueri glabrior* (Forel)**

Mesopleuron uniformly covered with pubescence (Figure 383)..... ..... ***Paratrechina cf. obscura* (Mayr) (ANIC SOS sp. 3)**

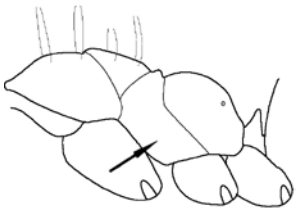

Figure 382

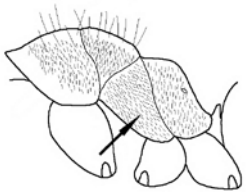

Figure 383

Pairs of stout setae on the upper surface of the mesosoma serve to characterise this genus. The genus *Prolasius* sometimes also has stout setae, which in one species often occurs as a pair on the mesonotum, but elsewhere on the body these setae are never closely paired. *Paratrechina* species are opportunists, and some have become tramp ants; at least three of the five species known from the SWBP are introductions. Three evolutionary radiations are evident among the local species. Members of the *P. minutula* species-group, which contains two taxa, are small and yellowish, and the erect, bristly setae on the head capsule are confined to the vertex and midline of the head capsule. *Paratrechina minutula* (Forel) is a rare inhabitant of urban bushland in the Perth area, where it was found nesting in rotting wood on one occasion. Specimens have also been collected on Rottnest Island (Wheeler 1934). Since the species is common on the east and south-east coasts of Australia, it is possible, though perhaps unlikely, that it has been introduced to Perth by human agency. *Paratrechina* sp. JDM 916 is an undescribed species in the *P. minutula* group that can be distinguished from *P. minutula* by its larger, asymmetrical eye. This species is a nocturnal forager in drier woodlands and semi-arid areas in the SWBP, and its range extends into the Eremaean Botanical Province.

Paratrechina longicornis (Latreille), found throughout the world's tropics, is a tramp species that reaches pest proportions in some places. As well as WA, it has been recorded from the NT

and Qld. In WA this ant is most common in the Kimberley region, but it also occurs in the more built up areas of Perth. This species is very gracile, with long appendages.

The remaining two *Paratrechina* species belong to the *obscura* group (S. Shattuck, unpublish.) The large, blackish-brown *Paratrechina* ANIC SOS sp. 3 is an apparent introduction in the SWBP, as it not found in undisturbed woodland or other native habitats. The same species occurs naturally in the Pilbara and Kimberley regions. In the Perth metropolitan area, the numbers of this ant appear to be increasing and it is becoming something of a minor pest. Although the workers do not usually forage indoors, they are great excavators of sand and leave unsightly mounds in patios, on lawns and between paving stones on footpaths. *Paratrechina braueri glabrior* (Forel), common in the north and north-west of this state, is known in the SWBP from a few records in the Fremantle area. A third species, *Paratrechina rosae* (Forel), has been collected near Eucla, and may occur in the far south-eastern fringes of the SWBP.

Plagiolepis

1. Eye small (eye width ≈ greatest width of antennal scape); yellowish brown species .... ***Plagiolepis* sp. JDM 189**

   Eye larger (eye width ≥ 2x greatest width of antennal scape); usually brown to black species..... **2**

2. Cuticle smooth and shining..... ..... ***P. lucidula* Wheeler**

   Cuticle finely sculptured, dull..... ..... ***P. squamulosa* Wheeler**

Ants of the genus *Plagiolepis* are very small to minute general predators, and also tend Hemiptera (Shattuck 1999). Small turrets of soil often betray the presence of the local species. *Plagiolepis* workers are distinguished from other minute formicines and dolichoderines by the combination of an acidipore (which sets them apart from dolichoderines like *Bothriomyrmex* and *Tapinoma*), a PF of 6,4 (which sets them apart from *Acropyga*), a smooth, unarmed propodeum (which differentiates them from *Stigmacros*) and 11-segmented antennae.

Three *Plagiolepis* taxa have been described from the SWBP, but only two of these appear to be good species. A third species appears to be undescribed. The two named *Plagiolepis* species found in the SWBP Province are common in the vicinity of Perth. *Plagiolepis lucidula* Wheeler has only been recorded from Rottnest Island, Hamelin Bay (specimens in the California Academy of Sciences Ant Collection) and Perth. This ant is winter active and is common in some gardens in the Fremantle area. The very small size of this species may be a factor that enables it to co-exist in urban locations with aggressive exotics like the big-headed ant. *Plagiolepis squamulosa* Wheeler was also described from Rottnest Island, but has a much wider range in southern WA, and possibly beyond. (The holotype of *Plagiolepis nynganensis* McAreavey, described from inland NSW, appears to be identical with workers of *P. squamulosa*, and I suspect the two may be conspecific. *Plagiolepis clarki* Wheeler, syntypes of which are in the MCZ, also looks to be conspecific with this species. The name *squamulosa* would have priority because of pagination.) Replete workers are often discovered in nests of *P. squamulosa*. *Plagiolepis* sp. JDM 189 is common in white, sandy soils between Eneabba and the south coast.

Polyrhachis

1. Humeral angles of pronotum armed with sharp spines, directed anteriad at angle of 45° (Figure 384) (subgenus *Chariomyrma*)..... ... ***P.* (*Chariomyrma*) *'aurea'* sp. A (JDM 807)**

   Humeral angles of pronotum armed with, at most, a pair of short, laterally directed denticles (e.g. Figure 385)..... **2**

Figure 384

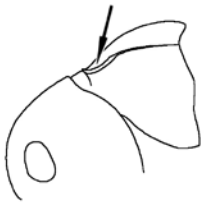

Figure 385

2. Node armed with two long, downwardly curved lateral spines only (Figure 386a); dorsum of node flat; in dorsal view, propodeum armed with two long, sinuate, cylindrical spines extending slightly beyond sides of ant when viewed dorsally (Figure 386b) (subgenus *Hagiomyrma*)..... ***P. ammonoeides* Roger**

   Node usually with four denticles or short spines (if middle pair obsolete or vestigial, then dorsum of node a thin scale) (e.g. Figure 387); propodeum either unarmed, or armed with short, upturned flanges, denticles or short, flattened spines (e.g. Figure 388) (subgenus *Campomyrma*) **3**

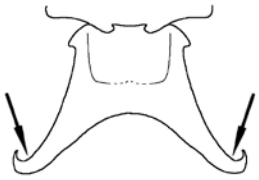

Figure 386a

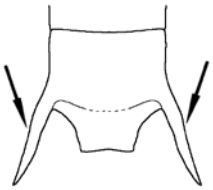

Figure 386b

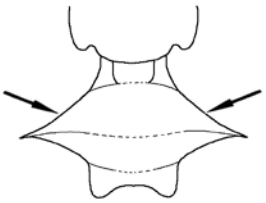

Figure 387

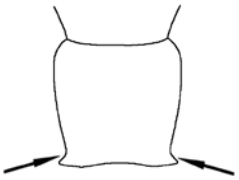

Figure 388

3. Dorsum of node with weak denticles or angles, or dorsal margin entire **4**

   Dorsum of node with pair of distinct spines or sharp denticles **8**

4. Gaster yellow, contrasting with black head and mesosoma; smaller (HW ≈ 1 mm) ..... ***Polyrhachis (Campomyrma)* sp. JDM 670**

   Head, mesosoma and gaster entirely or predominantly black or dark brown; larger species (HW ≥ 1.5 mm)..... **5**

5. Pronotum rounded, or with vestigial humeral angles; mesonotum rounded anteriad, strongly tapering towards junction with propodeum (Figure 389a); distance between frontal carinae broad, 1/3 HW >; head capsule without trace of angle between upper margin of eye and vertex (e.g. (Figure 389b) ....***P. femorata* F. Smith**

   Pronotum and mesonotum distinctly angulate anteriad, mesonotum tapering weakly towards junction with propodeum (e.g. Figure 390); distance between frontal carinae narrow, 1/3 HW<; head capsule with dull to sharp angle between upper margin of eye and vertex (Figure 391)..... **6**

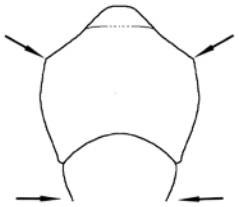

Figure 389a

Figure 389b

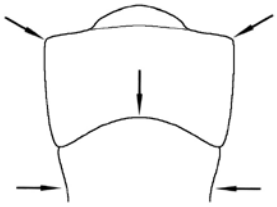

Figure 390

Figure 391

6. Angle between posterior margin of eye and vertex of head capsule strongly carinate, the upper gena slightly excavate (Figure 392a); lateral margins of node armed with sharp teeth, directed posteriad (Figure 392b)..... .....***P. schwiedlandi* Forel**

   Angle between posterior margin of eye and vertex of head capsule usually not strongly carinate; or, if strongly carinate, then teeth on lateral margins of node vestigial and directed laterad **7**

Figure 392a

Figure 392b

7. Propodeal angles terminating in short, upturned denticles; viewed dorsally, mesosoma with finely striate sculpture only, that on pronotum usually in form of distinct whorl (Figure 393); ... ***Polyrhachis (Campomyrma)*** **sp. JDM 1010**

   Rear of propodeum terminating in shelf, slightly lobate at angles; viewed dorsally, mesosoma with traces of superficial pits in addition to finely striate sculpture; sculpture of pronotum not in form of whorl (Figure 394);..... .....***Polyrhachis (Campomyrma)*** **sp. JDM 805**

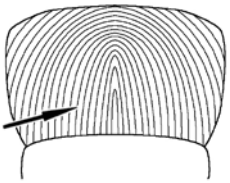

Figure 393

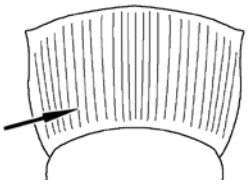

Figure 394

8. Few to many erect and semi-erect setae on first gastral tergite (may be short)..... **9**

   First gastral tergite lacking erect and semi-erect setae **12**

9. Head and mesosoma covered with long, slightly curved, erect setae; downy pubescence present on gaster; appearance non-gracile with short appendages..... ..... ***P. hirsuta*** **Mayr**

   Head and mesosoma with sparse, short, straight setae; downy pubescence absent from gaster; gracile appearance with long appendages..... ..... **10**

10. Lateral pair of spines on petiolar node shorter than dorsal pair and directed laterad (Figure 395) .....***P. gravis*** **Clark**

    Lateral pair of spines on petiolar node longer than dorsal pair, and directed vertically (Figure 396) **11**

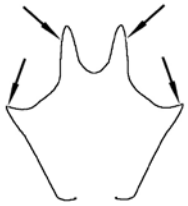

Figure 395

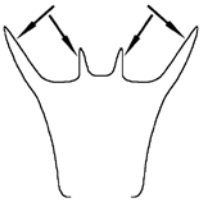

Figure 396

11. Propodeum only slightly longer than wide; flattened; sculpture of mesosoma often coarse (Figure 397) ..... ***P. macropa*** **Wheeler**

    Propodeum much longer than wide; gently excavate towards its centre; sculpture of mesosoma a uniform,very fine micro-reticulation (Figure 398)..... .....***P. pyrrhus*** **Forel**

Figure 397

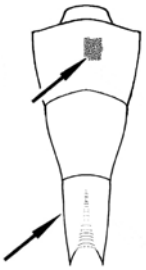

Figure 398

12. Gaster covered in fine pubescence..... **13**

    Gaster lacking fine pubescence **14**

13. In dorsal view, pronotum, mesonotum and propodeum of uniform appearance; propodeal spines short to very short and weakly upturned ..... ***P. phryne*** **Forel**

    In dorsal view, mesonotum and propodeum irregularly sculptured, while pronotum is more-or-less longitudinally striate; propodeal spines long and strongly upturned..... .....***Polyrhachis (Campomyrma)*** **sp. JDM 118**

14. Smaller species (HW ≈ 1 mm); lateral processes of node weak denticles..... .....***Polyrhachis (Campomyrma)*** **sp. JDM 802**

    Larger species (HW ≥ 1.5 mm); lateral processes of node usually strong denticles or spines, if weak, ant large (HW ≥ 2 mm) **15**

15. In full-face view, angles of vertex in form of small boss or protuberance just above each eye (Figure 399a); lateral spines on node distinctly longer than pair of spines on dorsum of node (Figure 399b) ....***P. leae*** **Forel**

    In full-face view, angles of vertex not protuberant (Figure 400); lateral spines on node the same size or smaller than pair of spines on dorsum of node (Figure 401) **16**

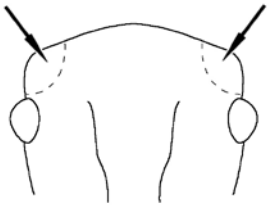

Figure 399a

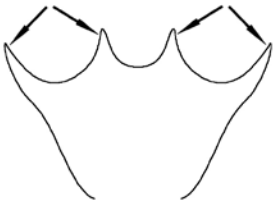

Figure 399b

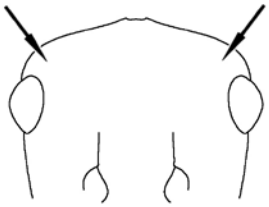

Figure 400

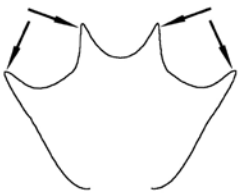

Figure 401

16. In dorsal view, vertex of head capsule without fine, microscopic microreticulation, vertex shining in appearance.....***P. ops*** **Forel**

    In dorsal view, vertex of head capsule with distinct microreticulate sculpture, vertex more dull in appearance **17**

17. In dorsal view, mesonotum distinctly wider than long (Figure 402a); propodeal angles directed upwards as weak denticles; in profile, spines on dorsum of node directed upward (Figure 402b) .....***P. sidnica*** **complex sp. JDM 390**

    In dorsal view, mesonotum about as wide as long; propodeal angles directed upward as flattened spines (Figure 401a); in profile, spines on dorsum of node tilted posteriad (Figure 401b) ....***P. sidnica*** **complex sp. JDM 671**

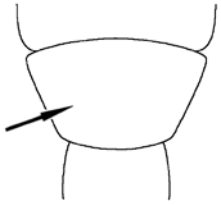

Figure 402a

Figure 402b

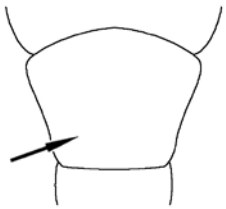

Figure 403a

Figure 403b

Globally, this is an enormously diverse genus, rivalling genera like *Camponotus* and *Pheidole* in size. The common name of 'spiny ants' sometimes given to *Polyrhachis* species is well-deserved in most cases. The spinose appearance of these usually black ants is normally distinctive, but the lack of a metapleural gland (an uncommon feature in Formicinae), an angular or toothed petiolar node and the large first gastral tergite set them apart from the few species of other genera with which they could be confused. Many species have colourful white to orange pubescence on their gasters. *Polyrhachis* ants are normally terrestrial, but a number of lignicolous

species make their nests in holes in tree-trunks and a few make silk nests among the leaves of trees. Two species actually nest in mangrove mudflats and forage at times of low tide (Shattuck 1999; Andersen 2000). The Australasian members of the genus have been undergoing a long process of revision by R. J. Kohout and R. W. Taylor, which has resulted in a periodic release of mainly short taxonomic articles (see Shattuck and Barnett [2007] for a full listing).

Eighteen species of this mainly tropical genus are covered in the key to the SWBP *Polyrhachis* fauna, though other species may occur on the fringes of the Province. Most of the taxa belong to the sub-genus *Campomyrma*. *Polyrhachis ammonoeides* Roger is the only member of the sub-genus *Hagiomyrma* occurring in the SWBP. In WA, this attractive, black-and-gold coastal species can be found from about Dongara to at least Barrow Island. Likewise, the northern *Polyrhachis* (*Chariomyrma*) sp. JDM 807 (in the *aurea* complex) is probably the only species in sub-genus *Chariomyrma* to occur in the SWBP. This is an arid area form that is a typical feature of the ant fauna of the inland Pilbara.

The remaining *Polyrhachis* all belong to the sub-genus *Campomyrma*. Undoubtedly the most common of these is *Polyrhachis phryne* Forel. According to Kohout (Kohout and Taylor 1990), *P. phryne* is one of the most widespread of all Australian ants, being definitely known from all Australian states except the NT and Tas. *Polyrhachis phryne* has an apparently close relative that can be found throughout the SWBP. This species, *Polyrhachis* (*Campomyrma*) sp. JDM 118, can be recognised by its longer propodeal spines and distinct sculpture of the mesosoma. *Polyrhachis phryne* itself may actually include sibling forms (R. Kohout, pers. comm.). Another widespread species is *Polyrhachis femorata* F. Smith, which occurs on the east coast of Australia (including Tasmania) as well as in south-west WA (Kohout 2000). In this taxon the humeri are rounded, which is not the case in other south-west *Polyrhachis* in the sub-genus *Campomyrma*. The author has seen workers of *P. femorata* emerging from holes, probably excavated by other insects, in the trunk of a Perth suburban jacaranda tree (Bignoniaceae).

Ants in the *Polyrhachis sidnica* complex appear to be closely related to *P. phryne*. These are species in which the workers have a petiolar node that is armed with paired spines both dorsally and laterally, and the gaster is lacking in distinct pubescence. In *Polyrhachis* (*Campomyrma*) sp. JDM 390 the petiolar node and its dorsal pair of spines, seen in profile, are directed vertically. These same structures are tilted posteriad in *Polyrhachis* (*Campomyrma*) sp. JDM 671 (possibly a species complex). *Polyrhachis* (*Campomyrma*) sp. JDM 390 is found inland of the Darling Range, south-east of Perth, while *Polyrhachis* (*Campomyrma*) sp. JDM 671 has a more extensive range throughout southern parts of the SWBP. *Polyrhachis ops* Forel is differentiated from these two taxa only by the smoother and shinier head capsule, and is found on the western south coast. An undescribed member of the *Campomyrma* subgenus, collected by a non-Curtin researcher in 2005 on Whitlock Island near Jurien Bay townsite, is currently on loan to Dr. Rudy Kohout, and has not been available for comparison with existing material in the Curtin Collection. Nor has it been assigned a JDM number. This species is likely to constitute a nineteenth south-western member for the genus. The sole specimen is morphologically close to *Polyrhachis patiens* Santschi, but is not identical to that eastern Australian species (R. Kohout, pers. comm.). This worker would come out in the SWBP *Polyrhachis* key somewhere near *P. ops* but has a much more gracile appearance than the latter species. Polyrhachis *leae* Forel, described from Tasmania, is similar to the aforementioned species but the corners of the vertex are slightly protuberant, so that the vertex resembles that of certain *Rhytidoponera*. Within the SWBP, specimens have mostly been collected in wetter coastal parts of the south-west, but have also been recorded from bark and intercept traps on Wandoo (*Eucalyptus wandoo* Blakely) and Powderbark Wandoo (*Eucalyptus accedens* W. Fitzg.) trunks in Dryandra State Forest.

Polyrhachis gravis Clark has a few erect and semi-erect setae on the gaster. The propodeum is strongly tapered posteriad. In the SWBP this species has been collected from the sandplain around Eneabba and in the Esperance district, but also occurs throughout inland WA. *Polyrhachis gravis* was originally described from the NT. The closely related and well-known mulga ant (*Polyrhachis macropa* Wheeler) has a range that extends to the northern fringe of the SWBP, and is part of a complex consisting of many species. *Polyrhachis pyrrhus* Forel has recently been found at Bunketch, in the north-east of the Province, and this ant also occurs in the Pilbara and the NT. The clay nests of this species are among the most spectacular ant nests in the SWBP, resembling large clay vases that have been half-buried in the ground. The entrance hole or holes in some instances are large enough to admit an animal the size of a rat.

Polyrhachis schwiedlandi Forel is one of the few *Polyrhachis* in the SWBP in which the dorsum of the petiolar node in the workers is unarmed. *Polyrhachis schwiedlandi* was described from NSW, but, like many of its southern brethren, its true range is probably much more extensive than that recorded in the literature. Workers are usually easily recognized by the carina extending from the posterior margin of the eye to the vertex of

the head capsule. The upper sector of the gena is slightly excavate. However, for northern collections examination of the configuration of the node is needed to distinguish this ant from two very similar species, i.e. *Polyrhachis* (*Campomyrma*) sp. JDM 1010 and *Polyrhachis* (*Campomyrma*) sp. JDM 805. In *C. schwiedlandi*, on either side of the node is a sharp, lateral tooth that projects posteriad. In the other species the lateral tooth is shorter and usually vestigial. *Polyrhachis* (*Campomyrma*) sp. JDM 1010 has been collected from Eneabba and from Nanga and Nerren Nerren Stations, south of Shark Bay, as well as from places north and east of the SWBP. In this species the lateral tooth or denticle projects laterad. *Polyrhachis* (*Campomyrma*) sp. JDM 805 is very similar to the preceding two species, but the head is less angular and the sculpture on the dorsum of the mesosoma is more delicate. The lateral processes on the petiolar node are vestigial and oriented posteriad, as with *P. schwiedlandi*. This is a mainly northern and eremaean species. *Polyrhachis hirsuta* Mayr is known in the Curtin Ant Collection from one nest discovered in soil in Jarrah-Marri woodland near Sawyers Valley, some 45 km east of Perth. However, other specimens from south-west WA are held at ANIC (R. Kohout, pers. comm.), and the species is also known to occur in NSW and QLD. The workers are extremely hairy.

Finally, two small and apparently uncommon *Polyrhachis* are *Polyrhachis* (*Campomyrma*) sp. JDM 620 and *Polyrhachis* (*Campomyrma*) sp. JDM 802. *Polyrhachis* (*Campomyrma*) sp. JDM 620 is unusual in that the cuticular colour of the whole gaster ranges from gold to light tan, a departure from the usual black or dark red found in the genus. Specimens have been collected only from Amery Siding in the central wheatbelt, and from 101 km SSE of Newman. *Polyrhachis* (*Campomyrma*) sp. JDM 802 is similar in size but its gaster is of the normal black colouration, and the petiolar node has paired dorsal spines (lacking in the other species). The only known specimens are from Torndirrup National Park, near Albany. Both species have very pale legs.

Prolasius

1. Pale, usually depigmented light yellow to orange species..... **2**

   Darker, brown to black species..... **5**

2. Pronotum with one pair of erect, bristly setae; dorsum of mesosoma pale yellow, sides of mesosoma distinctly darker..... ***P. hemiflavus* Clark**

   Pronotum with two pairs of erect, bristly setae (additional setae may be present); mesosoma not bicoloured..... **3**

3. Mesonotum with one erect, bristly seta at most; erect and semi-erect setae on antennal scape not conspicuous; propodeum smoothly rounded (Figure 404)..... ***Prolasius* sp. JDM 551**

   Mesonotum with two pairs of erect, bristly setae; erect and semi-erect setae on antennal scape conspicuous; propodeum with distinct dorsal and declivitous surfaces, often separated by a small, transverse carina (Figure 405)..... **4**

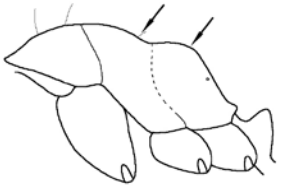

Figure 404

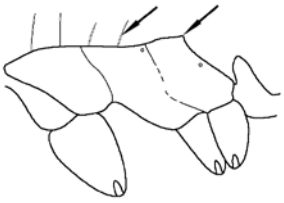

Figure 405

4. Seen from behind, propodeal dorsum laterally compressed, separated from declivitous face by a small, transverse carina (Figure 406) ..... ***Prolasius* sp. JDM 109**

   Seen from behind, propodeal dorsum not laterally compressed, transverse carina absent (Figure 407)..... ***Prolasius* sp. JDM 1044**

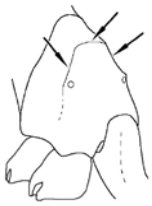

Figure 406

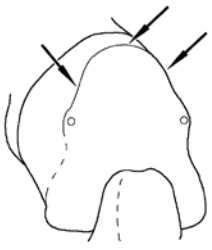

Figure 407

5. Mesosoma with 15 ≥ erect setae..... ***P. antennatus* McAreavey**

   Mesosoma with 10 ≤ erect setae..... **6**

6. Appressed setae very short, pubescence absent; mesosoma smooth and shining..... ..... ***Prolasius* sp. JDM 957**

   Appressed setae longer and dense, forming distinct pubescence; mostly duller in appearance with microsculpture present **7**

7. Mesosoma smooth and shining; erect setae on mesosoma (one pair on pronotum) and gaster fine and pale ..... ***Prolasius* sp. JDM 1120**

   Mesosoma duller with fine microsculpture; erect setae on mesosoma and gaster stout and dark ..... ***P. reticulatus* McAreavey**

In the field workers of dark *Prolasius* species can be confused with those of *Iridomyrmex* and *Paratrechina*. Closer examination of specimens under a microscope will readily eliminate *Iridomyrmex* (a dolichoderine genus), but species of *Prolasius* and *Paratrechina* share a number of features, including a bulbous clypeus, placement of the propodeal spiracle near the declivitous face of the propodeum, and, often, the presence of stout setae on the mesosoma. However, on the pronotum in *Prolasius* only two sets of setae, at most, are closely paired, whereas there are at least several adjacent pairs of setae on the pronotum of *Paratrechina* workers. *Prolasius* colonies are quite common in wetter parts of the south-west, where workers are found mainly on the soil surface or foraging on tree-trunks or on low vegetation. The diet of the WA species has not been studied, though some may take seeds (by inference from the known diet of related eastern states species – see Ashton 1979). Although several species of *Prolasius* may still be found in relictual native woodland in the Perth metropolitan area, they do not seem to persist in settled parts.

In the SWBP eight species of *Prolasius* have been identified, among which names can currently be assigned to only three species (a fourth available name, *Prolasius wheeleri* McAreavey, appears to the author to be no more than a synonym of *Prolasius reticulatus* McAreavey). Apart from *Prolasius hemiflavus* Clark, the known range of WA *Prolasius* species is restricted to the SWBP, but a revision of the group could well change this, as *Prolasius* taxa are also common in the humid south-east of Australia (Andersen 1991a).

Prolasius antennatus McAreavey is the species most frequently encountered in wooded parkland in the Perth metropolitan area and in central parts of the Darling Range. This is a brown ant with relatively long, downy pubescence and 15 or more erect setae on the mesosoma. *Prolasius reticulatus* is a large medium-brown to blackish species in which the cuticle is dull, and stout setae occur on the pronotum and, in some populations, the mesonotum. *Prolasius reticulatus* is commonly found in both the Darling Range and the Swan coastal plain. Workers have been collected in intercept traps on Wandoo and Powderbark Wandoo trunks at Dryandra. Workers collected in coastal woodlands growing on white sand in the lower west coast and south-west districts tend to be darker and hairier than those collected in the thicker forests of the Darling range. *Prolasius* sp. JDM 957 is similar to the above species, but is smooth and shining and lacks pubescence. This ant is known from one worker specimen collected in a pitfall trap at Dwellingup. Also occurring in the Dwellingup area is a large, gracile, pale species, *Prolasius* sp. JDM 109. This ant is not infrequently captured in pitfall traps, but has also been collected in an intercept trap on a Marri (*Corymbia calophylla* (Lindl.) K. D. Hill and L. A. S. Johnson) trunk. The range of this species extends to at least Manjimup, near the south coast. A very similar species to *Prolasius* sp. JDM 109 is the large, orange *Prolasius* sp. JDM 1044. This is the only *Prolasius* known from the central wheatbelt, and is represented by a single worker specimen held by WAM. This worker was collected 10 km north of Yorkrakine, and 240 km east of Perth.

Prolasius hemiflavus Clark and *Prolasius* sp. JDM 551 have small, yellow or depigmented workers. *Prolasius hemiflavus* has a distinct propodeal angle and one pair of erect setae on the pronotum. A few collections have been made of this species from trees, in pitfall traps, or under stones, on or near the south coast. The ant has also been recorded from an Alcoa site near Jarrahdale, some 60 km south of Perth. Outside of WA, this species is known from NSW, Tas., and Vic. *Prolasius* sp. JDM 551 has a rounded propodeum and is known from one collection taken from the south coast near Hopetoun, east of Albany and a single specimen collected at Lake Warden, near the Esperance townsite. *Prolasius* sp. JDM 1120, a brown species with fine, golden setae, was formerly thought to be confined to the heart of the Warren District, but recent records have come from the Huntly forest block, near Jarrahdale and Kings Park, near the Perth CBD.

Stigmacros

The key produced by McAreavey (1957) is, unfortunately, not easy to use, and may not reflect the outcome of a modern revision of the group; hence it has not been followed here.

1. Dorsum of node with pair of spines directed posteriad (Figure 408) **2**

   Dorsum of node unarmed, or nearly so (may be divided into pair of blunt lobes or vestigial denticles) (Figure 409) **6**

2. Propodeum armed with two pairs of stout spines; one pair at propodeal angles and one pair directly above propodeal spiracles, respectively (sub-genus *Hagiostigmacros*) (possibly two species represented here) (Figure 410)..... ***S. spinosa* McAreavey**

   Propodeum armed with one pair of spines or denticles directly above propodeal spiracles, propodeal angles produced as weak or vestigial denticles (Figure 411) **3**

Figure 408

Figure 409

Figure 410

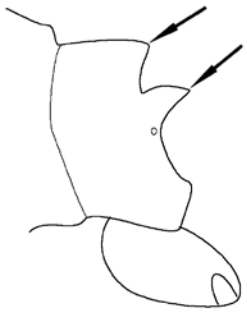

Figure 411

3. Head and mesosoma glossy black..... ..... ***S brachytera* McAreavey (a few workers)**

   Head and mesosoma yellow or reddish-brown **4**

4. Process directly above propodeal spiracle a short denticle (Figure 412)..... ..... ***Stigmacros* sp. JDM 832**

   Process directly above propodeal spiracle a stout spine (Figure 413) **5**

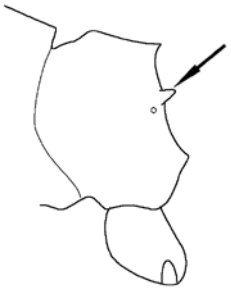

Figure 412

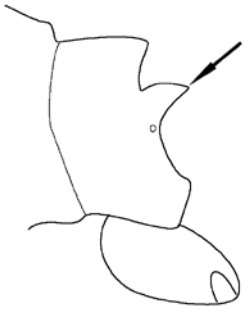

Figure 413

5. Yellow species; mesosoma and gaster with many erect setae, gaster also pubescent.. .... ***Stigmacros* sp. JDM 831**

   Gaster and head brown, mesosoma and appendages light reddish brown; sparse erect setae present only on margins of gastral tergites and underside of gaster, gaster not pubescent ..... ***Stigmacros* sp. JDM 622**

6. Gaster moderately to densely pubescent; cuticle of mesosoma microreticulate and usually matt, with many short, erect setae **7**

   Gaster, at most, with weak pubescence with appressed setulae normally sparse; cuticle of mesosoma often smooth, shining, rarely with erect setae (if present, these are normally long) **9**

7. Black or dark brown species with orange or brownish appendages, petiolar node orange to black..... ***Stigmacros* sp. JDM 341**

   Uniformly orange species **8**

8. Propodeum with distinctly longitudinal impressed furrow; propodeal angles blunt (Figure 414); sculpture of head and mesosoma superficial, cuticle more-or-less shiny; pubescence on first gastral tergite dense .... ***Stigmacros* sp. JDM 396**

Propodeum without longitudinal furrow or furrow vestigial and barely discernible; propodeal angles denticulate (Figure 415); cuticle of head and mesosoma finely microreticulate; dull; shagreenate; pubescence on first gastral tergite moderate, with short, appressed setae visibly separate..... ..... ***Stigmacros* sp. JDM 829**

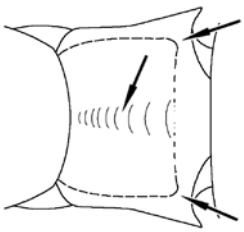

Figure 414

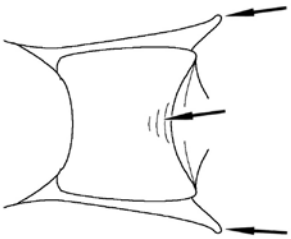

Figure 415

9. Erect setae present on mesosoma; non-marginal, erect setae present on gastral tergites..... **10**

   Erect setae absent from mesosoma; if erect setae present on gaster, then confined to margins of tergites **13**

10. Propodeum smoothly rounded without longitudinal furrow or lateral carinae (Figure 416)..... ***Stigmacros* sp. JDM 1046**

    Propodeum laterally carinate, longitudinal furrow present or absent (Figure 417) **11**

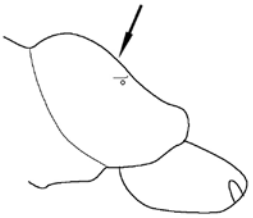

Figure 416

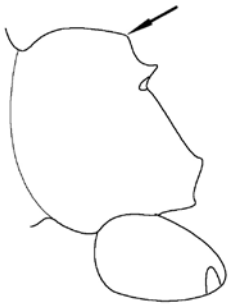

Figure 417

11. In profile, mesonotum convex, its dorsum smoothly rounded into its lateral surfaces (Figure 418)..... ***S. inermis* McAreavey**

    In profile, mesonotum flat, its dorsal and lateral surfaces distinct, often separated by a strong carina extending fully or partly along the length of the mesonotum (Figure 419)..... ..... **12**

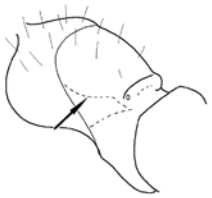

Figure 418

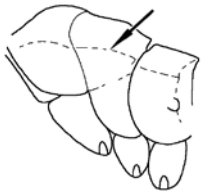

Figure 419

12. In profile, dorsum of propodeum smoothly confluent with declivitous face; propodeal angle absent (Figure 420); erect setae present on all surfaces of mesosoma..... ..... ***S. pilosella* (Viehmeyer)**

    In profile, dorsal and declivitous faces of propodeum distinct; propodeal angle present (Figure 421); erect setae virtually confined to pronotum (one or two short setae may be evident on mesonotum) .... ***S. stanleyi* McAreavey**

Figure 420

Figure 421

13. In profile, pronotum and mesonotum flat and on same plane, or mesonotum weakly convex; mesonotum and often pronotum laterally carinate (Figure 422); ants bicoloured, head,

mesosoma and gaster always black or shades of dark red-and-brown, appendages usually much lighter coloured, often yellow or orange **14**

In profile, pronotum and mesonotum weakly to strongly convex; pronotum never carinate, dorsum of mesonotum usually smoothly rounded onto sides (Figure 423), occasionally with weak angle between dorsal and lateral surfaces; species concolorous light yellow or orange or shades of brown without strong contrast between body and appendages **19**

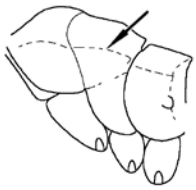

Figure 422

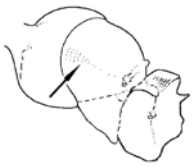

Figure 423

14. In dorsal view, head distinctly darker than mesosoma **15**

In dorsal view, head same colour as, or slightly lighter than mesosoma..... **16**

15. Propodeum with flat dorsal and declivitous faces, in profile, propodeal angle strong (Figure 424) ..... ***S. aemula*** **Forel**

Propodeum with a short dorsal face merging imperceptibly into a long, smooth, slightly concave declivitous face (Figure 425); in profile propodeal angle very weak ..... ***S. epinotalis*** **McAreavey**

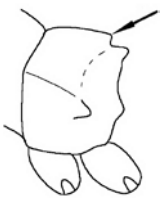

Figure 424

Figure 425

16. In dorsal view, mesonotum with strong punctate-microreticulate sculpture, appearance dull ..... ***S. anthracina*** **McAreavey**

In dorsal view, mesonotum with very fine microreticulation or sculpture lacking, appearance shining **17**

17. In profile, propodeum narrow, about 1/2 as wide as high, longitudinal furrow absent, propodeum with oblique outline (Figure 426); fine, microreticulate sculpture present on mesonotum ..... ***Stigmacros*** **sp. JDM 1045**

In profile, propodeum about as wide as high; longitudinal furrow present, propodeum with outline of anterior lateral carinae rectangular or describing an arc in a horizontal plane (Figures 427, 428); mesonotal sculpture absent **18**

Figure 426

Figure 427

Figure 428

18. Eye large, its width ≥ width of fore tibia; in full-face view (Figure 429a); dorsum of node bilobate (Figure 429b) ..... ***S. elegans*** **McAreavey**

Eye smaller, its width < width of fore tibia (Figure 430a); in full-face view, dorsum of node straight or slightly concave, meeting the sides at an angle (Figure 430b) ..... ***S. brachytera*** **McAreavey (most workers)**

Figure 429a

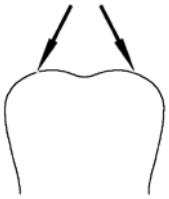

Figure 429b

Figure 430a

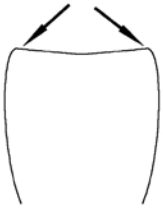

Figure 430b

19. Head, mesosoma, node, gaster, most of femora and extreme end of antenna chocolate, tips of femora, tibiae, tarsi and most of antenna ochraceous ..... ***S. reticulata*** **Clark**

    Appearance not as above **20**

20. Mesonotum smooth and shining; in profile, weakly convex (Figure 431); head and mesosoma nearly always concolorous yellow or light orange **21**

    Mesonotum with distinct, though sometimes weak sculpture; in profile strongly convex (Figure 432); colour yellowish or brown, head often darker than mesosoma (*S. occidentalis* complex) **24**

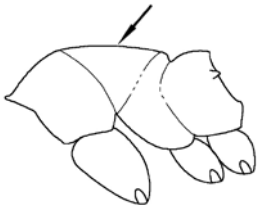

Figure 431

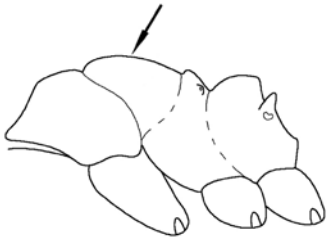

Figure 432

21. In profile, dorsum of propodeum rounded before it meets denticles directly above the spiracles (Figure 433) ..... ***Stigmacros*** **sp. JDM 1050**

    In profile, dorsum of propodeum angular or rectangular (*S. pusilla* complex) (Figure 434).... ..... **22**

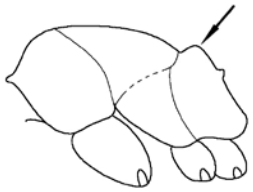

Figure 433

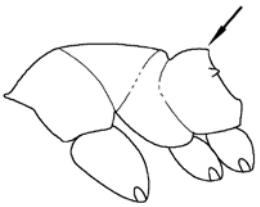

Figure 434

22. In profile, propodeal angles denticulate, directed upward (Figure 435); larger (HW > 0.5 mm) ... . ***Stigmacros pusilla*** **McAreavey**

    In profile, propodeal angles not denticulate, directed laterally (Figure 436); smaller (HW < 0.5 mm) **23**

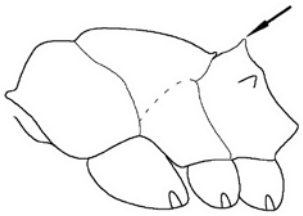

Figure 435

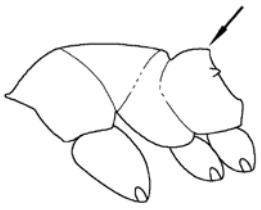

Figure 436

23. Eye moderate (eye width ≈ 0.25 × width of side of head capsule) ..... ***Stigmacros* sp. JDM 115**

    Eye large (eye width < 1/3 × width of side of head capsule) ..... ***Stigmacros* sp. JDM 188**

24. Pale yellowish species, head concolorous with mesosoma or only slightly darker **25**

    Brownish species, head usually distinctly darker than mesosoma **28**

25. Node deeply bilobate, lateral processes distinct denticles..... ***Stigmacros* sp. JDM 1067**

    Node not deeply bilobate, lateral processes vestigial or absent **26**

26. Eye width moderate (eye width, at most, only fractionally greater than greatest width of scape) ..... ***S. flava* McAreavey**

    Eye large (eye width ≥ 3 x greatest width of scape) **27**

27. In dorsal view, mesonotum as long as wide; (Figure 437) ..... ***Stigmacros* sp. JDM 1135**

    In dorsal view, mesonotum 1.5 – 2 x as long as wide (Figure 438) .... ***Stigmacros* sp. JDM 443**

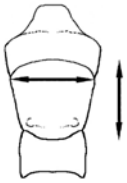

Figure 437

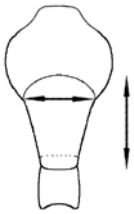

Figure 438

28. Eye large, ≈ 3 times as wide as antennal scape at its widest point..... ..... ***S. termitoxena* Wheeler**

    Eye smaller, ≈ as wide as antennal scape at its widest point **29**

29. Node with small but distinct lateral denticles (Figure 439) ..... ***S. occidentalis* (Crawley)**

    Node lacking lateral denticles (Figure 440)..... ..... ***S. glauerti* McAreavey**

Figure 439

Figure 440

With possibly as many as thirty species, *Stigmacros* is one of the most speciose formicine genera found in the SWBP. Despite this, the genus is poorly known, since most workers are small, inconspicuous ants that are mainly found in litter and are easily overlooked. McAreavey (1957) revised the genus but, unfortunately, the characters he used to distinguish the major radiations do not seem to be particularly robust, and his approach has not been adopted in my key to members of the genus. McAreavey separated this endemic Australian genus into subgenera based on such characters as the presence or absence of teeth on the propodeum and petiolar node, and the distinctiveness of the mesonotum. These characters are somewhat variable, however, and this author doubts their validity for separating most of the major groupings within the genus. As regards the fauna of the SWBP, the small, often black or bicoloured taxa with a smooth, flattened profile and carinate mesonotum placed by McAreavey in the subgenus *Campostigmacros* seem to stand apart from the other species as a monophyletic unit. *Stigmacros* are small, generalist predators that forage on the ground, in leaf litter or arboreally (Shattuck 1999). In the SWBP they are most frequently found under litter, stones or dead bark lying on the ground. Less frequently they nest under dead wood or directly into the soil surface. The author is unaware of any local species that nest in trees.

Stigmacros aemula (Forel) is the most common member of McAreavey's subgenus *Campostigmacros*, and is often found in Perth gardens. This shiny, brown-and-black species forages diurnally, and usually makes its nests directly into soil. Commonly, there is a cluster of nests. Larger ergatogynes, recognizable by their ocelli, which the workers lack, excavate nests and forage with the workers. *Stigmacros aemula* occurs on the Swan coastal plain and adjacent parts of the Darling Range. In general appearance *Stigmacros epinotalis* McAreavey is identical to *S. aemula*, except for the oblique declivitous face of its propodeum, and it is found over a similar range. *Stigmacros* sp. JDM

622 can be distinguished from *S. epinotalis* only by the appearance of its petiolar node, which bears a pair of short spines. This ant has been collected at Boddington and at Brookton, south-east of Perth.

Stigmacros brachytera McAreavey and *Stigmacros elegans* McAreavey are two jet-black ants with an oblique propodeum. In *S. brachytera* the head is rather flattened and the eyes are small. This species has been found from Perth to the south-west tip of the State and there is also one record from Lake Warden, near Esperance. *Stigmacros elegans* has relatively large eyes and the head is not so flattened. *Stigmacros elegans* also occurs in the Perth region, but has a much more extensive range than *S. brachytera*, and can be found throughout the State. The taxon was described from material collected in Nyngan, NSW. *Stigmacros anthracina* McAreavey is closely related to these ants, but can be recognized by the punctate-microreticulate sculpture of the mesonotum. In the SWBP this rather uncommon ant has only been collected in the Darling Range south of Perth, but it was originally described from Mt Lofty, near Adelaide, SA. *Stigmacros* sp. JDM 1045 also has a jet-black head and mesosoma, but possesses a light tan petiolar node and gaster. The propodeum is very oblique. One worker specimen, held in the WAM, is known. This species, which is near the South Australian *Stigmacros flavinodis* Clark, was collected at Durokoppin Nature Reserve, in the central wheatbelt.

Stigmacros stanleyi McAreavey and *Stigmacros pilosella* McAreavey are two reddish brown species which differ from the foregoing in that they have erect setae on the mesosoma, and non-marginal as well as marginal setae on the tergites of the gaster. The propodeum in *S. stanleyi* is truncate and rather square in dorsal view, whereas the propodeum in *S. pilosella* is oblique and identical with that of *S. epinotalis*. Within the SWBP both ants are typically part of the *Stigmacros* fauna of the wheatbelt and goldfields regions, but a queen and worker of *S. stanleyi* were collected at Martin in the Darling Range, on the outskirts of Perth. The two ants also occur interstate, *S. stanleyi* being found in NSW and Vic, and *S. pilosella* having been described from NSW. Both species are normally found in litter. Another litter-loving, hirsute species, *Stigmacros* JDM 341, also belongs to this subgenus, but may not be closely related to the other members of the subgenus discussed. The gaster of this ant is densely pubescent and its cuticle is dull and finely sculptured. This species is widely distributed throughout WA, and in the Perth metropolitan area has been collected in East Fremantle and at Buckland Hill Reserve, just north of Fremantle.

