

## A TAXONOMIC REVISION OF THE *CAMPONOTUS WIEDERKEHRI* AND *PERJURUS* SPECIES-GROUPS (HYMENOPTERA: FORMICIDAE)

by S. O. SHATTUCK\* & A. J. MCARTHUR\*\*

### Summary

SHATTUCK, S. O. & MCARTHUR, A. J. (2002) A taxonomic revision of the *Camponotus wiederkehri* and *perjurus* species-groups (Hymenoptera: Formicidae). *Transactions of the Royal Society of S. Aust.* (2002), 126 (2), 63-90, 29 November, 2002.

The *Camponotus wiederkehri* and *perjurus* species groups are defined for the first time and revised at species level. Thirteen species are included in the *wiederkehri* species group, six of which are newly described while four previously valid species are synonymised. These species include *arenatus* sp. nov., *aurocinctus* (Smith) (and its new synonym *midas* Froggatt), *ceriseipes* Clark, *domellani* sp. nov., *gouldianus* Forel, *owenae* sp. nov., *postcornutus* Clark, *prosseri* sp. nov., *rufonigrus* sp. nov., *setosus* sp. nov., *terebrans* (Lowne) (including its synonyms *testaceipes* Smith, *latrunculus victoriensis* Santschi and *myoporinus* Clark), *versicolor* Clark and *wiederkehri* Forel (with its new synonyms *denticulatus* Kirby, *latrunculus* Wheeler and *wiederkehri lucidior* Forel). The *perjurus* species group contains the single rare species *perjurus* sp. nov.

KEY WORDS: Hymenoptera, Formicidae, Formicinae, species-group, *Camponotus*.

### Introduction

In this paper we revise species of ants in the newly defined *wiederkehri* and *perjurus* species groups of the genus *Camponotus*. Fourteen species are recognised, seven of which are described for the first time; four previously valid species are treated as synonyms. These groups are restricted to Australia and contain species which range from common to rare and from widespread to restricted in distribution. They are most abundant and species rich in semi-arid regions and all are apparently ground nesting. Taxonomically, the species treated here were previously placed in the subgenera *Myrmophyma*, *Myrmosaulus*, *Myrmoturba* and *Tanaemyrmex*, placements which were made when the species were originally described and have not been discussed since. During this study it has become quite clear that the current subgeneric classification within *Camponotus* is chaotic and near-worthless. Species here placed in the *wiederkehri* species group share similarities in overall body shape and size including the placement of the compound eyes and the configuration of the mesosoma and petiole. In addition, all share a cluster of elongate hairs on the base of the mentum. This cluster is unique in the genus and strongly suggests they are monophyletic. At present, the higher-level classification within *Camponotus* is poorly understood and until the entire genus is examined more closely, it is inappropriate to speculate on

relationships among species. *Camponotus gouldianus* is associated with a leafhopper and *C. terebrans* is associated with a butterfly. For an overview of the subfamily (Formicinae) and genus (*Camponotus*) in Australia see Shattuck (1999).

### Methods

#### Measurements

Size and shape characters were quantified and are reported as lengths or indices. Measurements were made with a stereo microscope using a dual-axis stage micrometer wired to digital readouts. The following measurements and indices are reported.

- CI Cephalic index: HW/HL.
- HL Maximum head length in full face view, measured from the anterior-most point of the clypeal margin to the midpoint of a line drawn across the posterior margin of the head.
- HW Maximum head width in full face view excluding the eyes.
- ML Mesosomal length measured from the anterior margin of the pronotal collar to the posterior extension of the propodeum lobes.
- MTL Maximum length of mid tibia, excluding the proximal part of the articulation which is received into the distal end of the femur.
- SI Scape index: SL/HW.
- SL Length of the scape (first antennal segment) excluding the basal neck and condyle.

#### Location of material examined

AMSA, Australian Museum, Sydney, New South Wales; ANIC, Australian National Insect Collection, Canberra, ACT; BMNH, The Natural History Museum, London, UK; MCZC, Museum of

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\*\* South Australian Museum, North Terrace, Adelaide, South Australia, 5000, Australia.

Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA; MHNG, Muséum d'Histoire Naturelle, Geneva, Switzerland; MVMA, Museum of Victoria, Abbotsford, Victoria; SAMA, South Australian Museum, Adelaide, South Australia; WAMP, Western Australian Museum, Perth, Western Australia.

Most of the non-type material is in ANIC and SAMA.

#### Collectors of material examined.

AAS, A. A. Simpson; ACK, A. C. Kistner; AHB, A. H. Burbidge; AJM, A. J. McArthur; AJO, A. Johnson; AKN, A. K. Nousala; ALY, A. L. Yen; AMD, A. M. Douglas; AML, A. M. Lea; AMM, A. M. Morgan; ARP, A. R. Peilie; AWF, A. W. Forbes; AZE, A. Zeit; BBL, B. B. Lowery; BHO, B. Hölldobler; BPI, B. Pike; BRH, B. R. Hutchins; CBA, C. Barrett; CHW, C. H. Watts; CNI, C. Nilson; CTM, C. T. Mercovich; CWA, C. Warner; DCF, D. C. F. Rentz; DCO, D. Cox; DDA, D. Davidson; DHI, D. Hirst; DHK, D. H. Kistner; DSC, D. Schultz; EBB, E. B. Britton; EBR, E. Broomhead; EDE, E. D. Edwards; EFR, E. F. Riek; EGM, E. G. Mathews; ELO, E. Lockie; ETR, E. Troughton; EXP, South Australian Museum Expedition; EYE, E. Yeatman; FAC, F. A. Cudmore; FSC, F. Schaefer; FSH, F. Shepherd; GCA, G. Campbell; GCM, G. C. Medlin; GFG, G. F. Gross; GFR, G. Friend; GJM, G. J. Mutze; GLH, G. L. Howie; GPB, G. P. Browning; GRI, Griffith Collection South Australian Museum; HBW, H. B. White; HCS, Horn Centenary Survey NVMA; HFR, H. Frahn; HHE, H. Heatwole; HMC, H. M. Cane; HOF, H. O. Fletcher; HOW, H. Owens; HRE, H. Reynolds; HWE, H. Wesselman; IAR, I. Archibald; IFB, I. F. B. Common; IGE, I. Gee; IVA, I. Valentine; JAF, J. A. Forrest; JAH, J. A. Herridge; JAR, J. Archibald; JBA, J. Balderson; JBS, J. B. Stuckey; JCG, J. C. Goudie; JCM, J. C. Myers; JDE, J. D. Erskine; JDI, J. E. Dixon; JDM, J. D. Majer; JED, J. E. Dowse; JEF, J. E. Feehan; JFF, J. F. Field; JFI, J. Findley; JGO, J. G. O. Tepper; JHA, J. Hawkins; JLA, J. Lawrence; JMC, J. McAreavey; JRB, J. R. B. Low; JRE, J. Reid; JRJ, J. Rühle; JSH, J. Shaw; JSM, J. Smith; JTH, J. Thurmer; JWI, J. Wilkinson; KCA, K. Casparson; KDA, K. Davey; KMA, K. Martin; KMC, K. McKelson; KRO, K. Roth; KRP, K. R. Pullen; KTR, K. T. Richards; LHI, L. Hitch; LPK, L. P. Kelsey; LQU, L. Queale; MAA, M. A. Adams; MDA, M. Davies; MIT, Mitchell; MJD, M. J. Douglas; MLS, M. L. Simpson; MMA, M. Malpital; MPE, M. Peterson; MSU, M. S. Upton; NBT, N. B. Tindale; NCS, Nature Conservation Society of South Australia Inc.; NLA, N. Lawrence; PAI, P. Aitken; PCO, P. Copley; PGE, P. Gee; PGR,

P. Greenslade; PHU, P. Hudson; PJF, P. J. Fargher; PJM, P. J. M. Greenslade; PPL, P. Plym; PRB, P. R. Birks; PSW, P. S. Ward; RBH, R. B. Halliday; RBR, R. Brandle; RCC, R. C. Chandler; RDN, R. D. Nutting; REL, R. Elder; RFO, R. Foster; RHC, R. H. Crozier; RHM, R. H. Mew; RJB, R. J. Bartell; RJK, R. J. Kohout; RJW, R. J. White; RRA, R. Raven; RSI, R. Smith; RSM, R. S. McInnes; RVS, R. V. Southcott; RWT, R. W. Taylor; SAH, S. A. Harrington; SANGLS, S. Aust. National Parks and Wildlife, Goyders Lagoon Survey; SANPNOPS, South Australian National Parks and Wildlife, North Olary Plains Survey; SANPNS, South Australian National Parks and Wildlife, Nullarbor Survey; SANPPITJ, South Australian National Parks and Wildlife, Pitantjatjara Lands Survey; SANPSDS, South Australian National Parks and Wildlife, Stoney Desert Survey; SANPSOPS, South Australian National Parks and Wildlife, South Olary Plains Survey; SANPVS, South Australian National Parks and Wildlife, Vertebrate Survey; SANPWFRS, South Australian National Parks and Wildlife, Western Flinders Ranges Survey; SANPYS, South Australian National Parks and Wildlife, Yellabinnia Survey; SBA, S. Barker; SDO, S. Donnellan; SLE, S. Lewer; SMO, S. Morrison; SOS, S. O. Shattuck; SRM, S. R. Morton; TAW, T. A. Weir; TGR, T. Greaves; TGW, T. G. Wood; TRO, T. Robinson; WAL, W. A. Low; WBH, W. B. Hitchcock; WCC, W. C. Crawley; WDD, W. D. Dodd; WHC, Waterhouse Club, South Australian Museum; WKH, W. K. Head; WLB, W. L. Brown; WLN, W. L. Nutting; WMC, Western Mining & Royal Geographical Society Expedition; WMW, W. M. Wheeler; YCC, Y. C. Crozier.

#### Genus *Camponotus* Mayr 1861

##### Definition of the *C. wiederkehri* species group

Members of the *C. wiederkehri* species group can be separated from other Australian *Camponotus* by the presence of a cluster of four or more distinct elongate curved or "J"-shaped hairs on the base of the mentum (near the posterior region of the buccal cavity) in all worker castes (Fig. 1). In a few species related to *C. ephippium* similar hairs are present but these are scattered along the length of the mentum rather than being present as a posterior cluster.

##### Complexes within the *C. wiederkehri* species group

The *C. wiederkehri* species group can be divided into four complexes as follows. While it is likely that these complexes represent monophyletic groups (and there is no evidence that they do not) synapomorphies supporting these groupings have not been sought in this study. It is more appropriate for these studies to be developed as a holistic study of the genus.

1. *aurocinctus* complex: Includes *C. arenatus*, *aurocinctus*, *owensae*, *setosus* and *versicolor*. This complex is defined by the presence of a distinct and angular metanotal groove in minor workers which is depressed (sometimes only slightly) below the anterior region of the propodeum (Figs 3, 8, 9).
2. *ceriseipes* complex: Includes *C. ceriseipes*, *donnellani*, *prosseri* and *rufonigrus*. In this complex the posterior section of the mesonotum is weakly but distinctly convex immediately anterior of the metanotal groove (more so in minors, less so in majors) and the metanotal groove in minors varies from a distinct angle to a shallow concavity (Figs 12, 14, 18, 34, 36).
3. *postcornutus* complex: Includes *C. postcornutus*. In this complex the entire mesosoma in minor workers is strongly arched, lacks a metanotal groove and the posterior face of the propodeum is only weakly differentiated from the dorsal face (Fig. 31); in major workers the posterior corners of the head taper rearwards into blunt protuberances (Figs 28, 29).
4. *terebrans* complex: Includes *C. gouldianus*, *terebrans* and *wiederkehri*. In this complex the posterior section of the mesonotum is flat (or nearly so) immediately anterior of the metanotal groove and the metanotal groove in minor workers is absent or weakly developed (Figs 23, 47, 58).

##### Definition of the *C. perjurus* species group

This species group is recognised by having the head produced upwards so that its attachment to the pronotum is well below its upper margin (Fig. 61). It has a reduced number of hairs on the mentum compared to species of the *wiederkehri* group, approaching the arrangement found in relatives of *C. ephippium*. This group contains a single species, *C. perjurus*, described below.

##### Key to workers of the *Camponotus wiederkehri* species group

1. Erect hairs present on all surfaces of tibiae .....2  
Erect hairs absent from outer surfaces of tibiae, inner surface with a double-row (although appressed pubescence may be present) .....4
2. Metanotal groove in minor worker a distinct but sometimes shallow trough (Fig. 42); known only from the Kimberley region of northern Western Australia (Fig. 43) .....*setosus*  
Metanotal groove in minor worker weakly developed (Fig. 23) or absent (Fig. 47); known only from southern Australia (Figs 24, 48) .....3
3. Number of erect hairs on propodeum greater than 40; pubescence on head and gaster abundant

- and with individual hairs overlapping; summit of petiolar node in profile rounded in minor workers (Fig. 23), a blunt angle in major workers (Fig. 21) .....*gouldianus*  
Number of erect hairs on propodeum less than 25; pubescence on head and gaster sparse and with individual hairs generally non-overlapping or at most only slightly overlapping; summit of petiolar node in profile angular in both minor and major workers (Figs 45, 47) .....*terebrans*
4. Entire mesosoma in lateral view strongly arched, lacking a metanotal groove and with the posterior face of the propodeum only weakly differentiated from the dorsal face (Figs 29, 31); posterior corners of head of major worker tapering rearward into blunt protuberances (Figs 28, 29) .....*postcornutus*  
Mesosoma in lateral view flat or at most with the pronotum and mesonotum weakly arched and separated from the propodeum by a weak angle (Fig. 14) or a distinct, angular or concave metanotal groove (Fig. 9), the posterior face of the propodeum always separated from the dorsal face by a rounded angle (Fig. 14); posterolateral corners of head rounded in majors (Figs 33, 34), .....5
  5. Metanotal groove in minors depressed below the anterior region of propodeum (Figs 8, 9); metanotal groove in majors angular (Fig. 6); dorsum of petiolar node in minors broadly or weakly convex, flat or weakly concave, the anterior face much shorter than the posterior face (Figs 8, 9); petiolar node in majors broadly rounded above (Fig. 6) .....6  
Metanotal groove in minors absent (Fig. 58) or angular (Fig. 14) and always even with the anterior region of propodeum; metanotal groove in majors a broad, shallow angle (Fig. 12); dorsum of petiolar node in minors angular or broadly rounded, the anterior face at most only slightly shorter than the posterior face (Fig. 14); petiolar node in majors angular above (Fig. 12) .....9
  6. Dorsal and anterior regions of pronotum dark red-black, distinctly darker than the yellow-red mesonotum and propodeum .....*arenatus*  
Entire mesosoma uniform in colour, varying from dark red-black to black .....7
  7. Elongate (overlapping) and dense pubescence present on dorsum of head, mesosoma, gaster and tibiae .....*owensae*  
Short (non-overlapping) and scattered pubescence present on dorsum of head, mesosoma, gaster and tibiae .....8
  8. Anterior region of first gastral tergite dark reddish black or black, similar in colour to propodeum; metanotal groove in minors distinct

- and depressed well below the anterior region of propodeum (Figs 8, 9).....*aurocinctus*  
 First and second gastral tergites red, distinctly lighter in colour than the reddish black propodeum; metanotal groove in minors weakly to moderately depressed below the anterior region of the propodeum (Figs 52, 53).....*versicolor*
9. Posterior section of mesonotum flat (or nearly so) immediately anterior of metanotal groove; metanotal groove absent or weakly developed in minors (Fig. 58); anterior clypeal margin in majors projecting with a straight central region separated from lateral regions by distinct angles (Fig. 55).....*wiederkehri*  
 Posterior section of mesonotum weakly but distinctly convex immediately anterior of metanotal groove (more so in minors, less so in majors); metanotal groove varying from a distinct angle to a shallow concavity in minors (Figs 14, 18, 36); anterior clypeal margin in majors broadly convex across entire width (Fig. 11).....10
10. Propodeum with at most 4 elongate erect hairs which are limited to the angle between the dorsal and posterior faces.....*donnellani*  
 Propodeum generally with more than 10 erect hairs which are always scattered along the entire dorsal surface.....11
11. Metanotal groove well defined and angular (Fig. 39); black head contrasting with red mesonotum.....*rufonigrus*  
 Metanotal groove a weakly defined concavity (Figs 14, 36); head same colour as mesonotum (both either red or black).....12
12. Scapes relatively short (in minors, SI < 1.5) (Fig. 15); petiolar node of minors generally more upright and narrower (Fig. 14).....*ceriseipes*  
 Scapes relatively long (in minors, SI > 1.4) (Fig. 15); petiolar node of minors generally lower and broader (Fig. 36).....*prosseri*

#### Species of the *C. wiederkerhi* species group

#### *Camponotus arenatus* sp. nov. (FIGS 2-4)

#### Material Examined

**Holotype.** Minor worker from **South Australia:** Hambidge [labelled as Hambridge] National Park, 17 December 1970, E. B. Britton (ANIC).

**Paratypes.** Two minor workers, same data as holotype (ANIC, SAMA).

#### Other material examined

**Northern Territory:** 15km S Alice Springs (PJM).  
**South Australia:** Cowell (BBL); Maralinga (GFG);

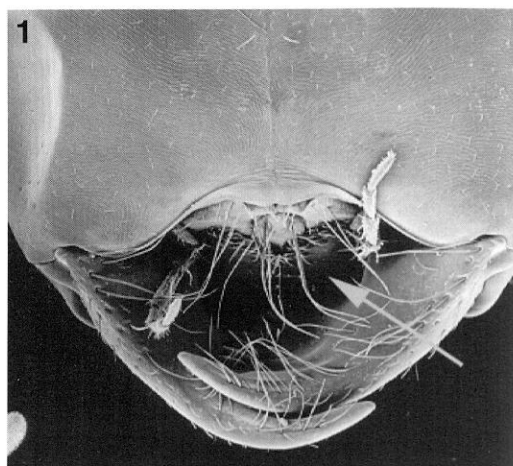
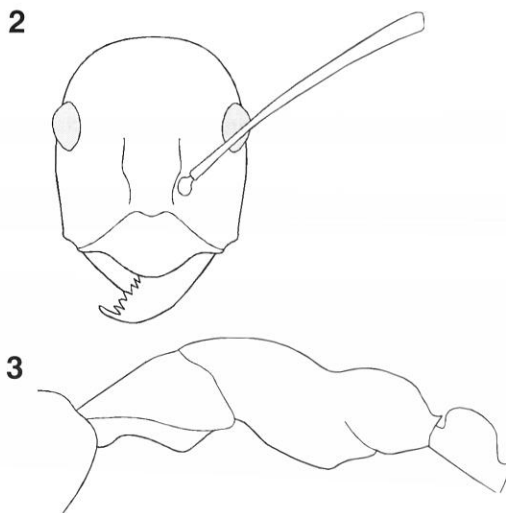


Fig. 1. Underside of the head showing distinctive cluster of elongate curved or "J"-shaped hairs (indicated by arrow) on the mentum.



Figs 2-3. *C. arenatus* workers. Fig. 2. Head of minor worker. Figs 3. Mesosoma and petiole of minor worker.

Yumbarra CP, 26km N Inila Rock Waters (HOW).  
**Western Australia:** 20mi. W Sandstone on Mt. Magnet Rd. (AMD & MJD).

#### Worker diagnosis (minor worker)

Tibiae and scapes lacking erect hairs. In minor workers metanotal groove depressed below level of the anterior region of the propodeum; dorsal surface of node broadly convex, its anterior face much shorter than the posterior face (Fig. 3). Dorsal and anterior regions of the pronotum dark red-black, distinctly darker than the yellow-red mesonotum and

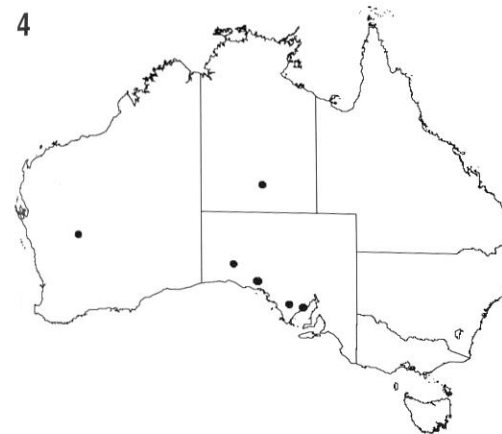


Fig. 4. Distribution of *C. arenatus* material examined during this study.

propodeum. This species is superficially similar to *C. donnellani* in overall colour pattern but differs in the larger size of the minor worker and the depressed metanotal groove.

#### Description (minor worker)

Anterior clypeal margin broadly convex (Fig. 2). Dorsal surface of pronotum weakly convex and separated from the weakly convex mesonotum by a shallow angle; metanotal groove slightly but distinctly depressed below the level of the anterior propodeum; propodeum uniformly and weakly convex and without a distinct angle, ratio of dorsum to declivity about 1.5 (Fig. 3). Petiolar node with a short anterior face which is weakly differentiated from the broadly convex upper surface, the rear face indistinguishable from the upper surface (Fig. 3). Erect hairs moderately abundant on all surfaces of the head and dorsal surfaces of the mesosoma, petiolar node and gaster, absent from scapes and tibiae. Head and anterior regions of pronotum black, posterolateral pronotum (immediately above the fore coxae), mesonotum, propodeum, petiole and legs yellow-red, gaster varying from entirely yellow-red to a combination of the yellow-red anteriorly and red-black posteriorly.

#### Measurements

**Minor worker** (n=5). CI 0.77 – 0.79; HL 1.94mm – 2.20mm; HW 1.50mm – 1.74mm; ML 3.45mm – 3.81mm; MTL 2.26mm – 2.47mm; SI 1.49 – 1.59; SL 2.38mm – 2.59mm.

#### Comments

This uncommon species is known from a limited number of minor workers. It ranges from south-central South Australia, north to southern Northern

Territory and west-central Western Australia (Fig. 4). The only biological information is provided by the single worker collected by B. B. Lowery. It was swept from mallee on red sand.

#### Etymology

From *arena*, alluding to the sandy nature of the known collection sites of this species.

#### *Camponotus aurocinctus* (F. Smith) (FIGS 5-10)

*Formica aurocincta* Smith, 1858: 39.

*Camponotus aurocinctus* – Mayr, 1886: 355.

*Camponotus midas* Froggatt, 1896: 390; Clark, 1930a: 22 (queen described, worker redescribed). New synonymy.

*Camponotus* sp. 8 – Imai *et al.*, 1977: 369.

#### Material examined

*Camponotus aurocinctus*. Worker holotype or syntypes from Adelaide, South Australia. A single specimen (minor worker) in BMNH is labelled as the type of this species. However, this specimen was acquired in 1870, several years after the original description was published. It is currently not known whether the acquisition date is in error or the type specimen is lost. For the purposes of this study this specimen is considered a type specimen for this name.

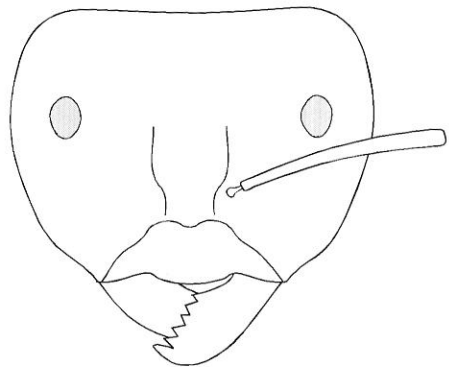
*Camponotus midas*. Syntypes from Illamurta, Northern Territory (1 worker (missing from point) and 1 queen in AMSA; 7 workers, 1 queen and 1 male in MCZ; 1 worker in MVMA; 3 workers in BMNH (with an additional 6 workers labelled as "C. Australia, Horn Coll., 96-37" and bearing a Type label).

#### Other material examined.

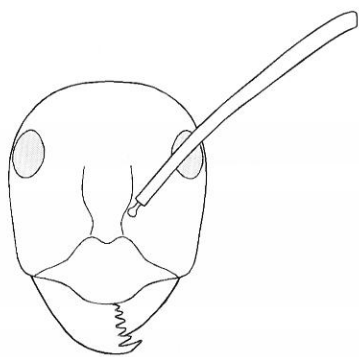
**New South Wales:** 12km S Coombah (PSW); 45km N Balranald (SOS); Ascot Vale (RSM); Black Hill Creek (RHM); Broken Hill (FSH); Broken Hill Airport (RSM); Matakana RS (BBL); Mount Gipps (RHM); Mundi Mundi, nr. Broken Hill (PJM & IVA); Pinnacles, 12mi. W Broken Hill (BBL); Pooncarie, W. Smith property (RHC & YCC & AKN); Silverton (PJM). **Northern Territory:** 15km S Alice Springs (PJM); 23mi. N Narwietooma HS (RSM & JED); 33km E Ayers Rock (JEF); 7km W Curtin Springs (SOS); Andado (HOF); Kings Creek Stn (SDO); nr. Ayers Rock (BBL); Old Andado, c.15km EbyN Andado HS (JEF); Uluru NP 15 km ESE (HCS). **Queensland:** Muncoonie Lake (RRA); Cunnamulla (BBL); Foxes Ck. (GCA); Sandringham (PJM). **South Australia:** 10km NW Emu Junction (JAH); 10km WSW Mt. Playford, Murnpeowie (JRE); 10mi. S Loxton (BBL); 11km ENE Arabana Hill, Murnpeowie (JRE); 14 km SW Taplan (SANPVS); 14km SbyW Beltana (JEF); 14km



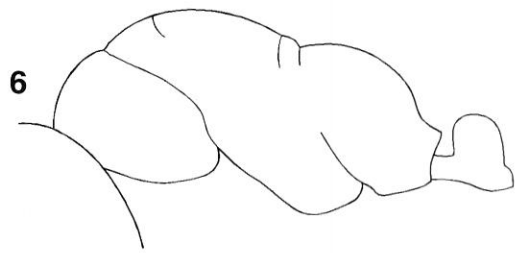
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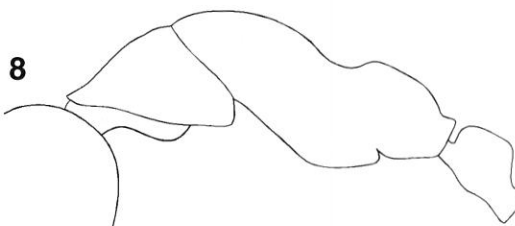
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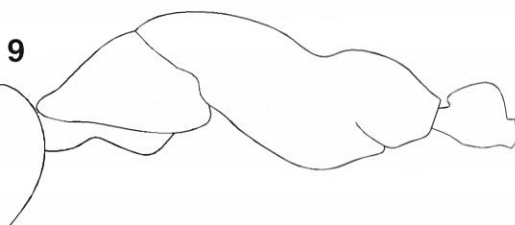
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8



9



Figs 5-9. *C. aurocinctus* workers. Fig. 5. Head of major worker. Fig. 6. Mesosoma and petiole of major worker. Fig. 7. Head of minor worker. Figs 8-9. Mesosoma and petiole of minor worker.

WNW Renmark (KRP); 1km N Vokes Hill junction (JAF); 1km W Emu Camp, Victoria Desert (PJM); 2.5km N Limestone dam (SANPSOPS); 26km SSE Illintjitja (SANPPITJ); 30mi E Farina, Mt. Lyndhurst (ETR); 31km NW Renmark (KRP); 3km W Emu Camp, Victoria Desert (PJM); 4.8km SE Coongie, Coongie Lakes Study site 10E (JRE); 40km W Vokes Hill Junct. (JAF); 40km WNW Emu, Victoria Desert (PJM); 40mi. SW Iron Knob (JRE); 45km WNW Emu, Victoria Desert (PJM); 4km NE Marroo Hill, Cowarie (PRB); 5 km SW Farina (SANPSOPS); 60km E Vokes Hill, Victoria Desert (PJM); 6km W Koonchera, Birdsville Track (PJM & JAF); 70km E Emu, Victoria Desert (PJM); 9km ESE Wapalanchie Tank, Cowarie (TRO); Adelaide (GRI); Adelaide (JGO); Alton Downs old HS, c.48km SW Birdsville (JEF); Ampeinna Hills 10.5 km E (SANPPITJ); Andamooka Ranges (MIT & GFG); Appodinna Attora Knolls 86.3 km SW (SANPSDS); Barton Siding (AML); Beda Hill (JAF); Bimbowrie 2 km NE (SANPNOPS); Brookfield Conservation Park (Site No. 1) (SOS);

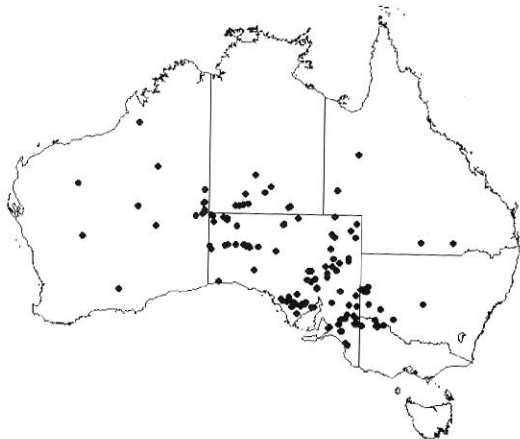


Fig. 10. Distribution of *C. aurocinctus* material examined during this study.

c.18km SSE Poochera (RWT & RJB); c.22km N Beltana (JEF); Calperum NE Boundary (AJM); Cambrai (PJM); Cheesman Peak 13.2 km NW (SANPPITJ); Clifton Hills Outstation (JAF & DHI); Coongie Lakes (JRE); Coongie Lake (DHI); Coongie Lakes (JRE); Cordillo Downs Stn (SANPSDS); Cordillo Downs Stn (SANPSOPS); Corrobin Hill, Eyre Penin. (KCA); Dangdali CP, Red Tank Dam (AJM); Darke Reske, Eyre Pen. (BBL); E Purni Bore at junction of French Track and Rig Rd., Simpson Desert (JAF); Emu Camp, Victoria Desert (PJM); Emu Junction 10 km NW (JAF); Etadunna Stn. (JTH); Farina 5 km SW (SANPSDS); Gammon Ra. NP, Balcanoon area (AJM); Gawler Ranges (PJM); Glenelg (WBH); Gum Lagoon (EGM & JAF); Hamilton Ck. (RBR); Hamilton Stn. (WKH); Hincks NP (EBB); Illintjitja 23 km WSW (SANPPITJ); Iron Knob 40 miles SW (EFR); Kendal (AWF); Killiparu CP (SLE); Kimba (PJM & IVA); Kimba, edge of Pinkawillinie C.P. (FSC); Koonamore (PJM); Koonamore 9 km E (SANPNOPS); Koonamore, Nillinghoo (PJM); Koonchera Waterhole 6.25 km S (SANPGLS); Koonchera, Birdsville Track (PJM & JAF); Kopi, Eyre Pen. (PJM); Kunytjanu 25 km NW (SANPPITJ); L. Meramangye, Victoria Desert (PJM); L. Torrens, nr. Beda Hill (JAF); Lake Appadare 2 km S (WHC); Lake Callabonna (AZE); Lake Gilles CP (BPI); Lake Palankarina (JTH); Little Pine Hill c. 32mi. SW Whyalla (EBB); Mabel Creek (PGR); Marpoo Waterhole (PGE & IGE); Marsella Hill 3.6 km SE (SANPSDS); Maryinna Hill 21.5 km ESE (SANPPITJ); May Hill 9.3 km WNW (SANPSDS); Montecollina Bore (JSH); Morganvale, Dangdali CP (AJM); Mount Lindsay 3.1 km WNW (SANPPITJ); Mt. Gunson, SE Woomera (PJM); Mt. Sturt, nr. salt lake, N. Eyre Pen. (JAF); Munyaroo CP, 7km SSW Moonable HS, 37km fr. Whyalla (WKH); NW Yaninee, Eyre Penin. (KCA); Olympic Dam (EGM & CWA); Paney, nr. Pink Lake, Gawler Ranges (WHC); Pinkawillinie CP, Eyre Pen. (JAF); Pinnacles Mine (RHM); Pipalyatjara 27.5 km NE (SANPPITJ); Poochera (BHO); Purni Bore 77 km E (SANPSDS); Purni Bore, SW Simpson Desert (PJM); Radium Hill (PAI); S end of L. Windabout (BBL); S Koonchera, Birdsville Track (PJM & JAF); S of Mann Ra, 8.5km NW Mt. Kintore (SANPPITJ); Serpentine L., Great Victoria Desert (PJM); Serpentine Lakes (JAF); Simpson Desert (DSC); Sinclair Gap (PHU); Stockyard Plain (AJM); Taplan 14 Km SW (SANPVS); Thirty Thousand Tank (GCM); Tomahawk Dam (JAF); Trinity Well (as Trinity) (EXP); Ungarinna Rockhole (SANPPITJ); Vokes Hill 1 km N (JAF); Wallatina 16 km W (SANPPITJ); Yelapawaralinn Waterhole 7.6 km NNW (SANPGLS). **Victoria:** 9km ESE Hattah