McAreavey's subgenus *Hagiostigmacros* has two representatives in the SWBP, though the true relationship between these and the plethora of species identified with McAreavey's subgenus *Cyrtostigmacros* is a moot point. *Stigmacros spinosa* McAreavey, as defined in the key, is variable in appearance, and WA material may include more than one species. A worker collected close to Eurardy Station, near Shark Bay, is yellow and more angulate in appearance compared with a reddish-brown worker collected near Eucla. Another worker collected 60 km south of Kambalda varies again, and none of these ants quite matches the holotype (from NSW) held in the Melbourne Museum. The pale *Stigmacros* sp. JDM 831 is a related but undescribed species that forages nocturnally in woodland around Perth. Specimens have been collected from both the Darling Range and the Swan coastal plain.

The subgenus *Stigmacros* includes one distinct complex related to *Stigmacros pusilla* McAreavey. The pale yellow *Stigmacros* sp. JDM 115, is common in wetter areas of the Darling Range. *Stigmacros* sp. JDM 1050 has a brown gaster and the propodeum is more rounded, but otherwise varies little from *Stigmacros* sp. JDM 115. This rather uncommon ant may be a wood specialist, the three specimens in the JDM Collection having been collected from a tree-trunk, a tree-trap and rotting wood, respectively. The species has been collected from between Perth and Denmark, on the south coast. *Stigmacros pusilla* McAreavey, itself, is also very similar to *Stigmacros* sp. JDM 115, but the propodeal angles are denticulate and directed vertically. This species is not uncommon in drier woodlands in the eastern wheatbelt. At least one worker in the Curtin Ant Collection was taken while foraging on a tree-trunk. Another likely member of the group, *Stigmacros* sp. JDM 443, is occasionally found in jarrah-marri woodland.

Stigmacros inermis McAreavey, placed in the subgenus *Pseudostigmacros* by McAreavey, appears to this author to be no more than a hairy variation on the *Cyrtostigmacros* theme. The spiracular spines are more pronounced in some northern specimens of this ant, which occurs throughout drier areas of the State. *Stigmacros inermis* also occurs in inland NSW. This is a rather large ant for a *Stigmacros*, one queen in the Curtin Ant Collection measuring 5 mm. *Stigmacros* sp. JDM 1046, known from one specimen held by WAM, is very close to *S. inermis*, but has a un-*Stigmacros*-like rounded propodeum. The single worker was collected 7 km south-east of Kodj-Kodjin in the central wheatbelt.

The largest grouping of *Stigmacros* in the SWBP includes most of the species placed by McAreavey in the subgenus *Cyrtostigmacros* and several placed in subgenera *Stigmacros* and *Campostigmacros*. Much of the WA fauna is undescribed, but even many named taxa, both from WA and from other Australian states, are doubtful: this author can see

no meaningful differences between a slew of ants described by McAreavey, including *S. aciculata*, *S. brooksi*, *S. clarki*, *S. castanea*, *S. rectangularis* (all from WA), *S. armstrongi, S. extreminigra,* S. *clivispina* and *S. ferruginea*. Among this group of taxa, *Stigmacros reticulata* Clark stands somewhat apart, both in terms of its *facies* and in terms of its behaviour. This shiny black (southern zone) or reddish-and-black (eastern and northern zones) species is a diurnal forager on white sand heathland and *Banksia* woodlands. If disturbed, the worker will freeze and remain immobile for some time. *Stigmacros flava* McAreavey is a very pale form from near Perth. Another pale, large-eyed member of this complex, *Stigmacros* sp. JDM 1135, is known from one specimen collected at Depot Dam, south of Merredin. *Stigmacros occidentalis* (Crawley) (with small teeth on the side of the node) and *Stigmacros glauerti* McAreavey (similar to the preceding, but without teeth) are found in the Perth area and the jarrah forest south of Perth. *Stigmacros glauerti*, however, although it is retained for now, on any future revision is likely to finish up as junior synonym of one of the other *Cyrtostigmacros* or *Stigmacros* subgenus species mentioned above. *Stigmacros termitoxena* Wheeler, thus named because the original colony was associated with a termite mound, is a large *Stigmacros* found in the more northern parts of the SWBP as well as regions to the north of the Province.

Stigmacros sp. JDM 188 and *Stigmacros* JDM 1067 are two apparently undescribed species that are small and pale yellow in colour. Both resemble members of the S. *occidentalis* complex, but the propodeal angle is more strongly defined in the form of small denticles. *Stigmacros* JDM 188 has a rounded petiolar node without lateral teeth, and is most characteristically a denizen of Jarrah-Marri woodland in the Perth region, and in areas to the south of Perth. Elsewhere, it has occasionally been recorded from the goldfields and the mid-north. In this species the mesonotum is only weakly convex, and its true affinities may lie with the *S. pusilla* complex. Stigmacros JDM 1067 has a bilobate petiolar node with small teeth on its lower lateral edges, and is known from one series of workers taken at Guilderton, at the mouth of the Moore River, and a few specimens from the Zuytdorp region. In the northern specimens the petiolar lobes are more spinose, and one of the ants has a few erect setae on the mesosoma. Finally, there are three *Stigmacros* species of uncertain affinities. *Stigmacros* sp. JDM 832 is known from one dark brown worker hand collected in the Darling Range just east of Perth. This specimen has short, paired dorsal spines on the petiolar node, but the mesosoma is reminiscent of subgenus *Cyrtostigmacros*. *Stigmacros* sp. JDM 396, on the other hand, resembles *S. stanleyi*, but workers of the former have a more rounded mesonotum. The species is known from four workers collected at Wongamine, north-east of Perth. A similar species, *Stigmacros* sp. JDM 829, is found in drier regions from the eastern goldfields to the Pilbara.

SUBFAMILY MYRMECIINAE

Members of this subfamily are now placed in two tribes (Bolton 2003). The tribe Myrmeciini contains the well-known bulldog ants. These ants are easily recognised by their combination of slightly curved, elongate mandibles with at least vestigial teeth on the inner margin, two distinct waist segments, and large eyes placed very near the mandibular insertions. *Myrmecia* are principally predators, but also garner nectar and plant juices (Shattuck 1999). The sting of at least some of these species can be dangerous, even life threatening to people who have a sensitivity to hymenopteran (i.e. bee, ant and wasp) venoms (Street *et al*. 1994).

The monotypic tribe Prionomyrmecini contains one extant genus and species *Nothomyrmecia macrops* Clark, though the tribe is more diverse in the fossil record. *Nothomyrmecia macrops* is superficially similar to bulldog ants. However, there is only one waist segment, the eyes are well separated from the mandibular insertions and the mandibles themselves have more than 15 intermeshing teeth.

Tribe Prionomyrmecini

Nothomyrmecia

One genus and species, *Nothomyrmecia macrops*, that is possibly extinct in this State. This species may readily be separated from members of the Tribe Myrmeciini by the many small, intermeshing teeth on the mandible. Workers and queens of Myrmeciini have linear, non-intermeshing mandibles with a mixture of large teeth and small denticles.

The single extant species *Nothomyrmecia macrops* Clark was discovered in Western Australia in 1931 in an unspecified locality east of Esperance, but has not been seen in this State since that time. The ant was rediscovered on the Eyre Peninsula in South Australia in 1975 (Taylor 1978), where it is a nocturnal forager in low temperatures (Hölldobler and Taylor 1983).

Tribe Myrmeciini

Myrmecia

This key adapted from Ogata and Taylor (1991): readers are also referred to illustrations in that key.

Note: The workerless parasite *Myrmecia inquilina* Douglas and Brown is not included in this key, which treats workers only.

1. Occipital carina present (indicated by broken lines) (Figure 441) **2**

Occipital carina lacking (curvature of occiput indicated by dotted lines) (Figure 442) **19**

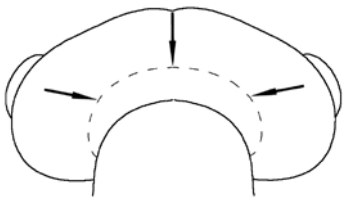

Figure 441

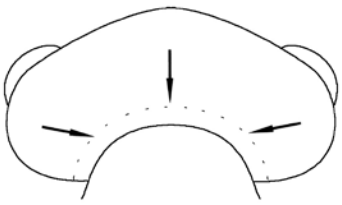

Figure 442

2. Subapical portion of mandible with a supplementary ventral tooth (Figure 443) **3**

   Subapical portion of mandible without a supplementary ventral tooth (Figure 444) **17**

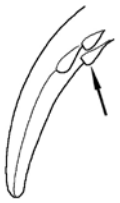

Figure 443

Figure 444

3. Mandibles each with 3 enlarged teeth apart from the apical tooth (Figure 445)..... ***M. forceps* Roger**

   Mandibles each with 4 or more enlarged teeth apart from the apical tooth (Figure 446)..... 4

Figure 445

Figure 446

4. Mandibles medium reddish-brown to dark brown, approximately concolorous with head capsule **5**

   Mandibles light yellowish- to reddish-brown, distinctly lighter in colour than head capsule. **6**

5. Apex of gaster reddish to yellowish ..... ***M. regularis* Crawley**

   Apex of gaster dark brown to blackish-brown .... ***M. erecta* Ogata and Taylor**

6. Apex of gaster yellowish; scapes darker than head **7**

   Apex of gaster blackish; scapes concolorous with, or lighter than head **8**

7. Basal portion of gaster dark blackish-brown ..... ***M. analis* Mayr**

   Basal portion of gaster reddish-brown ..... ***M. nigriscapa* Roger**

8. Mandibular shaft generally even in width, not narrowed basally (Figure 447) **9**

   Mandibular shaft narrow at extreme base, broadened over basal quarter to fifth of its length (Figure 448)..... **11**

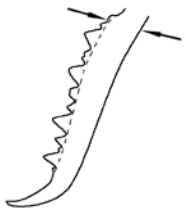

Figure 447

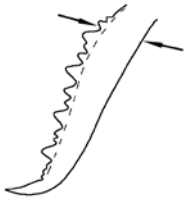

Figure 448

9. Petiolar peduncle short, at most as long as node, and not reaching the apices of the hind coxae when they are extended posteriad (Figure 449) ..... ***M. picticeps* Clark**

Petiolar peduncle longer than petiolar node; reaching or exceeding the apices of the hind coxae when they are extended posteriad (Figure 450) **10**

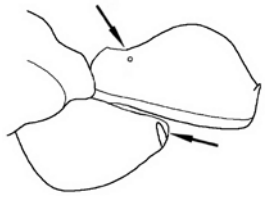

Figure 449

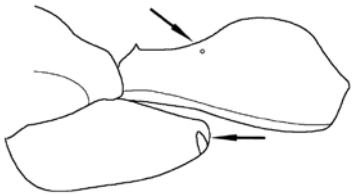

Figure 450

10. Pronotum with erect setae shorter than those of first funicular segment..... ..... ***M. rubripes*** **Clark**

    Pronotum with erect setae longer than those of first funicular segment..... ..... ***M. arnoldi*** **Clark**

11. Clypeus dark brown, concolorous with head .... ***M. pavida*** **Clark**

    Clypeus yellowish, concolorous with mandibles **12**

12. Setae on head and mesosoma long and thick, those on sides near posterior corners of head extending beyond outer margins of eyes..... ..... ***M. fulgida*** **Clark**

    Setae on head and mesosoma short and thin, those on sides near posterior corners of head not extending beyond outer margins of eyes **13**

13. Head blackish, concolorous with gaster; mesosoma and nodes pale yellow, concolorous with mandibles..... **14**

    Head dark reddish-brown to yellowish-brown, lighter than gaster; mesosoma and nodes light reddish-brown to dark brown, darker than mandibles..... **15**

14. Legs blackish-brown, much darker than mesosoma ..... ***M. fuscipes*** **Clark**

    Legs yellowish, concolorous with mesosoma..... ..... ***M. desertorum*** **Wheeler**

15. Scape with numerous erect or suberect setae (Note: this character may be hard to see on abraded specimens)..... ..... ***M. nigriceps*** **Mayr**

    Scape almost lacking erect or suberect setae **16**

16. Mesosoma light reddish-brown; head concolorous with mesosoma; petiolar spiracle usually situated somewhat dorsally on peduncle..... ***M. gratiosa*** **Clark**

    Mesosoma yellowish-brown to dark brown; petiolar spiracle usually situated laterally on peduncle..... ***M. vindex*** **F. Smith**

17. Coxae orange; femora predominantly orange tending to brown near attachment of tibiae .... ***M. urens complex*** **sp. JDM 728**

    Coxae dark brown; femora predominantly dark brown tending to orange near attachment of tibiae..... **18**

18. Viewed dorsally, mesosoma and node rugose and punctate (Figure 451); length of ocular setae usually < diameter of one facet..... ..... ***M. urens*** **complex sp. JDM 1**

    Viewed dorsally, mesosoma and node with reduced sculpture (node may be virtually smooth and shining) (Figure 452); length of ocular setae > width of one facet..... ..... ***M. urens*** **complex sp. JDM 71**

Figure 451

Figure 452

19. Posterior tibial spur of hind leg a simple spine-like process (Figure 453) .... ***M. callima*** **(Clark)**

    Posterior tibial spur of hind leg distinctly pectinate (Figure 454)..... **20**

Figure 453

Figure 454

20. Subapical portion of mandible with a single row of teeth (Figure 443); head bicoloured with anterior section yellow, posterior section brown to black ..... ***M. picta*** **F. Smith**

    Subapical portion of mandible with a supplementary ventral tooth (Figure 444); head uniformly coloured **21**

21. Dentition strongly developed along entire inner margin of mandible (Figure 455) **22**

    Dentition reduced or vestigial in the sub-basal portion of mandible (Figure 456) **30**

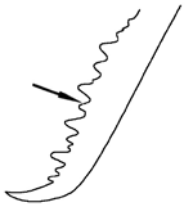

Figure 455

Figure 456

22. Clypeal setae long, reaching at least to the basal quarter of mandibles (Figure 457) **23**

    Clypeal setae short, at most only slightly exceeding anterior clypeal margin (Figure 458) **25**

Figure 457

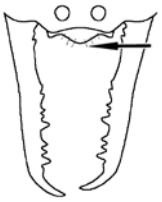

Figure 458

23. Postpetiole distinctly sculptured (Figure 459); pubescence on gaster yellow .... ***M. rugosa*** **Wheeler**

    Postpetiole with at most vestigial sculpture (Figure 460); in doubtful cases, pubescence on gaster bright orange **24**

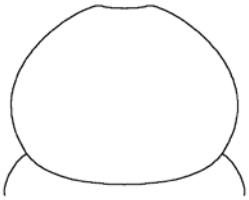

Figure 459

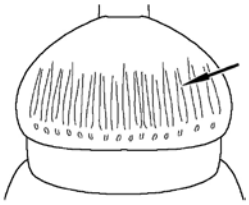

Figure 460

24. Standing setae on pronotum mostly longer than first funicular segment; clypeus without yellow pubescence; mandible of more-or-less the same width throughout its length; (bright orange pubescence on gaster distinctive) ....***M. michaelseni*** **Forel**

    Standing setae on pronotum mostly shorter than first funicular segment; clypeus may have yellowish pubescence; mandible noticeably tapered along its length (gastral pubescence off white to yellowish in specimens seen) .... ***M. varians*** **Mayr**

25. Erect setae on hind tibia abundant and long, some as long or longer than maximum width of tibia (Figure 461) **26**

Erect setae on hind tibia sparse and short, shorter than maximum width of tibia (Figure 462) 27

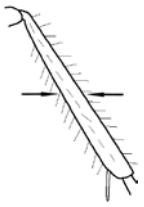

Figure 461

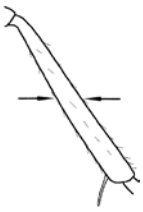

Figure 462

26. Mandibles yellowish, lighter than head .... ***M. chasei*** **Forel**

    Mandibles dark brown, concolorous with head .. .. ***M. ludlowi*** **Crawley**

27. Mesosoma essentially uniformly black; petiole black ....***Myrmecia*** **sp. near** ***M. pilosula*** **F. Smith**

    Mesosoma more-or-less uniformly light reddish to yellowish or bicoloured black-and-red; petiole yellowish to reddish brown **28**

28. With combination of mandibles dark brown, concolorous with head, and pubescence on clypeus whitish ..... ***M. dispar*** **(Clark)**

    Either mandibles lighter in colour, or pubescence on clypeus yellowish **29**

29. Pubescence of clypeus yellowish; scape not exceeding posterior border of head (and see Species Description) .....***M. elegans*** **(Clark)**

    Pubescence of clypeus whitish; scape exceeding posterior border of head by about half the length of first funicular segment (and see Species Description) ....***M. occidentalis*** **(Clark)**

30. Clypeus with distinctly long, forwardly directed setae, reaching to about half the length of the mandibles, or further ....***M. mandibularis*** **F. Smith**

    Clypeus with shorter setae **31**

31. Body more-or-less uniformly blackish brown..... ..... **32**

    Body bicoloured: head and gaster blackish-brown, mesosoma and petiole reddish **33**

32. Mandibles dark brown; dorsal surface of second and following gastral segments with gold pubescence ..... ***M. tepperi*** **Emery**

    Mandibles yellowish; dorsal surface of second and following gastral segments with sparse white pubescence ..... ***M. clarki*** **Crawley**

33. Legs reddish-brown, approximately concolorous with mesosoma (often a little lighter); postpetiole usually lighter in colour than gaster..... ***M. testaceipes*** **(Clark)**

    Legs distinctly darker brown than mesosoma; postpetiole dark in colour, concolorous with gaster..... **34**

34. Dorsal projection of labrum obtuse, broadly rounded (Figure 463) ....***M. swalei*** **Crawley**

    Dorsal projection of labrum narrow and acute (Figure 464) ..... ***M. acuta*** **Ogata and Taylor**

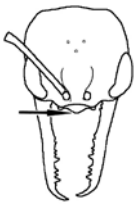

Figure 463

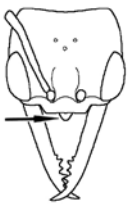

Figure 464

With at least 32 species out of a total of 89 named Australian species recognized by Ogata and Taylor (1991), and a further four taxa of uncertain identity, the SWBP has an impressive bulldog-ant fauna. Sixteen of these species belong to the *M. gulosa* group, these being large to very large bulldog-ants colloquially called 'inch ants' or 'sergeant ants'. *Myrmecia forceps* Roger has been collected rarely in this State, mainly from the wheatbelt. The blood-red *Myrmecia regularis* Crawley is common in more southerly regions, particularly the karri belt near the south-west coast. Another south coastal species is *Myrmecia analis* Mayr. The apex of the gaster in this red-and-black ant is a conspicuous yellow. *Myrmecia nigriscapa* Roger, which is widespread

in other states but seems to have a localised distribution in the Darling Range south of Perth in Western Australia, also has a yellow apex to the gaster. However, in this ant the basal portion of the gaster is red, rather than black.

Myrmecia arnoldi Clark, *Myrmecia pavida* Clark and *Myrmecia rubripes* Clark are closely related (Ogata and Taylor 1991) and, as a group, range from south-western WA to southern SA. *Myrmecia desertorum* Wheeler, *Myrmecia fuscipes* Clark, *Myrmecia gratiosa* Clark, *Myrmecia nigriceps* Mayr and *Myrmecia vindex* F. Smith are large to very large, reddish ants with red, brown or black heads and a black gaster. These are formidable insects: *M. desertorum* and *M. vindex*, in particular, are always ready to rush out of their mound nests to attack an intruder. *Myrmecia desertorum* is possibly the most common bulldog ant in the SWBP, and its mounds may be huge, up to 2 m in diameter (Ogata and Taylor 1991). Unlike the more aggressive bulldog-ants, *Myrmecia nigriscapa* Roger appears to be timid, members of one nest completely refusing to confront the author. The usual range of the hirsute *Myrmecia erecta*, according to its authors (Ogata and Taylor 1991), has a distribution ranging from south-eastern WA through to the southern gulfs of SA. However, the Curtin Ant Collection has a specimen, apparently of that species, that was collected at Karragullen, near Perth. The head capsule in *Myrmecia picticeps* Clark is bicoloured, the posterior sector being black and the anterior sector reddish. This is another ant found near the south-western coast. *Myrmecia fulgida* Clark has been recorded from the western goldfields, and recently Curtin staff and students at Carrabin Nature reserve inspected an active nest of this huge species, near where a specimen was also collected in a pitfall trap. This is a true 'inch ant', and is distinguished by the long, erect setae on the side of the head capsule. *Myrmecia inquilina* Douglas and Brown is a social parasite on other *Myrmecia* species and is known only from the queen.

Many of the above species appear to be uncommon or, at least, localised, and four of those mentioned (namely, *M. inquilina*, *M. nigriceps*, *M. pavida*, and *M. picticeps*) are not represented in the Curtin Ant Collection, which otherwise has a comprehensive array of species from most of the other ant genera. A characteristic of the distribution of the *M. gulosa* group in WA is that the bulk of the fauna is to be found in the humid south and south-west of the State. Only *M. desertorum* is common in the north and north-east portions of the SWBP.

The remaining species-groups constitute what are sometimes known as 'jumper ants' or 'jack jumpers', smaller species formerly combined under the old genus-level name *Promyrmecia*. Many, but by no means all of these ants move in short hops. The *M. pilosula* group in the SWBP contains nine species, excluding *Myrmecia pilosula* F. Smith itself. The only member of the *pilosula* complex found in the south-west differs from *M. pilosula* (species *sensu stricto*) in that the hind tibiae and tarsi are always dark-coloured in the WA species and light-coloured in *M. pilosula*. At this point of time, the name given to this species has not been formally published, so does not appear here. The ant is rare, being represented in the WA Museum by specimens collected many years ago at Albany, Esperance, Hovea, Lake Grace and Walpole. The Curtin Ant Collection has only recently acquired specimens from Torbay, on the South Coastal Hwy.

Of the remaining species, the attractively marked *Myrmecia occidentalis* (Clark) is widespread throughout the SWBP. This ant is particularly common in the Kwongan sand-plain north of Perth, where it can often be seen foraging on vegetation. *Myrmecia dispar* (Clark) is found in the south east of the Province (ANIC, Curtin University). The Curtin Ant Collection has one specimen collected from Monkey Rock (near Jerramungup) and another worker from Lake Warden, near Esperance. Western Australian specimens of *Myrmecia elegans* (Clark) are very difficult to separate from *M. occidentalis*, and I am unable to follow Ogata and Taylor (1991) wholly in their diagnosis of the species. The mandibles are often quite dark in colour, but can also be light yellow (they are light-coloured in *M. occidentalis*). The mesosoma varies from uniformly red or orange to bicoloured dark red and black, similar to *M. occidentalis*. The yellowish pubescence on the clypeus, as well as the shorter antennal scape, seem to be the surest guides to *M. elegans*, and, at least in local workers, the individual mandibular teeth tend to be slanted posteriad in *M. elegans* but are mostly evenly triangular in *M. occidentalis*.

Myrmecia chasei Forel and *Myrmecia ludlowi* Crawley have the same coloration as *M. elegans*, but are more robust ants with hairy tibiae. The separation of the two species by Ogata and Taylor (1991) is based purely on the colour of the mandibles (yellow in *chasei*, dark brown in *ludlowi*), but specimens seen by this author are not so easily distinguished, many having intermediate light to medium brown mandibles. Both species (if indeed they are separable species) are found in the Darling Range, including the Perth area. *Myrmecia michaelseni* Forel and *Myrmecia rugosa* Wheeler are two black *Myrmecia* with yellow pubescence on the gaster. *Myrmecia rugosa* can be distinguished by its sculptured postpetiole and canary yellow (as opposed to more orange-yellow) gastral pubescence. These two taxa are not uncommon in the Jarrah-Marri forests of the wetter south-western parts of the State. Normally associated with the above two species in keys is *Myrmecia varians* Mayr. *Myrmecia varians*, described from the eastern states,

is represented by one specimen each from Nerren Nerren Stn, just outside the recently amended boundaries of the SWBP (McKenzie, Keighery *et al.* 2000) and from Westonia. Little separates *M. varians* from *M. michaelseni* and *M. rugosa*, but Ogata and Taylor (1991) use subtle differences in the length of the pronotal setae and the appearance of the mandibles to distinguish them.

The *M. tepperi* species-group has five species in the SWBP. *Myrmecia tepperi* Emery is quite similar to *M. michaelseni* and *M. rugosa*, but can be distinguished by its reduced mandibular dentition (a characteristic of this and the *M. mandibularis* species-groups) and the absence of yellow pubescence from the first gastral tergite (present on the second and subsequent tergites). *Myrmecia clarki* Crawley is a small, dark *Myrmecia* with yellow mandibles. This ant is quite common in *Banksia* woodland around Perth, but has been collected as far north as Ethel Creek in the Pilbara. *Myrmecia swalei* Crawley strongly resembles the *M. chasei* complex in appearance but can easily be distinguished by its reduced mandibular teeth. This species is quite common in more coastal parts of the south-west, but can be found near the south coast at least as far east as Bremer Bay. *Myrmecia testaceipes* (Clark) resembles *M. swalei* but has reddish-brown legs (compared with blackish legs) and a postpetiole that is lighter in colour than the gaster (compared with one that is concolorous with the gaster). *Myrmecia acuta* Ogata and Taylor appears to have a restricted distribution in the Esperance area. I am not totally convinced that *M. acuta* is a distinct species: several representatives of *M. swalei* in the Curtin Ant Collection have a labral process almost as acuminate as that illustrated in Ogata and Taylor (1991), while others have a more broadly trapezoid process, and these extremes are connected by intermediate states in other workers.

Myrmecia picta F. Smith, the only member of the *M. picta* group in the SWBP, has a characteristic bicoloured head capsule, yellow anteriorly and blackish posteriorly. Within the SWBP, this species is quite common in Wandoo woodlands, on the eastern slopes of the Darling Range. The taxonomy of the *M. urens* species-group is problematic, and most named taxa (including *Myrmecia infima* Forel described from Perth, and *Myrmecia nigra* Forel, described from East Fremantle) cannot be identified with any confidence based on morphological characters. However, possibly three species from this group are represented in the SWBP (see species key). The smallest of these, *Myrmecia urens* group sp. JDM 71, which is quite common in relictual bushland just south of Perth, is the smallest bulldog ant in WA, and possibly in Australia. Workers are barely 5 mm in length. In the Darling Range and adjoining Swan Coastal Plain, *Myrmecia urens* group sp. JDM 1 is the most frequently encountered of these small bulldog ants, while *M. urens* group sp. JDM 728 appears to be restricted to coastal areas. Specimens of the latter species have been collected from between the Zuytdorp region, north of Kalbarri, and Kwinana, just south of Fremantle. *Myrmecia mandibularis* F. Smith, the only species in the SWBP of the species-group that bears its name, is a common and very conspicuous member of the Darling Range ant fauna, but can be found from south-western WA to Victoria.

The two members of the *M. cephalotes* species-group found in WA, *Myrmecia callima* (Clark) and *Myrmecia hilli* (Clark), have not been taken in the SWBP by Curtin staff, but *M. callima* has been collected at Corrigin and Southern Cross by ANIC researchers. Ants in this group can be distinguished from other *Myrmecia* by virtue of the non-pectinate tibial spur on their hind leg.

SUBFAMILY PSEUDOMYRMECINAE

Ants in this subfamily possess two waist segments. They are most likely to be confused with Myrmicinae, but, unlike the latter, the first segment of the mesosoma (the pronotum) is connected to the second segment (the mesonotum) by a flexible joint. The hind tibia is pectinate, a condition never found in myrmicine ants, and the tarsal claws are toothed (simple in Myrmicinae). This is an arboreal group of ants whose major centres of diversity are in the Old and New World tropics. Many of the New World species, in particular, are famous for their mutualistic associations with plants. The Oriental and Australian fauna has recently been revised by Ward (2001). Only the genus *Tetraponera* is represented in Australia, with one species in the SWBP.

Tetraponera

One species, Tetraponera punctulata *F. Smith.*

Tetraponera punctulata F. Smith has a wide distribution throughout Australia, except for the deep south and the arid zone, and is also found in Papua New Guinea (Ward 2001). While the ant will nest in dead branches of trees of several genera, it favours eucalypts, and is known to tend Coccoidea (Ward 2001). Within the SWBP, *T. punctulata* is widespread and reasonably common, and can typically be seen foraging around the trunk of Wandoos. The unusually long, thin outline of this species makes it readily recognizable in the field.

SUBFAMILY CERAPACHYINAE

Just two genera of this small subfamily occur in Australia, but both are well represented in the SWBP. Both genera are also specialist predators

on the brood of other ants. (For further details on the biology of the Australian fauna see Briese and Macauley (1981) and Shattuck (1999).)

Cerapachys

(Note: The current status of the Australian species found in this genus is confused, and badly in need of revision. The identity of a number of species keyed out below may alter substantially when this genus is revised. *Cerapachys mullewanus* (Wheeler) is described from a male, and *Cerapachys angustatus* (Clark) and *Cerapachys constrictus* (Clark) are described from queens (possibly ergatoid). They do not appear in this key, which deals with workers only.)

1. Eyes absent, antennae 9-segmented ..... ***C. edentatus* (Forel)**

   Eyes present, antennae 12-segmented **2**

2. Petiolar node without carinae, a deep anteromedial depression present on dorsal face of node (Figure 465); middle and hind tibiae without spur ..... ***Cerapachys* sp. JDM 574**

   Petiolar node with at least lateral carinae, deep anteromedial depression absent from dorsal face of node (Figure 466); middle and hind tibiae always with pectinate spur..... **3**

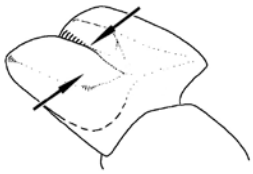

Figure 465

Figure 466

3. Petiolar node without distinct posterior angles, either square with an unbroken outline or sharply tapered posteriad, with a membranous border that is either entire or bifid in the form of a pair of lamellae (Figures 466–468)..... **4**

   Petiolar node with distinct posterior angles, these often produced as denticles or flanges... ..... **6**

4. Petiolar node square and concave anteriad, carinate on all sides (Figure 466) ..... ***C. simmonsae* (Clark)**

   Petiolar node with lateral margins convergent, ending in a blunt angle surrounded by a membranous lamina, or ending in a pair of processes **5**

5. Posterior processes of petiolar node a pair of minute denticles (Figure 467)..... ..... ***C. picipes* (Clark)**

   Petiolar node with a pair of rounded, membranous lamellae posteriad (Figure 468), or with single, unbroken lamella (Figure 469). .....***Cerapachys* sp. JDM 745**

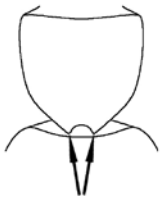

Figure 467

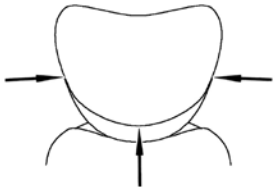

Figure 468

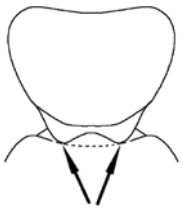

Figure 469

6. Posterior corners of head with well-developed dorsolateral carinae curving towards eye (Figure 470) **7**

   Posterior corners of head without well-developed dorsolateral carinae curving towards eye (vestigial carinae may be present near vertex) (Figure 471)..... **8**

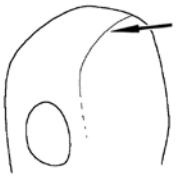

Figure 470

Figure 471

7. Eyes very large, length about one third length of side of head, eyes longer than distance between eye and mandibular insertion (Figure 472) ..... ***C. varians*** **(Clark)**

   Eyes smaller, length less than one-third length of side of head; length of eye ≤ distance between eye and mandibular insertion (Figure 473) ....***C. brevicollis*** **(Clark)/*C. flammeus*** **(Clark)**

Figure 472

Figure 473

8. Dorsal surface of mesosoma rounded onto lateral surfaces, lateral carinae vestigial or absent (Figure 474) **9**

   Dorsal surface of mesosoma delimited from lateral surfaces by distinct carinae (Figure 475) **10**

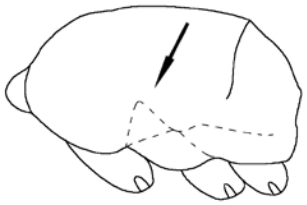

Figure 474

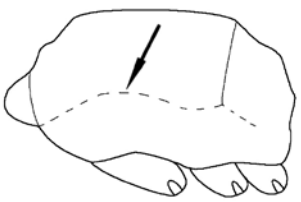

Figure 475

9. Head and abdominal segments IV-VII black, mesosoma, petiole and appendages light brown with some infuscation, abdominal segment III brown with an orange macula either side, its node wider than long; abdominal segment III only slightly narrower than segments IV-VII.....***C. longitarsus*** **(Mayr)**

   Head, mesosoma, petiole and abdominal segment III black, abdominal segments IV-VII black except for anterior orange band on abdominal tergite VI, appendages brown; petiolar node about as wide as long; abdominal segment III conspicuously narrower than segments IV-VII ....***Cerapachys*** **sp. JDM 746**

10. Body concolorous red **11**

    Body black, dark brown, bicoloured or variegated..... **20**

11. Head with three well-developed ocelli (Figure 476) **12**

    Ocelli absent, or represented by minute, vestigial pits (Figure 477)..... **15**

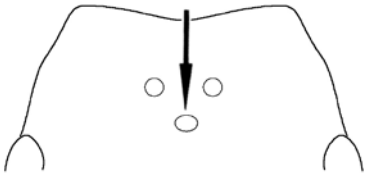

Figure 476

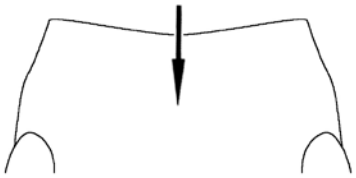

Figure 477

12. Abdominal segment III with anterior, transverse carina that joins each side at a distinct angle (Figure 478) ..... ***C. princeps*** **(Clark)**

    Abdominal segment III smoothly rounded towards its articulation with petiole (Figure 479) **13**

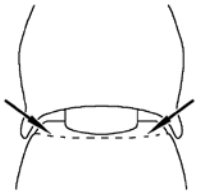

Figure 478

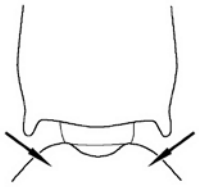

Figure 479

13. Posterior processes of node a pair of vestigial denticles; posterior corner of head with a faint, incomplete carina curving towards eye. ..... ***Cerapachys* sp. JDM 1103**

    Posterior processes of node a pair of distinct, acute denticles; posterior corner of head smoothly rounded without trace of a carina **14**

14. Larger (TL ≈ 8 mm); posterior carina of propodeum often distinctly concave in form of an inverted "V" (Figure 480)..... ..... ***C. sjostedti* Forel**

    Smaller (TL 7mm<); posterior carina of propodeum slightly indented to more-or-less straight (Figure 481)..... ..... ***C. greavesi* (Clark)**

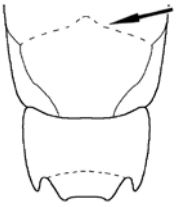

Figure 480

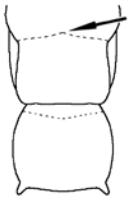

Figure 481

15. Posterior angles of petiolar node produced as acute-angled flanges that project beyond anterior corners of node (Figure 482)..... **16**

    Posterior angles of petiolar node either not armed, or produced as denticles that do not project beyond anterior corners of node (e.g. Figure 483)..... **18**

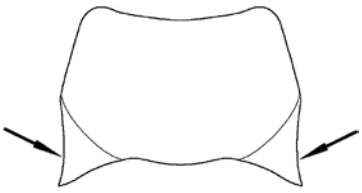

Figure 482

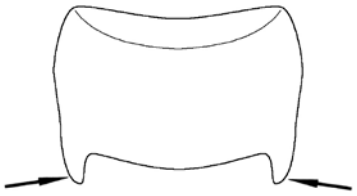

Figure 483

16. Petiolar node square or almost so, with nearly straight sides, broad lateral margins present that diminish towards posterior angles (Figure 484) ..... ***C. punctatissimus* (Clark)**

    Petiolar node about twice as wide as long, surrounded by lamellae that form an acute-angled flange at either posterior angle (Figure 485) **17**

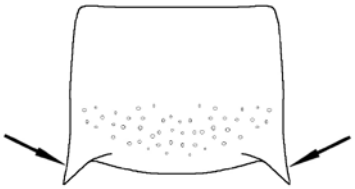

Figure 484

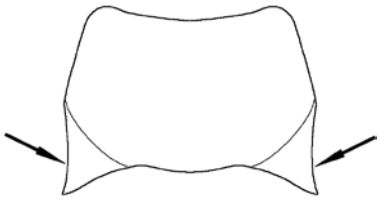

Figure 485

17. Dorsum of mesosoma smooth and unsculptured ..... ***C. clarki* (Crawley)**

    Dorsum of mesosoma finely, longitudinally striate ..... ***Cerapachys* sp. JDM 941**

18. Dorsum of mesosoma finely, longitudinally striate; dorsum of petiolar node and postpetiole also finely sculptured .... ***C. latus* (Wheeler)**

    Dorsum of mesosoma, petiolar node and postpetiole smooth and shining **19**

19. Petiolar node much wider than long, without processes on posterior corners, distinctly concave anteriad and posteriad; eyes large, length about twice the distance between eye and mandibular insertion .... ***C. incontentus* Brown**

    Petiolar node only slightly wider than long, with denticles on posterior corners; not or only slightly concave posteriad; eyes smaller, length less than twice the distance between eye and mandibular insertion .... ***C. fervidus* (Wheeler)**

20. Body entirely black..... ***C. ruficornis* (Clark)**

    At least the head and/or petiole coloured **21**

21. Viewed dorsally, promesonotal humeri slightly but distinctly narrower than sides of propodeum, the area above the narrowest section of the mesosoma smaller than the area

below it (Figure 486) ..... ***Cerapachys* sp. JDM 1040**

Viewed dorsally, promesonotal humeri about as widely separated as sides of propodeum, the area above the narrowest section of the propodeum usually about equal to the area below it (Figure 487) **22**

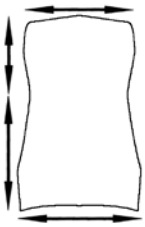

Figure 486

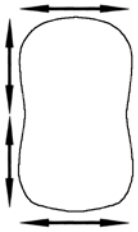

Figure 487

22. Petiole dark brown or blackish..... ..... ***C. gilesi* (Clark)**

Petiole lighter in colour (yellow to red, rarely light brown) **23**

23. Length of eye less than one third side of head, equal to distance between eye and mandibular insertion; anteocular space with two distinct carinae that reach eye; mesosoma and abdominal segment II-VII dark brown, head reddish ..... ***C. bicolor* (Clark)**

Without the above combination of characters..... ..... **24**

24. Posterior angles of petiolar node produced as small denticles (Figure 488); eye smaller, length less than one third length of side of head.....***C. elegans* (Wheeler)**

Posterior angles of petiolar node weakly obtuse, not produced as denticles (Figure 489); eyes larger in most specimens, length more than one third as long as side of head **25**

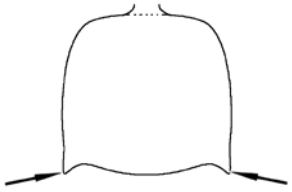

Figure 488

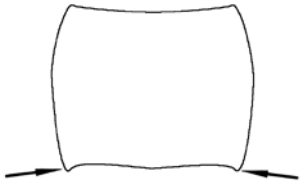

Figure 489

25. Head, mesosoma, petiole and abdominal segment III concolorous yellowish or reddish, remaining abdominal segments black or brown..... ***C. nigriventris* (Clark)**

Head, mesosoma, petiole and abdominal segment III not concolorous, petiole usually yellow (may be light brown contrasting with darker abdominal segment III), other parts variably coloured ..... ***C. brevis* (Clark)**

Cerapachys can be separated from *Sphinctomyrmex* by the outline of abdominal segments IV-VII, those parts possessing multiple constrictions in the latter genus. With 21 species described from workers and three other possible species (namely, *Cerapachys angustatus* (Clark), *Cerapachys constrictus* (Clark) and *Cerapachys mullewanus* (Wheeler)) described from queens or males, the SWBP is a major centre of diversity for *Cerapachys*. An additional six taxa are believed by this author to represent undescribed species. Despite the high species richness, many of the taxa are rare, being represented in the Curtin Ant Collection by one or a few specimens. Most frequently, stray workers have been collected by hand or in pitfall traps. Workers of the larger, reddish species are conspicuous in the field as they run over the ground, rapidly antennating the soil surface in search of their prey.

Like *Amblyopone*, *Cerapachys* appears to have been adversely affected by urbanization in the greater Perth area. Two species, i.e. *Cerapachys bicolor* (Clark) and *Cerapachys brevicollis* (Clark), described from material collected from Perth's eastern and south-eastern suburbs in the 1920's, have no representatives in the Curtin Ant Collection. Similarly, *Cerapachys punctatissimus* (Clark), described from specimens collected from Mundaring, near Perth, is only represented in the Curtin Collection by one specimen from Mt. Edith, in the Pilbara District (Eremaean Botanical Province).

Cerapachys edentatus (Forel) is the only SWBP representative of the group formerly placed in the genus *Syscia*. This eyeless ant is occasionally collected around Perth, even in Perth suburbs that retain some native vegetation, but has also been recorded in the ACT, NSW and Qld. The author notes that he has collected this species from under a rock on Mt Brown, near York in the western wheatbelt. The workers were in enormous numbers

and attached to one another by their mandibles, the insects falling away from the underside of the rock in huge, tangled skeins. The appearance of the colony, without any evidence of nest holes, suggested bivouacking in the manner of army ants. Indeed, *C. edentatus* bears some resemblance to species of *Aenictus,* from which it can quickly be distinguished by the appearance of abdominal segment III and the placement of the propodeal spiracle (posteriad in the former, and anteriad in the latter).

Cerapachys longitarsus (Mayr) is the only species in the SWBP formerly placed under *Lioponera*, the others, excluding *C. edentatus*, being subsumed under *Phryacaces* before Brown's (1975) revision of the Cerapachyini. The existence of this ant in Perth is interesting, given its tropical distribution elsewhere in Australia and overseas (south and south-east Asia). The species doubtless occurs as a tramp here: I have never seen specimens from outside of the Perth metropolitan area, and it is the only *Cerapachys* that can be found in built-up suburbs in Perth. Brown (1975) speculated that since it is a hollow twig dweller, it could have been transported across water in floating branches. However, the workers I have seen have all been found crawling on paths or grass.

Cerapachys flammeus (Clark), *Cerapachys greavesi* (Clark), *Cerapachys princeps* (Clark) and *Cerapachys sjostedti* Forel are all medium-sized to large, red species. Only *C. princeps* is known to occur outside of the State (i.e. also in SA), but the other species undoubtedly have a wide distribution in Western Australia, judging from local material. *Cerapachys flammeus* and *C. greavesi* occur at least as far north as the Pilbara region. The author also found the latter species in 1997 on newly rehabilitated minesites in Eneabba, where it was not uncommon. *Cerapachys* sp. JDM 1103 shares the same coloration as the preceding species, but the petiolar denticles are very rudimentary. This ant is known from a single worker collected at Nanga Stn., near the Peron Peninsula. *Cerapachys ruficornis* (Clark) is a black ant recorded from the south-west corner of the State and in the wheatbelt. *Cerapachys varians* (Clark) is a large-eyed species, of variable colouration, with a dorsolateral carina curving towards the eye. Specimens have mostly come from drier parts of the SWBP and the neighbouring Eremaean Botanical Province, but this species has also been recognised by the author among material collected from the Darling River region of NSW.

Cerapachys clarki (Crawley) is distinguished by the lack of a dorsolateral cephalic carina curving towards the eye, lack of ocelli and a wide node with posterior angles that in dorsal view extend laterally beyond its anterior margin. *Cerapachys clarki* is a predominantly sand-plain species that is also found in the NT and drier areas of south-eastern Australia.

Cerapachys picipes (Clark) and *Cerapachys* sp. JDM 745, from the eastern wheatbelt, are notable in that the lateral margins of the node converge strongly. Of the smaller, reddish species, *Cerapachys fervidus* is a rather variable ant (Brown 1975), which is widespread throughout Australia. Specimens referrable to this species are not uncommon in drier areas of the SWBP. *Cerapachys incontentus* Brown is an attractive, small, large-eyed species from the south-western woodlands and the wheatbelt, while *Cerapachys latus* Brown, found from at least the Perth region to Jurien Bay, possesses digitate spines on the posterior angles of the petiolar node. *Cerapachys* sp. JDM 941, with a heavily striate mesosoma, is known in the SWBP only from Jarrahdale. Elsewhere, it has been collected from Queen Victoria Spring Nature Reserve, east of Kalgoorlie

Of the smaller, bicoloured forms, *Cerapachys gilesi* (Clark), distinctive in that the pale head contrasts with a dark body, is one of the more common *Cerapachys* in woodlands around Perth. One record, possibly of this species, also comes from Ethel Creek in the Pilbara region. *Cerapachys elegans* (Wheeler) was described from NSW, but the Curtin Ant Collection also has a specimen from Corrigin in the south-eastern wheatbelt. *Cerapachys nigriventris* (Clark) is an inconspicuous small species found in the south-west and goldfields. The taxonomic boundaries of the minute *Cerapachys brevis* (Clark), found in, at least, WA and the NT, are unclear. Some forms have a distinctive yellow petiolar node that contrasts with the darker abdominal segment III, but the former feature is variable in colour. The morphology, however, is relatively uniform. *Cerapachys* sp. JDM 1040, which resembles *C. brevis* in general appearance, is known in the SWBP only from Jarrahdale (ALCOA site).