(ALY); Bannerton (CNI); Hattah (ALY); Lake Mournpall, Hattah-Kulkyne Nat. Park (SOS); Millewa South Bore (ALY); Halls Creek (KMA); Mungilli Claypan (KDA). **Western Australia:** 11km W Terhan W-H (PJM & HHE); 11mi. N Mt. Aloysius (RSM & JED); 163km SEbyE Broome (IFB); 16km W Mt. Aloysius (JEF); 16km W Mt. Aloysius (JEF & TWE); 19mi. N Mt. Aloysius (RSM & JED); 20mi. W Sandstone on Mt. Magnet Rd (AM & MJD); 22mi. WSW Mt. Forrest (RSM & JED); 24km SSW Turee Creek HS (MPE); 28mi. NE Carnegie HS (RSM & JED); 66km SWbyW Docker River, Northern Territory (JEF & TWE); Canning Stock Route (EXP); Cavenagh Ra. (KTR); Koonalda Cave (WHC); Meekatharra-Billiluna Pool Canning Stock Route (EXP); Norseman (BBL); Norseman Area (AM & MJD); Sir Fredrick Ra. (KTR).

#### Worker diagnosis

Tibiae lacking erect hairs. In minors, metanotal groove depressed below the level of the anterior region of the propodeum; dorsal surface of petiolar node relatively long and flat, its anterior face much shorter than the posterior face (Figs 8, 9). Mesosoma uniform in colour, varying from dark red-black to black, anterior region of first gastral tergite similar in colour to propodeum, gastral tergites often with the trailing edge golden yellow, the golden colour (when present) varying in width from a narrow band to involving most of the tergite.

#### Description (major worker)

Anterior clypeal margin weakly convex (Fig. 5). Dorsal surfaces of pronotum and mesonotum convex and separated by a shallow angle; propodeum uniformly convex and without a distinct angle; petiolar node with distinct anterior and posterior faces, its upper surface varying from a broad, blunt angle to uniformly convex and sometimes with the medial section nearly flat (Fig. 6). Erect hairs absent from scapes, petiole and tibiae, absent or a few scattered hairs on the outline of head and dorsum of mesosoma and gaster; underside of head with none to about 30. Body varying from dark red to red-black, the head and dorsal surfaces of pronotum and mesonotum sometimes darker than the lateral mesonotum, propodeum, legs and petiole; gaster reddish black with yellow-gold banding along the posterior edge of each segment which varies from being absent to involving the entire visible portion of the segment.

#### Description (minor worker)

Anterior clypeal margin convex to broadly angular (Fig. 7). Dorsal surfaces of pronotum and mesonotum convex and separated by a shallow, broad angle, the posterior metanotum ending in the



metanotal groove; metanotal groove distinct, separated from the anterior propodeum by a short face which varies from steep (Fig. 8) to gentle (Fig. 9); dorsal and posterior faces of propodeum flat to weakly concave and separated by a broad, gentle angle. Anterior face of petiolar node short and separated from the dorsal face by a sharp angle, dorsal face elongate and flat to weakly concave and separated from the posterior face by a broad, rounded angle, posterior face flat (Figs 8, 9). Erect hairs absent from scapes and legs, absent or with a few scattered hairs on the outline of head, mesosoma, petiole and gaster; underside of head with up to about 30 hairs. Body varying from red to red-black, head and sometimes propodeum, petiole and middle and hind legs usually slightly lighter than the pronotum; gaster dark reddish black and sometimes with yellow-gold banding along the posterior margin of each segment which varies from narrow to involving the entire visible segment, in which case the gaster is completely yellow-gold.

#### Measurements

*Workers* (n=20). CI 0.80 (minors) – 1.22 (majors); HL 2.04mm – 4.05mm; HW 1.63mm – 4.94mm; ML 3.68mm – 5.14mm; MTL 2.58mm – 3.14mm; SI 0.63 (majors) – 1.53 (minors); SL 2.50mm – 3.00mm.

#### Comments

*Camponotus midas*, established by Froggatt (1896), is here considered a synonym of *C. aurocinctus*. Froggatt made no mention of *C. aurocinctus* in his description of *C. midas* and it is unclear if he was aware of *aurocinctus*, and if so, how it differed from his species. Clark (1930a) redescribed *C. midas* and separated it from *C. aurocinctus* "by the shape of the thorax and node, and the colour of the gaster. In *C. aurocincta* the posterior margin of the segments is narrowly yellow. In *midas* the whole of the segments, except the base of the first, are entirely bright golden yellow." Unfortunately, the currently available material shows that all of these characters are highly variable. Many show an east-west clinal pattern, with several changing rapidly across central South Australia. For example, *C. aurocinctus* specimens from Western Australia are generally darker and hairier (especially on the underside of the head) compared to those from eastern South Australia eastward. The western populations also tend to have broader bands of golden yellow on the gaster with completely black gasters essentially unknown. In contrast, eastern populations often have narrow bands or lack banding completely, the gasters being uniformly

black. Other characters, such as the depth of the metanotal groove and the relative length of the petiolar node, vary considerably within local areas or within single nest series. This variation suggests that a single widespread and variable species is involved rather than two (or more) separate species.

*Camponotus aurocinctus* is known from south-central Queensland, western New South Wales and north-western Victoria west through South Australia and southern Northern Territory to west-central Western Australia (Fig. 10). It is ground nesting, shows a strong preference for sandy soils and is most often found as foragers during daylight hours. One of us (AJM) has observed this species at Stockyard Plain and Danggali Conservation Park, South Australia, foraging in the vicinity of *Camponotus terebrans*. The karyotype of this species was discussed by Imai *et al.* (1977) (as *Camponotus* sp. 8).

#### *Camponotus ceriseipes* Clark (FIGS 11-16)

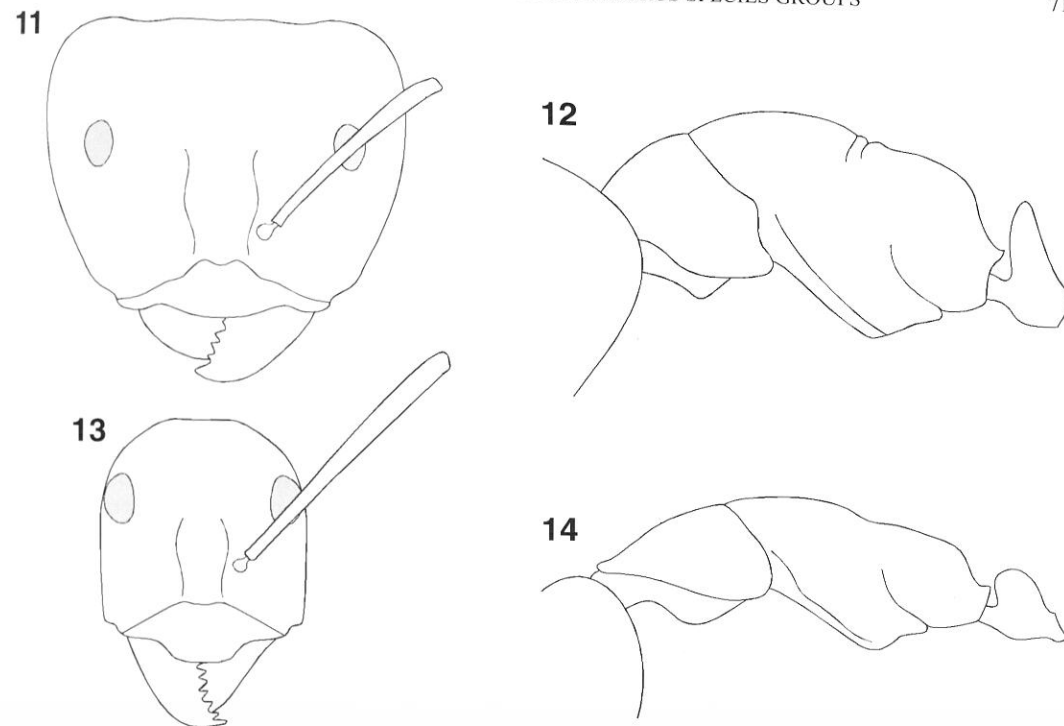
*Camponotus* (*Myrmophyma*) *ceriseipes* Clark, 1938: 378.

#### Material examined

*Syntypes*. Six workers from N. end of Reevesby Island, South Australia, December, 1936, J. Clark (3 in ANIC, 3 in MVMA).

#### Other material examined

**Northern Territory:** 15km S Alice Springs (PJM); NW Alice Springs, Atartinga (PJM). **South Australia:** 10km WSW Lameroo (PJM); 6km NW Mt. Pleasant (PJM); Banff, Coorong (PJM); Belair (PJM); Bridgewater (PJM); Calca (BBL); Calca, 30km SE Streaky Bay (BBL); Cape Bauer (RWT & RJB & BBL); Clifton Hills Outstation (JAF & DHI); Coorong, Coolatoo (PJM); Coorong, 5km WNW Pitlochry HS (PJM); Eyre Pen., 6km W Vanilla (PJM); Innes Natl. Pk., York Peninsula (PJM); Kangaroo Is., 1km N Breakneck Ck. (PJM); Kangaroo Is., N Breakneck R. (PJM); Mt. Compass (BBL); Mt. Lofty (BBL); Mt. Rescue CP, Jimmy's Well (JAF); Port Parham (BBL); Sandy Creek, Mt. Lofty Ranges (EYE); Poochera (PSW); Streaky Bay (BBL); Victor Harbour (PJM). **Western Australia:** 20km S Condingup (SOS); 53mi. EbyS Ravensthorpe (RWT); Cape Arid NP, Yokinup Bay (AHB); Coalmine Beach, Walpole-Nornalup Natl. Pk. (JLA & NLA); Esperance area (BBL); Green's Pool, William Bay Natl Pk (SOS); Junana Rock, 9km NW Mt. Ragged (RWT); Ocean Beach, Denmark (BBL); Redgate Beach, Leeuwin-Naturaliste Natl Pk (SOS); Waterfall Beach, William Bay Natl Pk (SOS); William Bay Rd., Denmark (BBL); William Bay, Denmark (BBL).



Figs 11-14. *C. ceriseipes* workers. Fig. 11. Head of major worker. Fig. 12. Mesosoma and petiole of major worker. Fig. 13. Head of minor worker. Fig. 14. Mesosoma and petiole of minor worker.

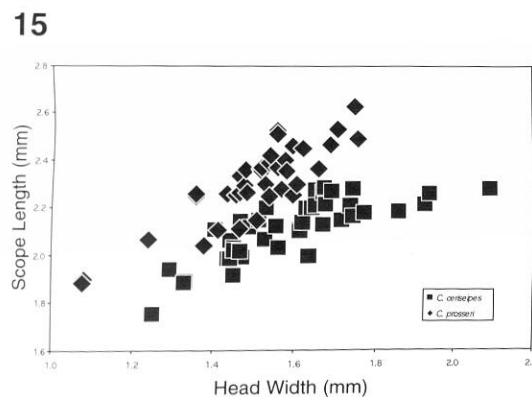


Fig. 15. Distribution of scape length versus head width for *C. ceriseipes* and *C. prosseri* minor workers.

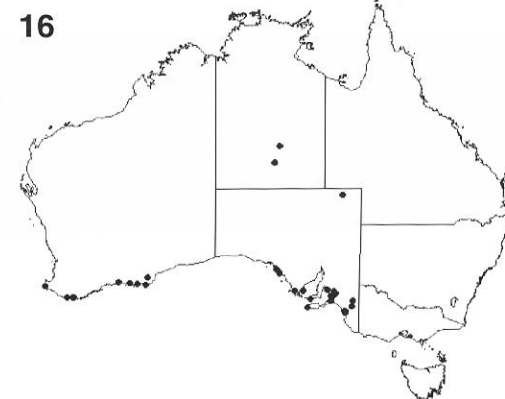


Fig. 16. Distribution of *C. ceriseipes* material examined during this study.

#### Worker diagnosis

Scapes relatively short (in minors, SI < 1.5) (Fig. 15). Posterior section of mesonotum weakly but distinctly convex immediately anterior of the metanotal groove (more so in minors, less so in majors); metanotal groove a shallow, weakly defined concavity in minors (Figs 12, 14). Petiolar node

angular or broadly rounded above, the anterior face at most only slightly shorter than the posterior face (Figs 12, 14). Tibiae and scapes lacking erect hairs, propodeum with more than 10 erect hairs (occasionally with fewer) which are scattered along the entire dorsal surface (never limited to near the propodeal angle as in *C. donnellani*). Anterior

clypeal margin in majors broadly convex across its entire width. Head same colour as mesonotum (both either red or black).

This species is most often confused with the morphologically similar *C. prosseri*. The surest way to separate these species is based on scape length. In larger minor workers of *C. ceriseipes* the scape is relatively short compared with similar sized *C. prosseri* workers (Fig. 15). Note, however, that this difference is minimal or non-existent in smaller workers due to allometry in this character. Other characters useful in separating minor workers of these taxa are the generally higher and narrower petiolar node (Fig. 14) and shiny integument in *C. ceriseipes* compared to the lower and broader node (Fig. 36) and duller integument in *C. prosseri*. The shape of the node works well for the majority of minor workers while the shininess of the integument is more problematic due to the highly qualitative nature of, and greater variation in, this character.

#### Description (major worker)

Pronotum and mesonotum gently convex, metanotum distinct, propodeal dorsum weakly convex, sometimes a little stronger near metanotum; angle well rounded and indistinct, anterior face of petiolar node straight, summit narrowly rounded, posterior face straight, feebly concave near summit (Fig. 12). Anterior margin of clypeus weakly convex, scarcely projecting, with a weak carina (Fig. 11). Posterior margin of head, underside of head, mesosoma, node and gaster with scattered long setae, tibiae and scapes lacking erect hairs. Head red to black, scape red to black, funiculus dark brown; pronotum red to dark brown; mesonotum red to dark brown; petiole red to black; gaster very dark brown to black; legs red to black.

#### Description (minor worker)

Anterior clypeal margin convex, carina distinct (Fig. 13). Pronotum and mesonotum an even, broad convexity; metanotum indistinct; anterior region of propodeum feebly concave, posterior region straight, angle distinct and widely rounded, ratio of dorsum to declivity near 2 (Fig. 14). Anterior face of petiolar node straight, inclined forward, summit rounded, posterior face straight (Fig. 14). Posterior margin of head, underside of head, mesosoma, petiole and gaster with scattered long setae, tibiae and scapes lacking erect hairs. Head red to black, scape red to black, funiculus dark brown; pronotum, mesonotum, propodeum and petiole each red to black; gaster very dark brown to black; legs red to black.

#### Measurements

**Workers** (n=94). CI 0.82 (minor) – 1.23 (major); HL 1.42mm – 3.31mm; HW 1.25mm – 4.06mm; ML

2.36mm – 4.28mm; MTL 1.59mm – 2.58mm; PnW 1.07mm – 2.45mm; SI 0.68 (major) – 1.42 (minor); SL 1.75mm – 2.58mm.

#### Remarks

The specimens here treated as belonging to this species show considerable variation in body colour. The head and mesosoma range from uniform red to uniform black with essentially all intermediate combinations displayed among the available material. There is a weak trend for the Western Australian specimens to be darker and a distinct trend for the Northern Territory specimens to be lighter. However, numerous specimens bridge the gaps between these colour forms, especially within Western Australia, and specimens nearly identical to those from the Northern Territory occur in South Australia along with more typical workers.

*Camponotus ceriseipes* ranges from eastern South Australia west along the coast through Western Australia, with two known collections from southern Northern Territory. It has been found in coastal sandplain heath, coastal scrub, limestone mallee, low scrub on a dry ridge and on vegetated coastal sand dunes. Nests have been found under rocks and in open sand and workers have been collected from pitfall traps and while beating vegetation. The species has been found with myrmecophilides (Orthoptera) at Mount Compass, South Australia, by B. B. Lowery.

#### *Camponotus donnellani* sp. nov. (FIGS 17-19)

#### Material examined

**Holotype.** Minor worker from Kings Creek Station, Northern Territory, 23 August, 1992, S. Donnellan, sandhill (ANIC).

**Paratypes.** Two minor workers, same data as holotype (ANIC, SAMA).

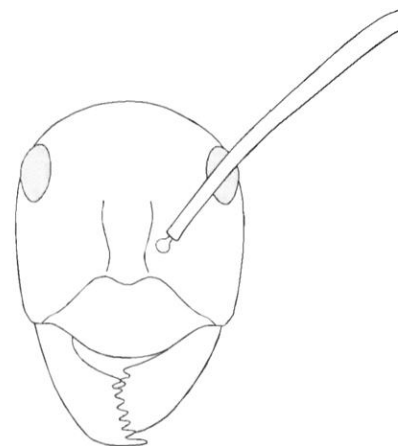
#### Other material examined

**Northern Territory:** 29km ESE Uluru, Uluru-Kata Tjuta (JWA); 15km ESE Uluru, Uluru-Kata Tjuta (JWA). **South Australia:** 3.1km WNW Mt. Lindsay (SANPITJ); E shore Serpentine Lakes (JAF).

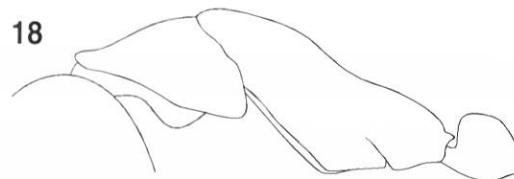
#### Worker diagnosis

Propodeum with at most 4 elongate erect hairs near the angle between the dorsal and posterior faces. Pronotum and mesonotum flatly convex, metanotal groove indistinct, anterior region of propodeal dorsum feebly concave, straight posterior. Petiolar node broadly rounded above, its anterior face at most only

17



18



Figs 17-18. *C. donnellani* worker. Fig. 17. Head of minor worker. Fig. 18. Mesosoma and petiole of minor worker.

19

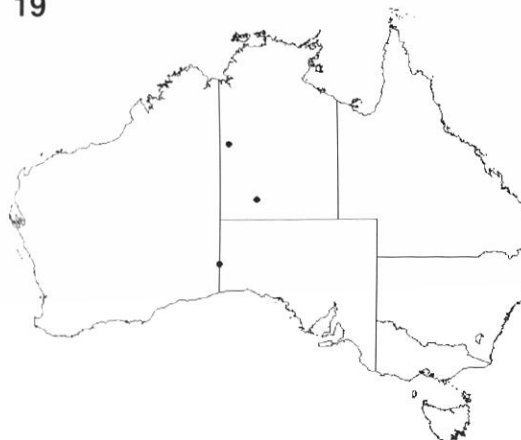


Fig. 19. Distribution of *C. donnellani* material examined during this study.

slightly shorter than the posterior face (Fig. 18). Tibiae and scapes lacking erect setae. Anterior clypeal margin feebly projecting, broadly convex across its whole width.

*Camponotus donnellani* is similar to *C. arenatus* in overall colour pattern but differs in the smaller size

of the minors and the flatter mesosomal dorsum with a less distinct metanotal groove. It may also be confused with smaller, paler workers of *C. ceriseipes*, but differs in having fewer erect hairs on the propodeal dorsum.

#### Description (minor worker)

Pronotum and mesonotum gently convex, metanotal groove indistinct; anterior region of propodeum feebly concave then straight, lacking an angle between the dorsal and posterior faces, ratio dorsum to declivity about 3 (Fig. 18). Anterior face of petiolar node about as long as dorsal face and separated from it by a moderate convexity; dorsal face weakly convex and separated from the posterior face by a broad, rounded angle; posterior face flat (Fig. 18). Elongate erect hairs scattered on all surfaces of head (including underside), mesosoma, node and gaster, absent from scapes and tibiae. Anterior clypeal margin convex broadly angular (Fig. 17). Head, mesosoma and petiole red with upper surfaces of head, pronotum and sometimes mesonotum infuscated with dark red-black, legs red-black basally, red distally; gaster dark red-black.

#### Measurements

**Holotype.** CI 0.89; HL 1.58mm; HW 1.40mm; ML 2.58mm; MTL 1.78mm; SI 1.32; SL 1.85mm.

#### Remarks

*Camponotus donnellani* has been encountered a limited number of times in north-western South Australia and south-western Northern Territory. It has been collected from a sand hill in association with *Triodia* spp. in the Great Victorian Desert of southern Northern Territory. Little else is known of its biology.

#### Etymology

Named after Dr Steve Donnellan of the South Australian Museum, the collector of this species.

#### *Camponotus gouldianus* Forel (FIGS 20-24)

*Camponotus gouldianus* Forel, 1922: 100.

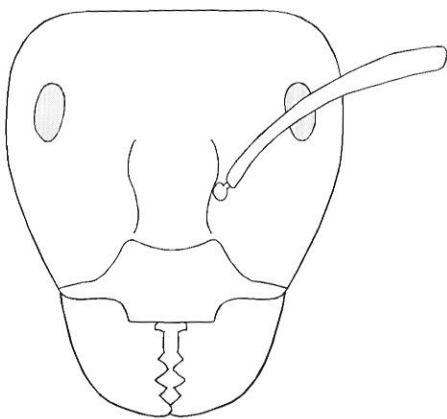
#### Material examined

**Syntypes.** Two medium workers from Sea Lake, Victoria, both badly damaged (MHNG).

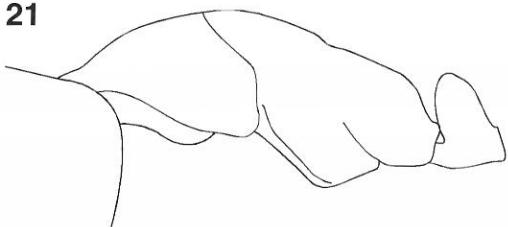
#### Other material examined

**New South Wales:** Balranald (JWI); c. 26km E Euston (RJK). **Northern Territory:** Illamurta Spr CP (JAF & DHI). **South Australia:** 10km NE Chilpuddie, Gawler Ranges (PJM); 10km NW Ceduna (RFO); 11km E Poochera (RWT & RJB &

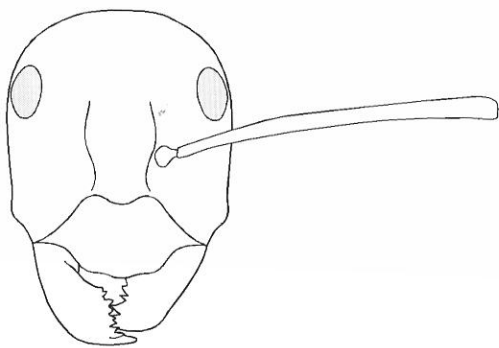
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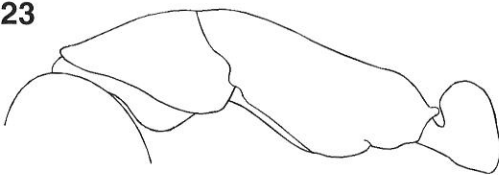
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23



Figs 20–23. *C. gouldianus* workers. Fig. 20. Head of major worker. Fig. 21. Mesosoma and petiole of major worker. Fig. 22. Head of minor worker. Fig. 23. Mesosoma and petiole of minor worker.

24

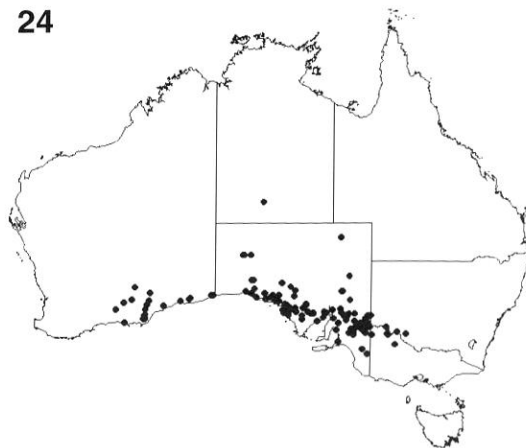


Fig. 24. Distribution of *C. gouldianus* material examined during this study.

ELO); 11mi. E Kimba (PJM); 12km E Ceduna (RFO); 12km E Warramboo, Eyre Pen. (PJM); 13km E Ooldea (JAF); 13mi. SE Streaky Bay (TGR); 15km NW Renmark (SOS); 18km E Ceduna (RFO); 20km E Ceduna (JAF); 20km E Paney HS, Gawler Ranges (PJM); 20km E Uooloo (PJM); 20km ENE Umberatana (PJM); 20km NW Minnipa (AJM); 23km NbyW Renmark (SOS); 32km N Renmark (SOS); 3mi. W Penong (TGR); 41km EbyN Nullarbor (RWT); 45km WNW Emu, Victoria Desert (PJM); 4km W Wirrulla (JAF); 4mi. E Orparinna (GFG); 53km E Vokes Hill, Victoria Desert (PJM); 53km NbyW Renmark (SOS); 58km E Vokes Hill, Victoria Desert (PJM); 5km N Poochera (RWT & RJB & ELO); 60km N Colona (EXP); 60km NNE Ceduna (JAF & PJM); 6km W Nundroo (RFO); 7.4km SW Poochera on Port Kenny Rd (RWT & RJB & ELO); 7.5km NW Venus Bay (SANPNS); 79km NNW Renmark (AJM); 7km NE Purnong (SANPVS); 7km SE Belah (SANPSOPS); 7km SSW Munyaroo CP (WKH); 7km W Inila Rock Waters (SANPVS); 9km N Atkindale HS (SANPSOPS); Aldinga Scrub (SMO); Allendale HS 9 km N (SANPSOPS); Baratta 6 km NW (SANPSOPS); Belah 7 km SE (SANPSOPS); Blyth (BBL); Brookfield Conservation Park, 0.5km S Camp area (SOS); Brookfield Conservation Park, Camp area (SOS); Buckleboo (EBR); Calpatanna CP, Eyre Pen. (JAF); Calpatanna Waterhole (JAF); Calperum Amalia (AJM); Calperum Murphys (AJM); Calperum NE corner (AJM); Cambrai (PJM); Canopus Dam (AJM); Canopus HS, Dangdali CP (TWE & KRP); Ceduna (KCA); Ceduna 10 km NW (RFO); Ceduna 18 km E (RFO); Chadee (LQU); Chowilla (TGW & PJM); Clements Gap CP (DHI); Colona 60 km N (EXP); Cooletong (GLH); Coultong

(AJA & MAA); Cowell (BRH); Dangdali Tipperary Dam (AJM); Dangdali, NE corner (AJM); Flash Jack Dam (SANPSOPS); Gawler Ra Lake Everard Stn (GFG); Gawler Ra Scrubby Peak (JAF); Gawler Ranges (PJM); Hideaway Hut (SANPSOPS); Inila Rock Waters 7 km W (SANPVS); Katarapko Creek (AJM); Kimba (PAI); Kokatha, Gawler Ranges (PJM); Kooma, Eyre Peninsula (PJM); Koonamore (PJM); Koonamore HS (JAF); Kychering Soak (RCC); Lake Everard Stn, Galwer Ranges (GFG); Lake Gilles (JAF); Lock (AJM); Loxton Paynes Farm (AJM); Loxton Snodgrass Farm (AJM); Mambray Creek, Port Augusta (PJM); Middle Dam (SANPSOPS); Middleback Stn. (AJO); Minnipa 20 km NW (AJM); Mitcherie Rockhole (SANPVS); Mongolata (SANPSOPS); Moorowie Plain (PJM); Morganvale, Dangdali CP (AJM); Mount Aroona (SANPNWERS); Mount Ive (AJA & PJF); Mount Rescue CP (JAF); Mundoora NP (PJM); Munyaroo CP 7 km SSW (W.K.Head); N.S.W. Coombah (PSW); Nundroo (AJA & SBA); Nundroo 6 km W (RFO); Nundroo Roadhouse (RFO); Oak Bore (GCM); Ooldea (AML); Ooldea 13 km E (JAF); Orparinna 4 mi E (GFG); Orparinna, Flinders Ranges (PJM); Orroroo (GFG); Pandappa (SANPSOPS); Paringa (SANPVS); Poochera (BHO); Poochera (GFG); Poochera (RWT & RJB & ELO); Poochera (AJM); Poochera area (RWT); Poochera area (RWT & PSW); Poochera Cemetery (AJM & CHW); Poochera Hotel (SOS); Poochera, "Freightline site" just S of village (RWT & RJB); Poochinook Flat (GLH); Port Kenny (SANPVS); Purnong 7 km NE (SANPVS); Rockwater Rockhole (SANPVS); Salt Lake (PHU); Scrubby Peak, Galwer Ranges (JAF & WKH); Stockyard Plain (GLH); Streaky Bay (BBL); Streaky Bay (JMC); Streaky Bay (PGR); Thirty Thousand Tank (GCM); Tinda Catch (SANPSOPS); Tipperary Dam, Dangdali CP (AJM); Venus Bay (SEG); Waikerie (BBL); Wedina Well, Calpatanna CP, Eyre Pen. (JAF); Weebubie (PAI); Whyalla (PJM & RBH); Windsor (HBW); Wingoone Hill (SANPSOPS); Wirrulla 4 km W (JAF); Wirrulla (KCA); Yalata (SANPNS); Yaninee (CWA); Yelapawaralinn Creek (JAH & DHI); Yookamurra (WHC); Yumbarra CP (JAH); Yumbarra dog fence (JAF); Yumbarra Rockhole (SANPVS). **Victoria:** 3.3km N Millewa South Bore (ALY); Hattah 6.3 km N (ALY); Lake Hattah (JDI); Mildura (JCM); Millewa South Bore 3.3 km N (ALY); Sea Lake (JCG). **Western Australia:** 10–25km N Junana Rock, on Balladonia Rd (RWT); 10km NE Peak Charles, Peak Charles Natl Pk (SOS); 10km S Balladonia (SOS); 10mi. SE Karonie (RWT); 12km SE Mt Ragged, Cape Arid Natl Pk (SOS); 160km ENE Esperance (PSW); 23km ESE of Cocklebidy (RWT); 23mi. W Fraser Rge. HS (RWT); 25mi. NbyW Balladonia HS (RWT); 36mi.

SE by E Zanthus (RWT); 3km SW Mt Ragged, Cape Arid Natl Pk (SOS); 55km S Balladonia (SOS); 60mi E Balladonia Stn. (TGR); 6km S Norseman (JEF); Balladonia 80 km E (AJM & SBA); Border Village (KMA); Cape Arid National Park (AJM & SBA); Cape Arid NP (RPF); Esperance (BBL); Eucla (SOS); Gora [as Gooru] Hill (TGR); Jarrahsend (AJM & WMA); Junana Rock, 9km NW Mt. Ragged (RWT); Kambalda31.30S 115.41E (JDM); Madura (AJM); Madura (IFB & MSU); Mt. Ragged (BBL); Mundrabilla Motel (AJM & SBA); Weebubie (PAI); Worsley (JDM).