Two aberrant forms, which seem well removed from the above species phylogenetically, complete the list. Both lack a lateral mesosomal carina. The appearance of *Cerapachys* sp. JDM 746 is suggestive of a wasp mimic: the anterior sector of the abdominal tergite IV is bright orange, contrasting with the black posterior sector. Narrow orange bands are also formed by the pale-coloured margins of the tergites. This species is known from a single worker specimen collected near Mettler Lake, east of Albany.

Cerapachys JDM 574 is a goldfields form. The ant is known from a few workers, and is highly aberrant in several respects. The very placement of this species in *Cerapachys* is itself in question, since it lacks the pectinate spur on mid and hind tibiae said to be a diagnostic character of the genus *Cerapachys* (Bolton 2003). The extralimital cerapachyine genus *Simopone* also lacks a mid tibial spur, but has a

pectinate spur on the hind tibia, and workers and queens have preapically toothed claws (lacking in *Cerapachys* sp. JDM 574). The petiolar node in the worker of *Cerapachys* sp. JDM 574 possesses a large anterior pit or sulcus. The node itself lacks a lateral carina. With further analysis, this ant may require placement in a new genus, or the concept of *Cerapachys* may need to be expanded to incorporate this genus and *Simopone*.

Sphinctomyrmex

1. Antenna 11-segmented ..... ***S. occidentalis* (Clarke)**

   Antenna 12-segmented **2**

2. Spaces between fovea on cuticle at sides of head and on dorsum of mesosoma and node very narrow so that these surfaces appear matt except in certain lights (Figure 490) ..... ***S. emeryi* Forel**

2. Spaces between fovea on cuticle at sides of head and on dorsum of mesosoma and node often broad, so that these surfaces appear smooth and shiny (Figure 491) ..... ***S. imbecilis* Forel**

Figure 490

Figure 491

Two representatives of this genus occur in the south-west of the SWBP. *Sphinctomyrmex imbecilis* Forel has a wide distribution in Australia, whereas *Sphinctomyrmex occidentalis* Forel is confined to the south-west corner. The two species can readily be separated through a count of the number of antennal segments. In the SWBP neither is very often seen, but their colonies can be found under rocks or logs. A third species, *Sphinctomyrmex emeryi* (Forel), was described from a worker collected at Baudin Island on the northern fringe of the SWBP. Differences between the degree of punctation on the fovea on the cuticle separate this ant from *S. imbecilis*, with which it shares 12 antennal segments. Specimens from the Kimberley and Gascoyne region held in the Curtin ant Collection correspond to the description given for *S. emeryi* in Brown's (1975) key, and may belong to that species.

SUBFAMILY LEPTANILLINAE

This is a subfamily consisting of minute army ants. *Leptanilla* is the only genus occurring in Australia, with one species, *Leptanilla swani* Wheeler, recorded from NSW, QLD, SA and WA. Workers in this subfamily may be confused with some very small, eyeless myrmicines, but the pronotum and mesonotum in *Leptanilla* are connected by a flexible hinge, and are not fused as they are in the Myrmicinae. Moreover, the antennal insertions are completely exposed in the former while they are at least partially covered in the latter. Nothing is known about the biology of the sole Australian species, but a Japanese relative specialises on geophilomorph centipedes (Hölldobler and Wilson 1990)

Leptanilla

One species, *Leptanilla swani* Wheeler. In this State, workers known from type colony only and were taken many years ago. Males, however, are not infrequently taken in pitfall traps

Leptanilla swani Wheeler was described from a colony discovered at Goyamin Pool, near Chittering, approximately 75 km north of Perth. According to Shattuck (1999), workers have only been collected twice since that time. Males, however, have been collected more frequently, which suggests that current collecting techniques are not successfully sampling these tiny, exclusively subterranean ants. The Curtin Ant Collection holds two minute, male ants believed to be of this species, while males have also been collected in a Curtin project undertaken on Barrow Island. The sole SWBP specimen was collected on an Alcoa mine site in Jarrahdale.

SUBFAMILY AMBLYOPONINAE

This is one of the resurrected or new subfamilies created by the recent splitting up of the portmanteau subfamily Ponerinae (Bolton 2003). Members of the subfamily are readily recognized through the broad attachment of the petiole to the abdominal segment III, and the row of small, dentiform teeth on the clypeus. Australia has a rich fauna of amblyoponine ants, with five genera being represented on the continent, but only one of these, *Amblyopone*, has representatives in the SWBP.

Amblyopone

1. Smaller species (HW < 1.5 mm) ..... ***Amblyopone glauerti* (Clark)**

   Larger species (HW > 1.5 mm) **2**

2. Mandible long and linear, virtually edentate except for the tip, which bears five denticles... ..... ***A. aberrans* Wheeler**

   Mandible not as above, broader, and bearing one or more teeth along its inner margin..... **3**

3. Mesosoma and dorsum of head with fine, longitudinal striae and elongate punctures..... .....***A. clarki* Wheeler**

   Mesosoma and dorsum of head shining and smooth, except for scattered punctation **4**

4. Frons of head and mesosoma with distinct punctation; lower genae adjacent to mandibular insertions terminating in a spine; prominent middle tooth of mandible preceded by one or more smaller denticles (Figure 492). ..... ***A. australis* Erichson**

   Frons of head and mesosoma with vestigial punctation; lower genae adjacent to mandibular insertions not terminating in a spine; prominent middle tooth of mandible unaccompanied by smaller denticles (Figure 493) .....***A. michaelseni* Forel**

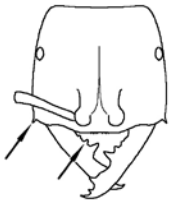

Figure 492

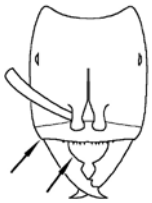

Figure 493

Amblyopone species have elongate, slender mandibles with teeth on the inner margins, and small eyes. These ants are cryptic predators in soil and litter, with some taxa preferring centipedes and others a range of soft-bodied arthropods (Shattuck 1999). The *Amblyopone* fauna of the SWBP includes one rather distinctive ant and two complexes, each consisting of two closely related species.

The distinctive *Amblyopone glauerti* (Clark) was originally described from the northern wheatbelt near Geraldton. Additional material in the ANIC comes from Bejoording and Pickering Brook in the Perth region and Mt. Ragged in the south-east. These are all old records. In contrast, *Amblyopone australis* Erichson has a broad distribution throughout Australia, but within the SWBP most records come from the Darling Range and near the south coast. Nests of this species are not uncommon under logs and rocks. This is the *Amblyopone* most commonly encountered in the hills behind Perth. The closely related *Amblyopone michaelseni* Forel has been collected in Western Australia and Victoria, but is apparently very rare in this State. Although the type specimen was taken at Jarrahdale, where Curtin University students and other researchers have done much work on ants, there are no specimens in the Curtin Ant Collection. Possibly this is a species that has been affected by alteration in land use around Perth.

Amblyopone clarki Wheeler and *Amblyopone aberrans* Wheeler also appear to form a taxonomic unit. The former is locally abundant on the sandy coastal plain north and south of Perth, especially in tuart (*Eucalyptus gomphocephala* DC.) and *Banksia* woodlands. Nests of this species are often conspicuous because of the presence of a peculiar little turret of sand, about 5 cm high. The author has often found just one worker (a sentry?) within the apex of the turret. The closely related *A. aberrans* is distinguished in having its mandibular teeth concentrated at the end of the mandible, rather than being distributed along the inner margin, as in *A. clarki*. The taxon was described from Mundaring, just east of Perth, but this is another *Amblyopone* that seems to have become increasingly rare with urbanisation, and there are no specimens in the Curtin Ant Collection.

SUBFAMILY PONERINAE

In the SWBP, the newly reconfigured subfamily Ponerinae (Bolton 2003) has had its glory much diminished, with the genera *Amblyopone*, *Discothyrea*, *Heteroponera* and *Rhytidoponera* now excluded and placed in other subfamilies. Ponerinae, as it is now understood, includes those ants whose workers have the torulus completely fused to the frontal lobe, while the outer margins of the frontal lobes themselves are convergent posteriad (except in *Platythyrea*). The lobes thus have a 'pinched in' appearance, according to Bolton (2003). Ponerinae do not now include ants with a lamellar apron on the anterior clypeal margin, or a median longitudinal carina on the front of the head capsule. Ants of the genus *Platythyrea* have several unique or unusual features among the Ponerinae, including broad insertion of the clypeus, and the presence of pectinate meso- and meta-tibial spurs. No other ponerines have a broad insertion of the clypeus, and only a few *Leptogenys* and *Pachycondyla* species (none in the SWBP, to my knowledge) have pectinate tibial spurs. *Platythyrea* is therefore placed in a separate tribe, the Platythyreini, by Bolton (2003). The remaining ponerines are placed in the tribe Ponerini. The latter is poorly characterised at

the generic level, and recent molecular work has cast doubt on the validity of a number of genera. Undoubtedly, this area of ant taxonomy will change markedly with the publication of papers that will arise from research currently being undertaken.

All ponerine ants have a single waist segment, and possess a sting. In all but *Odontomachus*, the gaster is characterised by a slight though distinct girdling impression between the first and second segments. *Odontomachus*, the only ponerine with a smoothly rounded gaster, has distinctive, forceps-like mandibles articulated close together under the head capsule. Although this type of mandible is shared with the genus *Anochetus*, the latter has the usual impression between first and second gastral segments. Ponerine ants are typically cryptic, and are usually found in small colonies. Some are quite minute species while others rival the larger bulldog-ants in size. Most are solitary generalist predators, but a few are specialist predators. None of the eight genera of Ponerinae found in the SWBP is locally speciose. *Platythyrea* is the best-represented genus in the SWBP, with five species.

Anochetus

One species, Anochetus armstrongi *McAreavey.*

The genus can readily be separated from all other ponerines except *Odontomachus* by virtue of its elongate spring-trap jaws. Jaws that have evolved separately along a similar principal can be found among some members of the unrelated myrmicine tribe Dacetini. Features of the gaster (mentioned above), the node (dorsally rounded or slightly bidentate in *Anochetus*, acuminate in *Odontomachus*) and the head capsule (smooth posteriad in *Anochetus* but with a pair of lines in *Odontomachus*) separate the genera *Anochetus* and *Odontomachus*. The genus *Anochetus* forms small nests, usually of less than 100 workers, the ants predating upon small arthropods and using their sting to subdue their prey (Shattuck 1999). Surprisingly, in view of its mandibular specialisations, the only species in the SWBP, *Anochetus armstrongi* McAreavey, may also take some seeds, since husks and other plant refuse have been found around its nests (pers. obs.). This insect is found fairly infrequently in the SWBP, including in the Perth region, but has a broad range in the lower half of Australia.

Hypoponera

1. Body and legs concolorous yellowish to orange.. .....***H. congrua* (Wheeler)**

   Body a deep, rich brown contrasting with orange legs .....***H. eduardi* (Forel)**

In the SWBP, the genus *Hypoponera* can commonly be found under rocks or logs or in termite nests, where it is a cryptic predator. The genus locally is often confused with *Pachycondyla* (sub-genus *Brachyponera*) but can be distinguished by the absence of a simple spur on the hind leg (present in *Pachycondyla*). On a global scale this genus may also be confused with *Ponera*, although this is unlikely in the SWBP, since the latter is represented by just a few records. However, the anteroventral process is a simple flange in *Hypoponera*, whereas the same flange has a circular, translucent sector of very thin cuticle in *Ponera*. The PF in the two genera is also different, *Hypoponera* having a PF of 2,2 and *Ponera* a PF of 1,1 or 1,2.

Two, possibly three species of *Hypoponera* are found in the SWBP, mainly in the south and south-west. Two distinct species are frequently seen in a variety of habitats, including the better-vegetated Perth suburban yards. Individual workers can often be seen in minute furrows in damp soil under rocks or logs, and are very adept at evading capture by disappearing into litter under or beside the covering object. *Hypoponera congrua* (Wheeler) is quite common in limestone and sandy soils in the Fremantle area, but is also found in wetter areas of the south-west. Of what are possibly two other species present in the SWBP, one is here assigned to *Hypoponera eduardi* (Forel), a tramp species, based on comparison with material in the Australian National Insect Collection (ANIC) in Canberra. This species is more commonly found in urban or otherwise disturbed environments, but has also been collected in relatively undisturbed woodland. What is possibly an additional species has been collected at Mt. Frankland near the south coast. This ant is an overall dark maroon, with yellow legs and a straight mesosoma without a distinct metanotal groove (*Hypoponera eduardi*, as far as the author can tell, has a brownish mesosoma, a darker head and gaster and the metanotal groove is distinct). However, the current taxonomic situation with Australian *Hypoponera* is confused, and, based on the type material seen by the author in the ANIC, a revision of the group is likely to result in some synonymization as well as the erection of new species.

Leptogenys

1. Head broader than long; mandibles longer than head, linear and evenly curved; median lobe of clypeus tridentate, with smaller teeth and denticles on adjacent anterior margin of clypeus (Figure 81); pronotum and mesonotum foveolate .... ***L. clarki* Wheeler**

   Head longer than broad; mandibles distinctly shorter than head, straighter and more triangular in form; median lobe of clypeus beak-like, without additional teeth or

denticles, these also lacking from adjacent anterior portions of the clypeus (Figure 88); pronotum and mesonotum smooth and shining with scattered, small punctures only. **2**

2. Eyes moderate, length one quarter to one fifth length of side of head (Figure 494); (n.b. small, ventral, plate- like process on underside of gastral presclerite that articulates with the node (the helcium) present) ..... ***L. neutralis* Forel**

Eyes larger, length almost one third of side of head (Figure 495); (n.b. small, ventral, plate-like process on underside of the helcium absent in the few specimens seen) ..... ***L. darlingtoni* Wheeler**

Figure 494

Figure 495

This is a distinctive genus in the SWBP, the local species being jet black with a strongly angular and projecting clypeus. The major diagnostic feature for the genus, however, is the pectinate tarsal claw. Specialised predatory behaviour is not known for the local species, but elsewhere in Australia some taxa specialise on Isopoda or termites (Shattuck 1999). Three taxa can be found in the SWBP.

Leptogenys clarki Wheeler is a very large, heavily sculptured and spectacular species found in coastal localities between Geraldton and Exmouth, but is rare in collections. However, a recent survey of the ants of the Carnarvon Basin (Gunawardene and Majer 2004) has revealed this ant to be quite common in the mid-west of WA. The remaining species are similar in appearance, being smooth and shining, and essentially black in colour. *Leptogenys neutralis* Forel is reasonably common in laterite soils in the Darling Range, whilst its counterpart in drier northern areas, *Leptogenys darlingtoni* Wheeler, has been collected as far north as the Pilbara.

Myopias

One species, Myopias tasmaniensis *Wheeler.*

The uncommon genus *Myopias* is characterised by elongate, curved mandibles and a narrow, projecting clypeus. One species is known from the SWBP. *Myopias tasmaniensis* Wheeler has been collected just twice from near Manjimup, in the extreme south-west. The same species is otherwise known from Victoria and Tasmania, and this discontinuous distribution is potentially of considerable interest to biogeographers.

Odontomachus

One species, Odontomachus ruficeps *Smith.*

The so-called 'trap-jaw ants' (http://www.myrmecos.net/anttaxa.html) cannot be mistaken for any other ant genus, except, perhaps, *Anochetus* (also a 'trap-jaw' ant), from which they may be distinguished by the features mentioned under the latter. When hunting, *Odontomachus* workers move about with their mandibles locked at 90° to the head capsule. The mandibles can close with phenomenal speed in a reflex action once certain sensory trigger hairs are touched, the speed of the reflex being possibly the fastest in the animal kingdom (Gronenberg 1995). These ants also possess a formidable sting. The only species recorded from the SWBP is *Odontomachus ruficeps* Smith, which has a wide distribution throughout the State. In the north of WA, *O. ruficeps* is one of the commonest ponerines, but further south it appears to be less abundant. Worker ants in localities at about the same latitude as Perth are generally concolorous black or reddish-black. Further north, workers usually have a bright red head capsule, contrasting with a darker red mesosoma and black gaster.

Pachycondyla

1. Large species (HW ≥ 2 mm); heavily sculptured (*Bothroponera* subgenus)..... **2**

   Smaller species (HW ≈ 1 mm); at most weakly sculptured **3**

2. Mandibles densely punctate, individual punctations separated by less than their own width (Figure 496); appressed setae on body surface white..... ***P. regularis* Forel**

   Mandibles sparsely punctate, punctations well separated by smooth surface (Figure 497); appressed setae on body surface yellow ..... ***P. denticulata* group sp. JDM 730**

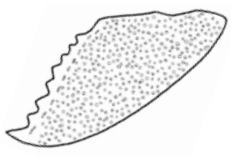

Figure 496

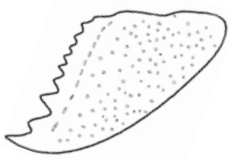

Figure 497

3. Mesonotal suture strongly defined, indented (Figure 498a); anterior clypeal margin straight (Figure 498b) .....***P. lutea*** **(Mayr)**

   Mesonotal suture weakly defined, not indented (Figure 499a); anterior clypeal margin gently convex (Figure 499b)..... ***P. rufonigra*** **(Clark)**

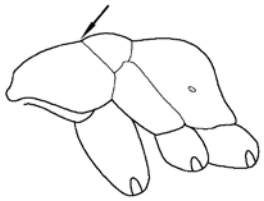

Figure 498a

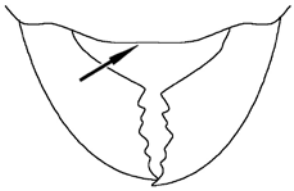

Figure 498b

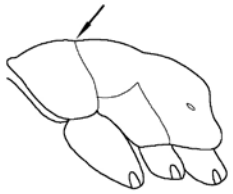

Figure 499a

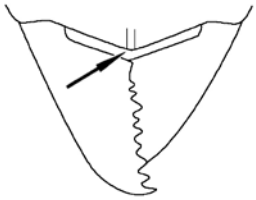

Figure 499b

Frederick Smith erected the genus *Pachycondyla* in 1858 (F. Smith 1858). Brown (1973) placed in provisional synonymy under this genus the genus-level names of two taxa found in the SWBP, namely, *Bothroponera* and *Trachymesopus*. Snelling (1981) made *Pachycondyla* a provisional senior synonym of *Brachyponera*, the other genus found in the SWBP. Unfortunately, confirmation of these provisional synonyms, among a number of others, has never been published; nor is it likely to be, since Brown, who was preparing a major revision of the group, died before publication of his work. Of those who have written recent taxonomic works on the Australian ant fauna, Bolton (1994, 1995) and Shattuck (1999) accept *Pachycondyla* as a senior synonym for the taxa mentioned above, while Andersen (2000) does not. Although, on a global basis, the monophyly of ants in the *Pachycondyla* group is problematic (e.g. do those taxa with a mandibular fovea belong here?), the Australian subgenera *Brachyponera*, *Bothroponera*, *Mesoponera* and *Trachymesopus*, at least, are united by well-defined taxonomic characters, and the name *Pachycondyla* appears to satisfy the conditions of the Zoological Code (International Commission on Zoological Nomenclature 1999). Hence, Bolton and Shattuck are followed here. Nonetheless, on a global scale, *Pachycondyla* awaits a more robust revisionary treatment than it has hitherto been given, which could well result in the reinstatement of some ancient genus-level names currently in synonymy.

In the SWBP, ants in the subgenera *Brachyponera* and *Trachymesopus* are most likely to be confused with *Hypoponera*, but possess both a pectinate and a simple spur on the hind leg. Ants in the subgenus *Bothroponera* are large, robust ants with a distinctive appearance, and are unlikely to be mistaken for anything else. The *Trachymesopus* and *Brachyponera* subgenera inhabit mainly the wetter, forested areas of the SWBP, where they are often found under rocks and logs, while the *Bothroponera* subgenus is characteristic of the wheatbelt and drier pastoral regions.

Four species of *Pachycondyla* can be found in the SWBP. *Pachycondyla* (*Brachyponera*) *lutea* (Mayr) is easily the most abundant species in the group, and occurs throughout Australia. Typically this species can be found cohabiting with termites under stones or rotting logs, and the latter are a prey item. As well as being widespread in native woodlands, *P. lutea* is common in suburban areas, where anecdotal reports suggest it not infrequently stings people tending their gardens. *Pachycondyla* (*Trachymesopus*) *clarki* (Wheeler) and *Pachycondyla* (*Trachymesopus*) *rufonigra* (Clark) appear to me to be no more than colour variations of the same species: *P. clarki* has a brown pronotum, but is otherwise indistinguishable from *P. rufonigra*, in which the pronotum varies from black to brownish-black. I here regard ***Pachycondyla*** (***Trachymesopus***) ***clarki*** (Wheeler) syn. revised as the junior synonym of

Pachycondyla (*Trachymesopus*) *rufonigra* (Clark), a position formerly entertained for this species (i.e. by Brown 1985). This species is confined to south-western WA, where it is mostly encountered as a retiring resident of litter in *Banksia* and Jarrah-Marri woodlands. *Pachycondyla* (*Bothroponera*) *piliventris regularis* Forel and *Pachycondyla* (*Bothroponera*) *denticulata* sp. JDM 730 are large, impressive ants that forage for prey on the ground surface. The former species has a broad distribution within more inland parts of the SWBP, while the latter has been collected in the vicinity of Shark Bay.

Platythyrea

1. Viewed dorsally, node longer than wide; dorsum of mesosoma without erect setae..... ..... ***P. parallela* (F. Smith)**

   Viewed dorsally, node wider than long; dorsum of mesosoma with erect setae **2**

2. Posterior dorsal surface of node with distinct median protuberance (Figure 500)..... ..... ***P. dentinodis* (Clark)**

   Posterior dorsal surface of node without protuberance (Figure 501)..... **3**

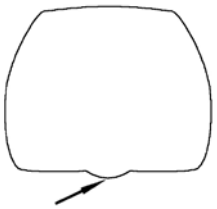

Figure 500

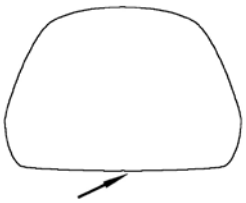

Figure 501

3. Erect setae long (≥ greatest width of antennal scape); head and mesosoma light reddish-brown; gaster dark brown .... ***P. brunnipes* (Clark)**

   Erect setae at most equal to greatest width of antennal scape, mostly shorter; if bicoloured then head darker than mesosoma..... **4**

4. Body distinctly bicoloured, mesosoma lighter than gaster and most of head, head with light coloured patches on genae .... ***P. turneri* Forel**

   Body uniformly coloured dark brown..... ..... ***P. micans* (Clark)**

Platythyrea

Platythyrea comprises a group of rather neat-looking, moderate-sized ponerine ants. In the SWBP the widely separated antennal sockets and the presence of paired pectinate spurs on the hind tibiae are diagnostic for the genus. Although generally rare, several of the WA species have a broad distribution that extends overseas in one case. In the SWBP, the ants can be found in rotting wood or soil or foraging on logs and tree-trunks.

With five species, the *Platythyrea* fauna of the SWBP is rather rich. The *P. parallela* group has one representative in the south-west, *Platythyrea parallela* (F. Smith), which can also be found throughout much of Australia and south-east Asia. However, Andersen (1991a) challenges the synonymization of several names under the senior synonym *parallela* by Brown (1975). The remaining *Platythyrea* are obviously taxonomically close. *Platythyrea micans* (Clark) is possibly the most common of these, and workers have been collected from pitfall traps and hand collections from the ground and tree trunks in Jarrah-Marri woodland south and south-east of Perth. Like *P. parallela*, *Platythyrea turneri* Forel has a wide distribution throughout Australia, and in WA can be found in wetter areas of the south-west. In the field this species has a remarkable resemblance to *Pachycondyla* (*Brachyponera*) *lutea*. *Platythyrea brunnipes* (Clark) is also found in the wetter south-west of this State, as well as SA, and the very rare *Platythyrea dentinodis* (Clark) was described from Tammin, in the western wheatbelt, and has recently been collected by a Curtin researcher near Worsley in the lower Darling Range. Even more surprisingly, since this work has been submitted for publication, *P. dentinodis* has been collected by a Curtin student in the coastal Perth suburb of Cottesloe, in relictual bushland.

***Ponera*[3]**

One species, Ponera sp. JDM 1122

The recent identification of a species of *Ponera* from pitfall trapped material near Jarrahdale, just south of the Perth metropolitan area came as a surprise, since this area has been exposed to regular monitoring of ant species. In addition, many

[3] The single specimen appears to lack the sharp angle or pair of spurs on the posterior margin of the anteroventral process, a feature used to characterize the genus. However, the small 'window' or fenestra anteriad is distinct. The broad node and minute eye (barely more than a fleck of discoloration) also make it highly unlikely that the specimen represents an undescribed species of *Hypoponera*. The only other possibility (*Cryptopone*), I think, is excluded by virtue of the lack of a mandibular fovea and spiny mid-tibia.

other collections of ants have been taken by Curtin students and University staff, and the area was also well covered by early ant researchers such as Clark. Ants in this genus form small nests of less than 100 workers in soil or in other substrates such as fallen wood or moss, and are cryptic foragers (Shattuck 1999). The single specimen is tiny and yellow, and appears to lack the normal posterior angle on the anteroventral petiolar process. The eye is virtually absent in the local species (other Australian species have distinct, though tiny eyes), being represented by a minute fleck of pigment.

The same species is represented in the ANIC Collection, but under the label '*Cryptopone*'. However, the ant lacks the mandibular fovea normally seen in species of *Cryptopone*, likewise the spiny setae on the middle tibiae found in members of that genus. The placement of this species may become much simpler in the future if, as seems likely, *Cryptopone*, *Ponera* and some other Ponerini become united at the generic level.

SUBFAMILY ECTATOMMINAE

This is one of the newly erected subfamilies introduced by Bolton (2003), after he had split the old subfamily Ponerinae. Ectatommine ants are most easily distinguished by the appearance of the metapleural gland orifice, which in profile is a longitudinal or obliquely curved slit or narrow crescent. Below, a convex rim of cuticle that directs the orifice dorsally or posterodorsally bounds this structure. Some myrmicine genera share this feature, but are distinguished by the presence of two strongly constricted waist segments, whereas in ectatommines the second waist segment is large and only weakly constricted. Nonetheless, the appearance of ectatommine ants suggests a relatively close if not sister group relationship with the myrmicines.

Rhytidoponera

1. Viewed from front, occiput with distinct raised corners (Figure 502) **2**

   Viewed from front occiput either rounded or square without raised corners (Figure 503) **3**

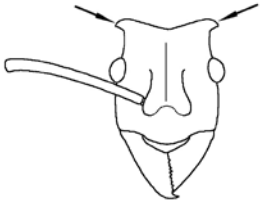

Figure 502

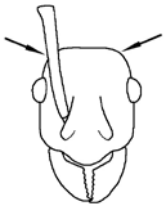

Figure 503

2. Corners of occiput in form of sharp, curved processes (Figure 504a); node conical (Figure 504b) ..... ***R. taurus*** **(Forel)**

   Corners of occiput in form of dull tubercles (Figure 505a); node subcuboidal (Figure 505b) ..... ***R. mayri*** **(Emery)**

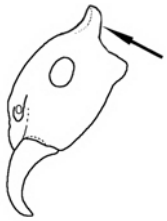

Figure 504a

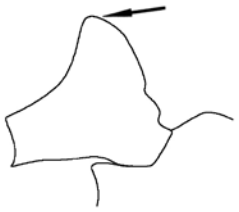

Figure 504b

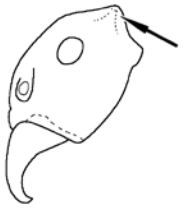

Figure 505a

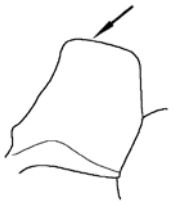

Figure 505b

3. Hind tibial spur absent..... **4**

   Hind tibial spur present, distinct..... **5**

4. Apex of node terminating as a sharp spur (usually) or dull point (rarely) directed posteriad (Figure 506) .... ***R. tyloxys*** **Brown and Douglas**

Apex of node rounded, lacking a process or point directed posteriad (Figure 507) .... ***R. dubia* group sp. JDM 904**

Figure 506

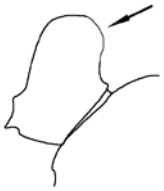

Figure 507

5. Eye very large, equal to ≈ 1/3 length of head capsule **6**

   Eye smaller, equal to, at most, 1/4 length of head capsule **7**

6. Mandible finely striate (Figure 508); head and body foveate-punctate, shining, without uniform fine microreticulation between striae and pits .... ***Rhytidoponera crassinoda* (Forel)**

   Mandible with superficial microreticulation only (Figure 509); head and body weakly to moderately sculptured, matt, with uniform microreticulation between larger sculpture .... ***Rhytidoponera* sp. JDM 736**

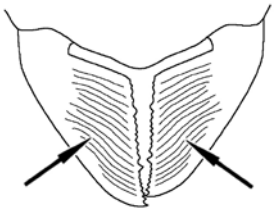

Figure 508

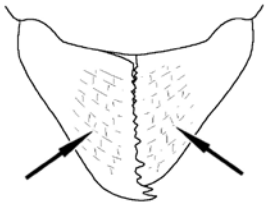

Figure 509

7. Head and mesosoma with shallow, vestigial punctation only (Figure 510), gaster glistening, with very fine, almost imperceptible stria **8**

   Head and mesosoma usually punctate-striate or foveate-reticulate (e.g. Figure 511) or, if punctate only, gaster shagreenate with vestigial punctation **9**

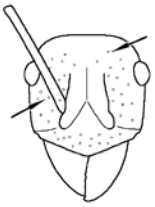

Figure 510

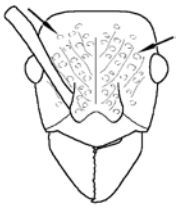

Figure 511

8. Fine striae on 2nd gastral tergite longitudinal without deviation (Figure 512) .... ***R. flavicornis* Clark**

   Fine striae on 2nd gastral tergite weakly arched around midline of tergite (Figure 513)..... ..... ***R. micans* Clark**

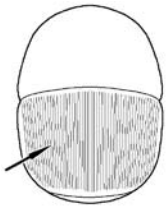

Figure 512

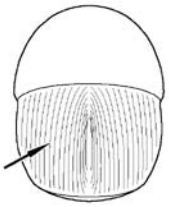

Figure 513

9. Head punctate (Figure 514) or reticulate-punctate (Figure 515); mesosoma punctate; gaster shagreenate with vestigial punctation..... ..... **8**

   Head and mesosoma punctate-striate (Figure 516) or foveate-reticulate; gaster usually with fine to coarse circular striae **9**

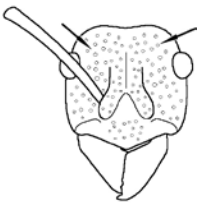

Figure 514

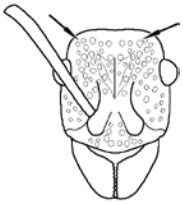

Figure 515

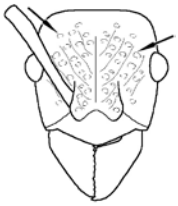

Figure 516

10. Frons punctate, with small, well-spaced pits (Figure 517a); ventral process of petiole a short spur (Figure 517b) .... ***R. levior*** **Crawley**

    Frons more reticulate-punctate, particularly towards centre of head capsule, edges of pits often confluent (Figure 518a); ventral process of petiole long, needle-like (Figure 518b) .... ***R. rufonigra*** **Clark**

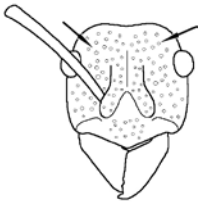

Figure 517a

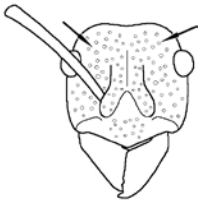

Figure 517b

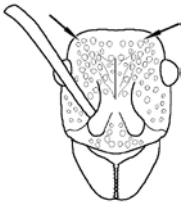

Figure 518a

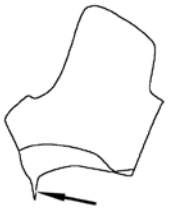

Figure 518b

11. In profile, vertex of head capsule flattened, its posterior angles distinctly lobate (Figure 519); node thick, cuboidal or subcuboidal..... ..... **12**

    In profile, vertex of head capsule more rounded, its posterior angles with at most a small, weak flange (Figure 520); node often thinner **17**

Figure 519

Figure 520

12. In profile, petiolar node low, at least as wide as high; subpetiolar process a long spine (*R. anceps* group)..... **13**

    In profile, petiolar node distinctly higher than wide; subpetiolar process spurlike (*R. metallica* group) **14**

13. First gastral tergite with fine, close, parallel striae (Figure 521).....***R. anceps*** **Emery**

    First gastral tergite with thick, discontinuous striae (Figure 522)..... .....***Rhytidoponera*** **sp. ANIC 44**

Figure 521

Figure 522

14. Body without strong iridescence (gaster may have coppery sheen) .... ***R. inornata*** **Crawley**

    Body with strong blue- or green-purple iridescence **15**

15. First gastral tergite strongly areolate, the areolae confluent (Figure 523); second gastral tergite with many shallow, elongate pits in additional to the fine, circular striae .... ***R. metallica*** **group JDM 1098**

    Sculpture of first and second gastral tergite usually confined to fine, circular striae, a few scattered, shallow pits may be present (Figure 524) **16**

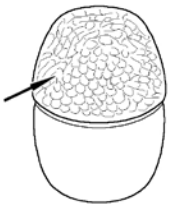

Figure 523

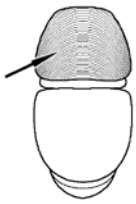

Figure 524

16. Appendages dark brown .... ***R. metallica*** **(F. Smith)**

    Appendages orange .... ***R. metallica*** **group JDM 1097**

17. Node thin, tapering, without vertical sulcus posteriad (Figure 525); gaster shiny; mostly with greenish-purple or coppery iridescence (lacking in a few northern populations)..... ..... ***R. violacea*** **(Forel)**

    Node either thicker, not tapering, or with vertical sulcus posteriad (e.g. Figure 526); gaster usually duller; iridescence always absent **18**

18. In profile, node acuminate, with vertical sulcus posteriad (Figure 526); short, erect setae virtually absent from body surfaces, very sparse on legs and antennae .... ***R. punctigera*** **Crawley**

    In profile, node cuboidal or subcuboidal without vertical sulcus (small, longitudinal sulcus may be present on dorsum) (Figure 527); short erect setae well distributed on body surfaces, legs and antennae **19**

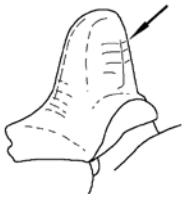

Figure 525

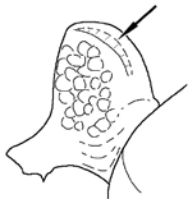

Figure 526

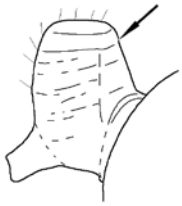

Figure 527

19. Frons finely longitudinally striate in dorsal sector, with scattered, sparse punctation (Figure 528) ..... ***R. micans*** **group sp. JDM 576**

    Frons reticulate-foveate in dorsal sector (Figure 529) ..... ***R. foveolata*** **Crawley**

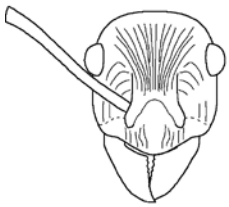

Figure 528

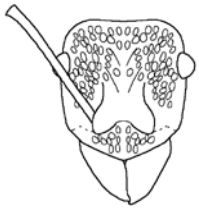

Figure 529

Rhytidoponera is the sole ectatommine genus found in the SWBP. However, from the standpoint of the applied myrmecologist this genus is of considerable importance. The dark-coloured, wrinkled integument of most species makes them easy to recognize in the field: indeed, to the mind of this author, 'wrinkled ants', which correctly reflects the genus name as well as the appearance, would be a preferable common name for the group rather than Andersen's punning name 'pony ants' (Andersen 2002). These ants are sometimes also called 'bull ants', but this name should be avoided because of confusion with the true bulldog ants (*Myrmecia* spp.). Rhytidoponera is speciose, with at least 20 representatives in the SWBP, several of which feature as valuable bioindicator species. Some, but probably not all of the species are opportunists, and their presence in numbers on a given site suggests that the habitat is likely to be disturbed or generally unsuitable for colonization by most ants. Clark (1936) produced an early monograph on *Rhytidoponera* and named many of the south-western species. Hanna Reichel (2003) has recently revised the genus.

In the SWBP, a very common smallish, iridescent species is probably identical with the well-known 'green-head' ant, *Rhytidoponera metallica* (Smith), of eastern Australia. In the suburbs of some major cities in the eastern states, where it is present in large numbers in parks and gardens, it is regarded as a stinging nuisance. This species, or a complex of sibling species, is found throughout Australia. *Rhytidoponera metallica* is fond of elaiosomes and has a significant role in dispersal of seeds (Hughes and Westoby 1992; Hughes *et al.* 1994). In the south-west corner of WA, the ant shares its habitat with a very similar but non-iridescent species, *Rhytidoponera inornata* Crawley. The two species are not normally collected together at a given site, however, suggesting they occupy different niches in the same habitat. Both ants can be found in urban areas, but *R. metallica* is by far the most common. In the extreme north of the SWBP a very similar species (*Rhytidoponera metallica* group sp. JDM 1097) has been collected. This ant has orange rather than dark brown appendages. Yet another *metallica*-like ant, with a strongly punctate gaster (*Rhytidoponera metallica* group sp. JDM 1098) occurs in the Shark Bay region. Belonging to a different group but with similar iridescence to *R. metallica*, is *Rhytidoponera violacea* (Forel). Unlike *R. metallica* and its relatives, *R. violacea* has a slender node. However, like *R. metallica*, *R. violacea* is abundant throughout WA, and is an important taxon for those using ants as bioindicators for environmental management purposes. A small population of this species on the northern coast around Geraldton lacks the usual iridescence, while specimens of *R. violacea* from more arid eastern and northern areas have a greenish-yellow rather than blue-purple iridescence on the head and mesosoma. Molecular or karyotype analysis of representatives of these populations may reveal that they are genetically distinct.

The remaining species of *Rhytidoponera* are much less conspicuous than those mentioned above. *Rhytidoponera punctigera* Crawley and *Rhytidoponera rufonigra* Clark are taxa whose main distribution is in the wetter areas of the Darling Range and Swan coastal plain. *Rhytidoponera levior* Crawley, which is morphologically very similar to *R. rufonigra*, has a predominantly coastal distribution in the Perth metropolitan area, but was described from Rottnest Island. *Rhytidoponera foveolata* Crawley is most common in the goldfields, although its distribution includes the Darling Range around Perth. *Rhytidoponera tyloxys* Brown and Douglas, one of the *R. dubia* group, can be found in the extreme north and probably also in the eastern fringes of the SWBP. Possibly consisting of a complex of two or more species, this highly distinctive taxon has an unmistakeable appearance, since the node is produced as a sharp spur or tooth directed posteriad. These ants may be specialist predators, unlike most *Rhytidoponera* (Andersen 2000). The worker of the closely related *Rhytidoponera dubia* group sp. JDM 904 has a rounded dorsum to the node. This species also possesses a smooth cuticle and large, protuberant eyes. Along with these two members of the R. *dubia* group, *Rhytidoponera flavicornis* Clark, *Rhytidoponera micans* Clark, *Rhytidoponera micans* complex sp. JDM 576 and *Rhytidoponera* sp. JDM 736 are also arid and semi-arid area species. *Rhytidoponera mayri* (Emery), the only member of the *R. mayri* group (*sensu* Andersen 2000) to be found in the SWBP, and the mostly northern *Rhytidoponera taurus* (Forel) are large ants, their workers easily being distinguished from other *Rhytidoponera* workers by their occipital cornicles.

Curtin specimens of the large-eyed *Rhytidoponera crassinoda* (Forel) come from outside the SWBP, but ANIC holdings suggest it may just enter the Province. Finally, two small, *metallica*-like species, *Rhytidoponera anceps* Emery and *Rhytidoponera anceps* group sp. ANIC 44, have been collected at various locations along the south coast of this state by ANIC workers, although neither is represented by SWBP material in the Curtin Ant Collection, and

the undescribed species is not represented at Curtin at all. The distribution of *R. anceps* is most peculiar, as it is otherwise known from the Qld and northern NSW coasts.

SUBFAMILY HETEROPONERINAE

This is another subfamily newly constituted by Bolton (2003). In the SWBP these small, cryptic predators or scavengers may be mistaken for *Rhytidoponera* by the uninitiated, but their workers and queens have a simple orifice to the metapleural gland, which is directed posteriad or laterad. The group has no unequivocally unique apomorphies, but the median longitudinal cephalic carina extending from the occipital margin to the anterior margin of the clypeus seems to be universal in the subfamily, and is not found is any other group of ants that share a single distinct waist segment. As another point of contrast with Ectatomminae, Heteroponerinae always have a simple apical claw on the pretarsal claws whereas in most ectatommine species the preapical claw is toothed. This feature, though, needs to be treated with caution: in some extralimital ectatommine species the preapical tooth is restricted to the claw of the foreleg. I have also seen one series of Australian *Rhytidoponera*, held by the California Academy of Science and apparently in the *R. metallica* group, in which the preapical tooth appears to be missing entirely.

Heteroponera

1. Larger species (HW ≈ 2mm), petiolar node acuminate (highly localised in woodland around Dwellingup, south of Perth) (Figure 530) ..... ***Heteroponera* sp. JDM 92**

   Smaller species (HW ≈ 1 mm), petiolar node cuboidal or subcuboidal (Figures 531, 532) **2**

2. Eye moderate, about as wide as antennal scape at its widest point; petiolar node subcuboidal (Figure 531); body brownish, legs orange..... ..... ***H. imbellis* (Emery)**

   Eye large, much wider than antennal scape at its widest point; petiolar node cuboidal (Figure 532); body and legs blackish ....***Heteroponera* sp. JDM 732**

Figure 530

Figure 531

Figure 532

Heteroponera is the only genus from this tiny subfamily, which consists of just two genera (three, if one includes the extralimital *Aulacopone*, known only from the queen), that occurs in Australia. In the SWBP *Heteroponera* workers have been collected as strays in soil and litter. Three species, two of them undescribed, are known from the SWBP. The single described species, *Heteroponera imbellis* (Emery), also has a broad distribution on Australia's east coast. In Western Australia it is most common in the wetter south-west, but there is at least one goldfields record (Kambalda). This species has also been collected in suburban Perth and on Rottnest Island. The undescribed *Heteroponera* sp. JDM 732 is clearly closely related to *H. imbellis* but can be distinguished by its dark colouration and large eyes. The taxon is known from just a few workers taken by hand or pitfall trap at Kings Park, near the Perth CBD, and at Karragullen in the Darling Range near Perth. *Heteroponera* sp. JDM 92 is a much larger species than the previous two, and obviously belongs to a different lineage. This ant has been recorded only from Jarrah-Marri woodland in the Dwellingup district, some 80 km south of Perth.

SUBFAMILY PROCERATIINAE

This is yet another subfamily created by Bolton (2003) from the deconstruction of the Ponerinae, though the group has previously enjoyed tribal status. The combination of the entirely exposed antennal sockets close to the anterior margin of the head, the fused promesonotal suture and the presence of a single distinct waist segment serve to separate members of this subfamily from other ants in the SWBP. Only the tribe Proceratiini occurs in the SWBP, and this tribe possesses an additional apomorphy in regards to abdominal tergite IV, which is enlarged and strongly arched. Sternite IV, by comparison, is very reduced in size. From a male collected from the far north of the State (held at the

California Academy of Sciences) I have recently recognized the genus *Probolomyrmex*, which belongs to a second tribe, Probolomyrmecini. *Probolomyrmex*, however, is most unlikely to occur in the SWBP.

Discothyrea

1. Propodeal declivity abrupt, propodeum with transverse carinae (sometimes crenulate in dorsal view) separating dorsal and declivitous propodeal faces (Figure 533); antennal club elongate, about three times as long as wide .... ***D. crassicornis*** **Clark**

Propodeal declivity more gradual, propodeum without transverse carina separating dorsal and declivitous faces (Figure 534); antennal club ovate, about twice as long as wide..... ..... ***D. turtoni*** **Clark**

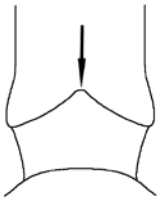

Figure 533

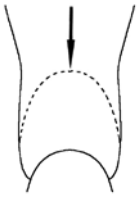

Figure 534

Discothyrea is the only proceratiine genus occurring in the SWBP. These peculiar little ants are thought to be specialist predators of arthropod eggs (Brown 1958). Since the ants are minute and have a cryptic lifeway, they are probably more common than records suggest, the two species occurring in the SWBP being known largely through a few stray workers collected in pitfall traps. Of the material housed in the Curtin Ant Collection, *Discothyrea crassicornis* Clark is known from one hand collected worker taken from under a log in the Darling Range, and a pitfall-trapped worker from Dwellingup. The other species, *Discothyrea turtoni* Clark, has been recorded from pitfall traps in Dwellingup, but was originally described from Victoria.

SUBFAMILY MYRMICINAE

The three subfamilies Dolichoderinae, Formicinae and Myrmicinae constitute by far the most abundant, diverse and important groups of ants. At the genus level, the Myrmicinae include almost 50% (actually, 48.9%) of the world's extant ant genera at the time of writing. The figure as a proportion of the existing ant genera is somewhat lower for the SWBP (i.e. 31.1%) but is still substantial. The impact of the Myrmicinae on the environment, however, depends on other qualities they possess rather than simply crude numbers and biodiversity. For instance, whereas very few ants in the other subfamilies that possess stings could be considered pests (apart from a handful of taxa capable of potentially serious envenomation), myrmicine ants with 'tramp ant' tendencies often become a matter for concern when transported into an area away from their natural range.

In Australia, major myrmicine pests include the coastal brown ant also known as the big-headed ant (*Pheidole megacephala* (Fabricius)), the Singapore ant (*Monomorium destructor* (Jerdon)) and the Pharaoh's ant (*Monomorium pharaonis* (Linnaeus)). All of these species can be found in the SWBP. In other parts of Australia, exotic fire ants (i.e. the tropical fire ant, *Solenopsis geminata* (Fabricius), and the recently introduced red imported fire ant, *Solenopsis invicta* (Buren)) are of major concern. The red imported fire ant (usually abbreviated as RIFA) is an horrific pest whose destructive capacities are of almost sci-fi proportions. On the other hand, many native myrmicine ants play a vital role in ecosystem maintenance, especially as seed dispersal agents, as disposers of carrion and as recyclers of nutrients in the soil.

Myrmicines are highly variable in appearance: while many have a smooth, rounded body form, the intricate sculpture of the exoskeleton in such genera as *Colobostruma* can be breath-takingly beautiful when viewed under the microscope. Despite the variation in morphology, however, all Australian myrmicine ants share the diagnostic characters for the subfamily; viz. possession of two waist segments, wholly or partially covered antennal bases and the fusion of the first and second thoracic segments. In his most recent key to the world ant fauna, Bolton (2003) adds features of the anterior postpetiole as a means of defining this subfamily on a global basis. In Myrmicinae the presclerites (helcium) of the postpetiole (i.e. the top plate or tergite and the bottom plate or sternite) meet together, but, with the exception of the afrotropical *Ankylomyrma*, they do not fuse. The diet of myrmicine ants is as varied as their morphology: while many are generalist predator-scavengers, the SWBP fauna also includes seed harvesters and specialist hunters of small arthropods like Collembola (springtails). Minute species of *Carebara* and *Solenopsis* are lestobiotic, feeding on the brood or eggs of other ants or termites. Overseas taxa include fungus growers. Myrmicinae also include many forms in which the worker caste is subdivided into major, minor and sometimes media workers. Various tasks within

the colony are divided between these subcastes. Interestingly, some genera with very small workers have disproportionately large queens.

Adlerzia

One species, Adlerzia froggatti *(Forel)*

The single species of *Adlerzia*, *A. froggatti* (Forel), has a wide distribution in southern Australia, but is absent from Tasmania (Shattuck 1999). The morphology of this genus and its worker subcaste structure link it closely to the more tropical *Machomyrma*, which in WA has been recorded in the Kimberley region. The workers of *Adlerzia* include large-headed majors as well as minor and media workers. The presence of large-headed majors suggests that the species may include seeds or similar hard plant material in its diet, but its biology has been scarcely studied. In the SWBP, *A. froggatti* is rarely encountered, but can be found at localities in the mid-north and south-west of the State, including parts of the Perth metropolitan area that retain tracts of native vegetation. The ant has also been recorded from Westonia in the western goldfields, and Rottnest Island.

Anisopheidole

One species, Anisopheidole antipodum *(F. Smith)*

Like *Adlerzia* and *Machomyrma*, *Anisopheidole* is a member of the tribe Solenopsidini (*Carebara* genus group). Workers of *Anisopheidole* somewhat resemble those of *Adlerzia* although the largest major workers exceed *Adlerzia* majors in size. Unlike *Adlerzia* and *Machomyrma*, *Anisopheidole* has a 12-segmented antenna.

In the SWBP these ants can be locally common in both laterite and sandy soils in the Perth region, where they are often found in association with termites. Nests are very frequently located under rocks. They also occur in the wheatbelt and along the south coast. Elsewhere in Australia, this endemic genus has been recorded from NSW, the NT, SA and Vic. *Anisopheidole antipodum* (Smith) is the only species in the genus.

Aphaenogaster

1. Eye relatively small, less than twice width of antennal scape at its widest point .... ***A. poultoni* Crawley**

   Eye larger, more than twice width of antennal scape at its widest point..... ..... ***Aphaenogaster* sp. JDM 854**

The gracile appearance of *Aphaenogaster*, along with its four-segmented antennal club, enable it to be set apart from all other myrmicine ants, although darker workers bear a resemblance to the rather large minors of *Pheidole hartmeyeri* Forel in the field. *Aphaenogaster* are sometimes called 'funnel ants', though this name can cause confusion between the inoffensive SWBP species and the notorious funnel ant *Aphaenogaster pythia* Forel of the eastern states, whose diggings cause degradation of pastures and recreational and service areas (such as unsealed airstrips). Local species of *Aphaenogaster* build highly distinctive nests, typically in sandy soils. In the lighter yellow soils of the wheatbelt and goldfields, these nests have a smooth, spherical entrance hole of approximately 1 cm diameter. A few workers can usually be seen loitering cautiously inside the entrance of the nest. The food of the species found in the SWBP is unclear, although eastern states taxa tend aphids (Saunders 1967). Andersen (1991a, 2000) and Shattuck (1999) have suggested that the nests act as pitfall traps for prey, but there is as yet little evidence for this theory (though Shattuck mentions the presence of arthropod fragments in upper portions of the nest).

Dr. Steve Shattuck (ANIC) is revising the Australian members of this genus. Two species, *Aphaenogaster barbigula* Wheeler and *Aphaenogaster poultoni* Crawley, have been recorded from the SWBP, but the former is likely to be only a synonym of the latter. Judging from local material, *A. poultoni* appears to be mainly confined to the wetter, western parts of the SWBP (one record from Westonia), but also occurs in the mid-west and the south-east of the Province (ANIC holdings). A large-eyed form, which will be described by Dr. Shattuck, has been collected in the eastern wheatbelt and the western goldfields in the SWBP, and also in the Pilbara.

Cardiocondyla

At least one species, *Cardiocondyla 'nuda'* (Mayr), recorded by Seifert (2003). The question of whether just the one species occurs in the SWBP has yet to be resolved. If different species are involved, workers from the two taxa may be distinguished by the appearance of the petiolar node in dorsal view (rounded in *C. 'nuda'*; elongate in indubitable *C. nuda*) and by the duller, evenly microreticulate appearance of the cuticle of the mesosoma and petiole in *C. nuda*.

Cardiocondyla resembles members of the Solenopsidini in that some species have a long, central seta on the anteromedial margin of the clypeus. Among the taxa found in the SWBP, these ants are most likely to be confused with *Monomorium* species. However, the clypeus is not bicarinate, the maxillary palp is five-segmented and the postpetiole, seen from above, is more massive than the petiolar node. In contrast, in local *Monomorium* the clypeal carinae are usually distinct,

the maxillary palp is one- or two-segmented, and the postpetiole is more massive than the petiolar node in only two species (not found in the SWBP).

Seifert (2003) has revised the worldwide species-groups of *Cardiocondyla* that include at least one tramp species. Unfortunately, the key to individual groups and species is formidable, requiring careful attention to morphometric measurements and use of a higher power stereomicroscope than is often available in laboratories. On the other hand, Seifert mentions in his coverage of groups just three species with an Australian distribution. Of these, only *Cardiocondyla nuda* (Mayr) was recorded from the SWBP (from Goyamin Pool, near Chittering) in his 2003 paper. One form is commonly seen, often in disturbed habitats, in the SWBP, and this comprises the majority of specimens held in the Curtin Ant Collection. Specimens can be keyed to the *C. nuda* species-group, but do not comfortably fit *C. nuda* in terms of the appearance of the node when seen in dorsal aspect (elongate in *C. nuda*; rounded in the above morphospecies) and the shinier appearance of the nodes and mesosoma. In appearance, these local workers strongly resemble *Cardiocondyla mauritanica* Forel, which has not been recorded from the Australasian region. A small number of workers from suburban Perth, in contrast, have the evenly microreticulate mesosoma and nodes associated with *C. nuda*, although their coloration is the same as workers of the preceding form. According to Seifert's current research (S. Shattuck, pers. comm.), *Cardiocondyla atalanta* Forel is the species found in southern Australia (including the SWBP), *C. nuda* being confined to the north and eastern coasts of Australia. This being said, the duller form does seem to match *C. nuda*. Since aspects of neither local morphospecies matches all the data provided by Seifert under *C. atalanta* in his published paper, the name '*nuda*' is here left in apostrophes, until the status of the local species can be more carefully considered.

In south-western Australia, *Cardiocondyla 'nuda'* is ubiquitous in most habitats, where in all likelihood it acts as a small generalist scavenger, but is particularly prevalent in towns and cities. This species avoids aggressive confrontation with other ants, and probably has a benign role in ecosystems where it occurs. The males of the local species, as in other *Cardiocondyla*, are very unusual in that they are wingless and resemble workers, except for the presence of ocelli (Seifert 2003; Heinze *et al*. 1993; pers. obs.).

Carebara

One species, Carebara sp. *JDM 440.*

Australian species of *Carebara* (formerly placed in *Oligomyrmex*) have a dimorphic worker caste. The major workers often possess a pair of minute denticles on the vertex of the head capsule. Even where these are absent, the major workers can be distinguished from small majors of *Pheidole* (the most similar genus) by the nine to 11-segmented antenna with a two-segmented club (the antenna is 12-segmented in *Pheidole* with a three-segmented club). Minor workers are among the world's smallest ants. I have measured the total length of a minor worker of the local species as just 0.75 mm. However, minor workers of the tropical *Carebara atomus* (Emery) are about one third smaller again! Paired setae on the clypeus will separate minor workers from *Solenopsis*, the genus with which they are likely to be confused. Based on overseas observations (e.g. Wilson 1962), it is reasonable to suppose Australian *Carebara* species feed on a range of small prey as well as arthropod eggs.

One undescribed species of *Carebara*, apparently in the *corniger* group (Taylor 1991), is known from the SWBP. Minor workers only of *Carebara* sp. JDM 440 have been collected from a handful of sites in the Darling Range, just east of Perth. Specimens collected near Gleneagle were found foraging under a boulder on a granite outcrop.

Colobostruma

(Adapted from the key in Shattuck 2000)

1. In lateral view, mesosoma strongly arched, propodeum low in relation to petiole and postpetiole (Figure 535) ..... ***C. nancyae* Brown**

   In lateral view, mesosoma at most weakly convex **2**

2. Lamellae absent from lateral face of postpetiole, expanded posteriad only (pale, depigmented species) (Figure 536) ..... ***C. cerornata* Brown**

   Lamellae present on both lateral and posterior faces of postpetiole, expanded to form wing-like flanges (Figure 537) **3**

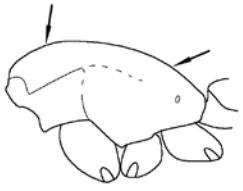

Figure 535

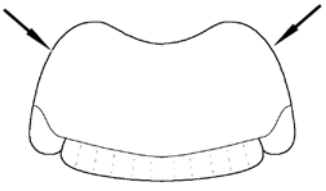

Figure 536

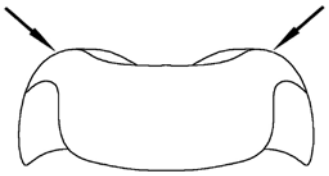

Figure 537

3. Wing-like flange of postpetiole with translucent windows along both anterior and posterior margins, its anterior margin formed by band of thickened integument (Figure 538)..... .....***C. mellea*** **Shattuck**

   Wing-like flange of postpetiole with a translucent window on its posterior margin only, its anterior margin formed by band of thickened integument (Figure 539)..... **4**

4. Antennae 4 or 5-segmented..... ..... ***C. elliotti*** **(Clark)**

   Antennae with 6 or more segments..... **5**

5. Antennae gently elbowed, lacking ventral lobe, antennal diameter changing gradually along its length..... ***C. australis*** **Brown**

   Antennae strongly elbowed, with ventral lobe, greatest diameter of antenna being across lobe..... **6**

6. In full-face view, ridges immediately in front of eyes nearly parallel or diverging posteriad (Figure 540) ..... ***C. papulata*** **Brown**

   In full-face view, ridges immediately in front of eyes converging posteriad (Figure 541) ....***C. froggatti*** **(Forel)**

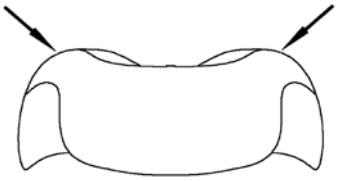

Figure 538

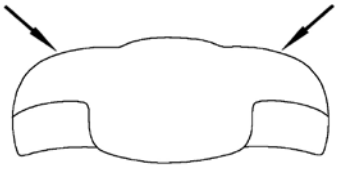

Figure 539

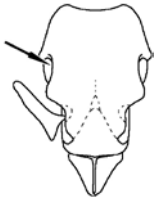

Figure 540

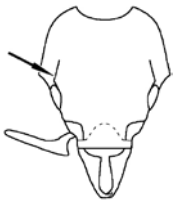

Figure 541

Colobostruma is one of the Dacetini, and the various species have attractively sculpted wing-like flanges and sometimes spines. Workers can be most easily confused with *Mesostruma*, but the latter lacks flanges on the post-petiole (always present in *Colobostruma*). *Colobostruma* and its close relatives, *Epopostruma* and *Mesostruma*, have been the subjects of a recent revision by Shattuck (2000). *Colobostruma* species are foragers in litter or vegetation. Although most species have a broad distribution within Australia, the genus is very rare in Western Australia, and colonies or even individual workers are seldom seen. Seven species are present in the SWBP, but the Curtin Ant Collection has representatives of only four of these. No specimens of *Colobostruma australis* Brown, *Colobostruma froggatti* (Forel) and *Colobostruma papulata* Brown are held in the Collection.

Of the four WA species originally described by Brown (1959), *C. papulata* has a south-eastern distribution, and was described from material collected in the Esperance region. *Colobostruma nancyae* Brown occurs in the same area, but has a much wider distribution in the SWBP and has been found as far north as the Moore River (Shattuck 2000). *Colobostruma cerornata* Brown was also described from specimens collected in Esperance but has a distribution that includes the eastern wheatbelt and Kwongan sand-plains around Eneabba, north of Perth, while *C. australis* has a broad distribution in eastern Australia, but is only known in the SWBP from the Thomas River, east of Esperance. *Colobostruma elliotti* (Clark) and *C. froggatti* are two other species found throughout much of temperate Australia. *Colobostruma mellea* Shattuck can be found in the northern wheatbelt and south-west corner of WA, and also in SA.

Crematogaster

1. Propodeum flattened and all sectors on the same plane (except for a narrow anterior strip behind metanotal groove in some specimens); anterior lateral carinae often present, extending from metanotal groove to propodeal angles (subgenus *Orthocrema*) (Figure 542) **2**

   Anterior sector of propodeum not flattened, often convex, not on same plane as posterior sector; anterior lateral carinae always absent (Figure 543) **7**

Figure 542

Figure 543

2. Head, mesosoma and nodes finely and uniformly microreticulate (Figure 544); stout, erect setae absent from dorsum of head, mesosoma (rarely present on humeral angles) and often nodes and gaster ....***Crematogaster*** **sp. JDM 859**

   Sculpture not as above; stout, erect setae always present on dorsum of head, mesosoma and gaster..... **3**

3. Viewed in profile, at least three lines of paired setae on promesonotum (Figure 545), or setae numerous, not always in line..... **4**

   Viewed in profile, two lines of setae on promesonotum (Figure 546)..... **6**

Figure 544

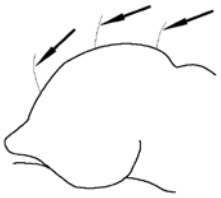

Figure 545

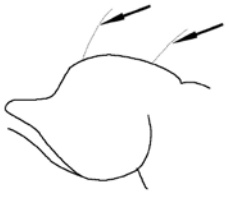

Figure 546

4. Postpetiole without longitudinal sulcus separating node into two lobes (Figure 547); promesonotal sculpture weak to vestigial, promesonotum often smooth and shining..... .....***C. dispar*** **Forel (pt.)**

   Postpetiole with longitudinal sulcus (may be weak and shallow) separating node into two lobes (e.g. Figure 548); promesonotum moderately to strongly sculptured..... **5**

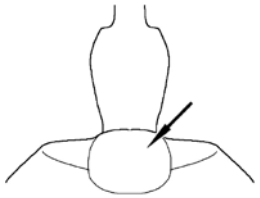

Figure 547

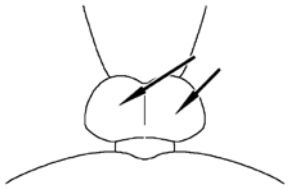

Figure 548

5. Sculpture of promesonotum medially with large reticulations, with microreticulation in between (Figure 549); viewed dorsally, lobes of postpetiole poorly developed, shining and close together; spines short, ≈ 1 x width of femora..... .....***C. queenslandica*** **group sp. JDM 1099**

   Sculpture of promesonotum medially with longitudinal striolae, with microreticulation in between (Figure 550); viewed dorsally, lobes of postpetiole relatively well-developed, matt and widely separated, with microreticulate sculpture in between them; propodeal spines very long in some northern populations, length ≈ 2 x width of femora..... .....***C. queenslandica gilberti*** **Forel**

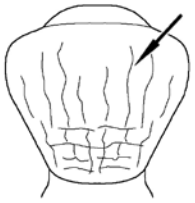

Figure 549

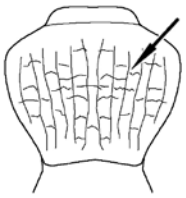

Figure 550

6. Viewed dorsally, postpetiole not wider than petiole and without two distinct lobes (Figure 551); promesonotum shining, often with reduced sculpture or unsculptured; head and gaster light brown, mesosoma yellowish..... .....***C. dispar*** **Forel (pt.)**

   Viewed dorsally, postpetiole wider than petiole, with two distinct lobes (Figure 552); promesonotum finely striate or microreticulate; mostly concolorous brown..... .....***C. queenslandica*** **group sp. JDM 428**

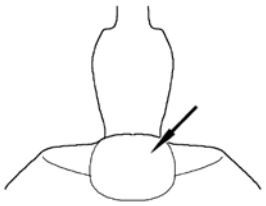

Figure 551

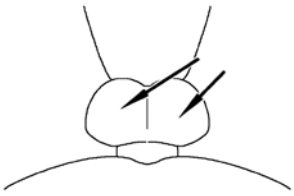

Figure 552

7. Stout, erect setae absent from dorsum of head, mesosoma and gaster..... .....***C. cornigera*** **group sp. JDM 126**

   Stout, erect setae present on dorsum of head, mesosoma and gaster..... **8**

8. Dorsum of mesosoma matt, strongly rugose-striate .... ***C. frivola*** **Forel/*C. perthensis* Crawley**

   Dorsum of mesosoma shining, often almost unsculptured..... **9**

10. Lateral projections of petiolar node rounded (Figure 553) .....***C. laeviceps chasei*** **Forel**

    Lateral projections of petiolar node rather angular (Figure 554) ....***C. laeviceps*** **group sp. JDM 858**

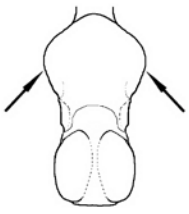

Figure 553

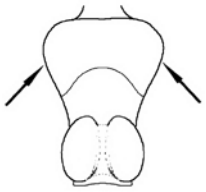

Figure 554

Once seen, this genus is not easily forgotten. *Crematogaster* workers have a heart-shaped gaster, the upper surface of which is attached to the postpetiole. The petiole lacks a node and the postpetiole usually possesses one or two small dorsal lobes. Workers forage on vegetation or on the ground, and are believed to be generalist predators, but also tend Hemiptera and some lepidopteran caterpillars (Sampson 1989; Shattuck 1999; Fiedler 2001). Overseas, members of the genus are called 'acrobat ants', presumably because their tilted gasters suggest a tumbler about to perform a somersault.

The current tally of *Crematogaster* species in the SWBP is nine, though this figure may rise with revision of the genus. The author can find no difference between *Crematogaster frivola* Forel and *Crematogaster perthensis* Crawley, and in his opinion they should be considered conspecific. ***Crematogaster frivola*** Forel is here considered the senior synonym of *Crematogaster perthensis* Crawley syn. nov. *Crematogaster frivola* is found throughout the SWBP, and is often seen trailing on the ground as well as on vegetation. *Crematogaster frivola sculpticeps* Forel, possibly also a candidate for synonymy, was described from Kalgoorlie, east of the SWBP.

The *C. queenslandica* group contains several species in the SWBP. *Crematogaster dispar* Forel is a small, yellowish-and-brown species in which the promesonotum is often smooth and shining. Colonies are often found in cryptic situations such as inside rotting logs or within moss. A larger, usually concolorous brown species (*C. queenslandica* group. sp. JDM 428), often occurs in sympatry with *C. dispar*. Apart from its generally larger size and duller, more striate promesonotum, *C. queenslandica* group. sp. JDM 428 differs from *C. dispar* in that its postpetiole is distinctly bilobate, whereas the postpetiole of the latter lacks a central furrow. *Crematogaster queenslandica* group sp. JDM 1099 differs from *C. queenslandica* group. sp. JDM 428 in possessing three instead of two lines of erect setae on the lateral margins of the promesonotum, and from *C. dispar* in the bilobate nature of its postpetiole. The promesonotum of this arid zone ant is strongly reticulate. *Crematogaster queenslandica gilberti* Forel, which also has at least three lines of erect propodeal setae, has thus far been found in

the GS and MAL districts in the SWBP, but was originally described from specimens collected in Mackay, QLD. Populations from the northern fringe of the SWBP have very long propodeal spines, but all specimens seen thus far lack the large reticulations of *Crematogaster queenslandica* group sp. JDM 1099. Workers of *Crematogaster* sp. JDM 859 can be distinguished from other members of the *C. queenslandica* group living in the SWBP by the usual absence of erect setae on head and mesosoma. The head and mesosoma are densely microreticulate. This is an ant of drier woodlands, north and east of the Jarrah-Marri belt.

The *C. cornigera* group is represented in the SWBP by *Crematogaster cornigera* group sp. JDM 126. This is a rather smooth-bodied ant, in which the propodeal spines are much reduced or represented by dull protuberances. The distribution of *Crematogaster cornigera* group sp. JDM 126 extends at least as far as the Kimberley region. In the south, workers of this species can often be seen trailing on the trunks of smooth-barked eucalypts.

Crematogaster laeviceps chasei Forel is the most common of the *Crematogaster* species in the SWBP, and is ubiquitous in nearly all environments. The ant is an arboreal nester. An eastern states relative is associated with the endangered Illidge's blue butterfly, whose larvae feed on the ants (Beale 1998). *Crematogaster laeviceps* group. sp. JDM 858 has been recorded from Mt Gibson, on the NE fringe of the SWBP. Worker specimens have also been collected on eucalypts near Paynes Find just north of the SWBP. The distinctly angular projections of the petiole separate this species from *C. laeviceps chasei*.

Epopostruma

Key adapted from Shattuck 2000.

1. Anterior as well as posterior angles of postpetiole expanded laterally in the form of spines or "wings" (Figure 555) **2**

   Anterior postpetiole either rounding smoothly on to sides or anterior angles in form of denticles only, never spinous or winglike (however, posterior extensions may form spines or angles, e.g. Figure 556) **3**

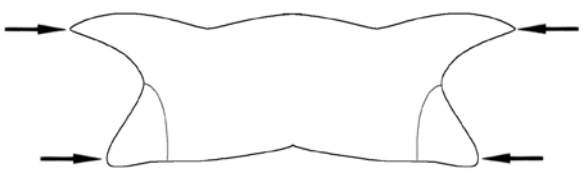

Figure 555

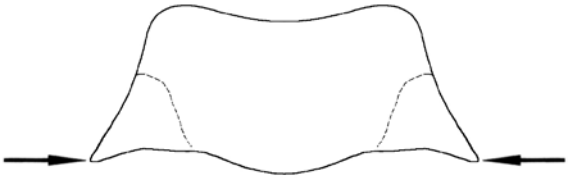

Figure 556

2. Area immediately above eye with a small tooth (Figure 557) ..... ***E. frosti* (Brown)**

   Area immediately above eye with a rounded angle (Figure 558) ..... ***E. lattini* Shattuck**

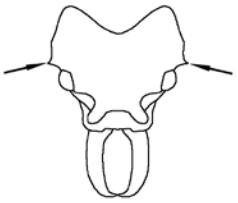

Figure 557

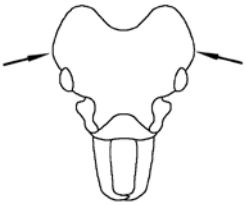

Figure 558

3. In dorsal view posterior angles of postpetiole forming distinct wings (e.g. Figure 559) **4**

   In dorsal view postpetiole either rounded posteriad or posterior angles weakly denticulate; not expanded as wings (e.g. Figure 560) **5**

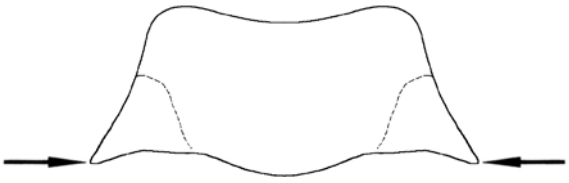

Figure 559

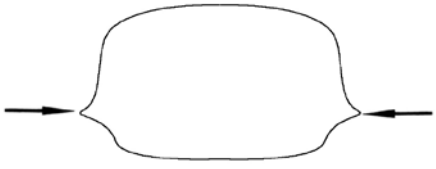

Figure 560

4. Bases of the propodeal spines and lobes not connected by flanges of any sort, petiolar spines well developed, distinct..... ***E. mercurii* Shattuck**

Posterior face of propodeum with broad, distinct flanges, which connect the bases of the spines to the propodeal lobes, petiolar spines well developed or indistinct, reduced to sharp angles ..... ***E. sowestensis*** **Shattuck**

5. Propodeal angles connected to propodeal lobes by flanges, developed propodeal spines lacking (Figure 561) ..... ***E. inomata*** **Shattuck**

Propodeal angles not connected to propodeal lobes by flanges, distinct propodeal spines present (Figure 562) **6**

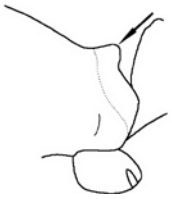

Figure 561

Figure 562

6. Posterolateral margin of petiole rounded, without protuberance (Figure 563) ..... ***E. quadrispinosa*** **(Forel)**

Posterolateral margin of postpetiole with a sharp angle or dentiform lateral protuberance (Figure 564) **7**

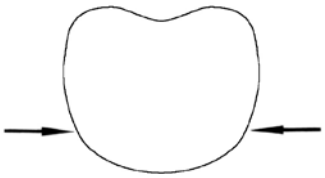

Figure 563

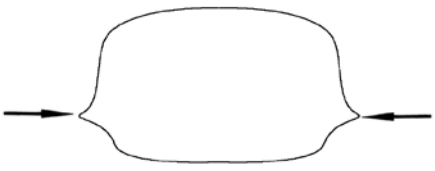

Figure 564

7. Postpetiole with distinct angle between anterior and dorsal faces (Figure 565); gaster with slight traces of superficial microreticulation, otherwise smooth and shining ..... ***E. natalae*** **Shattuck**

Postpetiole generally rounded without differentiation between anterior and dorsal faces (Figure 566); gaster evenly microreticulate, matt and dull ..... ***E. kangarooensis*** **Shattuck**

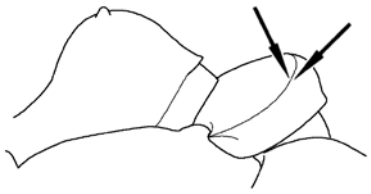

Figure 565

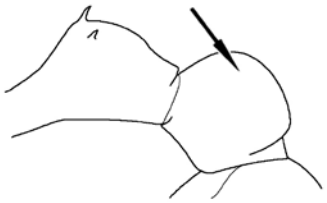

Figure 566

Like *Colobostruma*, *Epopostruma* is a member of the Dacetini, and in appearance closely resembles *Mesostruma*. However, the thin mandibles are well separated for most of their length, and meet only at the tips. The mandibles are in the form of a trap-jaw, by which means the ant can capture soft arthropod prey like Collembola (Shattuck 2000).

The SWBP has a rich *Epopostruma* fauna with seven described and one undescribed species. Tree-trunks are clearly an important substrate for foraging workers. These ants are not uncommon on eucalypts in the Darling Range, where several taxa have been collected in bark traps designed to sample invertebrate fauna (Heterick *et al*. 2001). *Epopostruma frosti* (Brown) is one of the species collected by this means at Dryandra and on the Brookton Hwy, SE of Perth, but occurs as far afield as the Southern gulfs in South Australia. This is perhaps the most distinctive of the local species, workers having a very broad head with a small projection or tooth above the eye. *Epopostruma natalae* Shattuck has a wide distribution across temperate Australia, and has recently been collected in Goomalling townsite. *Epopostruma sowestensis* Shattuck was described from material collected at Kojonup, in the southern wheatbelt. Specimens held in the Curtin ant Collection differ from the typical form in that the propodeal spines are well developed. In WA, *Epopostruma quadrispinosa* (Forel) has been collected from near North Bannister in the JF district, near Shark Bay, at Madura (near the edge of the Nullarbor), and Kambalda (in the goldfields). Elsewhere, it occurs along the east coast of Australia. *Epopostruma lattini* Shattuck and *Epopostruma mercurii* Shattuck, described from

material collected at Goomalling, in the western wheatbelt, and Eneabba, respectively, are not represented in the Curtin Ant Collection, and may be very rare.

Epopostruma kangarooensis Shattuck is represented by a single specimen from relictual woodland on Curtin University campus, and another specimen collected many years ago in Dwellingup. These represent new range extensions for this species. *Epopostruma mornata* Shattuck is only known from Karragullen near Perth.

Mayriella

One specimen from the south coast, *Mayriella occidua* Shattuck

The Australian distribution of these small ants, whose mesosoma and nodes resemble those of a *Carebara* minor worker, was thought to be restricted to the east and south-east coasts of Australia, with one record from Tasmania (Shattuck 1999). In a recent survey of the Nuyts wilderness area in the Walpole-Nornalup NP, however, DEC workers recovered a single worker of this genus. The specimen is held by DEC. The elongate eye (which is not dissimilar to some *Monomorium* species), deep antennal scrobes and ten-segmented antennal club distinguish this genus from all other myrmicine genera found in the SWBP. Dr. Shattuck (ANIC) has recently reviewed the genus.

Meranoplus

(Note: *Meranoplus dichrous* Forel was described from a queen (holotype, probably destroyed in World War I), and is not included in this key.)

1. Translucent fenestrae or flanges on sides of promesonotal shield lacking or vestigial; flanges on posterior margin of shield lacking or reduced to a short strip (species with shining black or dark-brown mesosomas) (e.g. Figure 567)..... **2**

   Translucent fenestrae or flanges generally present on sides of promesonotal shield; fenestrae and/or flanges always present on posterior margin of promesonotal shield (e.g. Figure 568)..... **3**

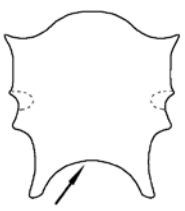

Figure 567

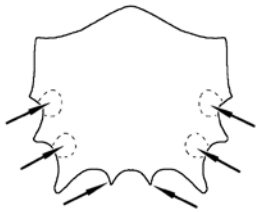

Figure 568

2. Promesonotal shield without spines or a flange on posterior margin (Figure 567)..... .....***M. dimidiatus*** **F. Smith**

   Promesonotal shield with a small flange on the posterior margin (Figure 569) .... ***M. dimidiatus*** **complex sp. JDM 423**

3. Large species (HW ≥ 1.5 mm); in dorsal view, head massive, extending well beyond humeral angles (Figure 570)..... ***M. diversus*** **F. Smith**

   Smaller spp. (HW ≤ 1.2 mm); in dorsal view, head less massive, not extending beyond humeral angles (e.g., Figure 571)..... **4**

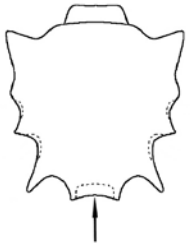

Figure 569

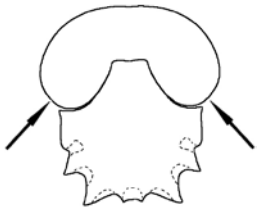

Figure 570

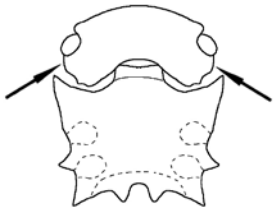

Figure 571

4. Promesonotal shield broadly expanded, fenestrae extensive, occupying about one third of surface area of shield (Figure 572); first gastral tergite strongly sculptured over most of its surface, and with its anterior margins expanded as flanges **5**

   Promesonotal shield not so broadly expanded, fenestrae occupy much less than one third

of surface area of shield (e.g. Figure 573); sculpture of first gastral tergite (if present) usually confined to basal portion of tergite; anterior margins of first gastral tergite usually not expanded **6**

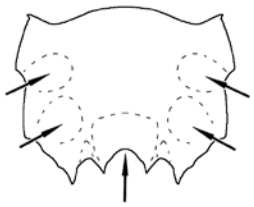

Figure 572

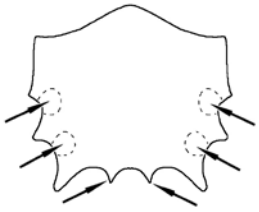

Figure 573

5. Viewed dorsally, postpetiole areolate; dorsum of first gastral tergite reticulate (more pronounced anteriad), with sculpture extending to expanded flanges of the tergite (Figure 574)..... ***Meranoplus* sp. JDM 922**

   Viewed dorsally, sculpture of postpetiole consisting of undulating striae; dorsum of first gastral tergite longitudinally striate, the expanded flanges on its anterior margin virtually without sculpture (Figure 575)..... ..... ***Meranoplus* sp. JDM 1101**

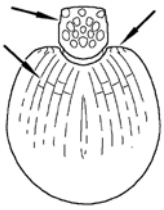

Figure 574

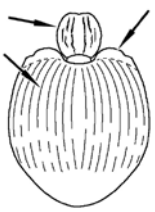

Figure 575

6. In full-face view, clypeus strongly incurved, weakly tapered anteriad, emarginate in appearance and extended only slightly beyond the apices of the antennal lobes; antennal lobes broad, often hiding most of the eye (*M. fenestratus* group) (Figure 576) **7**

   In full-face view, clypeus weakly incurved, moderately to strongly tapered anteriad with a straight anteromedial margin and extended well beyond the apices of the antennal lobes; antennal lobes more narrow, so eye can often be clearly seen (Figure 577)**12**

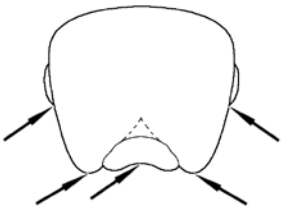

Figure 576

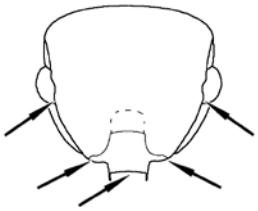

Figure 577

7. Dorsum of promesonotal shield smooth, with sculpture limited to very fine microreticulation and a few minute, circular striolae **8**

   Dorsum of promesonotal shield rough in appearance, always with conspicuous sculpture **9**

8. Humeral projections of promesonotal shield only slightly shorter than posterior angles; latter not incurved (larger ants; HW ≈ 1 mm) (Figure 578) ..... ***M. fenestratus* F. Smith**

   Humeral projections of promesonotal shield much shorter than posterior angles; latter long and incurved (smaller ants; HW < 1 mm) (Figure 579) ..... ***Meranoplus* sp. JDM 866**

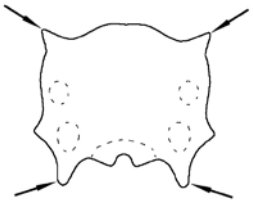

Figure 578

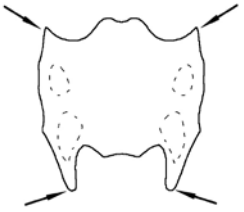

Figure 579

9. Posterior margin of postpetiole delimited by a strong carina and with a distinct, sharp overhang (Figure 580); sculpture on dorsum of promesonotal shield almost exclusively consisting of fine microreticulation and a lattice-work of weak striae.....
.....***M. oceanicus* F. Smith**

Posterior margin of postpetiole not delimited by a carina and with a weakly defined overhang or its posterior face more-or-less straight (Figure 581); dorsum of promesonotal shield with at least some areolate or reticulate sculpture **10**

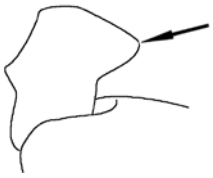

Figure 580

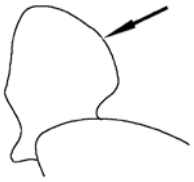

Figure 581

10. In dorsal view, posterior angles of promesonotal shield directed mesad (Figure 582a); in profile, apex of petiolar node wedge-shaped, tapering to a blunt edge (Figure 582b) .....
.....***M. ferrugineus* complex sp. JDM 424**

In dorsal view, posterior angles of promesonotal shield directed laterad (Figure 583a); in profile, apex of petiolar node not tapering to a blunt edge, that structure is subcuboidal or nearly so (Figure 583b) **11**

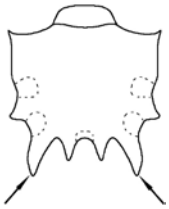

Figure 582a

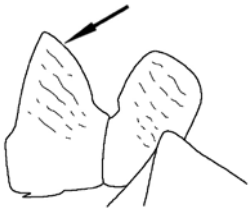

Figure 582b

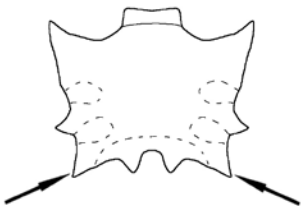

Figure 583a

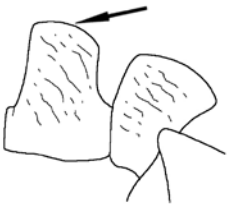

Figure 583b

11. In dorsal view, membrane of promesonotal shelf vestigial or restricted to narrow lamina around protruding processes (Figure 584); fenestrae relatively small; microreticulation between striae on promesonotal shield mostly absent, giving surface a shining appearance...
.....***M. ferrugineus* Crawley**

In dorsal view, membrane of promesonotal shield broader, particularly prominent between posterior processes (Figure 585); fenestrae relatively large; microreticulation between striae on promesonotal shield well-defined, giving surface a matt appearance.....
.....***M. ferrugineus* complex sp. JDM 267**

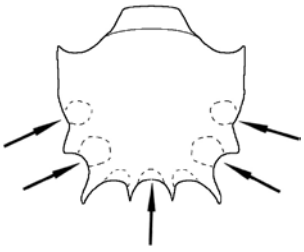

Figure 584

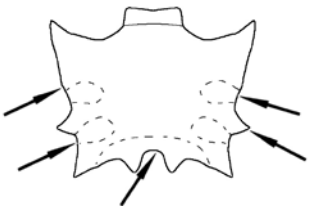

Figure 585

12. Petiole and post-petiole very thin, smooth and shining in appearance.....
.....***Meranoplus* sp. JDM 491**

Post-petiole, at least, broad, sculptured and matt in appearance **13**

13. Head and body clothed in very long, curved

setae, length of longest setae only slightly less than half width of promesonotal shield .... ***M. rugosus* group sp. JDM 677**

Head and body clothed in much shorter setae, length of longest setae < quarter of width of promesonotal shield **14**

14. Posterior face of petiolar node with sculpture almost effaced, shining; appressed setae on gaster very short, with or without a few longer, dark, suberect setae; postpetiole distinctly concave posteriorly, in dorsal view more-or-less triangular with a blunt apex facing posteriad **15**

Posterior face of petiolar node with well-defined sculpture, often matt; gaster normally with longer, abundant and often flexuous, decumbent, pale setae, but one species with many short, stout, dark, erect setae; postpetiole not triangular in dorsal view **16**

15. Viewed dorsally, posterior angles of promesonotal shelf connected by a more-or-less unbroken flange (Figure 586); postpetiole in form of flattened, inverted triangle .... ***Meranoplus* sp. JDM 627**

Viewed dorsally, posterior margin of promesonotal shelf denticulate (Figure 587) appearance of postpetiole less obviously triangular ..... ***Meranoplus* sp. JDM 1071**

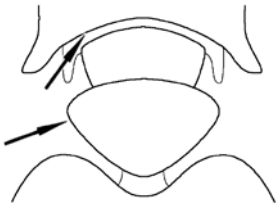

Figure 586

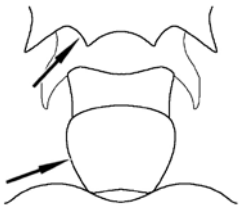

Figure 587

16. Large species (HW ≈ 1.2 mm); anterior angles of gaster markedly flattened (Figure 588); basal portion of gaster with many, fine, parallel striae that extend across anterior angles of gaster ..... ***M. similis* Viehmeyer**

Smaller spp. (HW ≤ 1 mm); anterior angles of gaster not markedly flattened (Figure 589); basal portion of gaster usually without fine, parallel striae (except *M. rugosus* – see below). **17**

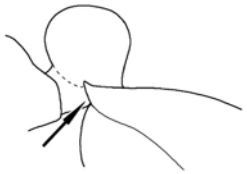

Figure 588

Figure 589

17. Seen in profile, eye large, eye length ≈ 1/3rd length of head capsule **18**

Seen in profile, eye moderate, eye length ≤ 1/4 length of head capsule **19**

18. Seen in profile, eye distinctly emarginate posteriad, reniform (Figure 590); colour variable, most commonly uniformly brown, or brown with a yellow gaster .... ***Meranoplus* sp. JDM 673**

Seen in profile, eye more-or-less elliptical or subcircular (Figure 591); colour uniform light orange ..... ***Meranoplus* sp. JDM 1107**

Figure 590

Figure 591

19. Posterior angles of promesonotal shield, long, digitate, extending well beyond peripheral membrane and directed posteriad (Figure 592) ..... ***Meranoplus* sp. JDM 967**

Posterior angles of promesonotal shield often obscure, frequently not extending beyond peripheral membrane, where present directed laterad (Figure 593) **20**

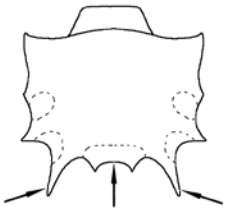

Figure 592

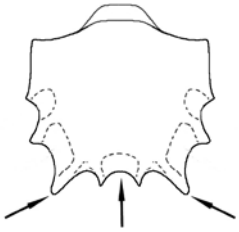

Figure 593

20. Basal portion of gaster, at least, with numerous distinct longitudinal striae; other sculpture (e.g. pitting) may be present, especially in samples from near the south coast..... .....***M. rugosus* Crawley**

Basal portion of gaster with, at most, a few vestigial striolae **21**

22. In full-face view, clypeus moderately tapered (Figure 594); mostly larger ants (HW ≈ 0.7 mm)..... ***M. puryi* complex sp. JDM 968**[4]

In full-face view, clypeus strongly tapered (Figure 595); mostly smaller ants (HW ≤ 0.7 mm, usually ≈ 0.5mm)..... .....***Meranoplus* sp. JDM 74**

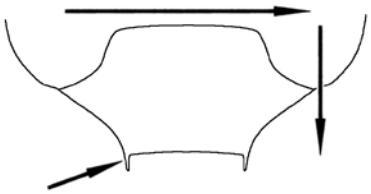

Figure 594

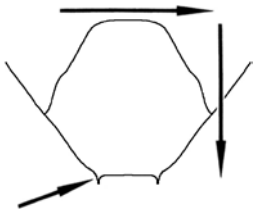

Figure 595

Prior to his recent untimely death, Dr S. Schödl (Museum of Natural History, Vienna) was revising this genus. Unfortunately, of those species found in the SWBP, only those taxa that have been previously described have been identified in the Curtin Ant Collection. *Meranoplus* workers and queens cannot be mistaken for anything else, their promesonotal shield and nine-segmented antennae pulling them apart from all other ants in any taxonomic key. The conspicuous promesonotal shield has caused Andersen to name the members of the genus 'shield ants' (Andersen 2002). Many habitats support several, if not many species of *Meranoplus*, which can be seen foraging in the cooler hours of the day for seeds or invertebrate carcases. Some species are nocturnal. The genus includes specialist seed harvesters in the *M. diversus* group, but there is probably only one member of this mainly northern group in the SWBP.

With at least 22 species in or near the SWBP, *Meranoplus* is one of the more significant genera of the region. The genus, in fact, accounts for a very high proportion of the novelties still trickling into the Curtin Collection. Many of these species are common. Within the group there are possibly five separate radiations that can be identified in the SWBP. Several other distinctive species have affinities that are at present uncertain.