#### Worker diagnosis

Erect hairs present on tibiae and scapes. Metanotal groove absent in minor workers. Propodeum with more than 40 erect short and long setae. Pubescence on head and gaster abundant, with individual hairs overlapping. In profile, dorsum of petiolar node rounded in minor workers, a blunt angle in major workers. The relatively elongate body with abundant erect hairs will separate this species from close relatives.

#### Description (major worker)

Anterior clypeal margin with a nearly straight but crenulate medial projection with angular corners (Fig. 20). Pronotum weakly convex; posterior mesonotum, metanotum and dorsum of propodeum flat and long; propodeal angle rounded, declivity straight, ratio dorsum to declivity about 2 (Fig. 21). Anterior face of petiolar node convex, summit blunt, posterior face mostly convex (Fig. 21). Except for funiculus, entire body covered with plentiful erect setae. Head red to dark brown, scape dark brown to black, funiculus dark brown; pronotum red-brown; propodeum red-brown; gaster black; legs lighter than mesosoma.

#### Description (minor worker)

Anterior clypeal margin feebly convex, strongly projecting, crenulate, anterior corners with wide angles; medial carina blunt (Fig. 22). Pronotum feebly convex; mesonotum and dorsum of propodeum flat and long, sometimes feebly concave, angle rounded, posterior face straight, ratio of dorsum to declivity about 3 (Fig. 23). Anterior face of petiolar node convex, summit bluntly rounded, posterior face convex (Fig. 23). Except for funiculus, entire body covered with plentiful erect setae. Head red to dark brown, scape dark brown to black, funiculus dark brown, mesosoma, node, and gaster darker, legs lighter than mesosoma.

#### Measurements

**Workers** (n=20). CI 0.86 (minor) – 1.11 (major); HL 1.83mm – 4.24mm; HW 1.59mm – 4.71mm; ML



2.87mm – 4.91mm; MTL 2.22mm – 3.04mm; PnW 1.18mm – 2.66mm; SI 0.65 (major) – 1.60 (minor); SL 2.46mm – 3.08mm.

### Remarks

This is one of the most commonly encountered species in this group. It occurs from western New South Wales and Victoria west to south-central Western Australia and can be found in a range of habitats including mallee on a number of soil types. In sandy soils nest entrances are at ground level generally close to the trunks of mallee or other tall vegetation. In heavier soils nest entrances are constructed of soil formed into a column about 30 mm diameter and 100 mm tall with an entrance hole in the side near the rounded summit. The purpose of this turret is not known but is likely to be related to predator avoidance and/or to prevent water entering the nest during flooding. A nuptial flight was observed at Waikerie, South Australia on 15 May 1998 at 3 pm when the temperature was 25°C. This ant is known to be the host for an unusual group of leafhoppers, members of the Eurymelidae (Hemiptera). These leafhoppers live in the ants' nests and forage nocturnally along with the ants (Day & Pullen 1999).

### *Camponotus owensae* sp. nov. (FIGS 25–27)

#### Material examined

**Holotype.** Minor worker from 32km NNE Inila Rock Waters, Yumbarra Conservation Park, 31° 44' 01" S 133° 26' 59" E, South Australia, 20–24 March, 1995, H. Owens (SAMA).

**Paratypes.** Three minor workers, same data as holotype (1 in SAMA, 2 in ANIC).

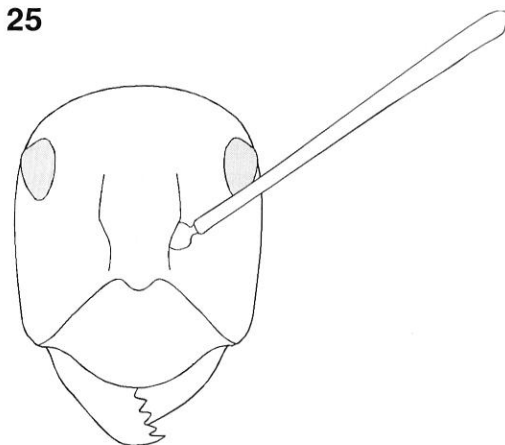
#### Worker diagnosis

Tibiae with abundant suberect hairs. In minors, metanotal groove depressed below the level of the anterior region of the propodeum; dorsal surface of petiolar node relatively long and flat, its anterior face much shorter than the posterior face. Elongate (overlapping) and dense pubescence present on head, mesosoma, gaster and tibiae. Body colour black. The configuration of the metanotal groove and the abundant pilosity will separate this species from others in this species group.

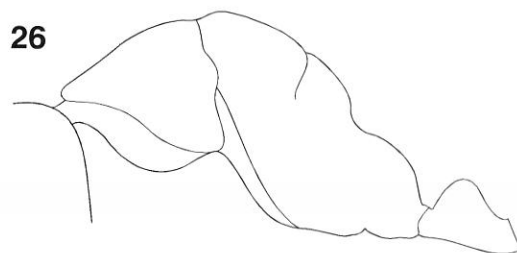
#### Description (minor worker)

Anterior clypeal margin projecting, median portion nearly straight and feebly crenulate with rounded angles laterally (Fig. 25). Pronotum, mesonotum, metanotum and the anterior one-fifth of

25



26



Figs 25–26. *C. owensae* workers. Fig. 25. Head of minor worker. Fig. 26. Mesosoma and petiole of minor worker.

27

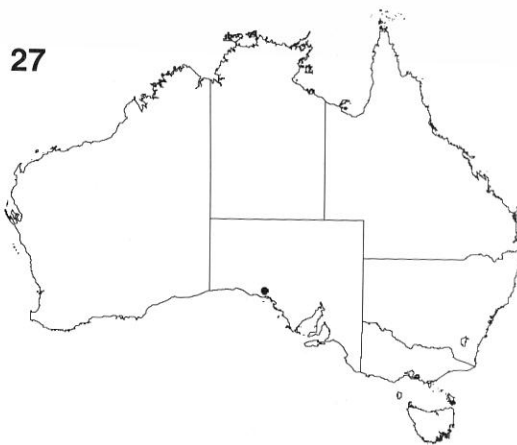


Fig. 27. Distribution of *C. owensae* material examined during this study.

propodeum a strong, even domed convexity distorted only by the two feeble, well separated sutures of the metanotum, the posterior four-fifths of propodeum rise from a wide concavity to a posterior hump which includes the rounded angle and the mostly straight posterior propodeal face (Fig. 26). Anterior face of petiolar node straight, shorter than posterior face, summit narrowing upwards to a rounded angle (Fig. 26). Entire body black and covered with plentiful erect and flat lying white setae except antennae where setae are flat lying to suberect.

#### Measurements

**Minor worker** (n=2). CI 0.80 – 0.83; HL 2.04mm – 2.35mm; HW 1.63mm – 1.95mm; ML 3.33mm – 3.89mm; MTL 2.98mm – 3.08mm; PnW 1.42mm – 1.60mm; SI 1.50 – 1.71; SL 2.79mm – 2.92mm.

#### Etymology

Named after Helen Owens of the South Australian Department of Environment, Heritage and Aboriginal Affairs, who found this species during a faunal survey.

### Remarks

This rare species has been collected only once from south-western South Australia (Fig. 27). Specimens were collected in pitfall traps in mallee. Nothing else is known of its biology.

### *Camponotus postcornutus* Clark (FIGS 28–32)

*Camponotus (Tanaemyrmex) postcornutus* Clark, 1930b: 121.

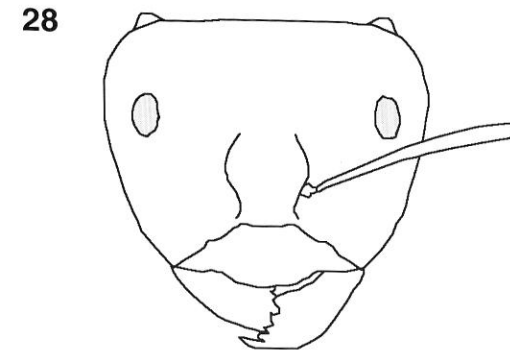
#### Material examined

**Syntypes.** 10 workers from Bungulla and Tammin, Western Australia (1 in AMSA, 5 in MCZC, 4 in MVMA).

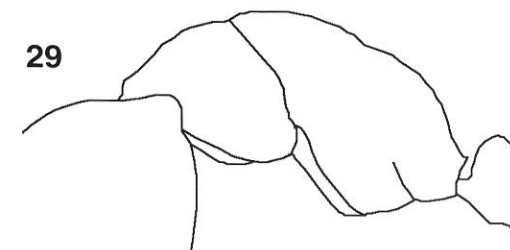
#### Other material examined

**South Australia:** Blythe (BBL). **Western Australia:** 26mi. NWbyW Norseman (RWT); 32km W Salmon Gums (GPB); 35km S Kambalda (JAF); 38.8km ex Murchism R-Billabong (DHK & ACK & WLN & RDN); 53mi SSW Coolgardie (RWT); 71km S Payne's Find (GPB); 9mi SW Grass Patch (RWT); Binneringie Road, 6km ESE Widgiemooltha (JAF); Bungulla (TGR); Frenchman Bay, S Albany (LPK); Kalbarri Natl Pk (BBL); Mullewa (WMW); Norseman Area (AMD & MJD); Parker Ra. [as Parkers] (TGR); Salmon Gums, 70mi. N Esperance (BBL); Tammin (TGR); Tardun (CTM).

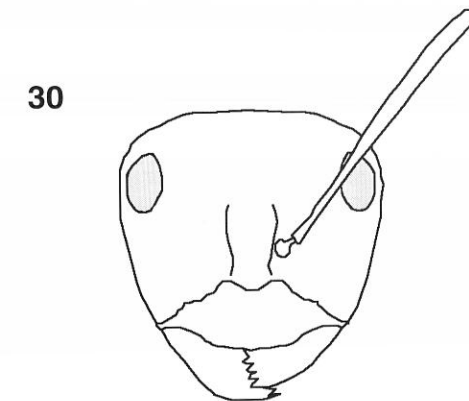
28



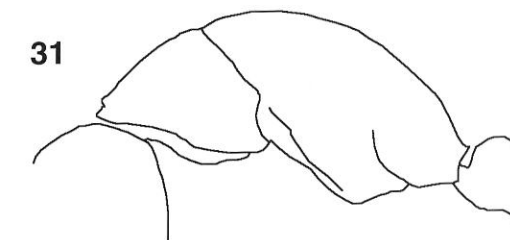
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30



31



Figs 28–31. *C. postcornutus* workers. Fig. 28. Head of major worker. Fig. 29. Mesosoma and petiole of major worker. Fig. 30. Head of minor worker. Fig. 31. Mesosoma and petiole of minor worker.

32

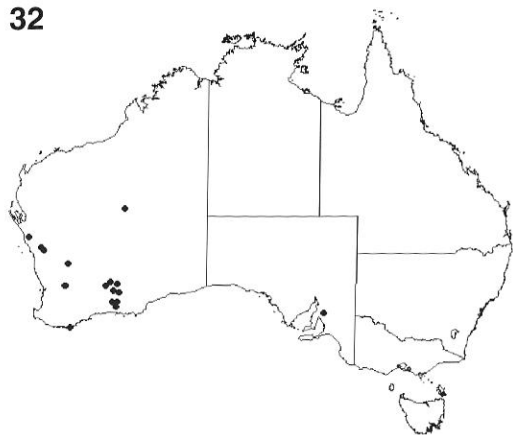


Fig. 32. Distribution of *C. postcornutus* material examined during this study.

#### Worker diagnosis

In minor workers, the pronotum, mesonotum and dorsum of propodeum form a strong, even convexity, the metanotal groove is absent and the posterior face of the propodeum is only weakly differentiated from the dorsal face. The posterior corners of the head in major workers taper rearward into blunt protuberances. The shape of the mesosoma and the cephalic protuberances in major workers will separate this species from close relatives.

#### Description (major worker)

Medial section of anterior clypeal margin weakly projecting anteriorly with broad lateral angles and a feeble medial concavity; carina distinct (Fig. 28). Posterior corners of head produced as blunt horns in major and medium workers (Figs 28, 29). Pronotum, mesonotum and metanotum form an even convexity, propodeal dorsum and posterior face form a separate even convexity without angle (Fig. 29). Anterior face of petiolar node convex, summit moderately sharp, posterior face straight (Fig. 29). Dorsal and undersides of head, mesosoma, petiole, gaster and coxa with sparse reddish, long erect setae. Entire body dark red-brown with the gaster darker.

#### Description (minor worker)

Anterior clypeal margin projecting weakly, carina sharp (Fig. 30). Pronotum, mesonotum and dorsum of propodeum form a reasonably even convexity; propodeal angle broadly rounded, posterior face straight, ratio of dorsum to declivity about 2 (Fig. 31). Anterior face of petiolar node convex, summit bluntly rounded, posterior face convex (Fig. 31). Dorsal and undersides of head, mesosoma, petiole, gaster and coxa with sparse reddish long erect setae. Entire body dark red-brown with the gaster darker.

#### Measurements

Workers (n=8). CI 1.06 – 1.18; HL 1.95mm – 4.16mm; HW 2.06mm – 4.89mm; ML 3.28mm – 4.90mm; MTL 2.16mm – 2.84mm; PnW 1.71mm – 3.13mm; SI 0.57 – 1.14; SL 2.35mm – 2.77mm.

#### Remarks

This species is ground nesting with a simple entrance hole. It is most common in south-western Western Australia with a single collection from South Australia which is lighter in colour than those from Western Australia. Material is mostly from relatively dry areas such as mallee.

*Camponotus prosseri* sp. nov.  
(FIGS 15, 33-37)

#### Material examined

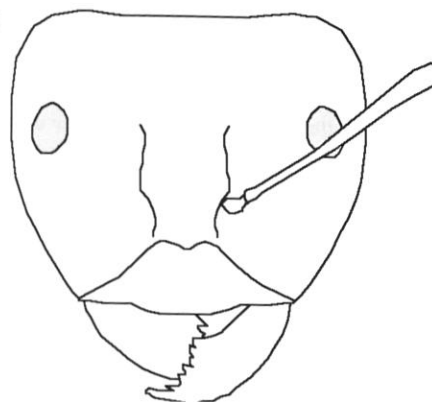
**Holotype.** Minor worker from Streaky Bay, South Australia, 30 August 1974, B. B. Lowery, mallee, in sand (ANIC).

**Paratypes.** 25 workers, 10 queens and 1 male, same data as holotype (2 workers and 1 male in SAMA, remainder in ANIC).

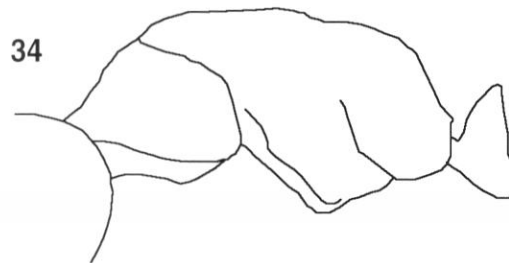
#### Other material examined

**New South Wales:** 1mi. S Hillston (BBL); 4mi. N Condobolin (BBL); 62.8km N Coonabarabran (LPK); 7mi. S Hillston (BBL); Berrigan SF (BBL); Pooncarie (RHC & YCC & AKN). **South Australia:** 20km E Uloomooloo (PJM); 32km N Renmark (KRP); 7km SE Balah (SANPSOPS); Aldinga (BBL); Innes Natl. Pk., York Peninsula (PJM); Innes Natl. Pk., York Peninsula (PJM); Koonamore (PJM); Loxton Payne's Farm (AMA); Loxton Snodgrass (AMA); Marion Bay, Yorke Pen. (RSI); Poochera (PSW); Poochera (RWT & RJB); Port Lincoln, 2km N Cape Tournefort (PJM); Port Lincoln, Eyre Pen., E Horse Rock (PJM); Port Lincoln, Horse Rock (PJM); Port Lincoln, Spalding Cove (PJM); Port Parham, 50mi. N Adelaide (BBL); Streaky Bay (BBL); Streaky Bay (BBL); Yumbera CP, 6km NNE Inila Rock Waters (HOW). **Western Australia:** 28km WSW Israelite Bay, Cape Arid Natl Pk (SOS); 30km W Israelite Bay (GPB & GJM); 53mi SSW Coolgardie (RWT); 53mi. SSW Coolgardie (RWT); 62km NE Albany, Hassell Natl Pk (SOS); 72km SW Norseman (SOS); 80km, West Talbot Rd, Beverley (AMD & MJD); Albany (TGR); Balladonia and Madura (BBL); Eucla (SOS); Gora [as Goora] Rock (TGR); Kings Park (BBL); Mt. Ragged, Cape Arid NP (AHB); Norseman (BBL); Salmon Gums (BBL); Stirling Ra. (GFR); Stirling Ra. NP (GPB).