The *M. rugosus* group can be identified by the large translucent windows or fenestrae on the promesonotal shield, and these ants often have a characteristic postpetiole that is very thick and has a smoothly vertical anterior face. *Meranoplus rugosus* Crawley, which is found in the south-western corner of the State, is the best known of the species in this group, and is probably the most abundant *Meranoplus* in the Perth area, being quite at home on suburban lawns. This small, orange species can be recognized immediately because of its anteriorly striate gaster and its rather square postpetiole with a steep anterior face. *Meranoplus* sp. JDM 922 (mid north) and *Meranoplus* sp. JDM 1101 (far north of the SWBP) have a very similar postpetiole to *M. rugosus*, and may be related to that species. However, the fenestrae occupy about one third of the area of the promesonotal shield, and the first gastral tergite is strongly striate-reticulate over much of its surface in *Meranoplus* sp. JDM 922 and both promesonotal shield and gaster are longitudinally striate in *Meranoplus* sp. JDM 1101. *Meranoplus rugosus* group sp. JDM 677, another species with much the same habitus as the two taxa mentioned above, is characterized by its very long, curved setae, and is known in the SWBP from Burakin. Elsewhere in WA it occurs at Ethel Creek, in the Pilbara. *Meranoplus similis* Viehmeyer shares gastral sculpture with both *M. rugosus* and *Meranoplus* sp. JDM 922. The anterior gastral angles are also flattened in this attractive orange ant, which can be found on the western coastal plain between at least Jurien Bay and Bunbury. This species also occurs in the Lake Eyre Basin in SA, from where it was described.

[4] *Meranoplus puryi* complex sp. JDM 968 and *Meranoplus* sp. JDM 74 may represent more than two species: see Discussion.

The *M. diversus* group was revised by Schödl (2007) prior to his death. The only SWBP member of the *M. diversus* group represented in the Curtin Ant Collection is *Meranoplus diversus* F. Smith. The one worker was collected at Durokoppin Nature Reserve in the north-eastern wheatbelt (on loan from the WA Museum). *Meranoplus mcarthuri* Schödl is known in the SWBP from one specimen collected at 'Morawa', on or just outside the north-eastern fringes of the Province (Schödl 2007). However, the main range of this ant lies well outside of the Province. Though not included in the species key, this taxon may be distinguished from M. *diversus*, which is concolorous orange-brown, by its distinctly bicoloured appearance, and the rugulose-reticulate posterior face of the petiolar node (posterior face of the node with strong, parallel striae in the former species). Meranoplus *dichrous* Forel, described from a queen, may also belong to the *M. diversus* group. However, the holotype was destroyed during World War II, and is not available for analysis.

The *Meranoplus fenestratus* radiation includes a number of ants that share a broadly incurved clypeus. The anterior margin of the clypeus in this group only extends a little way beyond the antennal lobes. The worker of *Meranoplus fenestratus* F. Smith has an almost smooth promesonotal shield. *Meranoplus oceanicus* F. Smith is closely related, but the dorsum of the promesonotal shield reveals distinct though slight reticulation. The two species are widespread in the SWBP, *M. oceanicus* also occurring in other states in southern Australia. (The type specimen for the latter taxon was described from Moreton Bay, Queensland.) *Meranoplus* sp. JDM 866 shares with *M. fenestratus* the smooth promesonotal shield, but the posterior angles of the shield are extended and distinctly acute. Possibly closely related to *Meranoplus fenestratus* is *Meranoplus ferrugineus* Crawley, along with several undescribed members of a complex that includes *M. ferrugineus*. *Meranoplus ferrugineus* and *Meranoplus ferrugineus* complex sp. JDM 267 are mainly separated on the appearance of the promesonotal shield (shiny in the former, with reduced flanges around the periphery of the shield compared to matt with more extensive fenestrae and peripheral flanging in the latter). Both ants occupy similar habitats in the Perth region and the south-west. Another member of the *ferrugineus* complex, *Meranoplus ferrugineus* sp. JDM 424, is very similar to its close allies, but has the posterior spines of the promesonotal shield directed posteriad rather than laterad. This ant prefers habitats in the mid-north and north-east of the Province, and does not seem to overlap with the other local members of the complex.

Workers from Ethel Creek, in the Pilbara, and Yalgoo that lack promesonotal fenestrae and flanges and have only rudimentary lateral spines have been tentatively assigned to *Meranoplus dimidiatus* F. Smith (though note Andersen 2000, who states that true *M. dimidiatus* is more-or-less confined to Australia's top end). The probable holotype of this species is in the British Museum of Natural History, but, based on Smith's description, in this species the posterior angles of the promesonotal shelf are blunt. However, two pins of specimens in the Curtin Ant Collection have acuminate spines instead of blunt angles, though otherwise their appearance agrees fairly closely with two separate specimens with the blunt angles apparently possessed by the type. Based on recent work on a huge assortment of ants from the Pilbara, held by DEC, these appear to represent two distinct species. *Meranoplus dimidiatus* complex sp. JDM 423, another species in the *M. dimidiatus* group, has a similar *facies* to the above, but possesses a small flange between two diminutive processes on the posterior margin of the promesonotal shield. This species appears to be widespread north and east of Perth.

Much of the *Meranoplus* fauna in the south-west appears to belong to the *M. puryi* group, and this fauna is almost intractable to morphological analysis for some species. Workers putatively belonging to this group possess a more-or-less uniform areolate sculpture on the promesonotal shield, and the lateral and posterior processes arising from the shield are generally much shorter than the propodeal spines. Fenestrae are usually small to vestigial, and flanging on the shield is also reduced, at least on its lateral margins. I have separated the very common *Meranoplus* sp. JDM 74, a tiny form, from *Meranoplus puryi* gp. sp. JDM 968, primarily on the basis of its size, but this is a far from satisfactory state of affairs. In fact, the two groups of ants exhibit no obvious diagnostic differences apart from size. *Meranoplus* sp. JDM 74 may be a species complex – the appearance of the promesonotal shield (rectangular with a posterior flange in some specimens and more square with protruding posterior processes in others) suggests the possibility of two or more cryptic species. Both of these ants are widely distributed throughout the SWBP, and indeed, the rest of the state. *Meranoplus* sp. JDM 673 and *Meranoplus* sp. JDM 1107 probably also belong to this group, being distinguished from the former species by their larger eyes. *Meranoplus* sp. JDM 673, mainly an ant of the wheatbelt, has distinctive, reniform eyes and prickly-looking, usually dark, erect setae on the head, mesosoma and gaster. Workers collected thus far range from dark brown to bicoloured brown or brownish-orange-and-light-yellow. *Meranoplus* sp. JDM 1107, more common in the north and north-east of the Province, has more flexuous, pale setae, a more rounded eye and is uniformly orange in colour.

Of several taxa that are not easily placed in groups, *Meranoplus* sp. JDM 491 is probably the most easily recognized. This is a brown species with a conspicuously thin and shiny petiolar node and postpetiole. The ant has only been collected from two bushland sites within the Perth metropolitan area and the adjacent Darling Range, respectively. In the attractively patterned *Meranoplus* sp. JDM 627, which has a wide distribution throughout drier areas of the State, the postpetiole viewed from above is in the form of an inverted triangle. *Meranoplus* sp. JDM 1071 has a similar postpetiole to *Meranoplus* sp. JDM 627, but possesses small processes on the posterior margin of the promesonotal shield (lacking in the former). This ant has been found at Boddington and also in the Pilbara. *Meranoplus* sp. JDM 967, in which the posterior angles of the promesonotal shield are represented by digitate spines, is known from a few workers collected on or near the south-east coast.

Mesostruma

Key from Shattuck 2000, modified.

1. Propodeum armed with long spines..... ..... ***M. spinosa* Shattuck**

   Propodeum armed with short spines or denticles, or with lamellae **2**

2. Seen dorsally, humeral angles of promesonotum armed with short spines, or, at least, distinct denticles..... **3**

   Seen dorsally, humeral angles of promesonotum rounded **4**

3. Propodeal lamellae well-developed; postpetiole with lateral flanges (Figure 596) .... ***M. laevigata* Brown**

   Propodeum with short denticles; postpetiole without lateral flanges (Figure 597) ....***M. eccentrica* Taylor**

Figure 596

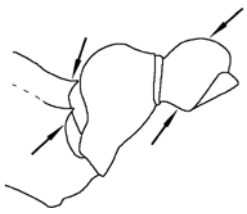

Figure 597

4. Dorsum of mesosoma with dense, almost confluent shallow punctures with cuticular sculpture between punctures (Figure 598) ....***M. inornata* Shattuck**

   Dorsum of mesosoma with scattered, well-separated punctures; cuticle between punctures smooth and unsculptured (Figure 599) .....***M. loweryi* Taylor**

Figure 598

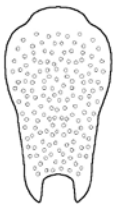

Figure 599

Among the Dacetini, *Mesostruma* is most readily confused with *Colobostruma*, but workers lack the flanges on the petiole seen in the latter. These attractive little ants are seldom collected, although several species appear to be reasonably common and have been found in bark traps in mixed Wandoo and Jarrah-Marri woodland in south-western Australia. Perhaps the best time to see them is in the evening, night or early morning when they can typically be found foraging on the lower trunks of eucalypts. Exactly three of the eight described species have been recorded from the SWBP thus far, and an additional undescribed species also occurs in the south-west.

Mesostruma spinosa Shattuck differs from all other known species in that the propodeum carries long spines, and there are no propodeal lamellae. The ant is known from one specimen collected from Manjimup in the Karri (*eucalyptus diversicolor* F. Muell.) belt. *Mesostruma eccentrica* Taylor has been taken from bark traps on Wandoo trunks at Dryandra and has also been collected in litter at Westdale in the eastern Darling Range. This species is widely distributed throughout southern Australia, as is *Mesostruma laevigata* Brown, which has been collected from bark traps on Powderbark Wandoo trunks at Dryandra. *Mesostruma loweryi* Taylor has been found in bark traps on Wandoo trunks in the same locality, and also features in hand collected and/or pitfall trap material from Boddington and from Kings Park, near Perth CBD. The taxon is also known from Geraldton and

from South Australia. A fifth species, *Mesostruma inornata* Shattuck, has been recorded south-east of Cocklebiddy and at Queen Victoria Spring Nature Reserve, east of Kalgoorlie, and may occur in the far south-east of the Province.

Monomorium

Key from Heterick (2001), modified. An additional species, *Monomorium kilianii*, has also been recorded from the south-west, but the record of this eastern Australian species is very dubious, and the ant is not included in this key.

1. Compound eyes absent (may occasionally be represented by minute fleck of pigment) ..... ***M. hildebrandti* gp. sp. JDM 438**

   Compound eyes present, moderate to large in size **2**

2. Antenna 10-segmented **3**

   Antenna 11 or 12-segmented **4**

3. PF 2,3; number of mandibular teeth 5; propodeum armed with sharp denticles..... ***M. decuria* Heterick**

   PF 1,2; number of mandibular teeth 4; propodeum unarmed..... ***M. sydneyense* Forel (pt.)**

4. Antenna 11-segmented **5**

   Antenna 12-segmented **15**

5. Viewed in profile, eye distinctly oblique, often reaching to venter of head capsule, distance from mandible usually much less than length of eye (Figure 600)..... **6**

   Viewed in profile, eye situated along longitudinal axis of head capsule, distance from mandible at most only slightly less than length of eye (Figure 601)..... **7**

Figure 600

Figure 601

6. PF 2,2; head square (Figure 602)..... ..... ***M. eremophilum* Heterick**

   PF 1,2; head rectangular (Figure 603) .... ***M. nanum* Heterick**

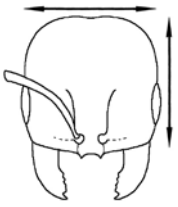

Figure 602

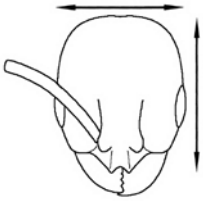

Figure 603

7. Propodeum distinctly cuboidal, laterally carinate, or with lamellae on propodeal lobes extending to or near propodeum; propodeal and mesopleural sculpture often shagreenate-punctate (Figure 604)..... **8**

   Propodeum more-or-less rounded, with small, inconspicuous propodeal lobes; propodeal and mesopleural sculpture never shagreenate-punctate, usually absent, if present, then confined to a few striae, particularly around the lower mesopleuron (Figure 605) **14**

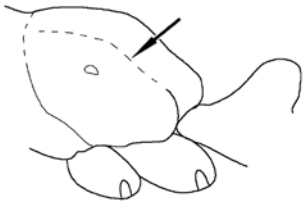

Figure 604

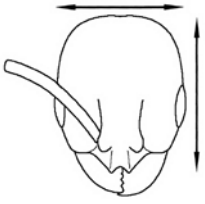

Figure 605

8. Mandible with three distinct teeth; eye small (approximately ≈ width of antennal scape); propodeum smooth and shining with only vestigial striae; propodeum with declivitous face long and oblique, carinate at sides and sometimes with small lamellae at propodeal angle (Figure 606); anterior clypeal margin rounded; long erect and suberect setae absent from mesosoma..... ***M. arenarium* Heterick**

Mandible usually with four teeth and denticles (basal tooth may be minute or an offset angle); if clypeal margin rounded then eye larger; propodeum shagreenate or otherwise sculptured (e.g. Figure 607) **9**

9. Yellow species or yellowish with reddish-brown head and gaster; erect and suberect setae on head and mesosoma; propodeum cuboidal to slightly elongate; eye large (eye width ≥ 2 × greatest width of antennal scape) (Figure 607) .....***M. silaceum*** **Heterick**

Never with above combination of characters; if yellow with a cuboidal propodeum and large eye, then erect and suberect setae absent from head and mesosoma **10**

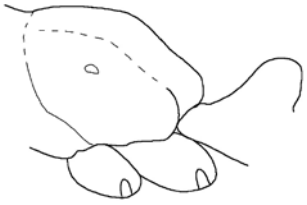

Figure 606

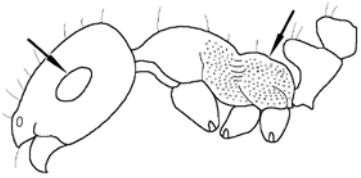

Figure 607

10. Mesonotal and mesopleural sectors of promesonotum distinctly microreticulate; in dorsal view, faint, longitudinal striae also often evident on mesonotal sector; eyes usually large (eye diameter > greatest antennal width) (Fig, 608); ant shades of reddish-orange to brown, alone or in combination **11**

Mesonotal sector of promesonotum, at least, smooth and shining with microreticulate sculpture and faint, longitudinal striae always absent; if ant with strong microreticulation on mesopleural sector and on propodeum, then eyes usually moderate to small in non-yellow specimens (eye diameter ≤ greatest antennal width) (Figure 609: *M. sydneyense* Forel); colour various..... **12**

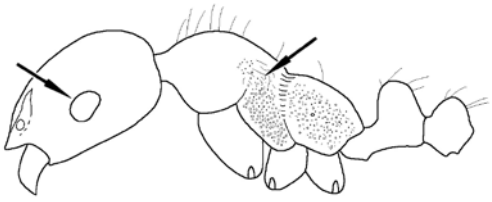

Figure 608

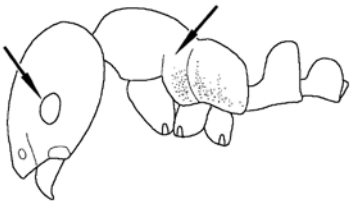

Figure 609

11. In profile, mesosoma an even arc, metanotal grove appearing as a slit between promesonotum (which is short) and propodeum; metanotal groove with few if any cross ribs; eye generally oval, smaller (eye width 1–1.5 × greatest width of antennal scape); erect setae generally absent on mesosoma (Figure 610) .....***M. aithoderum*** **Heterick**

In profile, promesonotum evenly rounded anteriad, more-or-less straight posteriad, metanotal groove broad but shallow, often with distinct lateral cross-ribs; promesonotum elongate; eye commonly reniform, larger (eye width 2× greatest width of antennal scape); erect setae often present on mesosoma in SWBP specimens (Figure 611) .....***M. stictonotum*** **Heterick**

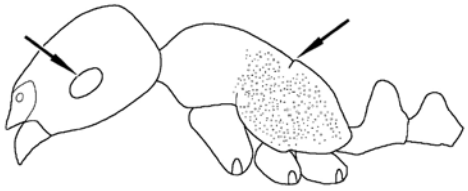

Figure 610

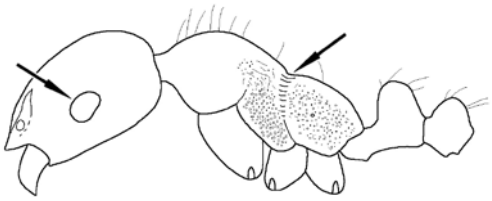

Figure 611

12. Eye moderate (eye width 1–1.5 × greatest width of antennal scape), oval (most workers) to slightly elongate (some bright yellow workers); viewed in profile, promesonotum flattened and truncated; colour very variable; erect and suberect setae absent from head, mesosoma and nodes in all bright yellow workers,usually also absent in non-yellow workers (see Figures 604, 609) ..... ***M. sydneyense*** **Forel (pt.)**

Eye large, (eye width ≥ 1.5 × greatest width of antennal scape), mostly elongate; viewed in profile, promesonotum often more elongate and rounded; colour always yellow (head may be slightly darker); erect or suberect setae usually present at least on petiole and postpetiole..... **13**

13. Eye very large (eye width ≥ 2 × greatest width of antennal scape), mesopleural sector of promesonotum and propodeum with strong microreticulate sculpture; erect and suberect setae (if present) restricted to nodes (Figure 612).....***M. micula*** **Heterick**

    Eye smaller (eye width ≈ 1.5 × greatest width of antennal scape); mesopleural sector of promesonotum and propodeum lacking strong sculpture, cuticle relatively smooth and shining; erect and suberect setae often present on head and mesosoma (workers in many northern populations with conspicuous, erect humeral setae, but other raised setae lacking on promesonotum) (Figure 613)..... ..... ***M. disetigerum*** **Heterick**

Figure 612

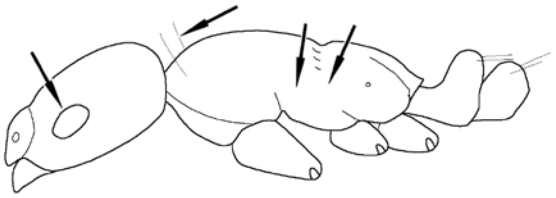

Figure 613

14. Yellowish-brown to dark brown in all SWBP populations (if yellowish-brown, then head and gaster darker); propodeum relatively short and usually smoothly rounded (Figure 614); eye compact and ovate..... ***M. fieldi*** **Forel**

    Uniformly yellow or yellow with first tergite of gaster also yellow, remaining tergites yellow-brown; propodeum usually relatively elongate (Figure 615); eye in larger specimens tending to large and elongate .....***M. laeve*** **Mayr**

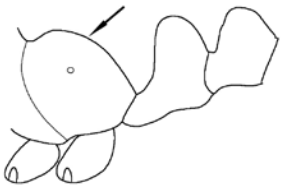

Figure 614

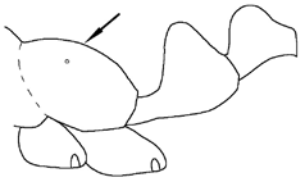

Figure 615

15. Number of mandibular teeth and denticles three.....***M. rothsteini*** **Forel**

    Number of mandibular teeth and denticles four to seven..... **16**

16. Eye much longer than wide, either distinctly elongate (Figure 616) coming to a point anteriad, or reniform (Figure 617); worker small (HW usually < 0.60 mm); brown or dark brown species **17**

    Eye circular, subcircular, weakly elongate (not coming to a point anteriad), elliptical or ovoid (e.g. Figure 618); worker usually larger (HW mostly > 0.60 mm)..... **18**

17. Eye elongate, reaching almost to mandible (Figure 616); mesosoma, propodeum and petiole strongly microreticulate; pilosity on promesonotum and propodeum consisting of dense, short setae; colour uniform dark brown.....***M. anthracinum*** **Heterick**

    Eye reniform (Figure 617); microreticulation on body surface less marked, and confined to lower mesopleuron and propodeum, otherwise smooth and shining; pilosity consisting of sparse, erect and suberect setae; colour brown or tawny orange with dark brown gaster .....***M. megalops*** **Heterick**

Figure 616

Figure 617

Figure 618

18. Petiolar node long and low, barrel-shaped (Figure 619)..... **19**

Petiolar node not as above (usually cuboidal, conical, cuneate or tumular)..... **20**

19. Head capsule trapezoidal in full-face view, narrowest at vertex (Figure 620); frons longitudinally striate with combination of appressed setulae and erect and suberect setae; promesonotal sculpture in form of microreticulation, striolae and striae on mesopleuron, and striolae on posterodorsal surface; head orange, mesosoma, petiole and postpetiole dark brown to black, gaster bright yellow, legs brown ....***M. flavonigrum*** **Heterick**

Head capsule rectangular in full-face view (Figure 621); frons longitudinally striate and reticulate with combination of incurved decumbent and subdecumbent setulae and erect and suberect setae; promesonotal sculpture in form of microreticulation and rugosity over entire promesonotum; otherwise coloured (usually a combination of a tawny or red head and mesosoma with some brown infuscation, and dark brown or black gaster).. .....***M. longinode*** **Heterick**

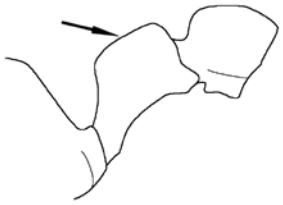

Figure 619

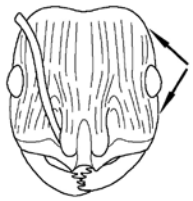

Figure 620

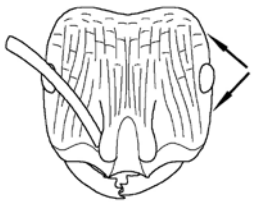

Figure 621

20. Anteromedial margin of clypeus a broadly U-shaped cleft between the median clypeal carinae, which are often produced as teeth, denticles or lobes (includes polymorphic species with disproportionately large, square heads in major caste; generally matt in appearance with rugose mesosoma) (Figure 622) **21**

Anteromedial margin of clypeus either convex and protuberant, straight, slightly emarginate, or with shallow V-shaped groove (e.g. Figures 623, 624, 625); at most, median clypeal carinae (if present) produced as weak lobes or denticles (includes mainly dry and wet sclerophyll forest species, often smooth and shining in appearance)..... **32**

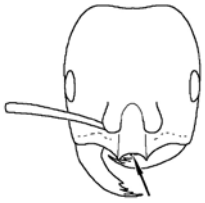

Figure 622

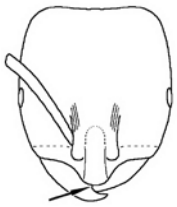

Figure 623

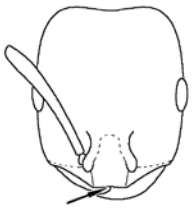

Figure 624

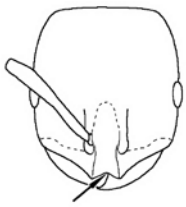

Figure 625

21. Petiolar node cuboidal or nearly so, about as high as wide (Figure 626)..... **22**

Petiolar node conical (Figure 627), cuneate (Figure 628) or tumular (Figure 629), usually tapered dorsally, but in profile always higher than wide **25**

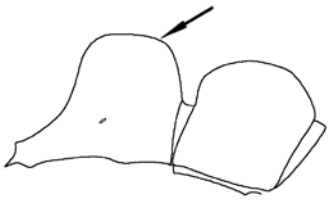

Figure 626

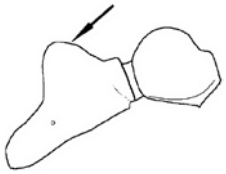

Figure 627

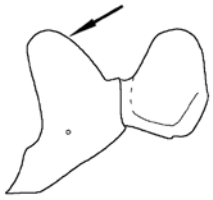

Figure 628

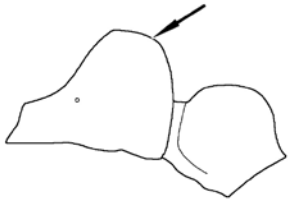

Figure 629

22. Propodeum armed with small denticles ....***M. longiceps*** **Wheeler (pt.)**

    Propodeum unarmed **23**

23. Frons and mesosoma shining and polished in appearance with scattered foveae and striolae; distinct lateral striae present on propodeum; median clypeal carinae raised and distinct, produced as blunt lobes (Figure 630); petiolar node rugose .....***M. xantheklemma*** **Heterick**

    Frons and mesosoma matt in appearance, with promesonotum, propodeum and petiole either rugose or granulose-reticulate; clypeal carinae developed as stout, incurved denticles or teeth (Figure 631) **24**

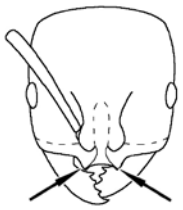

Figure 630

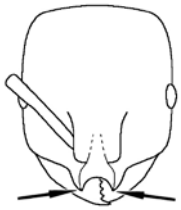

Figure 631

24. Frons longitudinally striate; promesonotum microreticulate and rugose; red or reddish-orange; posterior promesonotum, propodeum, petiole and postpetiole strongly infuscated with black.....***M. legulus*** **Heterick**

    Frons finely granulose-microreticulate and striolate; promesonotum finely granulose-microreticulate; concolorous reddish-orange, without infuscation ....***M. bihamatum*** **Heterick**

25. Frons densely foveate and microreticulate (Figure 632a); propodeal declivity strongly delimited anteriad by bevelled surface with well-defined anterior border (Figure 632b)..... ..... **26**

    Frons not foveate, propodeal declivity not as above..... **27**

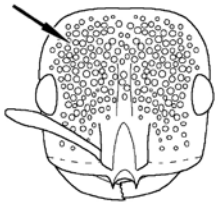

Figure 632a

Figure 632b

26. Head and mesosoma without erect or semi-erect setae; colour uniformly orange..... .....***M. elegantulum*** **Heterick**

    Head and mesosoma with a few erect and semi-erect setae (Figure 633); brownish to black head and gaster, tan mesosoma (Eneabba only) .....***M. falcatum*** **gp. sp. JDM 1178**

27. Head, mesosoma and gaster covered with decumbent setulae only, erect and suberect setae lacking; small (TL ≈ 2 mm)..... .....***M. pubescens*** **Heterick**

    Erect and suberect setae always present on body; larger (TL > 2 mm)..... **28**

28. Head capsule rectangular; usually five teeth and denticles, rarely four; monomorphic; colour tawny orange or red, often with some infuscation around propodeum, petiole and postpetiole, gaster orange, appendages brown .....***M. longiceps*** **Wheeler (pt.)**

Head capsule square and massive; always with four stout teeth; monomorphic, polymorphic or displaying monophasic allometry; colour variable **29**

29. Monomorphic; colour predominantly orange or red **30**

Polymorphic or displaying monophasic allometry, with considerable size range between largest and smallest workers; colour variable but black, brown, black-and-orange and black-and-red predominate **31**

30. Anteromedial margin of clypeus with two broad, longitudinally striate lobes (Figure 634a); frons longitudinally striate with erect and suberect setae, setae short (≤ width of eye); propodeum rounded, transversely striate (Figure 634b); crimson to orange ..... ***M. striatifrons*** **Heterick**

Median clypeal carinae produced apically as pair of pronounced teeth; frons microreticulate and striolate with erect and suberect setae; propodeum smoothly rounded or angulate in profile or armed with small denticles or flanges, but without transverse striae; crimson to reddish orange with head, gaster and appendages darker (rare and localised in north of SWBP) ..... ***M. majeri*** **Heterick**

Figure 633

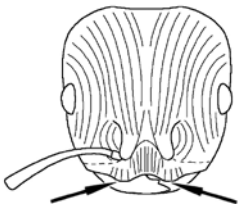

Figure 634a

Figure 634b

31. Smallest minor workers dissimilar in morphology and pilosity to media and major workers; major workers rather hirsute and rugose, minor workers with shorter setae and more angulate, microreticulate propodeum; typically among major and media workers head, gaster and appendages black, dark brown or brown, mesosoma, propodeum and waist segments orange to crimson; minor workers similar in colour, or uniformly brown or dark brown; median clypeal carinae produced as single pair of lobes or denticles in major and minor workers, occasionally feebly bilobate in media workers. (Possibly a complex of two or more species is represented here.)..... ***M. rufonigrum*** **Heterick**

Morphology of minor, media and major workers similar, colouration never as above in major and media workers (usually either concolorous orange, brown or black, or brown with yellow gaster); median clypeal carinae always produced as bifurcated lobes or denticles..... ***M. bicorne*** **Forel**

32. Viewed in profile, postpetiole a curved, horizontal cone, narrowest at its junction with petiole and widest at or near its junction with gaster (Figure 635) ..... ***M. crinitum*** **Heterick**

Viewed in profile, postpetiole strongly constricted both anteriad and posteriad, so that its greatest diameter is at its midpoint; postpetiolar shape round or square (Figure 636) **33**

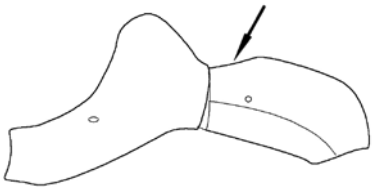

Figure 635

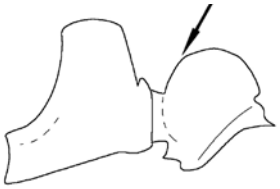

Figure 636

33. Subpetiolar process a broad flange ending in a spur anteriad; propodeal angles produced in the form of sharp spines (Figure 637); three larger teeth and four tiny denticles on inner mandibular edge..... ***M. sublamellatum*** **Heterick**

Subpetiolar process at most a tapering, narrow flange ending in a small, anteroventral protuberance or spur; propodeal angles

not produced as spines (e.g. Figure 638); maximum number of mandibular teeth and denticles five **34**

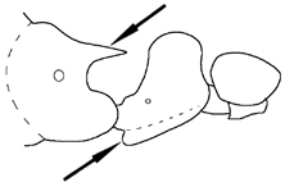

Figure 637

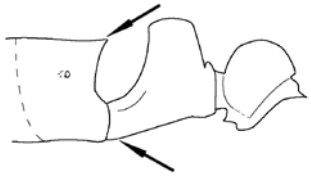

Figure 638

34. PF 1,2; small (HML 1.25–1.75 mm); four mandibular teeth and denticles; frons of head capsule and petiolar node unsculptured, smooth and shining, propodeal angles rounded ..... ***M. sordidum*** **Forel**

PF 2,2 or 2,3; size often larger, if small with four mandibular teeth and denticles, head and petiolar node distinctly sculptured or propodeal angles acute to denticulate **35**

35. Dorsum of head and entire mesosoma finely reticulate-punctate (Figure 639); PF 2,2 (introduced orange or yellow species, only found in highly disturbed, predominantly urban environments in Australia)..... ..... ***M. pharaonis*** **(L.)**

Sculpture not as above, species generally smooth; PF predominantly 2,3. ..... **36**

36. Frons with strong reticulate or foveate sculpture; propodeal declivity strongly delimited anteriad by oblique, bevelled surface with well-defined anterior border (Figure 640); viewed dorsally, mesosoma uniformly densely sculptured with longitudinal striae, reticulations and occasional foveae (Figure 641) ..... ***M. lacunosum*** **Heterick**

Frons with reduced sculpture (not as above) or completely smooth and shining; propodeal declivity without distinct oblique, bevelled surface with well-defined anterior border; sculpture of mesosoma not as above **37**

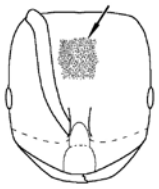

Figure 639

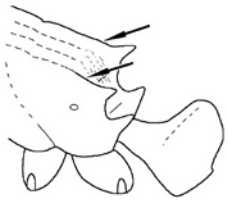

Figure 640

Figure 641

37. Basal tooth much broader than other pre-apical teeth (Figure 642); distinctly polymorphic, with large headed major workers having rather small eyes ..... ***M. euryodon*** **Heterick**

Basal tooth of same size or smaller than other pre-apical teeth; worker monomorphic or exhibiting monophasic allometry **38**

38. Frons and promesonotum with many evenly-spaced short (nearly all ≤ width of eye) erect and suberect setae (Figure 643)..... ..... ***M. brachythrix*** **Heterick**

Pilosity consisting mainly of longer erect and suberect setae (> width of eye), setation less dense **39**

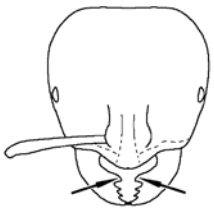

Figure 642

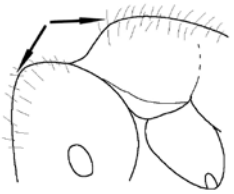

Figure 643

39. PF 2,2; mandible with four teeth and denticles; often only three visible; propodeum unarmed (introduced species in urban or otherwise disturbed habitats)..... ***M. destructor*** **(Jerdon)**

PF 2,3; four teeth always visible, five often present; propodeum usually angulate, propodeal angles often with denticles,

especially in larger workers (*M. centrale*, *M. leae*) **40**

40. Anteromedial margin of clypeus often projecting as narrow ellipse or rectangle, sometimes slightly emarginate, but never forming a shallow groove (Figure 644); clypeal denticles or lobes absent; petiolar node usually cuneate or tumular, only rarely subcuboidal or cuboidal ..... ***M. leae*** **Forel**

Anteromedial margin of clypeus forming a shallow V-shaped groove between median clypeal carinae, which are developed as denticles (Figure 645); petiolar node cuboidal or subcuboidal **41**

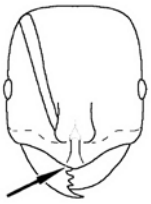

Figure 644

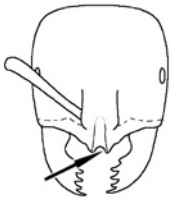

Figure 645

41. Eye moderate in size (eye width 0.5–1.5 x greatest width of antennal scape); head capsule nearly always darker than promesonotum in full-face view, but never lighter in colour; petiolar node higher than wide and tending to subcuboidal (Figure 646); number of mandibular teeth and denticles usually five (minute basal denticle may occasionally be lacking) ..... ***M. centrale*** **Forel**

Eye large (eye width > 1.5 x greatest width of antennal scape); head capsule lighter coloured than promesonotum in full-face view; petiolar node low and cuboidal in shape (Figure 647); four mandibular teeth and denticles (very rare) ..... ***M. durokoppinense*** **Heterick**

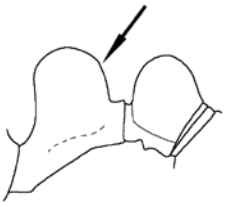

Figure 646

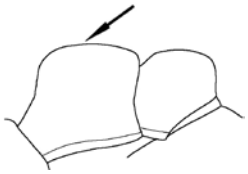

Figure 647

Monomorium

Monomorium ranks among the most important genera in the SWBP, along with speciose groups like *Iridomyrmex*, *Camponotus* and *Melophorus*. In terms of its impact on ordinary people, the genus probably rates above the others, since two major tramp species, the Singapore ant (*Monomorium destructor* (Jerdon)) and the Pharaoh's ant (*Monomorium pharaonis* (Linnaeus)) infest some sites in the Perth metropolitan area. Fortunately, these species have thus far not had the impact in Perth that they have had in other parts of the world. Nevertheless, *M. destructor* has caused some problems in towns in the Pilbara and Kimberley, not least because of its penchant for chewing through cabling. *Monomorium* species can be distinguished from other ants in the SWBP by a combination of an anteromedial clypeal seta, moderate-sized to large compound eyes, a three-segmented antennal club, and a postpetiole that is nearly always the same size or smaller than the petiolar node. As a group, the genus has very diverse habits, the small species in the *M. monomorium* species-group being mainly generalist predator-scavengers, while the larger forms include seed gatherers. Some of the larger species exhibit varying degrees of polymorphism, but *M. monomorium* group taxa are always monomorphic.

Next to *Camponotus*, *Monomorium*, with at least 40 spp. is the largest ant genus in the SWBP. Among the most abundant of all ants in Australia, particularly in urban areas, are the small members of the *M. monomorium* species-group. Many of these species are found across the entire Australian mainland. This group appears to be more derived in evolutionary terms than other Australian *Monomorium*, the reproductive castes lacking two of the significant wing cross veins. At least cross vein Cu-A is always present in other Australian *Monomorium*, and these veins are usually sclerotized. Members of the *M. monomorium* group are also taxonomically difficult in several cases, taxa like *Monomorium sydneyense* Forel and *Monomorium rothsteini* Forel revealing a high degree of variability in terms of morphology, pilosity and often colour. The taxonomic approach taken here (Heterick 2001) is a conservative one; see Andersen (2000) for a different approach.

Monomorium sydneyense Forel is possibly the most abundant ant in Australia, and can be found in virtually all Australian habitats. The appearance

of workers of what is currently known as *M. sydneyense* varies enormously, from uniformly dark chocolate with a shagreenate exoskeleton, through orange-and-brown to light yellow with a smooth, shiny appearance, along with many specimens of intermediate *facies*. The propodeum (and often, the promesonotum and mesopleuron) can be long and reticulate-punctate or shorter and relatively unsculptured. A minute, small-eyed pale form with a darker head is most common in the SWBP. In workers of coastal populations of this form the clypeal carinae are often extended beyond the clypeus as small spines, and the antennal count in at least some populations is 10. Since workers of these ants are all but morphologically indistinguishable from other workers with the normal count of 11 segments, molecular techniques are probably necessary to determine whether these populations represent a separate species. What appears to be a similar form with the same number of antennal segments has been identified in the Monarto region of South Australia. However, workers of the latter are darker in colour without extended clypeal carinae. Molecular analysis, currently being undertaken by Dr. Phil Lester (Victoria University of Wellington, NZ) on Australian *Monomorium*, may uncover the reason for the morphological variation in such taxa as *M. sydneyense*. Preliminary results suggest *M. sydneyense* may, in fact, be a complex of three or more sibling species. Apart from *M. sydneyense* itself and the small, pale form mentioned above, a consistently yellow ant (mentioned in Heterick 2001), common throughout temperate Australia, is a strong candidate for separate species status.

Monomorium disetigerum Heterick, *Monomorium micula* Heterick, and *Monomorium silaceum* Heterick are small, yellow species from drier regions that are often hard to distinguish from pale *M. sydneyense*. To look at just one described species, *Monomorium silaceum* populations in some areas of the north and north-east of the SWBP, and the Pilbara departs from the typical broad-headed, punctate yellow form. These variants have a brown head capsule, are smoother and less sculptured, and more gracile. *Monomorium aithoderum* Heterick, *Monomorium nanum* Heterick and *Monomorium stictonotum* Heterick are minute, nondescript orange or brownish species of very similar appearance that make up much of the *Monomorium* biomass in drier areas of southern Australia. Our understanding of this group of taxonomically difficult little ants may be assisted by Dr. Lester's work (see above); *M. nanum*, in particular, may be a species complex. An arid area taxon, *Monomorium eremophilum* Heterick, looks like a miniature *M. rothsteini*, but has 11-segmented antennae and the eye is elongate rather than ovate.

Monomorium fieldi Forel is a small, usually hairy, dark brown ant that is almost as ubiquitous as *M. sydneyense*. This is probably the most common species, apart from *M. sydneyense*, in Perth streets and gardens. The minute *Monomorium laeve nigrium* Forel was tentatively synomymized under *M. fieldi* by Heterick (2001), but shares important morphological characters with both *M. fieldi* and *M. sydneyense*, and may represent hybridisation between the two taxa. This form is most common on the east coast and in northern Australia, but is occasionally found in the SWBP. *Monomorium laeve* Mayr is a yellow ant whose workers range in appearance from very small and compact (mainly northern Australia) with small, oval eyes to small-medium and gracile with large, rather elongate eyes (mainly the wetter south-west). Many workers with intermediate features connect the two extremes. This species is very occasionally a minor pest, coming indoors after food (Clark 1924).

Monomorium arenarium Heterick, a small, orange ant whose queens have an unusual appearance, has been found in sandy areas at Swanbourne (Perth metropolitan area), Eneabba, Esperance and Nornalup in the SWBP, as well as in SA and Tas. *Monomorium rothsteini* Forel is ubiquitous throughout most of mainland Australia, being particularly abundant in semi-arid and arid areas where it is a significant seed harvester. Seeds of grasses and shrubs like saltbush (*Atriplex*) are commonly gathered, along with a small amount of animal matter (Briese and Macauley 1980). Workers of *M. rothsteini* vary widely in colour, and the clypeal margin is variously developed, leading some researchers such as Andersen (2000) to approach the taxon as a species complex, rather than a single species. Heterick (2001) presents the case that *M. rothsteini* is monophyletic. *Monomorium sordidum* Forel shares many morphological similarities with *M. rothsteini*, in both reproductive and worker castes. Moreover, the two taxa, along with *Monomorium megalops* Heterick, are the only Australian members of the *M. monomorium* group with 12-segmented antennae, the remaining members possessing 11-segmented antennae. *Monomorium sordidum* is yet another very common species in most Australian habitats. *Monomorium megalops* is identical to *M. sordidum*, apart from its large, reniform eye. The distribution of this species centres mainly on inland NSW and SA, but there is one record in the SWBP from Westonia, in the western goldfields. The exotic tramp species, *Monomorium floricola* (Jerdon), is another tiny ant with 12-segmented antennae found in tropical Australia. Although there is no official record of its presence in southern WA, there is some evidence that it may also have been able to establish colonies in Perth after entering via an infested caravan (M. Widmer, Agriculture Department of WA, pers. comm.).

Monomorium hildebrandti gp. sp. JDM 438 has until recently been confused with *Anillomyrma*, a genus that probably does not occur in Australia. The *hildebrandti* group of *Monomorium* has the Malagasy region as its stronghold (Heterick 2006), but several diminutive species from this clade have radiated or been introduced by human agency to various parts of the Pacific, including Australia. Possibly as many as half-a-dozen related species from the *hildebrandti* group are to be found on this continent, all of them characterized by small size, a depigmented cuticle and very reduced eyes or with eyes lacking altogether. Only one of these ants, *Monomorium australicum* Forel, has been described from Australian material, and most, including the local species, are undescribed. Workers can be distinguished from true *Anillomyrma* primarily by their palp formula (2,2 versus 2,1, which does not occur in any *Monomorium* species), and the appearance of the post-petiole. *Monomorium hildebrandti* gp. sp. JDM 438 can be distinguished from workers of nearly all Australian myrmicine genera by its eyeless condition. The only other myrmicine in the SWBP with which *Monomorium hildebrandti* gp. sp. JDM 438 could be confused is a *Solenopsis* species, *S. belisarius* Forel, but this ant has a two-segmented antennal club (three-segmented in the *Monomorium* species). This minute subterranean ant is found throughout the south-west of the State, including the Perth metropolitan area, and is sufficiently common for workers to appear frequently in pitfall trap samples. The biology of *Monomorium hildebrandti* gp. sp. JDM 438 is not known.

Many members of the remaining *Monomorium*, along with *M. rothsteini* and *M. sordidum*, were formerly included in the genus *Chelaner*, before it was synonymised under *Monomorium* by Bolton (1987). The *M. falcatum* group have such a distinctive *facies* that they are scarcely recognisable as *Monomorium*. Indeed, the very rare eastern states species *Monomorium falcatum* had the genus *Schizopelta* erected for it by McAreavey (1949), and *Monomorium elegantulum* Heterick appears *incognito* as 'Unnamed Genus #1' in Shattuck (1999)! The latter has occasionally been collected in drier inland regions in NSW and SA, as well as from the SWBP. The WA species in this group tend to be most common in sandplain and heathland environments. *Monomorium decuria* Heterick, confined to the south-west corner of this State, has a more localized distribution than most of the other members of the group. However, it is easily the most common, occurring in woodland up to the outskirts of towns and cities, including the Perth metropolitan area. Aside from members of some populations of putative *M. sydneyense*, this is the only Australian *Monomorium* with a 10-segmented antenna. Workers of *Monomorium lacunosum* Heterick depart from the usual predominantly glabrous appearance found in most other members of the group, in that the body surfaces are covered with many short, erect setae. The ant is apparently very rare, having been recorded in the SWBP on two occasions from Eneabba and once in Cape Arid National Park. Elsewhere in WA it has been found in Queen Victoria Spring Nature Reserve. There is also one record from SA. Just recently, an undescribed species in this group (*Monomorium falcatum* gp. sp. JDM 1178) has been recorded from near Eneabba. The workers are quite similar to those *M. decuria*, also found in the area, but have 12-segmented antennae and long, erect setae on the promesonotum.

Workers in the *M. bicorne* group exhibit polymorphism, the largest workers having disproportionately broad heads (not unlike some *Melophorus*, an unrelated formicine genus) and large clypeal teeth. Probably most species harvest seeds, but this is definitely known only for *Monomorium whitei* Wheeler (see Davison 1982, 1987), a species whose range may take in the extreme north-east of the SWBP. *Monomorium bicorne* Forel is a handsome dark brown to black-and-yellow species, which can be found throughout temperate Australia. East coast workers are essentially dark brown, black or black-and-brown, and were formerly placed in *Monomorium macareaveyi* (Ettershank) (synonymised Heterick 2001). Workers in the SWBP are black with yellow gasters. *Monomorium majeri* Heterick and *Monomorium striatifrons* Heterick are large, reddish species. *Monomorium majeri* has a very limited distribution east of Geraldton, but *M. striatifrons* is also found in the NT and SA. *Monomorium rufonigrum* Heterick is possibly a species complex, but may equally be a single species with alternative phenotypes depending on alleles possessed by the colonies. Some colonies contain polymorphic workers (major and media workers red-and-black or uniformly brownish, smallest minor workers uniformly brown or bicoloured light and dark brown), while others seem to contain monomorphic workers (uniformly red-and-black or uniformly brown). The head of the red-and-black workers is relatively broader than that of workers of the latter type of colony, but the morphology of the minor workers is very similar for both types of colony. The ant is widespread in the SWBP, and the red-and-black form has been collected in the Perth metropolitan area. Populations also occur in NSW and SA. *Monomorium anthracinum* Heterick, whose size is similar to many ants in the *M. monomorium* group, is an uncommon, elongate-eyed species. Most specimens have come from within the semi-arid areas of the SWBP, but the ant has also been collected from Bush Bay, in the Carnarvon district, just north of the Province. *Monomorium pubescens* Heterick is known only from the Perth region

(Mosman Park) and, more recently, from Eneabba. Workers of the latter species are very similar to minor workers within polymorphic populations of *M. rufonigrum*.

Members of the *M. kilianii* species-group, which constitutes an important part of the *Monomorium* fauna on Australia's east coast, have an elongate postpetiole. *Monomorium crinitum* Heterick was recorded many years ago from Mundaring, just east of Perth, but has not been seen in this State since. *Monomorium kilianii* Forel was recorded by J. Clark from Booanya, in the south-east of the State, and from Ludlow, on the south-west coast, but these ancient records must be regarded as doubtful, in view of the ant's known distribution in the generally more humid south-eastern corner of Australia.

Workers of the nine members of the *M. rubriceps* group found in the SWBP are all yellow, orange or red; some species also have brown infuscation of the mesosoma. *Monomorium leae* Forel is the most widespread and variable of these species, being found throughout Australia. Western Australia lacks the beautiful, bicoloured purplish brown-and-yellow race of the east coast rain forests and also the bright yellow form (formerly *Monomorium hemiphaeum* Clark). Western Australian *M. leae* are orange to reddish, and exhibit some polymorphism. Larger workers have distinct propodeal denticles, while the propodeum is more rounded in smaller workers (which resemble yellow *M. sydneyense*, but with a 12-segmented antenna). Locally, *M. leae* appears to be most abundant in more humid environments, e.g. near watercourses and around the boles of eucalypts in wetter parts of the south-west. *Monomorium centrale* Forel, which closely resembles M. *leae*, is also widespread, but most common in semi-arid and arid areas. *Monomorium durokoppinense* Heterick and *Monomorium xantheklemma* Heterick are two very rare, reddish-orange forms. Records of *Monomorium durokoppinense* are currently confined to a small area north of Kellerberrin in the WA wheatbelt, while *M. xantheklemma*, which is also found in the goldfields as well as the wheatbelt, has been recorded from the Clare Valley, in SA. *Monomorium bihamatum* Heterick and *Monomorium legulus* Heterick are very similar red species, the latter being distinguished chiefly by a darker band on the mesosoma. *Monomorium legulus* has not been recorded outside of WA, whereas *M. bihamatum* has also been recorded from NSW and SA. Both species harvest seeds of mallees (pers. obs. and label data). In Australian mainland states *Monomorium longiceps* Wheeler is a relatively common and widespread red or red-and-brown ant that has been collected from both ground and vegetation. Some populations can still be found in relictual bushland in the Perth metropolitan area and on Rottnest Is. The broad basal tooth on its mandible and its strongly polymorphic workers distinguish the widespread but rare *Monomorium euryodon* Heterick. *Monomorium brachythrix* Heterick, the workers of which are covered in very short, erect setae, appears to be confined to the sand-plains north and north-east of Perth.

The *M. longinode* group, whose members have a characteristic barrel-shaped petiolar node, are represented in the SWBP by *Monomorium longinode* Heterick and *Monomorium flavonigrum* Heterick. The former species is quite common in sandy soils in the south-west corner of the State, including relictual woodland in the Perth metropolitan area. *Monomorium flavonigrum* has a very limited known range in and around the Geraldton region, in the mid-north. Specimens in the Curtin Ant Collection come from Canna and the Kalbarri NP.

The bizarre *Monomorium sublamellatum* Heterick has three large and four minute teeth on each mandible, sharp propodeal spines (similar to those possessed by the eastern states species *Monomorium sculpturatum* Clark), and a large, ventrally carinate, subpetiolar process that ends in a spur anteriad. The phylogenetic affinities of this species are unknown (Heterick 2003). This small (TL < 2.5 mm) ant was collected many years ago from a litter berlesate from North Twin Peaks Island in the Recherche Archipelago. The holotype and sole known specimen (a worker) belongs to the WA Museum.

Orectognathus

One species, Orectognathus clarki *Brown.*

Orectognathus is the largest member of the Dacetini encountered in the SWBP. Workers can easily be identified by their five-segmented antenna, with the third segment much more elongate than the remaining segments of the flagellum. As with *Epopostruma*, *Strumigenys* and the ponerines *Anochetus* and *Odontomachus*, the mandibles are of the trap-jaw variety, long and thin. They capture soft-bodied arthropods (Shattuck 1999).

Only one species of *Orectognathus* has been recorded from the SWBP. *Orectognathus clarki* Brown, originally described from southern Vic., had previously been recorded from high rainfall areas near the south coast, notably the Porongorup and Stirling Ranges. Recently, a worker was collected by vegetation vacuuming in the Worsley mining area south-east of Perth. This constitutes a first record for Jarrah-Marri woodland in the Darling Range.

Pheidole

Major workers

(n.b. The major worker for *Pheidole* JDM 871 is not known.)

1. Viewed in profile, junction of postpetiole with gaster narrow (Figure 648) ..... ***P. megacephala* (Fabricius)**

   Viewed in profile, junction of postpetiole with gaster broad (Figure 649) **2**

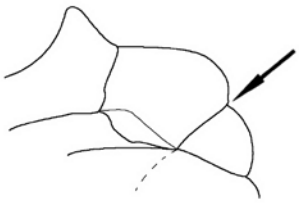

Figure 648

Figure 649

2. Viewed from above, vertex of head smooth and shining (Figure 650)..... **3**

   Viewed from above, vertex of head reticulate (Figure 651) or striate (Figure 652)..... **7**

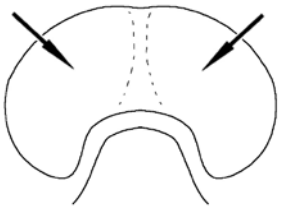

Figure 650

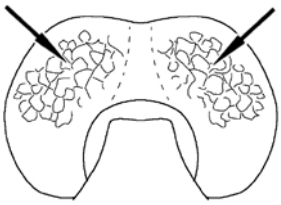

Figure 651

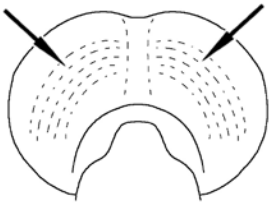

Figure 652

3. Mesosoma almost devoid of sculpture, smooth and shining..... ***Pheidole* sp. JDM 874**

   Mesosoma sculptured, with striae, at least, on promesonotum..... **4**

4. Larger species (HW ≥ 2 mm) **5**

   Smaller species (HW < 2 mm) **6**

5. Viewed from front, mandible quadrate, inner to outer surface (i.e. top to bottom) being about same length as angle to edge (i.e. from left to right) (Figure 653)..... ***P. hartmeyeri* Forel**

   Viewed from front, mandible relatively elongate, distance from inner to outer surface being much less than distance from angle to edge (Figure 654) ..... ***Pheidole* sp. JDM 558**

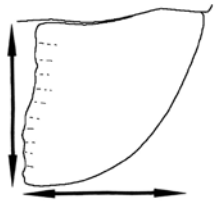

Figure 653

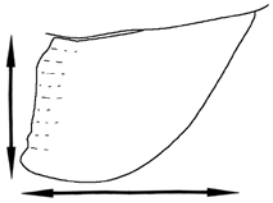

Figure 654

6. Medium-sized species (HW ≈ 1.5 mm) (mainly coastal)..... ***P. ampla* Forel**

   Small species (HW ≈ 1 mm) (found in N, NW) ... . ***Pheidole* sp. JDM 338**

7. Occipital lobes with strong, deep, reticulate sculpture (Figure 655) ..... ***Pheidole* sp. JDM 164**

   Occipital lobes striate, often weakly so (e.g. Figure 656)..... **8**

8. Viewed from front, longitudinal striae on head reaching to vertex (Figure 657) ..... ***Pheidole teneriffana* Forel**

   Viewed from front, longitudinal striae diverging strongly left and right near occipital lobes to become more-or-less horizontal (Figure 658) **9**

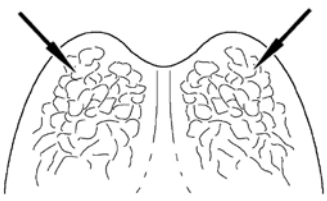

Figure 655

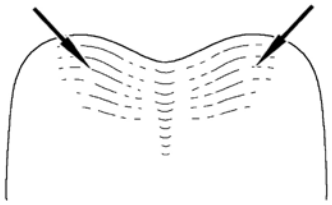

Figure 656

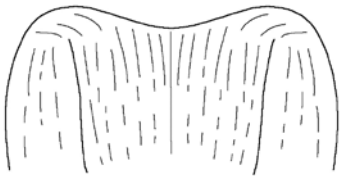

Figure 657

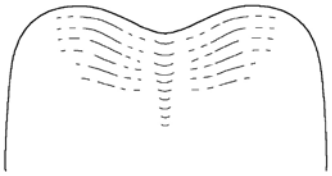

Figure 658

9. Antennal scrobe long, reaching to at least midpoint of head; head elongate, about 1.5–2 times as long as wide (Figure 659) (size of major very variable, according to locality)..... ***Pheidole* sp. near *variabilis* Mayr (JDM 177)**

   Antennal scrobe short, reaching to about midpoint of eye; head only slightly longer than wide (Figure 660) **10**

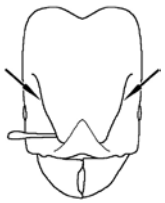

Figure 659

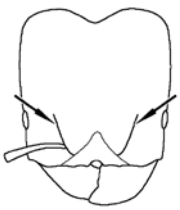

Figure 660

10. Eye oblique, distinctly attenuated anteriad (Figure 661a); anterolateral and anteromedial teeth on underside of head well-developed (Figure 661b)..... .....***P. ampla perthensis* Crawley**

    Eye variable in shape but not distinctly attenuated anteriad (e.g. Figure 662a); antero-lateral and anteromedial teeth on underside of head vestigial (Figure 662b) ....***Pheidole* sp. JDM 1138**

Figure 661a

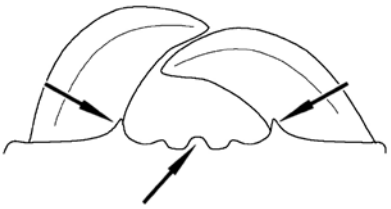

Figure 661b

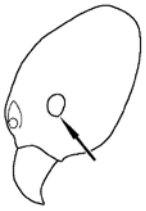

Figure 662a

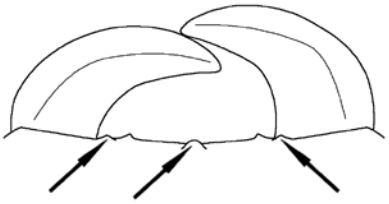

Figure 662b

Minor workers

1. Propodeum unarmed or with vestigial denticles .....***Pheidole* sp. JDM 874**

   Propodeum armed with distinct teeth or spines **2**

2. Postpetiole large and rather elongate, distinctly constricted towards its junction with gaster (Figure 663) **3**

   Postpetiole small and compact (about as high as long), not constricted towards its junction with gaster (Figure 664) **4**

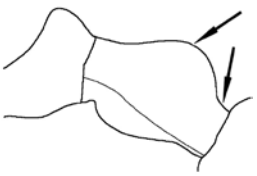

Figure 663

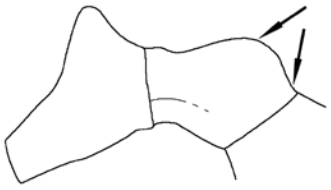

Figure 664

3. Promesonotum in profile forming a smooth curve (Figure 665) ..... ***P. megacephala* (Fabricius)**

   Promesonotum with protuberance in mesonotal region (Figure 666) ..... ***Pheidole teneriffana* Forel**

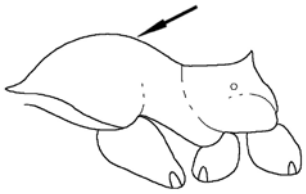

Figure 665

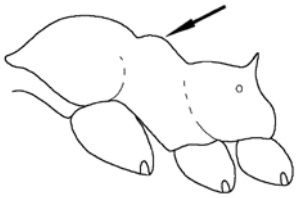

Figure 666

4. Eye markedly elongate anteriad, separated from mandibular insertion by much less than its own length (Figure 667) ..... ***Pheidole* sp. JDM 164**

   Eye more-or-less ovate, only slightly elongate anteriad, separated from mandibular insertion by at least its own length (Figure 668) **5**

Figure 667

Figure 668

5. Sculpture of vertex of head and dorsum of promesonotum with distinct, large reticulations, otherwise smooth and shining.. ..... ***Pheidole* sp. JDM 558**

   Sculpture of vertex of head usually longitudinally striate, striate-shagreenate or lacking; dorsum of promesonotum lacking large reticulations **6**

6. Bright yellow species; frons of head capsule smooth and shining and longitudinal striae virtually absent past level of eye and frons not shagreenate ..... ***Pheidole* sp. JDM 338**

   Species usually darker with fine but distinct longitudinal striae; if light in colour then frons of head capsule shagreenate **7**

7. Colour dark chocolate; promesonotum completely shagreenate without shining patches or obvious striae ..... ***Pheidole* sp. JDM 871**

   Either colour lighter, or promesonotum with striae or shining patches **8**

8. Small species (HW ≈ 0.5 mm) ..... ***Pheidole* sp. near variabilis Mayr (JDM 177)**

   Larger species (HW ≥ 0.8 mm) **9**

9. Mesosoma yellowish, head and gaster light brown ..... ***P. ampla* Forel**

   Species brown, reddish brown with darker head and gaster, or chocolate **10**

10. Scapes very long, exceeding vertex of head by about a third of their length, extensive shagreenate sculpture on mesosoma (Figure 669) ..... ***P. hartmeyeri* Forel**

    Scapes much shorter, barely exceeding vertex of head; shagreenate sculpture less extensive on mesosoma, especially promesonotum (Figure 670) **11**

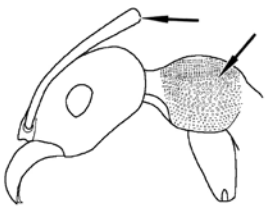

Figure 669

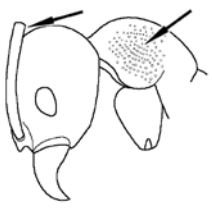

Figure 670

11. Eye oblique, smaller (eye width 0.25 < length of side of head capsule) (Figure 671).....
.....***P. ampla perthensis* Crawley**

Eye positioned along midline of head capsule, larger (eye width ≈ 1/3 length of side of head capsule) (Figure 672)...***Pheidole* sp. JDM 1138**

Figure 671

Figure 672

Pheidole

A combination of a 12-segmented antenna, a three-segmented club, and the propodeum compressed to well below the level of the anterior promesonotum serve to distinguish *Pheidole* from other myrmicines. Generically, these ants are called 'big-headed ants', but the term can be confusing since it is also applied specifically to the pest species *Pheidole megacephala* (Fabricius), particularly outside of Australia. The worker caste is dimorphic, major workers having huge heads. Despite the fact that *Pheidole* species are generally very common throughout Australia, in the SWBP they can be surprisingly scarce in some tracts of native vegetation (e.g. on parts of the sand-plain near Eneabba). On other sites, several species may be found foraging together. Possibly, their virtual absence in some locations reflects the lack of suitable seeds, these ants taking a lot of vegetable matter as well as being general predators and scavengers (Briese and Macauley 1981). The author notes that one large arid and semi-arid area species, *Pheidole hartmeyeri* Forel, typically surrounds its nest with seed husks, mainly those of saltbush (*Atriplex*).

The SWBP does not have a speciose *Pheidole* fauna. Just 13 species are currently identified for the Province, while the status of two other described species has yet to be clarified. Of the 13 species known to occur in the SWBP, three are introduced. The most significant of these is the notorious coastal brown or big-headed ant (*Pheidole megacephala* (Fabricius)). Though identified from stray specimens (possibly in cargo) much earlier, the pest first made its presence known as a colonist in South Perth in 1942 (May and Heterick 2000). The ant now occupies much of the metropolitan area, and is probably assisting, along with the Argentine Ant (*Linepithema humile* (Mayr)), with the ongoing demise of Perth's native ant fauna (Heterick *et al*. 2002). This pest can also be seen in many cities and towns throughout WA. *Pheidole teneriffana* Forel, another African tramp species, also found in the southern USA and the UK, as well as the Caribbean, and the Mediterranean, is currently only confirmed for the Fremantle area, but ants of similar appearance have been seen in Claremont (a Perth suburb) and the wheatbelt town of York. Unlike the case with most nests of *P. megacephala*, this species has diurnally active workers. *Pheidole teneriffana* has not previously been reported from Australia. *Pheidole* sp. JDM 874 is also believed to have been introduced to the Perth metropolitan area and to Adelaide. The provenance of *Pheidole* sp. JDM 874 is possibly southeast Asia, or even tropical Australia, where similar species occur.

Pheidole ampla perthensis Crawley is the native species most commonly seen in the south-west corner of the State. The minor workers of this and related forms are difficult to determine with accuracy, many having a relatively uniform morphology. The major workers, however, appear to have more taxonomically useful characters. One of these characters is the morphology of small teeth or denticles to be found on the anteroventral margin of the head capsule (Ogata and Yamane 2003). However, in the case of *P. ampla perthensis*, it is the horizontal ridges near the margin of the vertex in majors that serve to distinguish the ant from a lighter-coloured species, *Pheidole* sp. JDM 75, in which the head capsule is smooth. (The latter ant probably represents *Pheidole ampla* Forel, which was described from material collected on East Wallaby Is. in the Houtman Abrolhos. In support of this notion, worker 'topotypes' in the MCZ collected by Wheeler from the same locality as the type material of *P. ampla* and identified as such are morphologically inseparable from *Pheidole* sp. JDM 75.) *Pheidole ampla perthensis* is quite widespread in the SWBP. Minor workers of *Pheidole ampla perthensis* are very variable in sculpture, those from inland regions having a much smoother, shinier promesonotum compared with ants from mesic coastal or southern, forested areas. In the latter, the promesonotum is duller with varying degrees of microreticulation, along with small striae. Intermediate forms connect the two extremes.

Minor workers near this species from the Westonia region have rather larger and more protruding eyes, and two major workers appear to lack the small anteroventral teeth on the underside of the head capsule found in *P. ampla perthensis*.

More material is needed to determine whether these ants are another species in the complex or just a variant of *P. ampla perthensis*. For the present, the Curtin holdings of this ant have been assigned provisional separate status as *Pheidole* sp. JDM 1138.

Pheidole bos Forel was described from a worker collected in Fremantle. *Pheidole* sp. JDM 164 agrees with the description of *P. bos*, but as I have not inspected type specimens of the latter, the identity of the former must remain problematic for the present. *Pheidole* sp. JDM 164 is a generally small species, common throughout the SWBP. Major workers have a rugose vertex, and minor workers have an elongate eye. *Pheidole* sp. near *variabilis* Mayr is also common in the SWBP. Minor workers of this species are minute, with ovate eyes. The major worker, which can vary considerably in size, has a distinctly elongate head capsule. *Pheidole* sp. JDM 338 is a small, yellow, northern species.

Pheidole hartmeyeri Forel is the largest *Pheidole* species found in the SWBP. The major workers are medium-sized ants with large, elongate mandibles. In another large, semi-arid species, *Pheidole* sp. JDM 558, the major mandible is more compact and square in shape. The sculpture of the head capsule serves to distinguish the minor workers of both species, this being reticulate in *Pheidole* sp. JDM 558, and shagreenate in *P. hartmeyeri*. *Pheidole* sp. JDM 871 and *Pheidole* sp. JDM 873 are unremarkable small brown ants. In both cases the major worker is unknown. *Pheidole* sp. JDM 871 has been collected at Kadji Lake in the northern wheatbelt, and, outside of the SWBP, near Kalgoorlie and in the Pilbara (Ethel Creek and other locations). *Pheidole* sp. JDM 873 is known from one specimen collected near Balladonia, just north of the SWBP.

Podomyrma

1. First gastral tergite with paired white maculae... ..... ***P. adelaidae*** **(F. Smith)**

   First gastral tergite of uniform colour **2**

2. Propodeum unarmed **3**

   Propodeum armed with spines or teeth at its posterior angles **6**

3. Mesosoma punctate, punctures well separated and deep; erect setae on body surfaces very sparse, lacking on gaster..... ..... ***P. clarki*** **(Crawley)**

   Mesosoma longitudinally striate or striate-reticulate; erect setae abundant and well-distributed on body surfaces, including gaster..... **4**

4. Frons of head capsule with a few longitudinal striae, with large unsculptured space between them (Figure 673) .... ***P. macrophthalma*** **Viehmeyer (pt.)**

   Frons of head capsule with many close, parallel, longitudinal striae (e.g. Figure 674) **5**

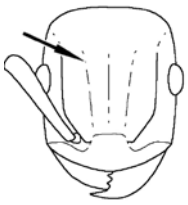

Figure 673

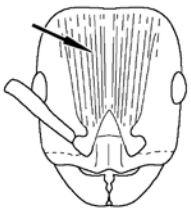

Figure 674

5. Humeri of promesonotum smoothly rounded (Figure 675); promesonotum longitudinally striate ..... ***P. elongata*** **Forel**

   Humeri of promesonotum each armed with a small denticle (Figure 676); promesonotum striate-reticulate .... ***P. chasei*** **Forel**

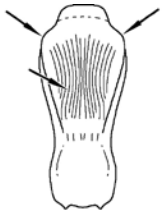

Figure 675

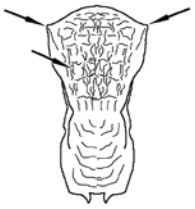

Figure 676

6. Node with a dorsal transverse ridge only, spines or denticles lacking (Figure 677)..... **7**

   Node armed with paired spines directed dorsally or laterally (Figure 678)..... **8**

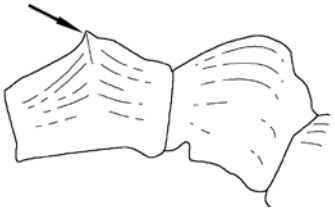

Figure 677

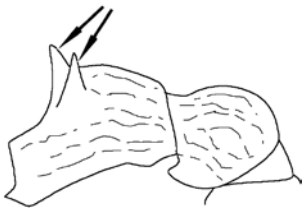

Figure 678

7. Top of vertex and dorsum of promesonotal sector areolate (Figure 679) ..... ***P. christae*** **(Forel) (pt.)**

   Top of vertex and dorsum of promesonotal sector mainly smooth and shining with a few longitudinal striae (Figure 680) ..... ***P. macrophthalma*** **Viehmeyer (pt.)**

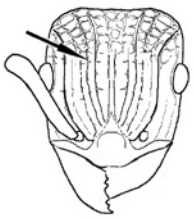

Figure 679

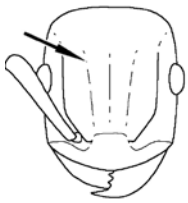

Figure 680

8. First gastral tergite with many erect setae; promesonotum deeply foveate-striate; viewed from behind, paired denticles on node directed obliquely upward at angle of 45°>..... **9**

   First gastral tergite with at most a pair of erect setae; promesonotal sculpture not as above; viewed from behind, paired denticles on node directed laterally at angle of <30°..... **10**

9. Each side of dorsum of promesonotum (just posteriad of mesonotal suture) armed with a small, sharp tooth directed vertically (Figure 681) ..... ***P. libra*** **(Forel)**

   Dorsum of promesonotum unarmed (Figure 682) ..... ***P. christae*** **(Forel) (pt.)**

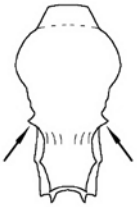

Figure 681

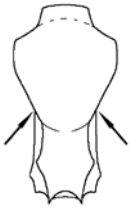

Figure 682

10. Head longitudinally striate (Figure 683); dorsum of promesonotum matt, dull ..... ***P. ferruginea*** **(Clark)**

    Head with transverse striae interconnecting with longitudinal striae, forming a semi-reticulate pattern (Figure 684); dorsum of promesonotum almost smooth, shining ..... ***Podomyrma*** **sp. JDM 997**

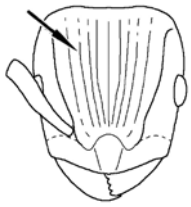

Figure 683

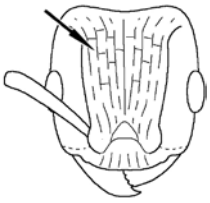

Figure 684

The genus *Podomyrma* is one of the few genera of SWBP ants that is principally arboreal. Many of the group are attractive medium-sized ants with rather long, low petioles, which are sometimes armed with small spines or denticles. The swollen tibiae, the 11-segmented antenna and usually the form of the petiole distinguish this genus from similar-looking myrmicines. Of the local myrmicine fauna, only *Adlerzia* and some *Monomorium* possess the same number of antennal segments. However, neither of these has the swollen tibiae of *Podomyrma*. *Podomyrma* nest in tree holes, existing beetle tunnels or in bark layers at the bases of trees. They

are probably primarily predators, but at least one species is known to tend Hemiptera (Gullan and Stewart 1996).

Nine species of *Podomyrma* can be found in the SWBP. Of these *Podomyrma adelaidae* (F. Smith) is the best known, and is widespread throughout temperate Australia and also the Kimberley region. A pair of white markings on the basal gastral tergite renders this ant unmistakeable. *Podomyrma adelaidae* workers can typically be seen foraging on the trunks of eucalypts, particularly smooth-barked eucalypts. The propodeum is unarmed in *Podomyrma clarki* (Crawley), *Podomyrma elongata* Forel and *Podomyrma chasei* Forel. All of these ants can be found in the vicinity of Perth. The largely glabrous *Podomyrma clarki* is probably the rarest of the trio, but has been recorded from coastal woodland in the Fremantle district, in Bold Park and from Eneabba. *Podomyrma chasei* resembles *P. adelaidae* but lacks the pair of white maculae. The promesonotum is longitudinally striate in *Podomyrma elongata*, which is also found on the east coast of Australia.

Podomyrma macrophthalma Viehmeyer is a very small *Crematogaster*-like species usually lacking spines or denticles on the node. This ant is occasionally seen in suburban Perth on trees or wooden fence-lines, and is also known from NSW. One specimen, taken by DEC researchers from the Nuyts Wilderness Area, near Walpole, and referred tentatively to this species, is slightly aberrant and has small, lateral teeth on the node. The propodeal angles in this ant are unarmed (normally small denticles are present). *Podomyrma libra* (Forel) is an attractive orange ant with a pair of semi-erect denticles on the petiolar node and small, upright teeth near the promesonotal suture. The ant has been recovered from bark debris at the base of eucalypts and on Wandoo trunks in drier woodlands of the SWBP. The very similar *Podomyrma christae* (Forel) lacks the promesonotal teeth. One example of *P. christae* recently recovered from a pitfall trap from Eneabba lacks teeth on the node, but is in all other respects identical to typical workers of this species. The denticles on the petiolar node are directed more on a horizontal plane in *Podomyrma ferruginea* (Clark) and *Podomyrma* sp. JDM 997. The former has been collected on powder-bark Wandoo trunks at Dryandra, and is occasionally found in the Perth region. The latter has been collected from marri in the Darling Range behind Perth, and also in a pitfall-trap at Mt Barker, on the south coast.

Rogeria

1. In dorsal view, dorsum of node and post-petiole approximately the same size, at most, postpetiole fractionally broader than node (Figure 685); smaller species (HW ≈ 0.5 mm) (widespread) ..... ***R. flavigaster*** **(Clark)**

In dorsal view, dorsum of postpetiole much larger than that of node, postpetiole distinctly broader than node (Figure 686); larger species (HW ≈ 1 mm) (localized, Swan Coastal Plain northwards) ..... ***Rogeria*** **sp. JDM 369**

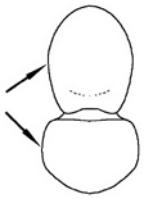

Figure 685

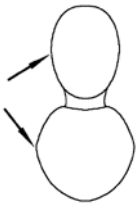

Figure 686

Superficially these ants could be mistaken for *Tetramorium* or the *Monomorium longinode* species-group. However, they lack the apical or preapical appendage on the sting and the clypeal ridge before the antennal insertions found in *Tetramorium*, and the anteromedial clypeal setae of *Monomorium*. Members of the *Monomorium longinode* group also lack the propodeal spines found in this group. Apart from the fact that the two species recognized here are terrestrial foragers, nothing more is known of their biology.

The single described species, *Rogeria flavigaster* (Clark), has had a chequered taxonomic history. Originally the species was placed in *Xiphomyrmex*, now a synonym of *Tetramorium*, but was transferred to *Chelaner* by Bolton (1976). In 1987, *Chelaner* became a junior synonym of *Monomorium* (Bolton 1987). The taxon was removed out of the genus *Monomorium* by Heterick (2001), and treated as *incertae sedis*. The species is here provisionally placed under *Rogeria*. The reason for my decision is as follows: based on the worker characters, the taxon can be considered as belonging to Tribe Stenammini according to Bolton's diagnosis for the group (Bolton 2003). Furthermore, the worker antennomere and dental counts, and palp and spur formulae also agree with the corresponding data for *Rogeria* in Appendix 2 from the same work. However, more careful analysis is required, including examination of the reproductives, for this placement to be confirmed. *Rogeria flavigaster* is quite common in woodlands throughout temperate Australia, and can be found

in newly developed suburbs in Perth, although it appears unable to persist over time in built up areas. The second species is rather larger than *R. flavigaster* and also differs in the proportions of the petiolar node and postpetiole. The latter ant appears to have a limited range in woodland and heathland north of Perth to about Geraldton.

Solenopsis

1. Eye absent or represented by a minute, pigmented speck (Figure 687)..... ..... ***S. belisarius*** **Forel**

   Eye small but distinct (Figure 688) ....***S. clarki*** **Crawley**

Figure 687

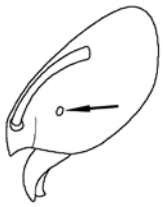

Figure 688

Endemic Australian *Solenopsis* species all belong to the subgenus *Diplorhoptrum* (Andersen 2000), commonly known as 'thief ants'. These are characteristically very small to minute yellow, small-eyed ants that are known to be lestobiotic, i.e. they steal the prey or brood of other ants or termites. The 10-segmented antenna with a two-segmented club will immediately separate these small ants from *Monomorium* species, with which they are easily confused by the novice, and the median clypeal seta distinguishes them from *Carebara* minor workers.

Two species of *Solenopsis* occur in the SWBP. *Solenopsis clarki* Crawley is widespread in the SWBP, and may extend much further north (what appears to be the same species also occurs in the Kimberley region). This species shows monophasic allometric differences between smaller minor workers and larger major workers. The two sub-castes possess a similar morphology but the major worker is larger and darker in colour with a broader head capsule. Stray workers or nests of *Solenopsis clarki* are often found when galleries in the nests of other ant species are excavated. Nests can also be found under rocks and pieces of wood or bark. *Solenopsis belisarius* Crawley has vestigial eyes and strongly resembles *Monomorium hildebrandti* group sp. JDM 438. This ant appears to be restricted to the mid-north, collections centring on and around the Geraldton and Carnarvon regions.

Officers of the WA Department of Agriculture have recently intercepted an introduced member of a quite different subgenus, to which belong the Neotropical fire ants, in Perth markets. This is *Solenopsis geminata* (Fabricius), a potential threat to the environment and to agriculture should it become established in the SWBP. The ant has colonised parts of northern Australia, and may occur in the north of this State.

Strumigenys

1. Setae on promesonotum thickened and inwardly curved, like those on head capsule (Figure 689) .....***S. quinquedentata*** **Crawley**

   Setae on promesonotum normal, erect, unlike thickened, curved setae on head capsule (Figure 690) .....***S. perplexa*** **(F. Smith)**

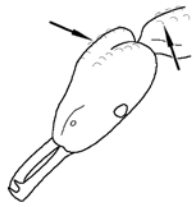

Figure 689

Figure 690

Ants of the two *Strumigenys* species found in the SWBP are the most common of the Dacetini occurring here. The four or six-segmented antenna, and the thin and elongate mandibles serve to categorize the genus. In the two SWBP species, spongiform cuticle surrounds the petiole, postpetiole and the lower part of the gaster. *Strumigenys* species are either specialist predators of Collembola, or take a range of small arthropods (Shattuck 1999). The genus has recently been revised by Bolton (2000).

Strumigenys quinquedentata Crawley has flat, spatulate setae on the mesosoma, and is quite common in the SW corner of the State, occasionally being found in gardens in suburban Perth. In sandy soils, several entrance holes may be found close together with a moderate amount of excavated

soil surrounding each of them. The emerging ants move slowly and deliberately. Though not officially listed for WA by Bolton (2000) or Taylor and Brown (1985), *Strumigenys perplexa* (Smith) has much the same range as *S. quinquedentata* in the SWBP. This species has simple, erect setae on the dorsum of the mesosoma.

Tetramorium

1. Antenna 12-segmented (introduced spp.)..... **2**

   Antenna 11-segmented (native spp) **3**

2. Anterior margin of clypeus entire (Figure 691); smaller species (TL ≈ 2 - 2.5 mm) ....***T. simillimum*** **(F. Smith)**

   Anterior margin of clypeus notched (Figure 692); larger species (TL ≈ 3.5 - 4.5 mm) ....***T. bicarinatum*** **(Nylander)**

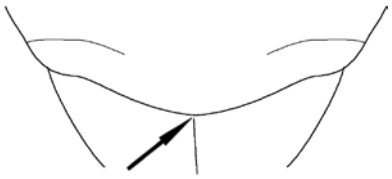

Figure 691

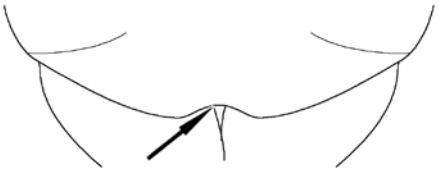

Figure 692

3. Dorsum of petiole and postpetiole smooth and shining, almost devoid of sculpture (black species).....***Tetramorium*** **sp. JDM 522**

   At least one of the nodes with distinct sculpture (species with some colour)..... **4**

4. Propodeum unarmed or with vestigial denticles at posterior angles..... .....***Tetramorium*** **sp. JDM 515**

   Propodeum armed with moderately stout spines..... **5**

5. In profile, mesosoma smoothly curved, without a hint of a metanotal groove (Figure 693a); dorsum of petiolar node large and triangular in cross section (Figure 693b) ....***Tetramorium*** **sp. JDM 1007**

   In profile, promesonotum gradually declining towards propodeum, not smoothly rounded (Figure 694); metanotal groove usually indicated by shallow depression or lateral indentations; dorsum of petiolar node smaller and rectangular in cross-section (e.g. Figure 695) **6**

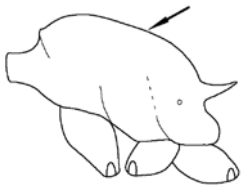

Figure 693a

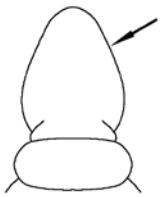

Figure 693b

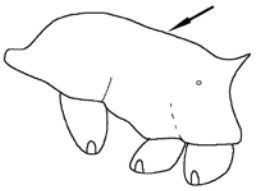

Figure 694

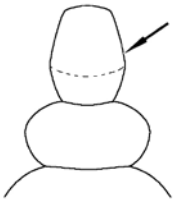

Figure 695

6. Antennal scrobes distinctly continuing to or close to vertex of head, sculpture within scrobes often reduced to fine punctation with longitudinal rugulae absent or vestigial (Figure 696) **7**

   Antennal scrobes not continuing beyond eye, often indistinct; sculpture within scrobes mostly similar to rest of vertex with longitudinal rugulae distinct (Figure 697)..... ..... **10**

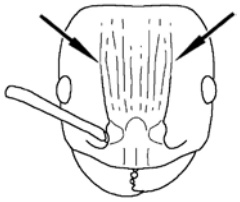

Figure 696

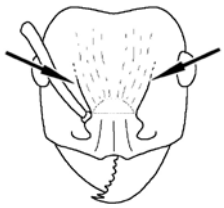

Figure 697

7. Eye very large (ocular diameter > 0.3 x HW); eye situated behind midpoint of head (Figure 698) ..... ***T. megalops*** **Bolton**

   Eye smaller (ocular diameter < 0.3 x HW); eye situated at or close to midlength of head capsule (Figure 699) **8**

Figure 698

Figure 699

8. Brown species ....***Tetramorium*** **sp. JDM 884**

   Concolorous orange, or orange with darker head capsule **9**

9. Clypeus not transversely concave or with median notch; viewed from above, dorsum of node trapezoid in shape (Figure 700), the anterior margin shorter than the posterior margin, and the dorsal surface distinctly longer than broad; base of gaster usually sculptured with fine, parallel, longitudinal striolae or finely microreticulate..... .....***T. striolatum*** **Viehmeyer**

   Clypeus transversely concave or with median notch; viewed from above, dorsum of node square, about as wide as long (Figure 701); base of gaster either smooth and shining or with faint, superficial microreticulation..... .....***T. viehmeyeri*** **Forel**

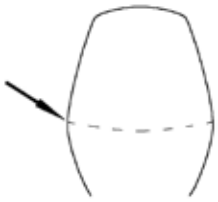

Figure 700

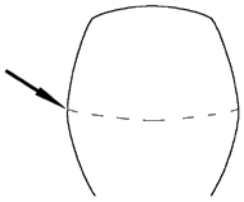

Figure 701

10. Postpetiolar dorsum smooth and shining; head, mesosoma and nodes reddish-orange, gaster and appendages yellow ....***Tetramorium*** **sp. JDM 1072**

    Postpetiolar dorsum sculptured; often bicoloured black- or brown-and-yellow, or reddish-brown-and-orange, in light coloured forms coxae nearly always darker than mesosoma (possibly two or more species involved here).. .....***T. impressum*** **(Viehmeyer)**

The local *Tetramorium* species are difficult to separate, most of the taxa in the SWBP belonging to the *T. striolatum* species-group (*sensu* Bolton 1977). All of the local native species have 11-segmented antennae. Two introduced species found in the Province can immediately be recognized by their 12-segmented antennae. Workers of the genus *Tetramorium* may be confused with large, orange or reddish *Monomorium* in the *Chelaner* group of taxa, but have an apical or preapical appendage on the sting, which is lacking in *Monomorium*. They also have the clypeal region just below the antennal sockets raised into a sharp ridge. *Tetramorium* are general scavengers, predators, and, in the case of some species, seed collectors (Briese and Macauley 1981). *Tetramorium impressum* (Viehmeyer) is common in newly rehabilitated sand mines (pers. obs.; also mentioned but not named in Bisevac and Majer 1999) where it may collect seeds of grasses or herbs. This species is much less abundant in sites representing later successional stages.

Some 10 taxa are tentatively recognized in the SWBP, but the taxonomic limits of *Tetramorium striolatum* Viehmeyer and its close allies are difficult to determine, so the final species count may be slightly different. Of those species that can be recognized without difficulty, the two exotic taxa, *Tetramorium simillimum* (F. Smith) and *Tetramorium bicarinatum* (Nylander) are common in Perth gardens, and have a wide distribution throughout

Australia. (The range for both species given by Brown and Taylor (1985) is probably understated; e.g. I have seen *T. bicarinatum* in Port Augusta, SA, although this State is not listed by the former authors.) Unlike some other exotic myrmicines in Australia, these two species do not seem to adversely affect the native ant fauna.

Tetramorium sp. JDM 1007 cannot be mistaken for any other *Tetramorium* in the SWBP: it appears to belong to the tropical *T. tortuosum* species-group, and is known from a handful of records from the Shark Bay region. One related species occurs in the north Kimberley and another (DEC material) has been collected in the Pilbara. Of the remainder of the *Tetramorium* species, all are from the *T. striolatum* species-group. The jet-black species *Tetramorium* sp. JDM 522 is known only from undisturbed heathland in a mining lease at Eneabba and from one series from Kensington bushland, in Perth. At Eneabba, even the oldest rehabilitated sites nearby do not support the ant. *Tetramorium* sp. JDM 515, also known from Eneabba as well as Nanga Stn., characteristically lacks strong teeth or denticles on the propodeal angles.

The remaining taxa are somewhat more difficult to distinguish. *Tetramorium megalops* Bolton, with large eyes, and *Tetramorium viehmeyeri* Forel, with a supposedly distinctive clypeal sculpture, are two semi-arid species. Type specimens of *T. megalops*, which I have seen in the MCZ, are not remarkable compared with other *Tetramorium* and the largish eye, though not the broad node, is shared with *T. viehmeyeri*. The type material for *T. megalops* was collected to the north of the SWBP, and the species may not occur in that Province, but is included in the key in the event that some populations may be found on the fringes of the Mallee Botanical District of the SWBP.

Tetramorium viehmeyeri, to my mind, is somewhat problematic. The holotype female may well have been destroyed in WW II (Taylor and Brown 1985). I have only seen the (unfortunately headless!) dealated queen holotype of *Tetramorium viehmeyeri venustus* Wheeler (WAM). This taxon was synonymised with *T. viehmeyeri* by Bolton (1977). However, three worker specimens on the same pin from the Mt Magnet area (in the ANIC Collection), identified by R. W. Taylor as *T. viehmeyeri*, do not show the supposedly characteristic clypeal feature very well (i.e. one worker does, two do not). I suspect the structure of the clypeus may be variable. However, in the event that the acquisition of more material may illuminate this problem, I am retaining the distinctive nature of the clypeus in the key as a diagnostic feature for the species. In other respects, what I think is likely to be *T. viehmeyeri* has dark red workers with lighter-coloured gasters. The workers are larger than those of *T. striolatum* and, when seen in profile, have a narrower petiolar node that is as higher than wide. Nominal *T. viehmeyeri* in the Curtin Ant Collection have mostly been collected in the Newman area in the Pilbara, but several specimens of this species have been collected at Westonia within the SWBP.

The synonymy of the supposed subspecies *Tetramorium viehmeyeri venustus* with the type species is questionable, not least because of the different phytogeographic region represented (the Swan Coastal Plain in the South-West Botanical Province versus the semi-arid Murchison in the Eremaean Botanical Province). No workers belonging to this subspecies ever appear to have been collected, *T. viehmeyeri venustus* having been described from a single, dealated queen. This ant is possibly something else, the most probable candidate being *T. impressum* (queens and workers of which also share the narrow petiole and often an anteromedial clypeal notch with *T. viehmeyeri*, the bicoloured appearance of many *T. impressum* specimens also agreeing with Wheeler's (1934) description). Since the whereabouts of the type specimen of *Tetramorium viehmeyeri venustus* are now known, this type can be compared with indubitable queen material of *Tetramorium viehmeyeri*, should the identity of such material be established.

Tetramorium sp. JDM 884, in common with *T. viehmeyeri* and *T. striolatum*, also possesses distinct, though shallow, antennal scrobes that continue to near the vertex of the head capsule. Within the scrobe, the sculpture of this species and *T. striolatum* is usually reduced (less so in large specimens of *T. striolatum*). Tetramorium sp. JDM 884, however, is uniformly brown (*T. striolatum* is orange or reddish-orange). *Tetramorium striolatum* here includes reddish specimens with a finely striolate basal sector of the first gastral tergite, and relatively massive petiolar nodes. Some doubt is here expressed that these are conspecific with other specimens that are orange, with, at most, basally shagreenate gasters and with less massive petiolar nodes.

Workers of *Tetramorium impressum* (Viehmeyer) and *Tetramorium* sp. JDM 1072 do not possess a distinct antennal scrobe beyond the level of the eye. *Tetramorium impressum* probably should be regarded as a species complex. Workers with black foreparts, yellow gaster and deeply impressed striae may well be genetically distinct from those that are reddish and more finely striate. However, the sculpture and shape of the node are identical in the two groups. Both forms also key out at *T. impressum* using Bolton's (1977) taxonomic key to Australian *Tetramorium* species. All are widespread throughout the SWBP. *Tetramorium* sp. JDM 1072 has a smooth postpetiolar dorsum, and is known only from Mt Gibson Station in the far NE of the SWBP.