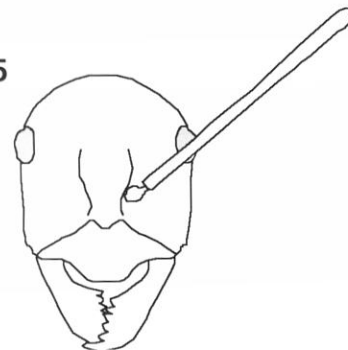
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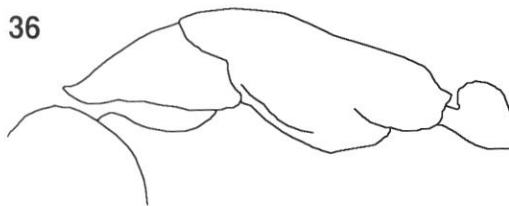
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35



36



Figs 33-36. *C. prosseri* workers. Fig. 33. Head of major worker. Fig. 34. Mesosoma and petiole of major worker. Fig. 35. Head of minor worker. Fig. 36. Mesosoma and petiole of minor worker.

37

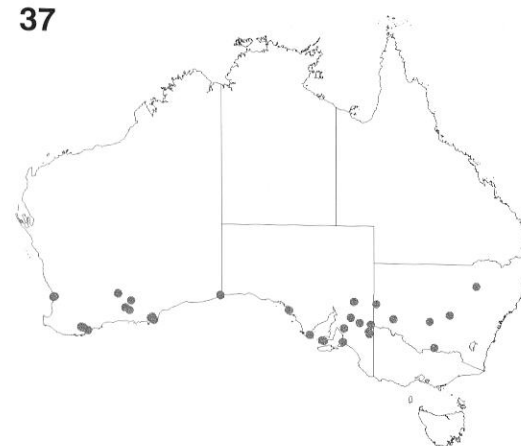


Fig. 37. Distribution of *C. prosseri* material examined during this study.

#### Worker diagnosis

Anterior clypeal margin in major workers broadly convex across its entire width (Fig. 33). Scapes relatively long (in minor workers, SI > 1.4) (Fig. 15). Tibiae lacking erect hairs, propodeum with more than 10 erect hairs which are scattered along the entire dorsal surface. Posterior section of mesonotum weakly but distinctly convex immediately anterior of the metanotal groove (more so in minors, less so in majors); metanotal groove a shallow, weakly defined concavity in minors (Figs 34, 36). Petiolar node angular or broadly rounded above, the anterior face at most only slightly shorter than the posterior face (Figs 34, 36). Head same colour as mesonotum (both either red or black).

This species is morphologically similar to *C. ceriseipes* and is easily confused with it. The difference is outlined under *C. ceriseipes* above.

#### Description (major worker)

Anterior clypeal margin weakly convex, scarcely projecting, with a weak carina (Fig. 33). Pronotum and mesonotum gently convex, metanotum distinct, dorsal propodeal face weakly convex, sometimes a little stronger near metanotum; angle well rounded (Fig. 34). Anterior face of petiolar node straight, summit rounded, posterior face straight, often feebly concave near summit in dorsal view (Fig. 34). Posterior margin and underside of head, mesosoma, petiole and gaster with scattered long setae, tibiae and scapes lacking erect setae. Head red to black, scape red to black, funiculus dark brown; pronotum red to dark brown; mesonotum red to dark brown; petiole red to black; gaster very dark brown to black; legs red to black.

*Description (minor worker)*

Anterior clypeal margin convex, carina distinct (Fig. 35). Pronotum and mesonotum an even, wide convexity, metanotum indistinct, propodeal dorsum feebly concave anteriorly, straight posteriorly, angle widely rounded, ratio of dorsum to declivity near 2 (Fig. 36). Anterior face of petiolar node short, flat, inclined forward, summit rounded, about as high as long, posterior face short, flat (Fig. 36). Posterior margin and underside of head, mesosoma, petiole and gaster with scattered long setae, tibiae and scapes lacking erect hairs. Head and mesosoma clothed in fine flat-lying pubescence sufficiently dense in places to hide the integument. Head red to black, scape red to black, funiculus dark brown; pronotum, mesonotum, propodeum and petiole each red to black; gaster very dark brown to black; legs red to black.

*Measurements*

*Workers* (n=94). CI 0.72 (minor) – 1.21 (major); HL 1.50mm – 3.21mm; HW 1.08mm – 3.88mm; ML 2.41mm – 4.13mm; MTL 2.14mm – 2.66mm; PnW 0.98mm – 2.42mm; SI 0.70 (major) – 1.76 (minor); SL 1.90mm – 2.71mm.

*Etymology*

Named after Dr Ian Prosser, Canberra, Australia.

**Remarks**

The specimens considered here as belonging to this species show consistency in overall head, mesosomal and petiolar shape as well as overall size. The length of the scape varies but this variation is highly correlated with head width (Fig. 15) as would be expected for a single taxon. However, these specimens do show considerable variation in colour and to a lesser extent pilosity. Allowing for a few apparently callow or faded individuals, all specimens have the head and gaster black. The mesosoma, petiole and legs, however, vary from black to yellow-red. These colours show considerable variation in intensity with essentially all shades between the extremes present. In general most nest series are fairly consistent in colour pattern with the exception of the petiole and legs, which can vary among individuals. However, the variation between series shows a more interesting pattern. The pronotum is generally black but is partially to completely red in a few collections from Western Australia. The mesosoma and propodeum vary from black to red but this variation occurs throughout the range of the species and the lighter colour is much more common, especially for the propodeum where red is more common than black. It should be noted that the development of the red colour follows a distinct

pattern. The propodeum must be red for the mesonotum to be red, and the mesonotum must be red for the pronotum to be red. This means that the most common colour pattern is black with a red propodeum followed by black pronotum with red mesonotum and propodeum and finally individuals with a completely red mesosoma. The colours of the petiole and legs vary independently of the mesosoma.

The variation in pilosity is substantial but generally less obvious than that found in body colour. Both the erect hairs and appressed pubescence vary from sparse to abundant on all major body regions. And as with colour, most variation occurs between nest series rather than within nest series. However, no significant geographic pattern was detected regarding the development of pilosity, and there was no obvious correlation between colour patterns and pilosity. The only exception to this is a set of specimens from south-western Western Australia which had abundant long erect setae. In spite of this one group, it proved difficult to segregate the available material into subsets for which diagnoses could be developed. There were distinct sets of individuals which shared colour or pilosity patterns but there remained a number of specimens which were either intermediate between these sets or which could not be placed comfortably within these sets. As a result, all of these specimens are here treated as belonging to a single, wide-ranging taxon which shows considerable variation in a number of characters, with a note that some of these may well represent distinct species which are not diagnosable with the material currently available.

Biologically, these ants have been found in mallee, *Callitris* woodlands and coastal scrub. They are known to nest under stones as well as in open soil without covering, especially in sand, and they have been taken in pitfall traps. They are known to forage on low vegetation including mallee and yellow box.

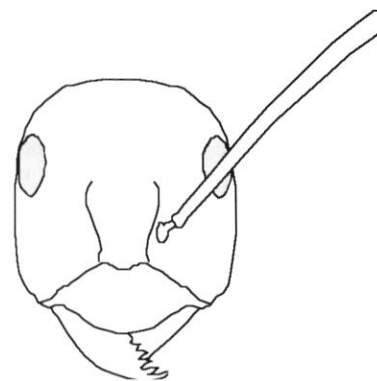
***Camponotus rufonigrus* sp. nov.**  
(FIGS 38-40)

*Material examined*

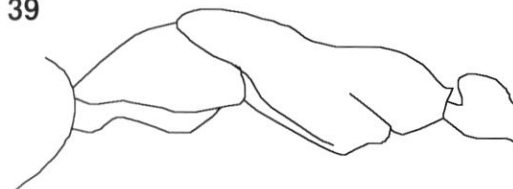
*Holotype*. Minor worker from Cambrai, South Australia, 4-7 February 1972, P. J. M. Greenslade, dune IIb, (ANIC).

*Paratypes*. 8 workers, same data as holotype except: 1 collected 21-25 February, 1972, dune III; 2 collected 7-10 February, 1972, dune III; 1 collected 25-29 February, 1972, dune Ib; 2 collected 28 January, 1972, dune; 2 collected 18-21 February, 1972, dune III (ANIC).

38



39



FIGS 38-39. *C. rufonigrus* workers. Fig. 38. Head of minor worker. Fig. 39. Mesosoma and petiole of minor worker.

40



Fig. 40. Distribution of *C. rufonigrus* material examined during this study.

*Other material examined*

**South Australia:** Gawler Ra. (PJM); Yumbarra CP, 23.5 km NW Inila Rock Waters (HOW).

*Worker diagnosis*

Anterior clypeal margin broadly convex across its entire width (Fig. 38). Tibiae and scapes lacking erect hairs; propodeum with more than 10 erect hairs

which are scattered along the entire dorsal surface. Petiolar node angular or broadly rounded above, the anterior face at most only slightly shorter than the posterior face (Fig. 39). Black head contrasting with red mesonotum.

*Description (minor worker)*

Anterior clypeal margin evenly convex, carina strong (Fig. 38). Pronotum and mesonotum forming an even convexity, metanotum indistinct, propodeal dorsum concave anteriorly and flat posteriorly, angle rounded, declivity straight, ratio of dorsum to declivity about 1.5 (Fig. 39). Anterior face of petiolar node flat, short, summit widely rounded, posterior face convex (Fig. 39). Dorsal and under surfaces of head, mesosoma, petiole, gaster and coxa with sparse long erect setae. Entire body clothed in fine short indistinct flat lying pubescence. Head, anterior of mesosoma, most of node and gaster dark brown to black, otherwise red-brown.

*Measurements*

*Minor worker* (n=3). CI 0.85 – 0.86; HL 1.37mm – 1.60mm; HW 1.16mm – 1.38mm; ML 2.19mm – 2.59mm; MTL 1.53mm – 1.96mm; PnW 0.98mm – 1.20mm; SI 1.44 – 1.55; SL 1.75mm – 2.14mm.

*Etymology*

Named after its red and black body colour.

**Remarks**

This species is known from three localities in southern South Australia (Fig. 40). Two collections consists of single minor workers, while one (from Cambrai) contains nine minor workers collected at six different times during January and February, 1972. Thus this species has been rarely collected and then generally in small numbers. The limited biological information suggests that this species occurs on sand.

***Camponotus setosus* sp. nov.**  
(FIGS 41-43)

*Material examined*

*Holotype*. Minor worker from Manning River Gorge, 16°39'S 125°55'E, Western Australia, 1 June 1992, S. O. Shattuck (ANIC).

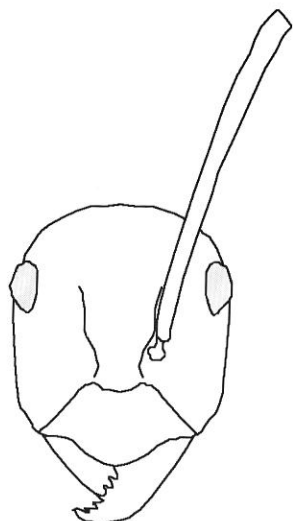
*Paratypes*. 21 minor workers, same data as holotype (3 in SAMA, 18 in ANIC).

*Other material examined*

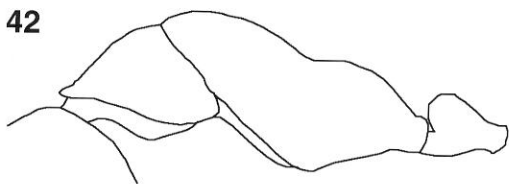
**Western Australia:** 1.5km W King Edward River crossing (SOS).



41



42



Figs 41-42. *C. setosus* workers. Fig. 41. Head of minor worker. Fig. 42. Mesosoma and petiole of minor worker.

43

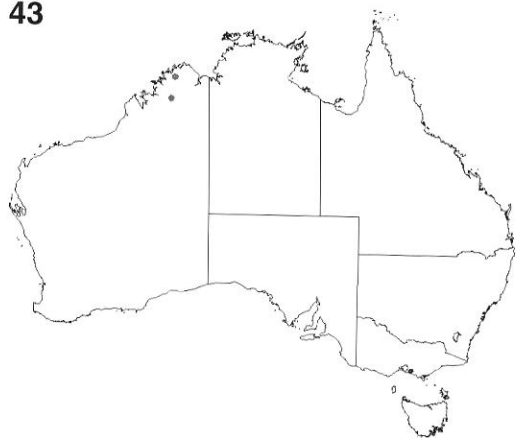


Fig. 43. Distribution of *C. setosus* material examined during this study.

#### Worker diagnosis

Erect hairs present on tibiae. Metanotal groove a distinct, shallow trough. These two characters will separate this distinctive species from others in this group.

#### Description (minor worker)

Pronotum and mesonotum form together an even, raised convexity followed by the angular trough of the metanotum, the weakly convex dorsal surface of the propodeum, a widely rounded angle and the straight posterior face (Fig. 42). Entire body covered with dense flat lying pubescence, erect setae absent from antennae. Pubescence on posterior of gaster yellow, elsewhere white. Gaster black, most of head, mesosoma and node black, the remainder with red patches; antennae dark brown; coxa and femora red, tibiae and tarsi brown.

#### Measurements

Workers (n=4). CI 0.85 – 0.88; HL 1.88mm – 1.96mm; HW 1.64mm – 1.69mm; ML 3.08mm – 3.20mm; MTL 2.34mm – 2.54mm; PnW 1.50mm – 1.54mm; SI 1.45 – 1.57; SL 2.45mm – 2.62mm.

#### Etymology

Named after the abundant long setae present on most regions of its body.

#### Remarks

This apparently uncommon species is restricted to the Kimberley region of Western Australia (Fig. 43). All known collections consist of ground-foraging workers in open *Eucalyptus* woodlands.

#### *Camponotus terebrans* (Lowne) (FIGS 44-48)

*Formica testaceipes* Smith, 1858: 39 (preoccupied by Leach, 1825: 290).

*Camponotus testaceipes* – Mayr, 1862: 662.

*Formica terebrans* Lowne, 1865: 278 (first available replacement name for *Formica testaceipes* Smith) – Mayr, 1876: 65.

*Camponotus* (*Myrmoturba*) *latrunculus victoriensis* Santschi, 1928: 479 – McArthur *et al.*, 1998: 587.

*Camponotus* (*Tanaemyrmex*) *myoporus* Clark 1938:379 – McArthur *et al.*, 1998: 587.

#### Material examined

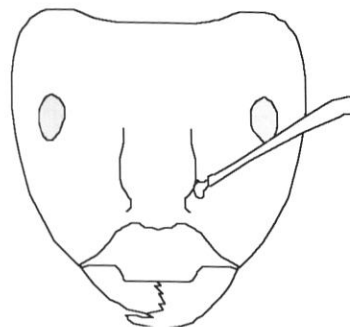
*Formica testaceipes*: Syntype workers from King George Sound, Western Australia (BMNH - see McArthur *et al.* (1998)).

*Formica terebrans*: Syntype workers and queens from Sydney, New South Wales (see McArthur *et al.* (1998)).

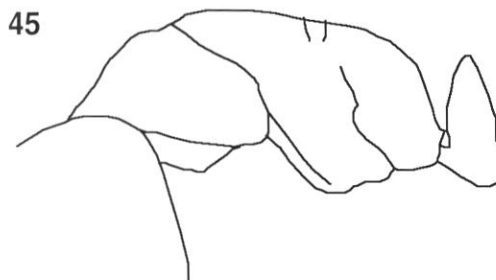
*Camponotus* (*Myrmoturba*) *latrunculus victoriensis*: Syntype workers and males from Elsternwick and Belgrave, Victoria (see McArthur *et al.* (1998)).

*Camponotus* (*Tanaemyrmex*) *myoporus*: Syntype

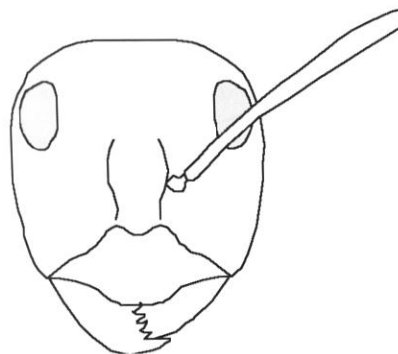
44



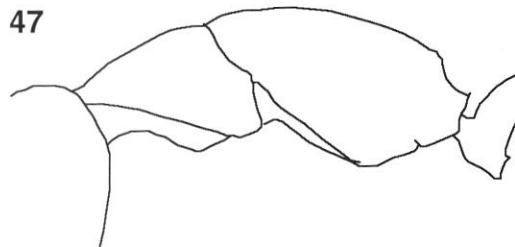
45



46



47



Figs 44-47. *C. terebrans* workers. Fig. 44. Head of major worker. Fig. 45. Mesosoma and petiole of major worker. Fig. 46. Head of minor worker. Fig. 47. Mesosoma and petiole of minor worker.

48

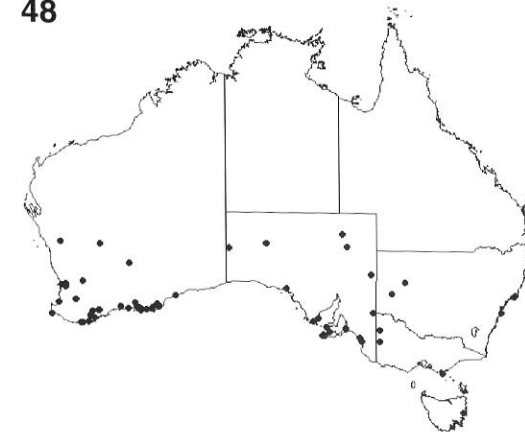


Fig. 48. Distribution of *C. terebrans* material examined during this study. For additional material see McArthur *et al.*, (1998).

workers from Reevesby Island, South Australia (3 in MVMA, 6 in ANIC - see McArthur *et al.* (1998)).

#### Other material examined

See McArthur *et al.* (1998).

#### Worker diagnosis

Erect hairs present on scapes and tibiae. Metanotal groove weakly developed and essentially absent (Figs 45, 47). Propodeum with 10 to 25 erect hairs. Pubescence on head and gaster sparse, with individual hairs generally non-overlapping or at most only slightly overlapping. In profile, dorsum of petiolar node angular in both minor and major workers (Fig. 45, 47). These characters will separate this taxon from close relatives, especially the morphologically similar *C. gouldianus*.

#### Description (major worker)

Medial section of anterior clypeal margin straight, projecting anteriorly with rectangular lateral corners, crenulate; carina indistinct (Fig. 44). Pronotum and mesonotum weakly convex; metanotum distinct as two parallel, transverse grooves; dorsal surface of propodeum straight, angle well rounded, posterior face mostly straight, length of dorsal and declining faces about equal (Fig. 45). Anterior face of petiolar node convex, summit sharp, posterior face mostly straight (Fig. 45). Entire body with plentiful long erect setae tending to suberect on tibiae and scape, absent from funiculi. Head red-brown to black, funiculi lighter, mesosoma and node yellow to brown, gaster darker than mesosoma, legs lighter.

#### Description (minor worker)

Anterior clypeal margin with median section

convex and strongly projecting, carina distinct (Fig. 46). Pronotum and mesonotum mostly weakly convex; the smallest workers without a metanotal groove; dorsal propodeal surface straight, angle well rounded, posterior face straight, ratio dorsum to declivity exceeds 2 in smallest workers (Fig. 47). Anterior and posterior faces of petiolar node generally parallel, summit bluntly convex (Fig. 47). Entire body with plentiful long and short erect setae tending to suberect on tibiae and scape, absent from funiculi. Head brown, funiculi lighter, mesosoma and node yellow to brown, gaster darker than mesosoma, limbs lighter.

#### Measurements

*Workers* (n=20). CI 0.85 (minors) – 1.11 (majors); HL 1.36mm – 3.28mm; HW 1.15mm – 3.64mm; ML 2.07mm – 3.64mm; MTL 1.56mm – 2.39mm; PnW 0.91mm – 2.02mm; SI 0.66 (majors) – 1.54 (minors); SL 1.77mm – 2.39mm.

#### Remarks

*Camponotus terebrans* is common in sandy soil or disturbed sites across much of southern Australia (Fig. 48). Nests are sometimes located adjacent to the trunks of trees or shrubs with abundant excavated soil deposited around the numerous entrances. In some cases excavations have been observed to apparently damage or kill nearby shrubs. In other cases nests and their entrances are in open areas and lack mounds. Colonies may be very large and sometimes have "highways" leading to trees and other colonies. This species is often found in association with *Ogyris* spp. butterflies (Braby 2000). For additional details see McArthur *et al.* (1998).

*Camponotus versicolor* Clark  
(FIGS 49–54)

*Camponotus* (*Myrmosaurus*) *versicolor* Clark, 1930b: 122.

#### Material examined

*Syntypes*. Workers from Emu Rocks, east of Ongerup, Western Australia (6 in ANIC, 3 in MCZC, 3 in WAMP, 5 in MVMA, 3 in BMNH).

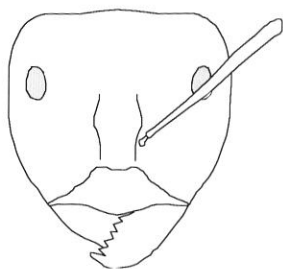
#### Other material examined

**Western Australia:** 33mi. SbyE Karonie (RWT); 9mi. E Newdegate (TGR); Bungulla (TGR); Emu Rock (HRE); Newdegate (HMC & TGR); Norseman (BBL).

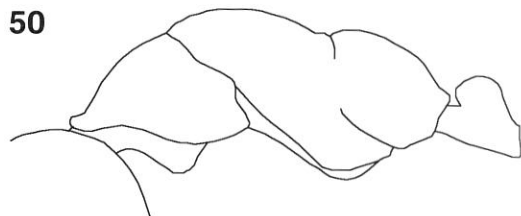
#### Worker diagnosis

Tibiae and scapes lacking erect hairs. In minor workers, metanotal groove angular to slightly

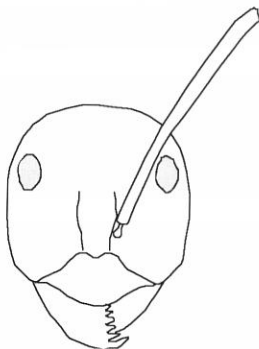
49



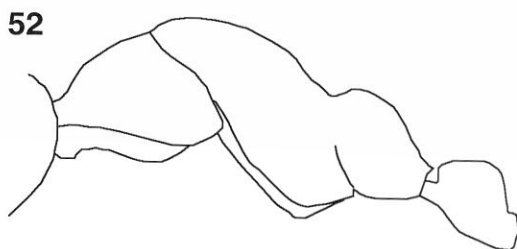
50



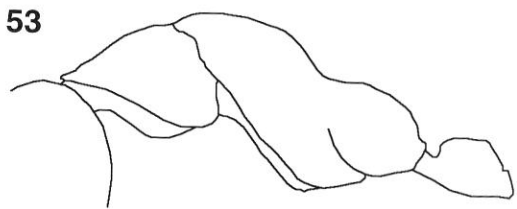
51



52



53



FIGS 49–53. *C. versicolor* workers. Fig. 49. Head of major worker. Fig. 50. Mesosoma and petiole of major worker. Fig. 51. Head of minor worker. Figs 52–53. Mesosoma and petiole of minor worker.

54

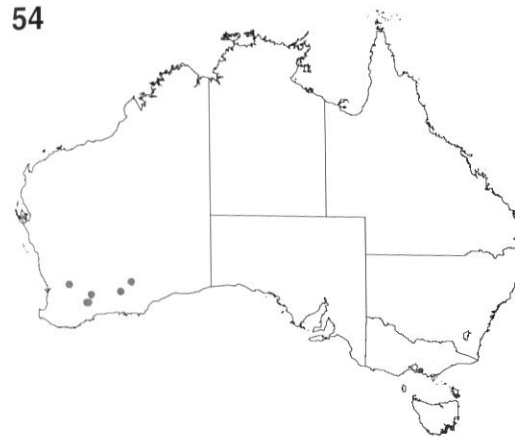


Fig. 54. Distribution of *C. versicolor* material examined during this study.

depressed below the anterior region of the propodeum (Figs 52, 53); dorsal surface of petiolar node in minors relatively long and flat to weakly convex, its anterior face much shorter than the posterior face (Figs 52, 53). Mesosoma black and with at least the first two gastral tergites red and distinctly lighter in colour than the propodeum, gastral tergites never with golden-yellow bands. The configuration of the metanotal groove combined with the distinctively coloured gaster will separate this species from close relatives.

#### Description (major worker)

Dorsal surfaces of pronotum and mesonotum convex and separated by a shallow angle; propodeum uniformly convex without a distinct angle; petiolar node with parallel anterior and posterior faces, its upper surface slightly elongated flat to weakly convex (Fig. 50). Erect hairs sparse on outline of head including underside, scattered on mesosoma, petiole, coxa and gaster, absent from tibiae and scapes. Anterior clypeal margin weakly convex (Fig. 49). Body red-black, head and petiole slightly lighter than mesosoma; gaster with the first two tergites red, the remainder red-black.

#### Description (minor worker)

Anterior clypeal margin convex (Fig. 51). Dorsal surfaces of pronotum and mesonotum convex and separated by a shallow, broad angle; metanotal groove either a broad angle (Fig. 53) or a shallow trough (Fig. 52); dorsal and posterior faces of propodeum flat to weakly convex and separated by at most a gentle angle. Anterior face of petiolar node short and separated from the dorsal face by a distinct angle, dorsal face elongate and flat to weakly convex and separated from the posterior face by a

broad, rounded angle, posterior face flat (Figs 52, 53). Erect hairs abundant on outline and underside of head, mesosoma, petiole, coxa and gaster; erect hairs absent from scapes and tibiae. Body dark red-black or black with the head sometimes slightly lighter; gaster with at least the first two tergites red and the remainder dark red-black, or sometimes entirely red.

#### Measurements

*Workers* (n=7). CI 0.82 (minors) – 1.06 (majors); HL 2.23mm – 3.20mm; HW 1.83mm – 3.42mm; ML 3.96mm – 4.86mm; MTL 2.72mm – 3.00mm; SI 1.45 (majors) – 1.60 (minors); SL 2.93mm – 4.95mm.

#### Remarks

*Camponotus versicolor* is an uncommon species which is limited to a narrow band across southern Western Australia (Fig. 54). It is most similar to *C. aurocinctus* and can be separated from it by the darker body colour and red gastral tergites. Minor workers of *C. aurocinctus* also have larger numbers of erect hairs on the head and mesosoma compared to this species. Essentially nothing is known concerning the biology of *C. versicolor*.

*Camponotus wiederkehri* Forel  
(FIGS 55–59)

*Camponotus wiederkehri* Forel, 1894: 232.

*Camponotus denticulatus* Kirby, 1896: 204 – Clark, 1930a: 19 (worker redescribed). New synonymy.

*Camponotus* (*Myrmoturba*) *latrunculus* Wheeler, 1915: 814. New synonymy.

*Camponotus wiederkehri lucidior* Forel, 1910: 81 – Crawley, 1915: 136 (queen description). New synonymy.

#### Material examined

*Camponotus wiederkehri*: Syntype workers from Charters Towers, Queensland (MHNG).

*Camponotus denticulatus*: Syntype workers from MacDonell (as McDonell) Ranges, Northern Territory (2 in MCZC, 1 in MVMA).

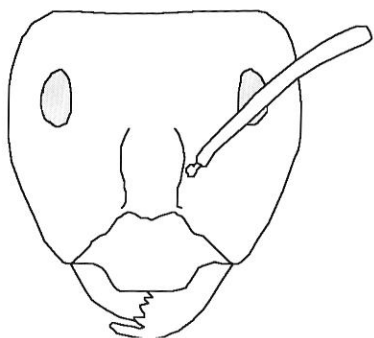
*Camponotus* (*Myrmoturba*) *latrunculus*: Syntype workers from Todmorden, South Australia (1 in SAMA).

*Camponotus wiederkehri lucidior*: Syntype workers and males from Tennant Creek, Northern Territory (3 workers in MCZC, 2 workers in MHNG).

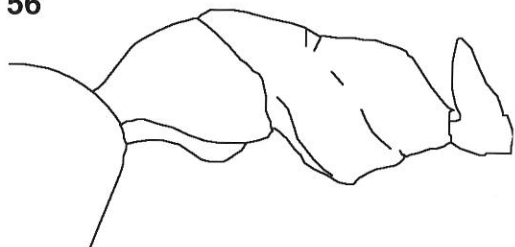
#### Other material examined

**New South Wales:** Waukerroo (RHM); 10 mi. N

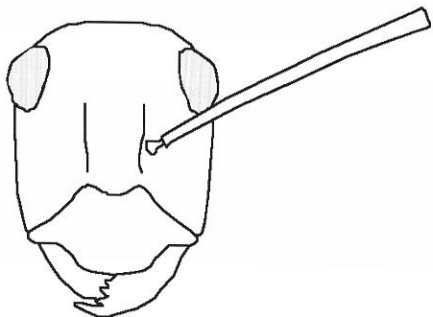
55



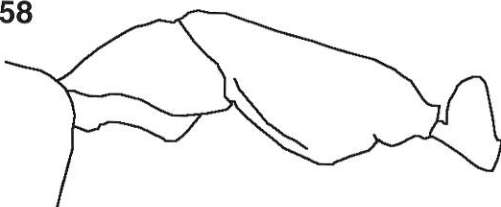
56



57



58



Figs 55-58. *C. wiederkehri* workers. Fig. 55. Head of major worker. Fig. 56. Mesosoma and petiole of major worker. Fig. 57. Head of minor worker. Fig. 58. Mesosoma and petiole of minor worker.

59

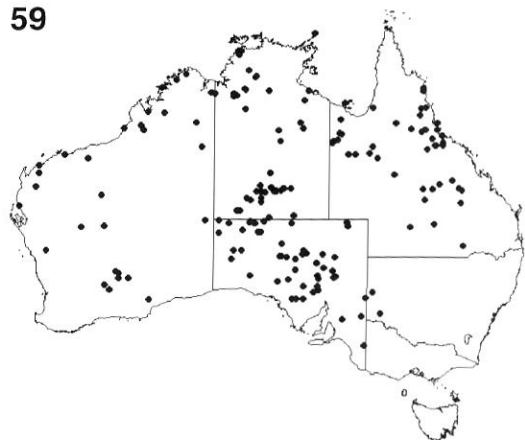


Fig. 59. Distribution of *C. wiederkehri* material examined during this study.