APPENDIX 1

Ant species and morphospecies recorded from the SWBP (species not in Curtin Ant Collection shown in bold; introduced species indicated by *; square brackets indicate likely synonymy)

DOLICHODERINAE

Anonychomyrma

Anonychomyrma itinerans perthensis (Forel)
Anonychomyrma nitidiceps (André)
Anonychomyrma sp. JDM 835

Arnoldius

Arnoldius sp. JDM 170
Arnoldius sp. JDM 433

Doleromyrma

Doleromyrma darwiniana fida (Forel)
Doleromyrma rottnestensis (Wheeler) comb. nov.
(= *Tapinoma rottnestense* Wheeler)

Dolichoderus

Dolichoderus angusticornis Clark
Dolichoderus clusor Forel
Dolichoderus formosus Clark
Dolichoderus glauerti Wheeler
Dolichoderus nigricornis Clark
Dolichoderus occidentalis Clark
Dolichoderus reflexus Clark
Dolichoderus ypsilon Forel
Dolichoderus ypsilon niger Forel
Dolichoderus ypsilon rufotibialis Forel
Dolichoderus sp. JDM 513
Dolichoderus sp. JDM 1106

Froggattella

Froggattella kirbii Lowne
Froggattella latispina Wheeler

Iridomyrmex

Iridomyrmex agilis Forel
Iridomyrmex agilis gp. sp. JDM 85
Iridomyrmex bicknelli Emery
Iridomyrmex bicknelli brunneus Forel
[=*Iridomyrmex gracilis minor* Forel]
Iridomyrmex calvus gp. sp. JDM 1069
Iridomyrmex chasei Forel
[= *Iridomyrmex chasei yalgooensis* Forel]
Iridomyrmex chasei concolor Forel
Iridomyrmex conifer Forel
Iridomyrmex discors Forel
Iridomyrmex dromus Clark
Iridomyrmex exsanguis Forel
Iridomyrmex gracilis spurcus Wheeler
Iridomyrmex greensladei Shattuck
Iridomyrmex hartmeyeri Forel
Iridomyrmex hartmeyeri gp. sp. JDM 849
Iridomyrmex hesperus Shattuck
Iridomyrmex innocens Forel
(= *Iridomyrmex argutus* Shattuck syn. nov.)
(= *Iridomyrmex occiduus* Shattuck syn. nov.)
Iridomyrmex lividus Shattuck
Iridomyrmex mattiroloi continentis Forel
Iridomyrmex mattiroloi splendens Clark
[= *Iridomyrmex vicinus* Clark]
Iridomyrmex mattiroloi complex sp. JDM 845
Iridomyrmex notialis Shattuck
Iridomyrmex prismatis Shattuck
Iridomyrmex reburrus Shattuck
Iridomyrmex rufoniger domesticus Forel
Iridomyrmex rufoniger suchieri Forel (2 pops.)
Iridomyrmex near *rufoniger suchieri* (sp. JDM 314)
Iridomyrmex setoconus Shattuck and McMillan
Iridomyrmex turbineus Shattuck
Iridomyrmex viridiaeneus Viehmeyer
Iridomyrmex sp. JDM 133
Iridomyrmex sp. JDM 846

Linepithema

Linepithema humile (Mayr)*

Nebothriomyrmex

Nebothriomyrmex majeri Dubovikov

Ochetellus

Ochetellus glaber gp. sp. JDM 19
Ochetellus sp. JDM 851

Papyrius

Papyrius nitidus (Mayr)
Papyrius sp. JDM 666

Tapinoma

Tapinoma melanocephalum (Fabricius)*
Tapinoma sp. JDM 78
Tapinoma sp. JDM 981

Technomyrmex

Technomyrmex jocosus Forel

FORMICINAE

Acropyga

Acropyga myops Forel

Acropyga pallida (Donisthorpe)

Calomyrmex

Calomyrmex glauerti Clark

Calomyrmex ANIC 1 sp. JDM 190

Camponotus

Camponotus arcuatus complex sp. JDM 694

Camponotus armstrongi McAreavey

Camponotus capito ebenithorax Forel

Camponotus capito ebenithorax Forel ("black soma")

Camponotus ceriseipes Clark

Camponotus ceriseipes complex sp. JDM 105

Camponotus chalceus Crawley

Camponotus cinereus amperei Forel

Camponotus cinereus notterae Forel

Camponotus clarior Forel

Camponotus claripes Mayr

Camponotus claripes marcens Forel

Camponotus claripes minimus Crawley

Camponotus claripes nudimalis Forel

Camponotus claripes complex sp. JDM 430

Camponotus claripes complex sp. JDM 767

Camponotus claripes complex sp. JDM 779

Camponotus claripes gp. sp. JDM 63

Camponotus claripes gp. sp. JDM 288

Camponotus claripes gp. sp. JDM 1073

Camponotus cowlei Froggatt

Camponotus darlingtoni Wheeler

Camponotus discors Forel

Camponotus discors complex sp. JDM 772

Camponotus discors complex sp. JDM 1104

Camponotus donnellani Shattuck and McArthur

Camponotus dromas Santschi

Camponotus dryandrae McArthur and Adams

Camponotus ephippium (F. Smith)

Camponotus near *ephippium* (sp. JDM 431)

Camponotus ephippium complex sp. JDM 775

Camponotus evae zeuxis Forel

Camponotus gasseri (Forel)

Camponotus gibbinotus Forel

Camponotus gouldianus Forel

Camponotus hartogi Forel

Camponotus innexus Forel

Camponotus johnclarki Taylor

Camponotus longideclivis McArthur and Adams

Camponotus longifacies McArthur

Camponotus lownei Forel

Camponotus lownei complex sp. JDM 616

Camponotus lownei complex sp. JDM 761

Camponotus macrocephalus gp. sp. JDM 927

Camponotus michaelseni Forel

[= *C. tumidus* Crawley]

[= *M. walkeri bardus* Forel]

Camponotus molossus Forel

Camponotus nigriceps (F. Smith)

Camponotus nigroaeneus gp. sp. JDM 1031

Camponotus oetkeri Forel

Camponotus oetkeri voltai Forel

[= *C. rudis* McArthur]

Camponotus pawseyi McArthur

Camponotus perjurus Shattuck and McArthur

Camponotus pitjantjatarae McArthur

Camponotus postcornutus Clark

Camponotus prosseri Shattuck and McArthur

Camponotus prostans Forel

Camponotus rufus Crawley

Camponotus scotti McArthur

Camponotus scratius Forel

Camponotus simpsoni McArthur

Camponotus sponsorum Forel

Camponotus terebrans (Lowne)

Camponotus tricoloratus Clark

Camponotus tristis Clark

Camponotus versicolor Clark

Camponotus walkeri Forel

Camponotus whitei Wheeler

Camponotus wiederkehri Forel

Camponotus wiederkehri gp. sp. JDM 924

Camponotus wiederkehri gp. sp. JDM 925

Camponotus sp. JDM 26

Camponotus sp. JDM 695

Camponotus sp. JDM 771

Camponotus sp. JDM 1038

Melophorus

Melophorus near *aeneovirens* (sp. JDM 545)

Melophorus bruneus complex sp. JDM 520

Melophorus bruneus complex sp. JDM 600

Melophorus insularis Wheeler

Melophorus ludius sulla Forel
Melophorus majeri Agosti
Melophorus mjobergi Forel
Melophorus mjobergi complex sp. JDM 1121
Melophorus potteri McAreavey
Melophorus potteri group sp. JDM 1032
Melophorus potteri group sp. JDM 1082
Melophorus turneri Forel
Melophorus turneri perthensis Wheeler
Melophorus turneri complex sp. JDM 791
Melophorus wheeleri Forel
Melophorus wheeleri complex sp. JDM 783
Melophorus wheeleri complex sp. JDM 1077
Melophorus ANIC 3 (sp. JDM 59)
Melophorus sp. JDM 176
Melophorus sp. JDM 199
Melophorus sp. JDM 230
Melophorus sp. JDM 470
Melophorus sp. JDM 500
Melophorus sp. JDM 613
Melophorus sp. JDM 784
Melophorus sp. JDM 786
Melophorus sp. JDM 787
Melophorus sp. JDM 788
Melophorus sp. JDM 1063
Melophorus sp. JDM 1070
Melophorus sp. JDM 1102
Melophorus sp. JDM 1105
Melophorus sp. JDM 1180

Myrmecorhynchus
Myrmecorhynchus emeryi André

Notoncus
Notoncus cf. *capitatus* Forel
Notoncus enormis Szabó
Notoncus gilberti Forel
Notoncus hickmani Clark
Notoncus sp. JDM 487

Opisthopsis
Opisthopsis rufithorax Emery

Paratrechina
Paratrechina braueri glabrior (Forel)
Paratrechina longicornis (Latreille)*
Paratrechina minutula (Forel)
Paratrechina minutula gp. sp. JDM 916
Paratrechina ANIC sp. 3

Plagiolepis
Plagiolepis lucidula Wheeler
Plagiolepis squamulosa Wheeler
Plagiolepis sp. JDM 189

Polyrhachis
Polyrhachis (*Campomyrma*) *femorata* F. Smith
Polyrhachis (*Campomyrma*) *gravis* Clark
Polyrhachis (*Campomyrma*) cf. *hirsuta* Mayr
Polyrhachis (*Campomyrma*) *leae* Forel
Polyrhachis (*Campomyrma*) *macropa* Wheeler
Polyrhachis (*Campomyrma*) *ops* Forel
Polyrhachis (*Campomyrma*) *phryne* Forel
Polyrhachis (*Campomyrma*) *pyrrhus* Forel
Polyrhachis (*Campomyrma*) *schwiedlandi* Forel
Polyrhachis (*Campomyrma*) *sidnica* complex sp. JDM 390
Polyrhachis (*Campomyrma*) *sidnica* complex sp. JDM 671
Polyrhachis (*Campomyrma*) sp. JDM 118
Polyrhachis (*Campomyrma*) sp. JDM 670
Polyrhachis (*Campomyrma*) sp. JDM 802
Polyrhachis (*Campomyrma*) sp. JDM 805
Polyrhachis (*Campomyrma*) sp. JDM 1010
Polyrhachis (*Chariomyrma*) *'aurea'* sp. A
Polyrhachis (*Hagiomyrma*) *ammonoeides* Roger

Prolasius
Prolasius antennatus McAreavey
Prolasius hemiflavus Clark
Prolasius reticulatus McAreavey
[= *P. wheeleri* McAreavey]
Prolasius sp. JDM 109
Prolasius sp. JDM 551
Prolasius sp. JDM 957
Prolasius sp. JDM 1044 (loan)
Prolasius sp. JDM 1120

Stigmacros
Stigmacros aemula Forel
Stigmacros anthracina McAreavey
Stigmacros brachytera McAreavey
Stigmacros elegans McAreavey
Stigmacros flava McAreavey
Stigmacros epinotalis McAreavey
Stigmacros glauerti McAreavey
[? = *Stigmacros brooksi* McAreavey]
[? = *Stigmacros castanea* McAreavey]
[? = *Stigmacros clarki* McAreavey]
[? = *Stigmacros rectangularis* McAreavey]

Stigmacros inermis McAreavey
Stigmacros occidentalis (Crawley)
Stigmacros pilosella (Viehmeyer)
Stigmacros pusilla McAreavey
Stigmacros reticulata Clark
Stigmacros spinosa McAreavey
Stigmacros stanleyi McAreavey
Stigmacros termitoxena Wheeler
Stigmacros (*Cyrtostigmacros*) sp. JDM 1067
Stigmacros sp. JDM 115
Stigmacros sp. JDM 188
Stigmacros sp. JDM 341
Stigmacros sp. JDM 396
Stigmacros sp. JDM 443
Stigmacros sp. JDM 622
Stigmacros sp. JDM 829
Stigmacros sp. JDM 831
Stigmacros sp. JDM 832
Stigmacros sp. JDM 1045 (loan)
Stigmacros sp. JDM 1046 (loan)
Stigmacros sp. JDM 1050
Stigmacros sp. JDM 1135

MYRMECIINAE

Myrmecia
Myrmecia acuta Ogata and Taylor
Myrmecia analis Mayr
Myrmecia arnoldi Clark
Myrmecia callima (Clark)
Myrmecia chasei Forel
Myrmecia clarki Crawley
Myrmecia dispar (Clark)
Myrmecia desertorum Wheeler
Myrmecia elegans (Clark)
Myrmecia erecta Ogata and Taylor
Myrmecia forceps Roger
Myrmecia fulgida Clark
Myrmecia fuscipes Clark
Myrmecia gratiosa Clark
Myrmecia inquilina Douglas and Brown
Myrmecia ludlowi Crawley
Myrmecia mandibularis F. Smith
Myrmecia michaelseni Forel
Myrmecia nigriceps Mayr
Myrmecia nigriscapa Roger
Myrmecia occidentalis (Clark)
Myrmecia pavida Clark
Myrmecia picta F. Smith
Myrmecia pilosula group
Myrmecia picticeps Clark
Myrmecia regularis Crawley
Myrmecia rubripes Clark
Myrmecia rugosa Wheeler
Myrmecia swalei Crawley
Myrmecia tepperi Emery
Myrmecia testaceipes (Clark)
Myrmecia urens complex sp. JDM 1
Myrmecia urens complex sp. JDM 71
Myrmecia urens complex sp. JDM 728
Myrmecia varians Mayr
Myrmecia vindex F. Smith

Nothomyrmecia
Nothomyrmecia macrops Clark

PSEUDOMYRMECINAE

Tetraponera
Tetraponera punctulata F. Smith

CERAPACHYINAE

Cerapachys
Cerapachys bicolor (Clark)
Cerapachys brevicollis (Clark)
Cerapachys brevis (Clark)
Cerapachys clarki (Crawley)
Cerapachys edentatus (Forel)
Cerapachys elegans (Wheeler)
Cerapachys fervidus (Wheeler)
Cerapachys flammeus (Clark)
Cerapachys gilesi (Clark)
Cerapachys greavesi (Clark)
Cerapachys incontentus Brown
Cerapachys latus Brown
Cerapachys longitarsus (Mayr)*
Cerapachys nigriventris (Clark)
Cerapachys picipes (Clark)
Cerapachys princeps (Clark)
Cerapachys punctatissimus (Clark)
Cerapachys ruficornis (Clark)
Cerapachys simmonsae (Clark)
Cerapachys sjostedti Forel
Cerapachys varians (Clark)
Cerapachys sp. JDM 574
Cerapachys sp. JDM 745
Cerapachys sp. JDM 746
Cerapachys sp. JDM 941

Cerapachys sp. JDM 1040
Cerapachys sp. JDM 1103

Sphinctomyrmex
Sphinctomyrmex emeryi Forel
Sphinctomyrmex imbecilis Forel
Sphinctomyrmex occidentalis (Clark)

LEPTANILLINAE

Leptanilla (males in Collection)
Leptanilla swani Wheeler (worker)

AMBLYOPONINAE

Amblyopone
Amblyopone aberrans Wheeler
Amblyopone australis Erichson
Amblyopone clarki Wheeler
Amblyopone glauerti (Clark)
Amblyopone michaelseni Forel

PONERINAE

Anochetus
Anochetus armstrongi McAreavey

Hypoponera
Hypoponera congrua (Wheeler)
Hypoponera eduardi (Forel)*

Leptogenys
Leptogenys clarki Wheeler
Leptogenys darlingtoni Wheeler
Leptogenys neutralis Forel

Myopias
Myopias tasmaniensis Wheeler

Odontomachus
Odontomachus ruficeps Smith

Pachycondyla
Pachycondyla (*Bothro.*) *denticulata* gp. sp. JDM 730
Pachycondyla (*Bothroponera*) *regularis* Forel
Pachycondyla (*Brachyponer*a) *lutea* (Mayr)
Pachycondyla (*Trachy.*) *rufonigra* (Clark)
(= *P. clarki* (Wheeler) syn. rev.)

Platythyrea
Platythyrea brunnipes (Clark)
Platythyrea dentinodis (Clark)
Platythyrea micans (Clark)
Platythyrea parallela (F. Smith)
Platythyrea turneri Forel

Ponera
Ponera sp. JDM 1122

ECTATOMMINAE

Rhytidoponera
Rhytidoponera anceps Emery
Rhytidoponera anceps group sp. ANIC 44
Rhytidoponera crassinoda (Forel)
Rhytidoponera dubia gp. sp. JDM 904
Rhytidoponera flavicornis Clark
Rhytidoponera foveolata Crawley
Rhytidoponera inornata Crawley
Rhytidoponera levior Crawley
Rhytidoponera mayri (Emery)
Rhytidoponera metallica (F. Smith)
Rhytidoponera metallica gp. sp. JDM 1097
Rhytidoponera metallica gp. sp. JDM 1098
Rhytidoponera micans Clark
Rhytidoponera micans gp. sp. JDM 576
Rhytidoponera punctigera Crawley
Rhytidoponera rufonigra Clark
Rhytidoponera taurus (Forel)
Rhytidoponera tyloxys Brown and Douglas
Rhytidoponera violacea (Forel)
Rhytidoponera sp. JDM 736

HETEROPONERINAE

Heteroponera
Heteroponera imbellis (Emery)
Heteroponera sp. JDM 92
Heteroponera sp. JDM 732

PROCERATIINAE

Discothyrea
Discothyrea crassicornis Clark
Discothyrea turtoni Clark

MYRMICINAE

Adlerzia
Adlerzia froggatti (Forel)

Anisopheidole
Anisopheidole antipodum (F. Smith)

Aphaenogaster
Aphaenogaster poultoni Crawley

Aphaenogaster sp. JDM 854

Cardiocondyla
Cardiocondyla 'nuda' (Mayr)*

Carebara
Carebara sp. JDM 440

Colobostruma
Colobostruma australis Brown
Colobostruma cerornata Brown
Colobostruma elliotti (Clark)
Colobostruma froggatti (Forel)
Colobostruma mellea Shattuck
Colobostruma nancyae Brown
Colobostruma papulata Brown

Crematogaster
Crematogaster cornigera gp. sp. JDM 126
Crematogaster dispar Forel
Crematogaster frivola Forel
(= *Crematogaster perthensis* Crawley syn. nov.)
[=*Crematogaster frivola sculpticeps* Forel]
Crematogaster laeviceps chasei Forel
Crematogaster laeviceps gp. sp. JDM 858
Crematogaster queenslandica gilberti Forel
Crematogaster queenslandica gp. sp. JDM 428
Crematogaster queenslandica gp. sp. JDM 1099
Crematogaster sp. JDM 859

Epopostruma
Epopostruma frosti (Brown)
Epopostruma inornata Shattuck
Epopostruma kangarooensis Shattuck
Epopostruma lattini Shattuck
Epopostruma mercurii Shattuck
Epopostruma natalae Shattuck
Epopostruma quadrispinosa (Forel)
Epopostruma sowestensis Shattuck

Mayriella
Mayriella occidua Shattuck

Meranoplus
Meranoplus dimidiatus F. Smith
Meranoplus dimidiatus complex sp. JDM 423
Meranoplus diversus F. Smith
Meranoplus fenestratus F. Smith
Meranoplus ferrugineus Crawley
Meranoplus ferrugineus complex sp. JDM 267
Meranoplus ferrugineus complex sp. JDM 424
Meranoplus mcarthuri Schödl (?in SWBP)
Meranoplus oceanicus F. Smith
Meranoplus puryi complex sp. JDM 968
Meranoplus rugosus Crawley
Meranoplus rugosus gp. sp. JDM 677
Meranoplus similis Viehmeyer
Meranoplus sp. JDM 74
Meranoplus sp. JDM 491
Meranoplus sp. JDM 627
Meranoplus sp. JDM 673
Meranoplus sp. JDM 866
Meranoplus sp. JDM 922
Meranoplus sp. JDM 967
Meranoplus sp. JDM 1071
Meranoplus sp. JDM 1101
Meranoplus sp. JDM 1107

Mesostruma
Mesostruma eccentrica Taylor
Mesostruma laevigata Brown
Mesostruma loweryi Taylor
Mesostruma spinosa Shattuck

Monomorium
Monomorium aithoderum Heterick
Monomorium anthracinum Heterick
Monomorium arenarium Heterick
Monomorium bicorne Forel
Monomorium bihamatum Heterick
Monomorium brachythrix Heterick
Monomorium centrale Forel
Monomorium crinitum Heterick
Monomorium decuria Heterick
Monomorium destructor (Jerdon)*
Monomorium disetigerum Heterick
Monomorium durokoppinense Heterick
Monomorium elegantulum Heterick
Monomorium eremophilum Heterick
Monomorium euryodon Heterick
Monomorium falcatum gp. sp. JDM 1178
Monomorium fieldi Forel
Monomorium flavonigrum Heterick
Monomorium hildebrandti gp. sp. JDM 438
Monomorium lacunosum Heterick
Monomorium laeve Mayr
Monomorium leae Forel
Monomorium legulus Heterick
Monomorium longiceps Wheeler

Monomorium longinode Heterick
Monomorium majeri Heterick
Monomorium megalops Heterick
Monomorium micula Heterick
Monomorium nanum Heterick
Monomorium pharaonis (Linnaeus)*
Monomorium pubescens Heterick
Monomorium rothsteini Forel
Monomorium rufonigrum Heterick
Monomorium silaceum Heterick
Monomorium sordidum Forel
Monomorium stictonotum Heterick
Monomorium striatifrons Heterick
Monomorium sublamellatum Heterick (WAM)
Monomorium sydneyense Forel
Monomorium xantheklemma Heterick

Orectognathus
Orectognathus clarki Brown

Pheidole
Pheidole ampla Forel
Pheidole ampla perthensis Crawley
Pheidole hartmeyeri Forel
Pheidole megacephala (Fabricius)*
Pheidole teneriffana Forel*
Pheidole sp. near *variabilis* (sp. JDM 177)
Pheidole sp. JDM 164
Pheidole sp. JDM 338
Pheidole sp. JDM 558
Pheidole sp. JDM 871
Pheidole sp. JDM 873
Pheidole sp. JDM 874*
Pheidole sp. JDM 1138

Podomyrma
Podomyrma adelaidae (F. Smith)
Podomyrma chasei Forel
Podomyrma christae (Forel)
Podomyrma clarki (Crawley)
Podomyrma elongata Forel
Podomyrma ferruginea (Clark)
Podomyrma libra (Forel)
Podomyrma macrophthalma Viehmeyer
Podomyrma sp. JDM 997

Rogeria
Rogeria flavigaster (Clark)
Rogeria sp. JDM 639

Solenopsis
Solenopsis belisarius Forel
Solenopsis clarki Crawley

Strumigenys
Strumigenys perplexa (F. Smith)
Strumigenys quinquedentata Crawley

Tetramorium
Tetramorium bicarinatum (Nylander)*
Tetramorium impressum (Viehmeyer)
Tetramorium simillimum (F. Smith)*
Tetramorium striolatum Viehmeyer
Tetramorium viehmeyeri Forel
Tetramorium sp. JDM 515
Tetramorium sp. JDM 522
Tetramorium sp. JDM 884
Tetramorium sp. JDM 1007
Tetramorium sp. JDM 1072

Total 498 (incl. 32 spp. not in JDM Coll.)

STATUS UNCERTAIN

Arnoldius
Arnoldius flavus (Crawley)
Arnoldius scissor (Crawley)

Camponotus
Camponotus insipidus Forel

Iridomyrmex
Iridomyrmex bicknelli splendidus Forel
Iridomyrmex gracilis fusciventris Forel

Pheidole
Pheidole bos Forel

APPENDIX 2

Ant species and morphospecies recorded from the SWBP placed by botanical district.

(n.b. Many species occur in more than one botanical district.)

	Botanical Division						
Taxon	**AW**	**ESP**	**GS**	**JF**	**MAL**	**SWA**	**WA**
Anonychomyrma itinerans perthensis (Forel)		√	√	√		√	√
Anonychomyrma nitidiceps (André)		√		√		√	√
Anonychomyrma sp. JDM 835				√		√	
Arnoldius sp. JDM 170		√	√	√			
Arnoldius sp. JDM 433		√		√	√		
Doleromyrma darwiniana fida (Forel)	√	√	√	√	√	√	√
Doleromyrma rottnestensis (Wheeler)		√	√	√		√	
Dolichoderus angusticornis Clark	√	√					
Dolichoderus clusor Forel	√		√			√	
Dolichoderus formosus Clark	√	√	√	√	√		
Dolichoderus glauerti Wheeler	√			√		√	
***Dolichoderus nigricornis* Clark**	√						
Dolichoderus occidentalis Clark				√			
Dolichoderus reflexus Clark			√				
Dolichoderus ypsilon Forel	√	√	√	√		√	
Dolichoderus ypsilon niger Forel			√	√		√	
Dolichoderus ypsilon rufotibialis Forel		√		√			√
Dolichoderus sp. JDM 513			√		√	√	
Dolichoderus sp. JDM 1106		√	√				
Froggattella kirbii Lowne	√				√		
Froggattella latispina Wheeler		√					
Iridomyrmex agilis Forel	√				√		
Iridomyrmex agilis gp. sp. JDM 85		√	√	√		√	
Iridomyrmex bicknelli Emery	√	√	√	√	√	√	√
Iridomyrmex bicknelli brunneus Forel	√		√	√	√	√	
Iridomyrmex calvus gp. sp. JDM 1069			√	√	√		
Iridomyrmex chasei Forel	√	√	√	√	√	√	
Iridomyrmex chasei concolor Forel	√		√	√	√	√	
Iridomyrmex conifer Forel	√	√	√	√		√	√
Iridomyrmex discors Forel	√	√	√	√	√	√	√
Iridomyrmex dromus Clark	√	√	√	√	√	√	
Iridomyrmex exsanguis Forel		√	√			√	
Iridomyrmex gracilis spurcus Wheeler	√						
Iridomyrmex greensladei Shattuck	√	√	√	√	√	√	
Ir*idomyrmex hartmeyeri* Forel	√				√		
Iridomyrmex hartmeyeri gp. sp. JDM 849	√	√	√	√	√		
Iridomyrmex hesperus Shattuck					√		√
Iridomyrmex innocens Forel		√		√			√
Iridomyrmex lividus Shattuck		√			√		

Iridomyrmex mattiroloi continentis Forel	√		√		√		
Iridomyrmex mattiroloi splendens Clark	√	√	√	√	√	√	√
Iridomyrmex mattiroloi complex sp. JDM 845		√		√		√	√
Iridomyrmex notialis Shattuck		√		√		√	√
Iridomyrmex prismatis Shattuck		√					
Iridomyrmex reburrus Shattuck					√		
Iridomyrmex rufoniger domesticus Forel	√						
Iridomyrmex rufoniger suchieri Forel (pop. 1)	√	√	√	√	√	√	
Iridomyrmex rufoniger suchieri Forel (pop. 2)	√	√		√		√	√
Iridomyrmex near rufoniger suchieri Forel	√						
***Iridomyrmex setoconus* Shattuck and McMillan**		√					
Iridomyrmex turbineus Shattuck	√	√	√	√			√
Iridomyrmex viridiaeneus Viehmeyer	√				√		
Iridomyrmex sp. JDM 133			√				
Iridomyrmex sp. JDM 846	√	√	√	√	√		
Linepithema humile (Mayr)*				√		√	√
Nebothriomyrmex majeri Dubovikov		√		√		√	
Ochetellus glaber gp. sp. JDM 19		√	√	√	√	√	√
Ochetellus sp. JDM 851	√	√	√		√		
Papyrius nitidus (Mayr)	√	√		√	√	√	
Papyrius sp. JDM 666	√			√			
Tapinoma melanocephalum (Fabricius)*						√	
Tapinoma sp. JDM 78	√	√	√	√	√	√	√
Tapinoma sp. JDM 981	√			√			
Technomyrmex jocosus Forel				√		√	√
Acropyga myops Forel	√			√			
Acropyga pallida (Donisthorpe)							√
Calomyrmex glauerti Clark	√		√				
Calomyrmex ANIC 1 sp. JDM 190	√		√		√	√	
Camponotus arcuatus complex sp. JDM 694			√				
Camponotus armstrongi McAreavey	√				√		
Camponotus capito ebenithorax Forel	√	√	√	√	√	√	
Camponotus capito ebenithorax Forel (“black soma”)	√				√		
Camponotus cerisipes Clark		√			√	√	√
Camponotus ceriseipes complex sp. JDM 105		√				√	√
Camponotus chalceus Crawley	√	√	√	√	√	√	
Camponotus cinereus amperei Forel	√				√		
Camponotus cinereus notterae Forel	√			√			
Camponotus clarior Forel			√				
Camponotus claripes Mayr	√	√	√	√	√	√	
Camponotus claripes marcens Forel				√		√	
Camponotus claripes minimus Crawley	√	√	√	√	√	√	√
Camponotus claripes nudimalis Forel				√		√	√
Camponotus claripes complex sp. JDM 430				√			
Camponotus claripes complex sp. JDM 767				√			
Camponotus claripes complex sp. JDM 779	√			√			

Camponotus claripes gp. sp. JDM 63		√	√	√		√	
Camponotus claripes gp. sp. JDM 288	√			√			
Camponotus claripes gp. sp. JDM 1073				√			
Camponotus cowlei Froggatt	√	√	√	√		√	
Camponotus darlingtoni Wheeler		√	√	√		√	
Camponotus discors Forel		√					
Camponotus discors complex sp. JDM 772			√			√	
Camponotus discors complex sp. JDM 1104	√		√				
Camponotus donnellani Shattuck and McArthur					√		
Camponotus dromas Santschi	√		√	√		√	
Camponotus dryandrae McArthur and Adams	√	√	√	√	√	√	
Camponotus ephippium (F. Smith)		√	√		√		
Camponotus near *ephippium* sp. JDM 431	√						
Camponotus ephippium complex sp. JDM 775	√			√			
Camponotus evae zeuxis Forel	√	√	√		√	√	
Camponotus gasseri (Forel)	√	√	√	√	√	√	√
Camponotus gibbinotus Forel	√	√	√	√	√	√	
Camponotus gouldianus Forel		√			√		
Camponotus hartogi Forel		√					
Camponotus innexus Forel		√			√	√	√
Camponotus johnclarki Taylor				√	√	√	
Camponotus longideclivis McArthur and Adams		√			√		
Camponotus longifacies McArthur	√					√	
Camponotus lownei Forel	√	√	√		√	√	
Camponotus lownei complex sp. JDM 616	√						
Camponotus lownei complex sp. JDM 761	√		√	√		√	
Camponotus macrocephalus gp. sp. JDM 927			√			√	
Camponotus michaelseni Forel	√			√			
Camponotus molossus Forel				√		√	
Camponotus nigriceps (F. Smith)	√	√	√	√	√	√	√
Camponotus nigroaeneus gp. sp. JDM 1031				√			
Camponotus oetkeri Forel	√	√	√	√	√		
Camponotus oetkeri voltai Forel		√		√			
Camponotus pawseyi McArthur	√	√		√	√	√	
***Camponotus perjurus* Shattuck and McArthur**		√			√		
Camponotus pitjantjatarae McArthur	√		√				
Camponotus postcornutus Clark	√	√	√	√	√		
Camponotus prosseri Shattuck and McArthur	√	√		√	√	√	
Camponotus prostans Forel	√	√		√	√	√	√
Camponotus rufus Crawley			√	√		√	
Camponotus scotti McArthur				√			
Camponotus scratius Forel		√	√		√	√	
Camponotus simpsoni McArthur		√		√	√	√	
Camponotus sponsorum Forel	√		√	√	√	√	
Camponotus terebrans (Lowne)	√	√	√	√	√	√	√
Camponotus tricaloratus Clark	√		√	√			

Camponotus tristis Clark	√	√	√	√	√	√	
Camponotus versicolor Clark	√				√		
Camponotus walkeri Forel			√			√	
Camponotus whitei Wheeler	√	√	√	√		√	
Camponotus wiederkehri Forel	√	√	√				
Camponotus wiederkehri gp. sp. JDM 924			√				
Camponotus wiederkehri gp. sp. JDM 925			√				
Camponotus sp. JDM 26	√	√	√	√	√	√	
Camponotus sp. JDM 695	√						
Camponotus sp. JDM 771	√						
Camponotus sp. JDM 1038	√						
Melophorus nr. aeneovirens (Lowne) sp. JDM 545	√		√	√			
Melophorus bruneus complex sp. JDM 520	√					√	
Melophorus bruneus complex sp. JDM 600	√						
Melophorus insularis Wheeler	√	√	√	√	√	√	√
Melophorus ludius sulla Forel	√		√		√		
M*elophorus majeri* Agosti		√	√				
Melophorus mjobergi Forel	√		√	√	√	√	
Melophorus mjobergi complex sp. JDM 1121	√						
Melophorus potteri McAreavey	√		√	√			
Melophorus potteri group sp. JDM 1032	√						
Melophorus potteri group sp. JDM 1082	√						
Melophorus turneri Forel	√	√	√	√	√	√	
Melophorus turneri perthensis Wheeler	√		√	√	√	√	
Melophorus turneri complex sp. JDM 791	√		√				
Melophorus wheeleri Forel	√						
Melophorus wheeleri complex sp. JDM 783			√			√	
Melophorus wheeleri complex sp. JDM 1077	√						
Melophorus ANIC 3 (sp. JDM 59)	√		√	√	√	√	√
Melophorus sp. JDM 176	√	√	√	√	√	√	
Melophorus sp. JDM 199	√		√				
Melophorus sp. JDM 230						√	
Melophorus sp. JDM 470			√				
Melophorus sp. JDM 500			√			√	
Melophorus sp. JDM 613				√			
Melophorus sp. JDM 784	√		√	√			
Melophorus sp. JDM 786	√				√		
Melophorus sp. JDM 787	√						
Melophorus sp. JDM 788	√		√				
Melophorus sp. JDM 1063			√				
Melophorus sp. JDM 1070	√		√				
Melophorus sp. JDM 1102			√				
Melophorus sp. JDM 1105			√				
Melophorus sp. JDM 1180			√				
Myrmecorhynchus emeryi André	√			√	√		√
Notoncus cf. capitatus Forel	√					√	

Notoncus enormis Szabó	√						
Notoncus gilberti Forel	√		√	√		√	
Notoncus hickmani Clark	√		√	√		√	√
Notoncus sp. JDM 487						√	
Opisthopsis rufithorax Emery	√		√		√	√	
Paratrechina braueri glabrior (Forel)						√	
Paratrechina longicornis (Latreille)*						√	
Paratrechina minutula (Forel)						√	
Paratrechina minutula gp. sp. JDM 916	√		√	√		√	
Paratrechina ANIC sp. 3*	√					√	
Plagiolepis lucidula Wheeler						√	√
Plagiolepis squamulosa Wheeler			√	√	√	√	√
Plagiolepis sp. JDM 189		√	√	√		√	√
Polyrhachis (Campomyrma) femorata F. Smith				√		√	√
Polyrhachis (Campomyrma) gravis Clark	√	√	√				
Polyrhachis (Campomyrma) hirsuta Mayr				√			
Polyrhachis (Campomyrma) leae Forel	√	√	√	√		√	
Polyrhachis (Campomyrma) macropa Wheeler	√		√				
Polyrhachis (Campomyrma) ops Forel			?√	√			√
Polyrhachis (Campomyrma) phryne Forel	√	√		√	√	√	
Polyrhachis (Campomyrma) pyrrhus Forel	√						
Polyrhachis (Campomyrma) schwiedlandi Forel	√			√			
Polyrhachis (Campomyrma) sidnica complex sp. JDM 390				√			
Polyrhachis (Campomyrma) sidnica complex sp. JDM 671	√	√		√	√		
Polyrhachis (Campomyrma) sp. JDM 118	√	√	√	√		√	
Polyrhachis (Campomyrma) sp. JDM 670	√						
Polyrhachis (Campomyrma) sp. JDM 802				√			
Polyrhachis (Campomyrma) sp. JDM 805			√				
Polyrhachis (Campomyrma) sp. JDM 1010			√				
Polyrhachis (Chariomyrma) 'aurea' sp. A	√						
Polyrhachis (Hagiomyrma) ammonoeides Roger			√				
Prolasius antennatus McAreavey				√		√	√
Prolasius hemiflavus Clark				√			√
Prolasius reticulatus McAreavey	√	√		√		√	√
Prolasius sp. JDM 109				√			√
Prolasius sp. JDM 551	√	√			√		
Prolasius sp. JDM 957				√			
***Prolasius* sp. JDM 1044** (loan)							
Prolasius sp. JDM 1120				√		√	√
Stigmacros aemula Forel		√	√	√		√	
Stigmacros anthracina McAreavey				√			
Stigmacros brachytera McAreavey	√	√		√			
Stigmacros elegans McAreavey	√					√	
***Stigmacros flava* McAreavey**				√			
Stigmacros epinotalis McAreavey				√	√	√	√
Stigmacros glauerti McAreavey				√		√	√

Stigmacros inermis McAreavey	√			√			
Stigmacros occidentalis (Crawley)				√		√	√
Stigmacros pilosella (Viehmeyer)	√						
Stigmacros reticulata Clark			√			√	
Stigmacros spinosa McAreavey			√				
Stigmacros stanleyi McAreavey	√			√			
Stigmacros termitoxena Wheeler	√		√		√		
Stigmacros (Cyrtostigmacros) sp. JDM 1067			√			√	
Stigmacros sp. JDM 115				√		√	
Stigmacros sp. JDM 188				√			
Stigmacros sp. JDM 341	√		√	√		√	
Stigmacros sp. JDM 396	√			√			
Stigmacros sp. JDM 443	√			√			
Stigmacros sp. JDM 622	√			√			
Stigmacros sp. JDM 829	√		√				
Stigmacros sp. JDM 831				√		√	
Stigmacros sp. JDM 832				√			
Stigmacros sp. JDM 1015	√						
***Stigmacros* sp. JDM 1045** (loan)	√						
***Stigmacros* sp. JDM 1046** (loan)	√						
Stigmacros sp. JDM 1050				√		√	√
Stigmacros sp. JDM 1135	√						
***Myrmecia acuta* Ogata and Taylor**		√					
Myrmecia analis Mayr		√		√		√	√
Myrmecia arnoldi Clark		√			√		
Myrmecia callima (Clark)	√						
Myrmecia chasei Forel		√		√		√	
Myrmecia clarki Crawley				√		√	√
Myrmecia dispar (Clark)		√	√		√		
Myrmecia desertorum Wheeler	√			√		√	
Myrmecia elegans (Clark)	√	√		√	√		
Myrmecia erecta Ogata and Taylor				√	√		
Myrmecia forceps Roger	√	√					
Myrmecia fulgida Clark	√				√		
Myrmecia fuscipes Clark	√	√			√		
Myrmecia gratiosa Clark	√	√	√	√	√	√	
***Myrmecia inquilina* Douglas and Brown**	√						
Myrmecia ludlowi Crawley				√		√	√
Myrmecia mandibularis F. Smith		√		√		√	√
Myrmecia michaelseni Forel		√		√		√	√
***Myrmecia nigriceps* Mayr**	√				√	√	
Myrmecia nigriscapa Roger				√		√	
Myrmecia occidentalis (Clark)	√	√	√		√	√	
***Myrmecia pavida* Clark**	√	√		√	√		
Myrmecia picta F. Smith	√			√			
Myrmecia pilosula group		√		√	√		√

***Myrmecia picticeps* Clark**				√			
Myrmecia regularis Crawley				√			√
Myrmecia rubripes Clark	√	√				√	
Myrmecia rugosa Wheeler				√		√	√
Myrmecia swalei Crawley		√		√		√	
Myrmecia tepperi Emery	√			√			
***Myrmecia testaceipes* (Clark)**				√			
Myrmecia urens complex sp. JDM 1	√		√	√		√	√
Myrmecia urens complex sp. JDM 71		√			√	√	
Myrmecia urens complex sp. JDM 728						√	
Myrmecia varians Mayr	√		√				
Myrmecia vindex F. Smith	√	√	√	√	√	√	√
Nothomyrmecia macrops Clark		√					
Tetraponera punctulata F. Smith	√		√	√			
***Cerapachys bicolor* (Clark)**				√			
***Cerapachys brevicollis* (Clark)**				√		√	
Cerapachys brevis (Clark)	√			√	√		
Cerapachys clarki (Crawley)			√	√		√	
Cerapachys edentatus (Forel)	√			√		√	
Cerapachys elegans (Wheeler)	√						
Cerapachys fervidus (Wheeler)	√		√	√		√	
Cerapachys flammeus (Clark)				√		√	
Cerapachys gilesi (Clark)				√		√	√
Cerapachys greavesi (Clark)	√		√				
Cerapachys incontentus Brown	√			√			
Cerapachys latus Brown			√	√			
Cerapachys longitarsus (Mayr)*						√	
Cerapachys nigriventris (Clark)	√			√		√	
***Cerapachys picipes* (Clark)**	√						
Cerapachys princeps (Clark)	√		√	√		√	
Cerapachys punctatissimus (Clark)				√			
Cerapachys ruficornis (Clark)	√			√			
Cerapachys simmonsae (Clark)	√			√			√
Cerapachys sjostedti Forel			√				
Cerapachys varians (Clark)			√	√			
Cerapachys sp. JDM 574	√						
Cerapachys sp. JDM 745	√						
Cerapachys sp. JDM 746		√			√		
Cerapachys sp. JDM 941				√			
Cerapachys sp. JDM 1040				√			
Cerapachys sp. JDM 1103			√				
Sphinctomyrmex emeryi Forel			√				
Sphinctomyrmex imbecilis Forel				√			
Sphinctomyrmex occidentalis (Clark)				√			
***Leptanilla swani* Wheeler (worker)**				√			
***Amblyopone aberrans* Wheeler**				√			

Amblyopone australis Erichson				√			√
Amblyopone clarki Wheeler			√			√	
***Amblyopone glauerti* (Clark)**			√	√	√		
***Amblyopone michaelseni* Forel**				√			
Anochetus armstrongi McAreavey	√		√	√			
Hypoponera congrua (Wheeler)				√		√	√
Hypoponera eduardi (Forel)*				√		√	√
Leptogenys clarki Wheeler			√				
Leptogenys darlingtoni Wheeler	√		√				
Leptogenys neutralis Forel				√			√
Myopias tasmaniensis Wheeler							√
Odontomachus ruficeps Smith	√		√	√			
Pachycondyla (Bothroponera) denticulata gp. sp. JDM 730			√				
Pachycondyla (Bothroponera) regularis Forel	√		√				
Pachycondyla (Brachyponera) lutea (Mayr)	√	√	√	√		√	√
Pachycondyla (Trachymesopus) rufonigra (Clark)		√	√	√		√	√
Platythyrea brunnipes (Clark)						√	
Platythyrea dentinodis (Clark)	√			√			
Platythyrea micans (Clark)				√			
Platythyrea parallela (F. Smith)				√			
Platythyrea turneri Forel				√		√	√
Ponera sp. JDM 1122				√			
Rhytidoponera anceps Emery		√			√		
Rhytidponera anceps group sp. ANIC 44				√			√
Rhytidoponera crassinoda (Forel)			√		√		
Rhytidoponera flavicornis Clark	√		√				
Rhytidoponera foveolata Crawley	√			√		√	
Rhytidoponera inornata Crawley		√		√		√	√
Rhytidoponera levior Crawley			√		√	√	
Rhytidoponera mayri (Emery)	√		√				
Rhytidoponera metallica (F. Smith)	√	√	√	√	√	√	
Rhytidoponera metallica gp. sp. JDM 1097			√				
Rhytidoponera metallica gp. sp. JDM 1098			√				
Rhytidoponera micans Clark	√		√				
Rhytidoponera micans gp. sp. JDM 576	√						
Rhytidoponera punctigera Crawley				√		√	√
Rhytidoponera rufonigra Clark		√		√		√	
Rhytidoponera taurus (Forel)			√				
Rhytidoponera tyloxys Brown and Douglas			√				
Rhytidoponera violacea (Forel)	√	√	√	√	√	√	
Rhytidoponera sp. JDM 736			√				
Heteroponera imbellis (Emery)	√			√		√	
Heteroponera sp. JDM 92				√			
Heteroponera sp. JDM 732				√		√	
Discothyrea crassicornis Clark				√			√
Discothyrea turtoni Clark				√			

Adlerzia froggatti (Forel)	√		√	√		√	
Anisopheidole antipodum (F. Smith)	√		√	√	√	√	√
Aphaenogaster poultoni Crawley	√	√	√	√	√	√	
Aphaenogaster sp. JDM 854	√						
Cardiocondyla 'nuda' (Mayr)*	√	√	√	√		√	
Carebara sp. JDM 440				√			
***Colobostruma australis* Brown**		√					
Colobostruma cerornata Brown	√	√	√				
Colobostruma elliotti (Clark)			√			√	
***Colobostruma froggatti* (Forel)**			√				√
Colobostruma mellea Shattuck	√		√	√			
Colobostruma nancyae Brown	√	√		√	√	√	
***Colobostruma papulata* Brown**		√					
Crematogaster dispar Forel	√		√	√		√	√
Crematogaster frivola Forel	√	√	√		√	√	
Crematogaster laeviceps chasei Forel	√	√		√	√	√	
Crematogaster laeviceps gp. sp. JDM 858	√						
Crematogaster queenslandica gilberti Forel		√		√			
Crematogaster queenslandica gp. sp. JDM 428	√	√	√	√	√	√	
Crematogaster queenslandica gp. sp. JDM 1099	√		√				
Crematogaster sp. JDM 126	√		√	√	√	√	
Crematogaster sp. JDM 859	√		√		√		
Epopostruma frosti (Brown)	√			√	√		
Epopostruma inornata Shattuck				√		√	
Epopostruma kangarooensis Shattuck	√			√			
***Epopostruma lattini* Shattuck**			√				
***Epopostruma mercurii* Shattuck**				√		√	
Epopostruma natalae Shattuck				√			
Epopostruma quadrispinosa (Forel)	√			√			
Epopostruma sowestensis Shattuck				√			
***Mayriella occidua* Shattuck**							√
Meranoplus dimidiatus F. Smith	√		√				
Meranoplus dimidiatus complex sp. JDM 423	√		√	√	√	√	
Meranoplus diversus F. Smith			√				
Meranoplus fenestratus F. Smith	√		√	√			
Meranoplus ferrugineus Crawley	√			√		√	√
Meranoplus ferrugineus complex sp. JDM 267	√			√		√	√
Meranoplus ferrugineus complex sp. JDM 424	√		√				
***Meranoplus mcarthuri* Schödl**	√?						
Meranoplus oceanicus F. Smith		√	√	√	√		
Meranoplus rugosus Crawley	√		√	√		√	√
Meranoplus rugosus gp. sp. JDM 677	√						
Meranoplus puryi complex sp. JDM 968	√		√	√		√	
Meranoplus similis Viehmeyer			√			√	
Meranoplus sp. JDM 74	√	√	√	√	√	√	√
Meranoplus sp. JDM 491				√		√	

Meranoplus sp. JDM 627	√				√		
Meranoplus sp. JDM 673	√		√				
Meranoplus sp. JDM 866			√	√		√	
Meranoplus sp. JDM 922			√				
Meranoplus sp. JDM 967		√					
Meranoplus sp. JDM 1071			√	√			
Meranoplus sp. JDM 1101			√				
Meranoplus sp. JDM 1107	√		√	√			
Mesostruma eccentrica Taylor	√	√	√	√	√		
Mesostruma laevigata Brown	√			√	√	√	
Mesostruma loweryi Taylor			√	√			
Mesostruma spinosa Shattuck							√
Monomorium aithoderum Heterick	√	√	√	√	√	√	
Monomorium anthracinum Heterick	√				√		
Monomorium arenarium Heterick		√	√			√	√
Monomorium bicorne Forel	√		√	√			
Monomorium bihamatum Heterick	√	√				√	
Monomorium brachythrix Heterick	√		√			√	
Monomorium centrale Forel	√			√			
***Monomorium crinitum* Heterick**				√			
Monomorium decuria Heterick		√	√	√		√	√
Monomorium destructor (Jerdon)*						√	
Monomorium disetigerum Heterick	√						
Monomorium durokoppinense Heterick	√						
Monomorium elegantulum Heterick	√						
Monomorium eremophilum Heterick	√		√				
Monomorium euryodon Heterick	√	√					
Monomorium falcatum gp. sp. JDM 1178			√				
Monomorium fieldi Forel	√	√	√	√	√	√	
Monomorium flavonigrum Heterick	√		√				
Monomorium hildebrandti group sp. JDM 438				√		√	√
Monomorium lacunosum Heterick		√	√				
Monomorium laeve Mayr	√		√	√		√	
Monomorium leae Forel	√	√	√	√		√	√
Monomorium legulus Heterick	√		√		√		
Monomorium longiceps Wheeler	√	√	√	√	√	√	
Monomorium longinode Heterick	√	√		√	√	√	
***Monomorium majeri* Heterick**	√		√				
Monomorium megalops Heterick	√						
Monomorium micula Heterick	√			√			
Monomorium nanum Heterick	√		√				
Monomorium pharaonis (Linnaeus)*						√	
Monomorium pubescens Heterick			√			√	
Monomorium rothsteini Forel	√	√	√	√	√	√	
Monomorium rufonigrum Heterick	√		√			√	
Monomorium silaceum Heterick	√						

Monomorium sordidum Forel	√	√	√	√	√	√	
Monomorium stictonotum Heterick	√			√	√		
Monomorium striatifrons Heterick	√		√	√			
Monomorium sublamellatum Heterick (WAM)	√						
Monomorium sydneyense Forel	√	√	√	√	√	√	√
Monomorium xantheklemma Heterick	√						
Orectognathus clarki Brown	√			√			
Pheidole ampla Forel	√		√			√	
Pheidole ampla perthensis Crawley	√	√	√	√	√	√	√
Pheidole hartmeyeri Forel	√		√			√	
Pheidole megacephala (Fabricius)*	√	√	√	√		√	
Pheidole teneriffana Forel*						√	
Pheidole sp. *near variabilis* Mayr (JDM 177)	√	√	√	√	√	√	√
Pheidole sp. JDM 164	√	√	√	√		√	
Pheidole sp. JDM 338	√						
Pheidole sp. JDM 558	√	√			√		
Pheidole sp. JDM 871	√						
Pheidole sp. JDM 873					√		
Pheidole sp. JDM 874*						√	
Pheidole sp. JDM 1138	√						
Podomyrma adelaidae (F. Smith)	√	√	√	√	√	√	
Podomyrma chasei Forel				√		√	√
Podomyrma christae (Forel)			√	√		√	
Podomyrma clarki (Crawley)			√			√	
Podomyrma elongata Forel				√			
Podomyrma ferruginea (Clark)				√			
Podomyrma libra (Forel)	√		√				
Podomyrma macrophthalma Viehmeyer				√		√	√
Podomyrma sp. JDM 997				√			√
Rogeria flavigaster (Clark)	√			√	√	√	√
Rogeria sp. JDM 639			√			√	
Solenopsis belisarius Forel	√		√				
Solenopsis clarki Crawley	√	√	√	√		√	√
Strumigenys perplexa (F. Smith)				√		√	√
Strumigenys quinquedentata Crawley			√	√		√	√
Tetramorium bicarinatum (Nylander)*						√	
Tetramorium impressum (Viehmeyer)	√	√	√	√		√	
Tetramorium simillimum (F. Smith)*						√	
Tetramorium striolatum Viehmeyer	√		√	√	√	√	√
Tetramorium viehmeyeri Forel	√					√	
Tetramorium sp. JDM 515			√				
Tetramorium sp. JDM 522			√				
Tetramorium sp. JDM 884			√			√	
Tetramorium sp. JDM 1007			√				
Tetramorium sp. JDM 1072	√		√				
Total	**268**	**156**	**228**	**273**	**130**	**218**	**93**

GLOSSARY OF TERMS USED IN THIS WORK

Acidipore – orifice of the formic acid system, formed from the hypopygium, found only in subfamily Formicinae. The acidipore usually appears as a tiny nozzle, surrounded by a circlet of small setae, but sometimes the circlet is absent and the nozzle is concealed.

Acuminate – tapering to a slender point

Alate – possessing wings and capable of flight

Algorithm – (in computer parlance) a step-by-step procedure for solving a problem

Anepisternum – see Mesopleuron

Anteocular – situated in front of the eye(s)

Anteriad – directed or facing towards the front

Anteromedial – at the middle or midpoint of the anterior margin (e.g. of the clypeus)

Anteroventral – at the anterior end of the ventral surface

Apomorphy – an observable trait or character of an organism that is derived (or believed to be derived, since the actual ancestry of most organisms can only be inferred)

Appressed – lying flat

Areolate – covered with small depressions or cavities

Bauplan – a German concept referring to the structural essence (including architectural range and limits) of a design, often now applied to groups of organisms by taxonomists

Berlesate – the organisms collected through use of a Berlese Funnel, a device that extracts creatures from litter. (The litter is placed on top of a sieve, and the heat of a light source drives the animals in the litter to the base of the litter mass, at which time they fall through the sieve and into a preservative-filled container.)

Bicarinate – having paired carinae (i.e. ridges or keel-like crests)

Bidentate – possessing two teeth

Bifid – divided into two equal parts by a median cleft

Bilobate – divided into two lobes

Carina (pl. carinae) – a ridge or keel-like crest

Cladistic analysis – a type of analysis that examines groups of organisms related to one another by shared traits not found in their common ancestor. The various taxa involved are placed in a branching hierarchy that is visually represented in a tree-like form. Branching occurs when a new trait emerges. However, the separate units at the end of each branch, termed clades, can all be traced back to one common ancestor. This method of analysis was pioneered by Willi Hennig.

Cladogram – the tree diagram produced for the purpose of cladistic analysis. This is constructed by the manipulation of a set of organisms and their respective character traits. The construction of the tree is now almost always performed by computer.

Clypeus – a plate or sclerite fused to the lower frontal sector of the cranium of an insect. The mandibles meet just below the anterior margin of the clypeus, and the posterior clypeal margin often projects between the antennal sockets. In ants, the clypeus frequently has the superficial appearance of an upper 'lip', but it can be very reduced in some taxa. Structures (e.g. spines, teeth or ridges) on the anterior clypeal margin can prove a valuable diagnostic tool for taxonomic purposes.

Concolorous – all of the one colour

Confluent – flowing or coming together (here especially referring to lack of strongly demarcated boundaries between separate plates or sclerites)

Conspecific – belonging to the same species

Cornicle – literally 'little horn'; a short, blunt horn or rounded protuberance

Coxa (pl. coxae) – the first segment of the leg, i.e. the one that articulates with the mesosoma

Crepuscular – active in the twilight, i.e. just before daybreak or just after sunset

Cuneate – shaped like a wedge

Cuticle – the outermost layer of an animal's integument

Dealate – lacking wings (which have been shed)

Declivitous – pertaining to a downward slope; descending

Decumbent – projecting out from a surface at an angle and then bent back towards that surface

Denticle – a small tooth

Dimorphic – occurring in two morphologically distinct forms (in ants: with reference to worker subcastes – see monomorphic)

Distal – pertaining to the end of an extremity (i.e. in contrast to proximal)

DNA – shorthand for deoxyribonucleic acid, the genetic material of inheritance found in the nucleus of cellular organisms

Dorsum – a dorsal surface

Edentate – lacking teeth

Elliptical – having the shape of a flattened circle

Emarginate – having a shallow notch

Ergatogyne – a fertile female ant that is wingless and intermediate between a queen and a worker

Extralimital – occurring outside of the region of reference

Facies – (Lat.) general appearance

Femur (pl. femora) – the third segment of the leg, counting from the part (the coxa) that articulates with the mesosoma

Flagellum (pl. flagella) (= Funiculus) – the smaller segments of the antenna, excluding the scape, which together constitute the flexible part of the antenna. The flagellum may be of even diameter throughout or the terminal segments may be enlarged to form a club. Queen and worker ants in the SWBP have a minimum of three funicular segments (in some species of *Colobostruma*) and a maximum of 11 segments. Males may have as many as 12 funicular segments.

Foramen – an opening or perforation: here the opening in the head capsule that permits the entry of the aorta, foregut, neck muscles and ventral nerve cord into the mesosoma

Formenkreis – a Germanic systematics concept predating Darwin: more recently applied to a group of related species that occupy mutually exclusive geographic areas

Foveate – covered with small pits or foveae

Frass – debris produced by insects. Ant frass may include wood shavings or plant fibres, cuticle from other arthropods and excrement.

Frons – the anterior or uppermost part of the head of an insect

Frontal carinae – A pair of longitudinal ridges on the front of the head of an ant. They are variably developed in different species, and often cover or partially cover the antennal sockets.

Funiculus – see Flagellum

Gaster – the part of the abdomen behind the one or two abbreviated waist segments. Morphologically, the gaster represents abdominal segments 3–7 (waist of a single segment) or segments 4–7 (waist of two segments).

Gena (pl. genae) – area of the front of the head between the posterior margin of the clypeus and the anterior margin of the eye, and delimited medially by the antennal socket

Genotype – the specific genetic make-up of an individual organism

Glabrous – 'having no hairs' (in ants, usually meaning having no standing setae, although small, appressed setae are generally present)

Gracile – of slender and delicate appearance

Granulose – having a surface covered with granular protuberances

Habitus – (Lat.) the physical characteristics of an organism

Holotype – the single specimen or illustration of a specimen used as the basis for the name of a species

Humeral angles – the anterior, lateral margins of the pronotum or promesonotum

Hypopygium – The sternite (upper plate) of abdominal segment 7, which is the terminal visible segment of the gaster

Incertae sedis – Lat. (lit.) 'of uncertain standing'. Of uncertain taxonomic position

Infraspecific – within species

Integument – the outer covering (e.g. skin, cuticle, membrane) of an organism

Insolated – exposed to sunlight

Karyotype – the complete set of all the chromosomes of the cell of an organism

Katepisternum – see Mesopleuron

Kwongan – An ecoregion consisting of heathland, confined to South-western Australia. The Kwongan is valued chiefly for its rich endemic flora.

Labial palp – One of a pair of sensory palps located on the labium underneath the head of an insect. In ants the number of segments in each palp ranges from 1 to 6.

Labrum – A plate or sclerite that is hinged to the back of the clypeus. Usually it is folded back and down to cover the edges of the maxillae and labium when the mouthparts are not in use. In most ants the labrum is a bilobed plate that is invisible to normal view (i.e. dorsal or full-face), but it can project forward or be modified into prominent lobes in some taxa.

Lamellate – possessing a thin membrane or lamella

Lamina – a thin plate or scale

Laterad – directed or facing towards the side

Lestobiotic – refers to the habit of some small ant species of nesting in the walls of a colony of another ant species with the design of robbing the latter of brood or food stores

Lignicolous – dwelling in wood

Macula – in entomological terms, a pigmented blotch or large spot

Matt – dull; reflecting very little light

Maxillary palp – One of a pair of sensory palps located on the maxilla. In insects, each maxillary palp is to be found on the outside of a labial palp. In ants the number of maxillary palp segments ranges from 1 to 4.

Mentum – one of two parts of the labium. The presence or absence of standing J-shaped setae on the mentum in some ant species may be useful for diagnosing the species.

Mesad – directed or facing towards the middle

Mesonotum – the upper plate or tergite that constitutes part of the mesothorax in ants

Mesopleuron – this is the large side plate, or pleuron, that constitutes part of the mesothorax; it is hinged to the mesonotum. In ants, it may be entire or it may be divided by a groove into an upper sector (the anepisternum) and a lower sector (the katepisternum).

Mesosoma – the second whole segment after the head. In ants, this consists of the thorax and the first segment of the abdomen (the propodeum), which is fused to the thorax

Metanotal groove – In most ants, a transverse groove or impression representing a vestigial metanotum on the dorsal mesosoma: this feature may be absent

Metapleural gland – an exocrine gland whose orifice is found on the lower rear corner of the mesosoma, just above the hind pair of coxae. The gland is often visible under the cuticle, and the appearance of the orifice itself may have diagnostic value, even at the subfamily level. The orifice usually has guard setae around it.

Metapleuron – the side plate or pleuron belonging to the metathorax that is found below the propodeum and is fused with it.

Metathoracic – pertaining to the metathorax, the final member of the three body segments of the thorax. In ants the metathorax is fused posteriorly with the propodeum.

Micropunctate – covered with many very small punctures

Microreticulate – covered with a very fine network of ridges (striolae)

Mitochondria – an organelle found outside the nucleus in most eukaryotes, it produces energy for the cell through cellular respiration. Mitochondrial DNA, inherited only from the mother, is now commonly used to establish phylogenies for many organisms, including ants

Monograph – a treatise on a single subject

Monomorphic – occurring in one morphologically

distinct form (in ants: with reference to worker subcastes – see dimorphic)

Monophasic allometry – a type of polymorphism in which the variability in size of worker body parts is non-isometric. Typically, there is also a variation in size between the largest and smallest workers, but both are connected morphologically by intermediates.

Monotypic – including only a single representative (e.g. a genus with one species)

Morphology – study of the form and structure of an organism

Morphospecies – a species defined on the basis of its morphology: in current practice the term often has the notion of a preliminary placement of an organism in a named or unnamed category by a person with little or no taxonomic training.

Mutualism – a relationship between two species of organisms that benefits both

Node – a raised swelling; here applied to the dorsal petiolar protuberance found in most ant species. The term may also refer more generally to the whole petiole itself.

Nomenclature – In Biology, a standardized and internationally recognized system of names applied to different groups of plants and animals

Occipital – here pertaining to the back part of the head capsule or cranium of an insect

Ocellus – a small, simple, unfaceted eye

Ochraceous – ochre coloured

Ovoid – egg-shaped, i.e. with one end more narrowly rounded than the other

Palp formula – the number of segments in the maxillary palp and the number of segments in the labial palp, expressed as a standardized formula and separated by a comma (i.e. number, number)

Paratype – A specimen not designated as a type of a particular species, but listed as a representative of that species in the original type description.

Pectinate – comb-like

Peduncle – The usually narrow anterior sector of the petiole that articulates with the propodeum at its anterior end and links with the petiolar node at its posterior end. This narrow sector is lacking in many taxa. (n.b. When the peduncle is present, the petiole is said to be *pedunculate*, when it is absent, the petiole is *sessile*.)

Petiole – the second abdominal segment, which follows the propodeum. It is usually reduced in size and is always isolated.

Phylogeny – the evolutionary development and history of a taxon

Phytogeographic – pertaining to the geographic distribution of plants.

Phytogeographic province – a region containing a distinct flora characterised by a high degree of floristic affinity and endemism.

Pilosity – in reference to ants and other insects: the longer, standing setae that stand out above the shorter, finer hairs constituting the pubescence

Planar – level; on the same plane

Polymorphic – occurring in multiple morphologically distinct forms (in ants, this frequently refers to the presence of more than two worker subcastes; i.e. major and minor workers are connected by one or more media workers).

Posteriad – directed or facing towards the rear

Postpetiole – the third abdominal segment. Strictly speaking, the term is only applied when this segment is reduced in size and separated from the petiole anteriorly and the gaster anteriorly.

Pretarsal claws – The pair of terminal claws that is found on the apical tarsal segment. The claws may form a simple curve or have an internal tooth (a preapical tooth) or set of even-sized teeth (the pectinate condition).

Promesonotal shelf – a flattened shelf formed by the promesonotum in some myrmicine genera (most characteristically seen in the genus *Meranoplus*)

Promesonotum – the fused pronotum and mesonotum considered as a whole. This condition is found in several Australian ant subfamilies. In other subfamilies the pronotum and promesonotum are separated by a suture and are able to move independently.

Pronotum – the first segment of the thorax

Propodeal lobes – a pair of lobes arising from the base of the propodeum. These lobes are often rounded, but may terminate in an angle or a spinous projection.

Propodeum – the first dorsal plate or tergite of the abdominal segment, which is fused to the thorax and forms part of the mesosoma. The posterior angles of the propodeum are often furnished with spines, teeth or lamellae. The propodeum normally has a dorsal and a declivitous (or descending) face at the base of which there is often a pair of lobes (the propodeal lobes).

Proximal – with reference to a limb or other extremity; nearest to the point of attachment to the body (i.e. in contrast to distal)

Pubescence – in reference to ants and other insects: short, fine hairs, usually appressed, that typically form a second layer beneath the pilosity (standing, coarser hairs)

Punctate – dotted with small depressions

Pygidium – the tergite or dorsal plate of abdominal segment 7. This is the second visible gastral tergite.

Quadrate – square or approximately square in appearance

Relictual – reduced to a residual population or cluster of organisms, although once widespread

Reniform – kidney-shaped

Replete – in ants: an individual worker whose crop is distended with liquid food so that the abdominal segments are pulled apart and the intersegmental membranes stretched tight. Such individuals have greatly enlarged gasters, and act as food reservoirs for their colony, regurgitating food on demand to their fellow workers.

Reticulate – covered with a network of ridges (striae or striolae)

Riparian – located on the banks of a stream or river

RNA – shorthand for ribonucleic acid, an information encoded strand of nucleotides similar to DNA, but

with a slightly different chemical structure. The information from a gene is transferred from a strand of DNA by the construction (called transcription) of a complementary strand of RNA. Ribonucleic acid, which comes in several forms, can be found in various parts of the cell and also its nucleus, and like DNA, is currently used in constructing phylogenies of organisms.

Ruga, -ae – a fold, crease or wrinkle; here, in the cuticle or outer covering of an ant's body

Rugose – consisting of multiple, approximately parallel wrinkles or rugae

Rugula, -ae – small folds or wrinkles

Scape – in ants, the normally elongate basal segment of the antenna

Sclerite – a plate, composed of chitin, which forms part of the exoskeleton of an insect. Sclerites are usually separated from one another by a suture or a membranous area.

Sclerophyll – a type of vegetation characterised by the possession of small, tough, evergreen leaves designed to reduce water loss in a dry climate

Sclerotized – hardened, especially by the formation of sclerotin (an insoluble, tanned protein that stiffens the chitin in insect cuticle)

Scrobe – in ants, a groove or impression that runs above or below the eye, designed to accommodate all or part of the antenna when the latter is folded back. Usually referred to as the antennal scrobe.

Seta (plural setae) – a hairlike bristle that is socketed basally

Setula (pl setulae) – a short, fine seta

Shagreenate – refers to a surface that has a fine, irregular roughness

Sinuate – curved in and out

Soma – the entire body of an organism

Spongiform – like a sponge; in ants, referring specifically to masses of external cuticular tissue found around the petiole and postpetiole in some groups of myrmicines

Squamiform – having the form of a scale; in ants, usually refers to the shape of the node

Sternite – the lower plate or sclerite of a segment

Striate – referring to a body surface covered with impressed lines or grooves (striae)

Striolate – referring to a body surface covered with small or weak striae

Sulcus – a deep, narrow furrow or groove

Synapomorphy – an observable trait or character shared by a group of organisms (see apomorphy)

Syntype – Multiple specimens used collectively as the basis for the name of a species. In current practice it is customary though not mandatory to choose a single specimen (e.g. the holotype, lectotype or neotype) as the name-bearing type.

Tarsus (plural tarsi) – a collective term for the apical segments of the leg of an insect. In ants, there are five such segments. The segment of the tarsus that articulates with the tibia is the first tarsal segment. The fifth tarsal segment carries the pretarsal claws.

Taxon (pl. taxa) – a taxonomic category or group

Taxonomy – The classification of organisms in an ordered system that indicates their natural relationships.

Tergite – the upper plate or sclerite of a segment

Thermophilic – heat-loving, i.e. active in the hottest part of the day

Tibia – the fourth segment of the leg, intermediate between the tarsus and the femur

Torulus – a small, annular sclerite that surrounds the antennal socket. The torulus may be independent from or fused to the frontal lobe, a character useful for separating out some ant subfamilies

Tree diagram – a figure that branches from a single root

Tridentate – possessing three teeth

Truncate – with the appearance of being abruptly shortened

Tumular – mound-shaped

Venter – the underside of a structure or organ

Vertex – the top of the head; in insects, the upper surface of the head between the eyes and the occiput. It includes the frons.

REFERENCES

Agosti, D. (1997). Two new enigmatic *Melophorus* species (Hymenoptera: Formicidae) from Australia. *Journal of the New York Entomological Society* 105: 161–169.

Andersen, A.N. (1990). The use of ants to evaluate change in Australian terrestrial ecosystems: a review and a recipe. *Proceedings of the Ecological Society of Australia* 16: 347–357.

Andersen, A.N. (1991a). *The ants of southern Australia. A guide to the Bassian fauna*. Melbourne: CSIRO Publications. vii + 70 pp.

Andersen, A.N. (1991b). Parallels between ants and plants: implications for community ecology. pp. 539–558 In C.R. Huxley, and D.F. Cutler (eds), *Ant-Plant Interactions*. Oxford University Press, Oxford. xviii + 601 pp.

Andersen, A.N. (1995). A classification of Australian ant communities, based on functional groups which parallel plant life-forms in relation to stress and disturbance. *Journal of Biogeography* 22: 15–29.

Andersen, A.N. (2000). *The Ants of Northern Australia: a guide to the monsoonal fauna*. CSIRO Publishing, Collingwood, VIC. v + 106pp.

Andersen A.N. (2002). Common names for Australian ants (Hymenoptera: Formicidae). *Australian Journal of Entomology* 41: 285–293.

Ashton, D.H. (1979). Seed harvesting by ants in forests of *Eucalyptus regnans* F. Muell. in central Victoria: Effect on natural regeneration. *Australian Journal of Ecology* 4: 265–277.

Beale, J.P. (1998). Temporal and spatial distribution of the rare, myrmecophagous Illidge's ant-blue butterfly, *Acrodipsas illidgei* (Lycaenidae) (Waterhouse and Lyell). *Journal of the Lepidopterists Society* 52: 139–150.

Beard, J.S., Chapman, A.R. and Gioia, P. (2000). Species richness and endemism in the western Australian flora. *Journal of Biogeography* 27: 1257–1268.

Bisevac, L. and Majer, J.D. (1999). Comparative study of ant communities of rehabilitated mineral sand mines and heathland, Western Australia. *Restoration Ecology* 7: 117–126.

Bolton, B. (1976). The ant tribe Tetramoriini (Hymenoptera: Formicidae). Constituent genera, review of smaller genera and revision of *Triglyphothrix* Forel. *Bulletin of the British Museum of Natural History (Entomology)* 34: 283–379.

Bolton, B. (1977). The ant tribe Tetramoriini (Hymenoptera: Formicidae). The genus *Tetramorium* Mayr in the Oriental and Indo-Australian regions, and in Australia. *Bulletin of the British Museum (Natural History) Entomology* 36: 67–151.

Bolton, B. (1987). A review of the *Solenopsis* genus-group and revision of Afrotropical *Monomorium* Mayr (Hymenoptera: Formicidae). *Bulletin of the British Museum (Natural History) Entomology* 54: 263–452.

Bolton, B. (1994). *Identification guide to the ant genera of the world*. Harvard University Press: Cambridge, Massachusetts, USA. 222 pp.

Bolton, B. (1995). *A new general catalogue of the ants of the world*. Harvard University Press: Cambridge, Massachusetts, USA. 504 pp.

Bolton, B. (2000). The ant tribe Dacetini. *Memoirs of the American Entomological Institute* 65: 1–1028.

Bolton, B. (2003). Synopsis and classification of Formicidae. *Memoirs of the American Entomological Institute* 71: 1–370.

Braby, M.F. (2000). *Butterflies of Australia, their identification, biology and distribution*. CSIRO, Melbourne. 2 vols. 1008 pp.

Briese, D.T., and Macauley, B.J. (1980). Temporal structure of an ant community in semi-arid Australia. *Australian Journal of Ecology* 5: 121–134.

Briese, D.T. and Macauley, B.J. (1981). Food collection within an ant community in semi-arid Australia, with special reference to seed harvesters. *Australian Journal of Ecology* 6: 1–19.

Brown, W.L. (Jr.). (1956). Some synonymies in the ant genus *Camponotus*. *Psyche (Cambridge)* 63: 38–40.

Brown, W.L., (Jr.) (1958). Predation of arthropod eggs by the ant genera *Proceratium* and *Discothyrea*. *Psyche (Camb.)* 64: 115.

Brown, W.L., (Jr.). (1959). Some new species of dacetine ants. *Breviora* 108: 1–11.

Brown, W.L., (Jr.). (1973). A comparison of the Hylean and Congo-West African rain forest ant faunas. pp. 161–185. *In:* B.J. Meggers, E.S. Ayensu and W.D. Duckworth (eds), *Tropical forest ecosystems in Africa and South America: a comparative review*. Smithsonian Institution Press, Washington, D.C.

Brown, W.L. (Jr.). (1975). Contributions toward a reclassification of the Formicidae. V. Ponerinae, tribes Platythyreini, Cerapachyini, Cylindromyrmecini, Acanthostichini, and Aenictogitonini. *Search Agriculture* 5: 1–116.

Clark, J. (1924). Ants as a domestic pest. *Journal of the Department of Agriculture, Western Australia* (2)1: 191–192.

Clark, J. (1936). A revision of Australian species of *Rhytidoponera* Mayr (Formicidae). *Memoirs of the National Museum of Victoria* 9: 14–89, pls 3–6.

Clark, J. (1938). The Sir Joseph Banks Islands. Reports of the McCoy Society for Field Investigation and Research. Part 10. Formicidae (Hymenoptera). *Proceedings of the Royal Society of Victoria* 50: 356–382.

Coyne, J.A. and Orr, H.A. (2004). *Speciation*. Sinauer Associates, Sunderland, Massachusetts. 545 pp., 45 illustr.

Cracraft, J. (1983). Species Concepts and Speciation Analysis. *In* R. Johnston, (ed), *Current Ornithology*. Plenum Press, New York. pp. 159–187.

Crawley, W.C. (1922). New ants from Australia. *Annals and Magazine of Natural History* (9) 10: 16–36.

Davis, J.I. and Nixon, K.C. (1992). Populations, genetic variation, and species concepts. *Bioscience* 41: 421–435.

Davison, E.A. (1982). Seed utilization by harvester ants. pp. 1–6 *In* R.C. Buckley (ed), *Ant-Plant Interactions in Australia*. W. Junk, the Hague.

Davison, E.A. (1987). Respiration and energy flow in two Australian species of desert harvester ants, *Chelaner rothsteini* and *Chelaner whitei*. *Journal of Arid Environments* 12: 61–82.

Donisthorpe, H. (1944). A new species of *Bothriomyrmex* Emery (Hym. Formicidae), and some notes on the genus. *Proceedings of the Royal Entomological Society of London*. *Series B*: 13: 101–103.

Dubovikov, D.A. (2004). *Nebothriomyrmex majeri* gen. et sp. n., a new genus and species of ants (Hymenoptera, Formicidae, Dolichoderinae) from Australia. *Entomologicheskoe obozrenie* 83: 487–489.

Ereshefsky, M., ed. (1992). *Units of Evolution: Essays on the Nature of Species*. MIT Press, Cambridge, MA/ London.

Fernandez, F. (2004). The American species of the myrmicine ant genus *Carebara* Westwood (Hymenoptera: Formicidae). *Caldasia* 26: 191–238.

Fiedler, K. (2001). Ants that associate with Lycaeninae butterfly larvae: diversity, ecology and biogeography. *Diversity and Distributions* 7: 45–60.

Field, R.P. (1997). The *Ogyris idmo* complex (Lepidoptera: Lycaenidae) as flagship species for conservation in southern Australia. *Memoirs of the Museum of Victoria* 56: 389–392.

Forel, A. (1893). Nouvelles fourmis d'Australie et des Canaries. *Annales de la Société Entomologique de Belgique* 36: 454–466.

Forel, A. (1907). Formicidae. *In:* W. Michaelsen, and R. Hartmeyer (eds), *Die Fauna Sudwest-Australiens. Band I, Lieferung 7*. Jena: Gustav Fischer, pp. 263–310.

Greenslade, P.J.M. (1978). Ants. pp. 109–113. *In:* W. A. Low (ed.), *The physical and biological features of Kunoth Paddock in central Australia*. CSIRO Division of Land Resources Technical Paper No. 4, Canberra.

Greenslade, P.J.M. (1979). *A guide to ants of South Australia*. South Australian Museum (Special educational Bulletin Series), Adelaide. xi + 44pp.

Gronenberg, W. (1995). The fast mandible strike in the trap-jaw ant *Odontomachus*: motor control. *Journal of Comparative Physiology A* 176: 399–408.

Gullan, P.J. and Stewart, A.C. (1996). A new genus and species of ant-associated coccid (Hemiptera: Coccidae: Myzolecaniinae) from *Canthium* Lam. (Rubiaceae). *Memoirs of the Queensland Museum* 39: 307–314.

Gunawardene, N. and Majer, J.D. (2004). Ants of the southern Carnarvon Basin, Western Australia: An investigation into patterns of association *Records of the Western Australian Museum* 22: 219–239.

Harrison, R.G. (1998). Origins: A Brief History of Research on Speciation. (Chapter 2) *In:* D.J. Howard, and S.H. Berlocher (eds), *Endless Forms*. Oxford University Press, New York, pp. 19–31.

Heinze, J., Kuhnholz, S., Schilder, K. and Hölldobler, B. (1993). Behavior of ergatoid males in the ant, *Cardiocondyla nuda*. *Insectes Sociaux* 40: 273–282.

Heterick, B.E. (2001). Revision of the Australian ants of the genus *Monomorium* (Hymenoptera: Formicidae). *Invertebrate Taxonomy* 15: 353–459.

Heterick, B.E. (2003). Two new Australian *Monomorium* Mayr (Hymenoptera: Formicidae), including a highly distinctive species. *Australian Journal of Entomology* 42: 249–253.

Heterick, B.E. (2006). A Revision of the Malagasy ants belonging to genus *Monomorium* Mayr, 1855 (Hymenoptera: Formicidae). *Proceedings of the California Academy of Sciences* 57(3): 69–202, 105 Figures

Heterick, B.E., Casella, J. and Majer, J.D. (2000). Influence of Argentine and Coastal brown ant (Hymenoptera: Formicidae) invasions on ant communities in Perth gardens, Western Australia. *Urban Ecosystems* 4: 277–292.

Heterick, B.E., Majer, J.D., Recher, H.F., and Postle, A.C. (2001). A checklist of the canopy, bark, soil and litter fauna of the Darling Plateau and adjacent woodland near Perth, Western Australia, with reference to the conservation of forest and woodland fauna. *Curtin University of Technology School of Environmental Biology Bulletin No.* 21. 35pp.

Heterick, B.E., Majer, J.D., Recher, H.F. and Postle, A.C. (2002). The canopy, bark, soil and litter fauna of the Darling Range and adjacent coastal woodland near Perth, Western Australia, with reference to the diversity of forest and woodland fauna. *Pacific Conservation Biology* 7: 229–239.

Hölldobler, B. and Taylor, R.W. (1983). A behavioral study of the primitive ant *Nothomyrmecia macrops* Clark. *Insectes Sociaux* 30: 384–401.

Hölldobler, B., and Wilson, E.O. (1990). *The Ants*. Springer-Verlag, Berlin Heidelberg, xii + 732 pp.

International Commission on Zoological Nomenaclature (1999). *International Code of Zoological Nomenclature: Fourth Edition*. (1999). The International Trust for Zoological Nomenclature, Natural History Museum, Cromwell Road, London. XXIX + 306 pp.

Kohout, R.J. (2000). A review of the distribution of the *Polyrhachis* and *Echinopla* ants of the Queensland Wet Tropics (Hymenoptera: Formicidae: Formicinae). *Memoirs of the Queensland Museum* 46: 183–209.

Kohout, R.J. and Taylor, R.W. (1990). Notes on Australian ants of the genus *Polyrhachis* Fr. Smith, with a synonymic list of the species (Hymenoptera: Formicidae: Formicinae). *Memoirs of the Queensland Museum* 28: 509–522.

LaPolla, J.S. 2004. *Acropyga* (Hymenoptera: Formicidae) of the World. *Contributions of the American Entomological Institute* 33: 1–130.

McAreavey, J.J. (1947). New species of the genera *Prolasius* Forel and *Melophorus* Lubbock (Hymenoptera, Formicidae). *Memoirs of the National Museum of Victoria* 15: 7–27.

McAreavey, J.J. (1949). Australian Formicidae. New genera and species. *Proceedings of the Linnaean Society of New South Wales* 74: 1–25.

McAreavey, J.J. (1957). Revision of the genus *Stigmacros* Forel. *Memoirs of the National Museum of Victoria* 21: 7–64.

McArthur, A.J. (2003). New species of *Camponotus* (Hymenoptera: Formicidae) from Australia. *Transactions of the Royal Society of South Australia* 127: 5–14.

McArthur, A.J. (2007). A key to *Camponotus* Mayr of Australia, pp. 290–351. *In:* R.R. Snelling, B.L. Fisher and P.S. Ward (eds), *Advances in ant systematics* (*Hymenoptera*: *Formicidae*): *homage to E.O. Wilson – 50 years of contributions*. Memoirs of the American Entomological Institute, 80.

McArthur, A.J. and Adams, M. (1996). A morphological and molecular revision of the *Camponotus nigriceps* group (Hymenoptera: Formicidae) from Australia. *Invertebrate Taxonomy* 10: 1–46.

McArthur, A.J., Adams, M. and Shattuck, S.O. (1997). A morphological and molecular review of the *Camponotus terebrans* Lowne (Hymenoptera: Formicidae) complex in southern Australia. *Australian Journal of Zoology* 45: 579–598.

McArthur, A.J. and Shattuck, S.O. (2001). A taxonomic revision of the *Camponotus macrocephalus* species group (Hymenoptera: Formicidae) in Australia. *Transactions of the Royal Society of South Australia* 125(1): 25–43.

McKenzie, N., Keighery, G., Gibson, N., Hopkins, A. and Tinley, K. (2000). *IBRA sub-regions in Western Australia: a report to Environment Australia*. Department of Conservation and Land Management, Western Australia, 8 pp.

Majer, J. D. (1982). Ant-plant interactions in the Darling Botanical District of Western Australia. pp. 45–61 *In* R.C. Buckley (ed), *Ant-Plant Interactions in Australia* . W. Junk Press, The Hague, Netherlands.

Majer, J. (1983). Ants: bio-indicators of mine-site rehabilitation, land use and land conservation. *Environmental Management* 7: 375–383.

Majer, J.D. and Brown, K.R. (1986). The effects of urbanization on the ant fauna of the Swan Coastal Plain near Perth, Western Australia, *Journal of the Royal Society of Western Australia* 69: 13–17.

Mallet, J. (1995). A species definition for the Modern Synthesis. *Trends in Ecology and Evolution* 10: 294–299.

May, J.E. and Heterick, B.E. (2000). Effects of the coastal brown ant *Pheidole megacephala* (Fabricius) on the ant fauna of the Perth metropolitan region, Western Australia. *Pacific Conservation Biology* 6: 81–85.

Mayr, E. (1942). *Systematics and the Origin of Species*. Columbia University Press, New York. 334 pp.

Mayr, E. (1963). *Animal Species and Evolution*. Belknap Press, Cambridge, Massachusetts. 797 pp.

Mayr, E. (1982). *The Growth of Biological Thought: Diversity, Evolution and Inheritance*. Harvard University Press, Cambridge, Massachusetts. 974 pp.

Mischler, B.D. and Brandon, R. (1987). Individuality, pluralism and the Phylogenetic Species Concept. *Biology and Philosophy* 2: 397–414.

Nitikin, M.I. (1979). Geographical distribution of three species of small ants common in New South Wales. *Australian Entomological Magazine* 5: 101–102.

Ogata, K. and Taylor, R.W. (1991). Ants of the genus *Myrmecia* Fabricius: a preliminary review and key to the named species (Hymenoptera: Formicidae: Myrmeciinae). *Journal of Natural History* 25: 1623–1673.

Ogata, K. and Yamane, S. (2003). Japanese Ant Database Group. http://ant.edb.miyakyo-u.ac.jp/E/JADG/index.html

Paterson, H.E.H. (1978). More evidence against speciation by reinforcement. *South African Journal of Science* 74: 369–371.

Paterson, H.E.H. (1981). The continuing search for the unknown and unknowable: a critique of contemporary ideas on speciation. *South African Journal of Science* 77: 113–119.

Paterson, H.E.H. (1982). Darwin and the origin of species. *South African Journal of Science* 78: 272–275.

Paterson, H.E.H. (1984). The Recognition Concept of Species: Michael MacNamara interviews H.E.H. Paterson. *South African Journal of Science* 80: 313–318.

Paterson, H.E.H. (1985). The Recognition Concept of Species. *In* B. Vrba (ed), *Species and Speciation*. Transvaal Museum Monograph No. 4, Pretoria pp. 21–29.

Paterson, H.E.H. (1988). On defining species in terms of sterility: problems and alternatives. *Pacific Science* 42: 65–71.

Paterson, H.E.H. (1993). *Evolution and the Recognition Concept of Species; Collected Writings* (McEvey, S. F., ed.). Johns Hopkins University Press, Baltimore, Maryland, xix+234 pp.

Philippe, H., Lartillot N. and Brinkmann, H. (2005). Multigene Analyses of Bilaterian Animals Corroborate the Monophyly of Ecdysozoa, Lophotrochozoa, and Protostomia. *Molecular Biology and Evolution* 22: 1246–1253.

Reichel, H.L.M. (2003) *Systematics of the ant genus* Rhytidoponera *(Hymenoptera: Formicidae) in Australia.* PhD thesis (unpubl.). viii + 229 pp.

Revision of the Interim Biogeographic Regionalisation for Australia (IBRA) and Development of Version 5.1 - Summary Report (2000). http://www.deh.gov.au/parks/nrs/ibra/version5–1/summary-report/

Samson, P.R (1989). Morphology and biology of *Acrodipsas illidgei* (Waterhouse and Lyell), a myrmecophagous lycaenid (Lepidoptera: Lycaenidae: Theclinae). *Journal of the Australian Entomological Society* 28: 161–168.

Santschi, F. (1906). A propos de moeurs parasitiques temporaires des fourmis du genre *Bothriomyrmex*. *Annales de la Société Entomologique de France* 75: 363–392.

Saunders, G.W. (1967). Funnel ants (*Aphaenogaster* spp., Formicidae) as pasture pests in North Queensland: I. Ecological background, status and distribution. *Bulletin of Entomological Research* 57: 419–432.

Schödl, S. (2007). Revision of Australian *Meranoplus*; the *Meranoplus diversus* group, pp. 370–424. *In:* R.R. Snelling, B.L. Fisher, and P.S. Ward (eds), *Advances in ant systematics* (*Hymenoptera*: *Formicidae*): *homage to E. O. Wilson – 50 years of contributions*. Memoirs of the American Entomological Institute, 80.

Seifert, B. (2003). The ant genus *Cardiocondyla* (Insecta: Hymenoptera; Formicidae) – a taxonomic revision of the *C. elegans, C. bulgarica, C. batesii, C. nuda, C. shuckardi, C. stambuloffi, C. wroughtonii, C. emeryi* and *C. minutior* species-groups. *Annalen des Naturhistorischen Museums in Wien* 104B: 203–338.

Shattuck, S.O. (1992a). Review of the dolichoderine ant genus *Iridomyrmex* Mayr with descriptions of three new genera (Hymenoptera: Formicidae). *Journal of the Australian Entomological Society* 31: 13–18.

Shattuck, S.O. (1992b). Generic revision of the ant subfamily Dolichoderinae (Hymenoptera: Formicidae). *Sociobiology* 21: 1–181.

Shattuck, S.O. (1993a). Revision of the *Iridomyrmex purpureus* species-group (Hymenoptera: Formicidae). *Invertebrate Taxonomy* 7: 113–149.

Shattuck, S.O. (1993b). Revision of the *Iridomyrmex calvus* species-group (Hymenoptera: Formicidae). *Invertebrate Taxonomy* 7: 1303–1325.

Shattuck, S.O. (1996). Revision of the *Iridomyrmex discors* species-group (Hymenoptera: Formicidae). *Australian Journal of Entomology* 35: 43–47.

Shattuck, S.O. (1999). *Australian Ants: their biology and identification*. CSIRO Publishing, Collingwood, VIC. 226 pp.

Shattuck, S.O. (2000). The epopostrumiform genus group, pp. 30–67. *In* Bolton, B. The ant tribe Dacetini. *Memoirs of the American Entomological Institute* 65: 1–1028.

Shattuck, S.O. (2007). New species of myrmicine ants from Western Australia (Hymenoptera: Formicidae). *Zootaxa* 1661: 47–50

Shattuck, S.O. and Barnett, N.J. (2007). Australian ants online. CSIRO, Camberra. Available at http://www.ento.csiro.au/science/ants/

Shattuck, S.O. and McArthur, A.J. (2002). A taxonomic revision of the *Camponotus wiederkehri* and *perjurus* species-groups (Hymenoptera: Formicidae). *Transactions of the Royal Society of South Australia* 126: 63–90.

Shattuck, S.O. and McMillan, P. (1998). Revision of the *Iridomyrmex conifer* group (Hymenoptera: Formicidae) with notes on their biology. *Australian Journal of Zoology* 46(3): 301–315.

Smith, F. (1858). *Catalogue of hymenopterous insects in the collection of the British Museum. Part VI. Formicidae*. British Museum (Natural History), London. 216 pp.

Snelling, R.R. (1981). Systematics of social Hymenoptera. *In* H. R. Hermann (ed), *Social Insects*, vol. 2, pp. 369–474. Academic Press, New York.

Street, M.D., Donovan, G.R., Baldo, B.A., and Sutherland, S. (1994). Immediate allergic reactions to *Myrmecia* ant stings: immunochemical analysis of *Myrmecia* venoms. *Clinical and Experimental Allergy* 24: 590–597.

Taylor, R.W. (1978). *Nothomyrmecia macrops*: a living-fossil ant rediscovered. *Science (Washington D. C.)* 201: 979–985.

Taylor, R.W. (1990). The nomenclature and distribution of some Australian and New Caledonian ants of the genus *Meranoplus* Fr. Smith (Hymenoptera: Formicidae: Myrmicinae). *General and Applied Entomology* 22: 31–40.

Taylor, R.W. (1991). Nomenclature and distribution of some Australasian ants of the Myrmicinae. *Memoirs of the Queensland Museum* 30: 599–614.

Taylor, R.W. (1992). Nomenclature and distribution of some Australian and New Guinean ants of the subfamily Formicinae (Hymenoptera: Formicidae). *Journal of the Australian Entomological Society* 31: 57–69.

Taylor, R.W. and Brown, D.R. (1985). Formicoidea. pp. 1–149 *In:* D.W. Walton (ed), *Zoological Catalogue of Australia, Vol. 2. Hymenoptera: Formicoidea, Vespoidea and Sphecoidea*. Canberra: Australian Government Publishing Service. vi + 381 pp.

Templeton, A.R. (1989). The meaning of species and speciation: a genetic perspective. *In:* D. Otte, and J.A. Endler (eds), *Speciation and its Consequences*. Sinauer, Sunderland, Massachusetts, pp. 3–27.

Vander Meer, R.K., Jaffe, K. and Cedeno, A. (eds) (1990). *Applied Myrmecology: a World Perspective*. Westview Press, Boulder. xv + 741 p. pp. 3–14.

Ward, P.S. (2001). Taxonomy, phylogeny and biogeography of the ant genus *Tetraponera* (Hymenoptera: Formicidae) in the Oriental and Australian regions. *Invertebrate Taxonomy* 15: 589–665.

Wheeler, W.M. (1934). Contributions to the fauna of Rottnest Island, Western Australia. No. IX. The ants. *Journal of the Royal Society of Western Australia* 20: 137–163.

Williams, D.F. (ed) (1994). *Exotic ants. Biology, impact, and control of introduced species*. Westview Press, Boulder. xvii + 332 p.

Williams, D.J. (1978). The anomalous ant-attending mealybugs (Homoptera: Pseudococcidae) of south-east Asia. *Bulletin of the British Museum* (*Natural History*). *Entomology* 37: 1–72.

Williams, D. J. (1985). *Australian mealybugs*. British Museum (Natural History), London. 431pp.

Williams, D. J. and Watson, G. W. (1988). *The Scale Insects of the tropical South Pacific region. Part 2. The mealybugs (Pseudococcidae)*. CAB International Inst. Wallingford, Oxon. 260 pp.

Wilson, E.O. (1962). The Trinidad cave ant *Erebomyrma* (=*Spelaeomyrmex*) *urichi* (Wheeler), with a comment on cavernicolous ants in general. *Psyche* 69: 62–72.

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