Broken Hill (RHM). **Northern Territory:** 1.5km N Alice Springs (PJM & RJW); 12km SW Katherine (PJM); 15km S Tea Tree (MMA & JHA); 20mi. SE Anthonys Lagoon (TGR); 25km S Andado Stn Rodinga Ra (JAF & DHI); 35km S Darwin (LHI); 37km E Wallara Ranch (SOS); 3km E Serpentine Gorge (SOS); 50km WNW Hermannsburg (SOS); 7km W Timber Creek (MMA); Alice Springs (CBA); Alice Springs (WLB); Alice Springs (WCC); Alice Springs (LHI); Alice Springs (PPL); Alice Springs (KRO); Batten Ck., 30km WSW Borroloola (JEF); Bing Bong HS (JEF); Bitter Springs Creek (JAF & DHI); Bullita Outstation (MMA); Camfield (IAR); Colyer Creek, 8km N Alice Springs (SOS); Corroboree Rock, 2(km E Alice Springs (SOS); Darwin (SMO); Darwin (HWE); Doyles Ridge nr. Birdum (TGR); Flying Fox Creek (SMO); Glen Helen (SOS); Helen's Ck., Banka Banka Rd. (TGR); Illamurta Spring (JAF & DHI); Jasper Gorge (IAR); Katherine (RVS); Kings Canyon Nat. Pk. (SOS); Kings Creek Caravan Park (SDO); Kulgera (JBS); Kunoth Paddock, 30km NW Alice Springs (WAL); Kunoth Park nr. Alice Springs (PJM & WLO); Macdonnell Downs (SAMA Exped.); McArthur R., 48km SWbyS Borroloola (JEF); Narwietooma (AWF); NW Brunette Downs (TGR); Phillip's River (TGR); Port Darwin (WDD); Rimbija Is., Wessel Islands (EDE); Rimbija Is., Wessel Islands (TAW); Roderick Creek (IAR); Ruby Gap Gorge (JAF & DHI); Tennant Creek (JFF); Trephina Gorge Nature Park (JBS); Trephina Gorge, 55km ENE Alice Springs (SOS); Turnoff into Ormiston Gorge (SOS); Umbrawarra Gorge (JAR & IAR); Valley of Winds, The Olgas (JEF & TAW); Victoria River (BRH); Yulara, campground (SOS). **Queensland:** 1.5km WNW Riversleigh HS, nr. Gregory R. (JAF); 106mi.

NW Mt. Isa (TGR); 10mi. W Mt. Garnet (BBL); 16mi. ESE Gilbert R. Crossing, E of Croydon (JED); 18mi. ESE Emerald (JED); 1mi. S Carpentaria Downs HS, SE Einasleigh (JED); 1mi. SE Lorraine HS (JED); 25km S Woodstock (PJM); 28mi. N Thornton HS, NE of Camooweal (JED); 2mi. SE Camel Ck. HS, W of Ingham (JED); 2mi. SE Mary Kathleen (JED); 4mi. NE Oorindi (JED); 50mi. N Julia Creek (REL); 52km S Woodstock (PJM); 5mi. W Lotus Vale HS, N of Normanton (JED); 7km E Charters Towers (PJM); 9mi. NE Camooweal (JED); Barcardine (GFG); Blackall (JBS); Carpentaria Downs (JED); Charters Towers; Clermont (BBL); Cooktown (BHO); Dalgongally, nr. Cloncurry R. (JED); Doomadgee Mission Station (PAI & NBT); Emerald (FAC); Emerald (JHA); Emerald District (SAH); Greenvale (JED); Greenvale Station area (SAH); Helenslee (TGR); Homestead (FHI); Jericho (FAC); Mareeba (BBL); Mornington Mission (PAI & NBT); Mt. Isa (JRU); nr. Dimbulah (RWT & JEF); Quilpie (JSM); St. George (BBL); Star R. Crossing (SAH); Surbiton (FAC); Townsville-Charters Towers Rd. (TGR); Undilla HS, NE of Camooweal (JED); Winton (FAC). **South Australia:** 10km W Mabel Ck. (PJM); 11km N Maryinna Hill (SANPPITJ); 155km N Cook (JAF); 20km ENE Pipalyatjara (SANPPITJ); 26mi S Kunytjanu (SANPPITJ); 53km E Vokes Hill, Victoria Desert (PJM); 60km S Pimba (MAA); 7mi. E Wilgena (TGR); 80km E Emu Junction, Victoria Desert (PJM); Andamooka (JAH); Arltunga (DCO); Aroona Dam (AJM & JDE); Belah (SANPSOPS); Birthday Hill, N Tarcoola (PJM); Blood Ck. (CBA); Box Creek (AJM & JDE); 22km N Beltana (JEF); Clifton Hills Outstation (JAF & DHI); Coober Pedy (BBL); Copper Hill (HFR); Curdimurka, L. Eyre (BBL); Davenport Range (AJM & MAA); Douglas Creek (MAA); Dulkaninna (PCO); Ernabella Mission (NBT); Ernabella Mission Stn. (BBL); Everard Park (JFI); Farina (PJM); Gawler Ranges (PJM); Hideaway Hut (SANPSOPS); Lake Eyre (BBL); Lake Gairdner (AAS & MLS); Mabel Ck (TGR); Mimilli (SANPPITJ); Mitchell Nob (SANPPITJ); Mt. Cooperina (SANPPITJ); Mt. Finke (PJM & JAF); Musgrave Ranges (BBL); Ngarutjara (SANPPITJ); Ooldea (AML); River Diamantina (AMM); Robertstown (SANPSOPS); Ronald Well (SANPPITJ); S end of L. Windabout (BBL); Screech Owl Creek (WMC); The Twins HS (RSM); Vokes Hill (JAF); Vokes Hill (GFG); Vokes Hill, Victoria Desert (PJM); Womikata Bore, Musgrave Ra. (SANPPITJ); Woocalla (RSM); Yardea (AJM & PJF). **Western Australia:** 100km E Southern Cross (PJM); 100km SEbyE Broome (IFB); 11km N Wiluna (DDA & SRM); 163km SEbyE Broome (IFB); 45mi. S Onslow (GCA); 50km N Kalgoorlie (PJM); 53mi. SSW Coolgardie

(RWT); 70km E Kalgoorlie (JEF); 7km W Kununurra, Bandicoot Ra. (DCF & JBA); Ashburton River (RHM & GCA); Balgo Mission (ARP); Balladonia (BBL); Black Stone Range (KTR); Canegrass, NNE Kalgoorlie (JED); Derby (WDD); Jigalong (JHI); Kalgoorlie (PAI); Kalgoorlie [as Kalgoole] (TGR); Kalumburu Mission (MDA); Kimberley area nr. Kalumburu Mission (<5 mi.) (WLE); Kununurra boat ramp (RHM & GCA); LaGrange Mission, 120km S Broome (KMC); Lyndon R., Carnarvon (RHM); Lyndon River, Carvarvon (RHM); Meekatharra, Mt. Newman mid. Gascoyne R. (PJM); Mitchell Plateau (mining camp) (DCF & JBA); Moola Bulla (NBT); Onslow (RHM); Ord R. (SAH); Pilgangoora Mining Centre (NBT); Pindar (CTM); Port George iv (JRB); Roebourne (WDD); Windjana Gorge NP (PSW).

#### Worker diagnosis

Anterior clypeal margin in major workers projecting, the central region straight with rectangular sides joining the lateral regions (Fig. 55). Posterior section of mesonotum flat (or nearly so) immediately anterior of the metanotal groove, metanotal groove essentially absent or weakly developed in minors (Fig. 58), a broad, shallow angle in majors (Fig. 56). Petiolar node angular or broadly rounded above, the anterior face at most only slightly shorter than the posterior face (Figs 56, 58). Tibiae and scapes lacking erect hairs.

#### Description (major worker)

Medial section of anterior clypeus strongly projecting, its margin straight and lateral corners broadly angular, carina weak (Fig. 55). Pronotum and mesonotum a slightly raised even convexity; metanotum with two distinct groves, the anterior section of the propodeal dorsum feebly concave anteriorly and feebly convex posteriorly, propodeal angle widely rounded, posterior face mostly straight, ratio of dorsum to declivity about 1 (Fig. 56). Anterior and posterior faces of petiolar node straight; summit flat, narrow and sharp, sometimes bidentate, its posterior margin feebly concave (Fig. 56). Dorsum and underside of head, mesosoma, petiole, coxa and gaster with plentiful scattered erect setae, reduced numbers on propodeal angle and declivity, absent from scapes, flat lying on tibiae. Head yellow-red to dark brown, antennae red to red-brown, mesosoma and node yellow-red to brown; gaster darker, legs lighter.

#### Description (minor worker)

Medial section of anterior clypeus strongly projecting, its margin convex, crenulate; carina distinct (Fig. 57). Pronotum weakly convex, anterior section of mesonotum weakly convex, the remainder



joins with propodeal dorsum to form a long flat surface ending in a widely rounded propodeal angle and short posterior face, ratio of dorsum to declivity about 3 (Fig. 58). Anterior face of petiolar node mostly convex, summit sharp (in front view pointed), posterior face mostly flat (Fig. 58). Dorsum and underside of head, mesosoma, petiole, coxa and gaster with scattered long setae; reduced numbers on propodeal angle and declivity; absent from tibiae and scapes. Entire body clothed with fine pubescence. Mesosoma yellow-red to dark red-brown, sometimes with darker or lighter patches; head, node and gaster generally darker, legs lighter.

#### Measurements

**Workers** (n=20). CI 0.80 (minors)–1.08 (majors); HL 1.51mm – 3.33mm; HW 1.21mm – 3.61mm; ML 2.51mm – 3.83mm; MTL 1.92mm – 2.62mm; PnW 0.97mm – 2.13mm; SI 0.68 (majors) – 1.60 (minors); SL 1.94mm – 2.45mm.

#### Remarks

This is one of the most commonly encountered and widespread species in this group (Fig. 59). In southern Australia nests are generally mounds approximately 150 to 200mm in diameter with steeply sloping sides and a flat summit with the entrance in a slight depression in the centre. These mounds are often decorated with small stones. Nests are often in heavy soil in open areas and are less common or are absent from areas of high rainfall. Often several mounds may be seen within a few metres of each other.

Morphologically, this species (as conceived here) shows minimal variation in body shape and pilosity (other than that expected for a polymorphic taxon) but does show considerable variation in colour. The colour ranges from clear yellow-red to black with essentially all grades of colour in between. In most cases the colour is uniform within an individual but various degrees of infuscation on the mesosoma are common. Also, most variation occurs between rather than within nest series although the development of infuscation does vary within nest series. Finally, this colour variation shows little geographic pattern with essentially all colour forms being found in all regions, the only exception being northern regions of the Northern Territory where light forms predominate.

The types of *C. wiederkehri* and *C. wiederkehri lucidior* represent the more lightly coloured forms of this taxon. These two taxa were separated based on trivial and non-significant differences in size, sculpturing and the shape of the anterior clypeal margin (Forel 1910) and they clearly represent the same taxon. *Camponotus latrunculus* represents an

intermediately coloured form and compares well with the types of *C. wiederkehri*. Wheeler (1915) was apparently unaware of *C. wiederkehri* as he made no mention of it in his description of *C. latrunculus* and this is likely the cause of this synonymy. The final previously proposed name, *C. denticulatus*, represents the dark form of this taxon. However, it is morphologically very similar to the other forms placed here and no justification could be found for treating it as a separate taxon.

#### Species of the *C. perjurus* species group

#### *Camponotus perjurus* sp. nov. (FIGS 60–62)

#### Material examined

**Holotype.** Minor worker from 74 km E by N Cosmo Newberry, Western Australia, 13 November 1977, J. E. Feehan (ANIC).

**Other material examined.** **South Australia:** 80km NNE Ceduna (JAF); Emu Camp, Victoria Desert (PJM); Mt. Gunson, SE Woomera (PJM). **Western Australia:** 40km SE Ravensthorpe (RWT); Borden (EFR).

#### Worker diagnosis

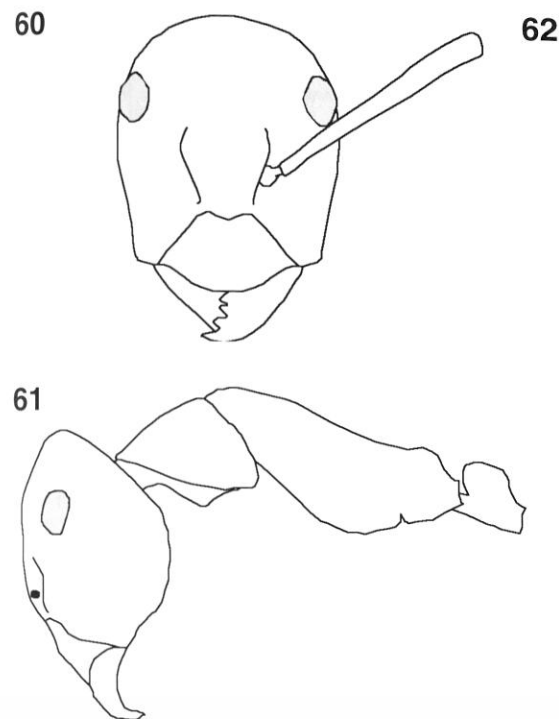
Head of minor worker produced upwards so that its attachment to the pronotum is well below its upper margin (Fig. 61). Often with weak purple or green iridescent hue on head and body. The attachment of the head is unique to this species group, if not the genus, and will readily separate this species from others.

#### Description (minor worker)

Anterior clypeal margin wide, projecting, evenly convex and feebly crenulate, with a feeble medial carina (Fig. 60). Pronotum and mesonotum a raised convexity which smoothly joins the feebly concave dorsal surface of the propodeum, the propodeal angle rounded, its posterior face short and straight, the ratio of dorsum to declivity about 4 (Fig. 61). Metanotal spiracles high, near the dorsal mesosomal surface. Petiolar node leaning forward, parallel anteriorly and posteriorly, with a long, weakly convex summit (Fig. 61). Body red-brown except for gaster and parts of legs which are darker, sometimes with a weak purple or green iridescent hue. Entire body clothed in fine white indistinct pubescence with sparse long setae on the anterior and posterior of head, mesosoma, petiolar node and gaster, absent on the underside of head.

#### Measurements

**Minor worker** (n=5). CI 0.79 – 0.95; HL 1.89mm –



Figs 60–61. *C. perjurus* workers. Fig. 60. Head of minor worker. Fig. 61. Mesosoma and petiole of minor worker.

2.31mm; HW 1.72mm – 1.84mm; ML 2.84mm – 3.11mm; MTL 2.32mm – 2.43mm; PnW 1.41mm – 1.54mm; SI 1.22 – 1.28; SL 2.14mm – 2.30mm.

#### Etymology

From *perjurus*, to lie about one's true nature.

#### Remarks

This species appears to be a mimic of members of

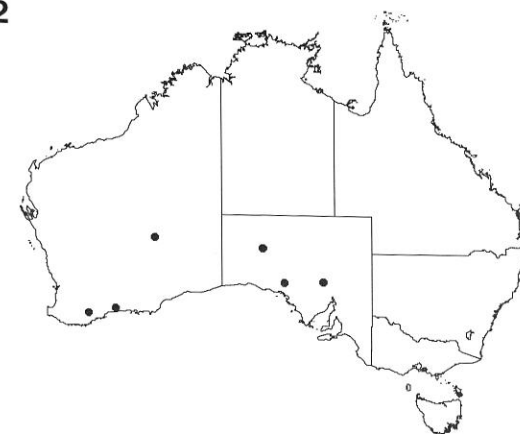


Fig. 62. Distribution of *C. perjurus* material examined during this study.

the *Iridomyrmex purpureus* species group (subfamily Dolichoderinae). This is based on the purple or green iridescent colour which is similar to *Iridomyrmex viridiaeneus* Viehmeier (Shattuck 1993). Also, only single foragers have been found and most of these have been collected in association with *Iridomyrmex spodipilus* Shattuck and *Camponotus prosseri* Shattuck and McArthur. They have been found from central South Australia west into south-central Western Australia (Fig. 62).

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