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New species of *Camponotus* (Insecta: Hymenoptera: Formicidae) from Australia

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Abstract

Eight new species of ants from Australia are described for the first time viz *Camponotus andyyoungi* sp.n., *Camponotus christmasensis* sp.n., *Camponotus churchetti* sp.n., *Camponotus fraseri* sp.n., *Camponotus judithmorrisae* sp.n., *Camponotus philwardi* sp.n., *Camponotus samueli* sp.n. and *Camponotus woodroffeensis* sp.n. They are widespread in South Australia and all are ground nesting. Descriptions, photographs and distribution maps of the new species and comparisons with related species are provided.

Key words: ants, Formicinae, *Camponotus*, *C. andyyoungi* sp.n., *C. christmasensis* sp.n., *C. churchetti* sp.n., *C. fraseri* sp.n., *C. judithmorrisae* sp.n., *C. philwardi* sp.n., *C. samueli* sp.n., *C. woodroffeensis* sp.n.

Zusammenfassung

Acht Ameisenarten aus Australien werden neu beschrieben: *Camponotus andyyoungi* sp.n., *Camponotus christmasensis* sp.n., *Camponotus churchetti* sp.n., *Camponotus fraseri* sp.n., *Camponotus judithmorrisae* sp.n., *Camponotus philwardi* sp.n., *Camponotus samueli* sp.n. und *Camponotus woodroffeensis* sp.n. Alle Arten sind in Südaustralien weit verbreitet und haben Bodennester. Beschreibungen, Fotos und Verbreitungskarten der neuen Arten werden präsentiert und verwandte Arten werden mit ihnen verglichen.

Introduction

In 1862, Gustav Mayr described the genus *Camponotus*. Therein, he selected 43 species of ants with common characters from the world to form the genus. Included in the genus were 6 species from Australia. Today over 1400 species of *Camponotus* have been described from the world (BOLTON 2006) and this includes 163 species from Australia (MCARTHUR 2007a). Since acceptance of this manuscript, five new species from Australia have been added (MCARTHUR 2006, 2007b). A key for the identification of 101 species of *Camponotus* from Australia has been constructed (MCARTHUR 2007a). There are about 100 ant genera including *Camponotus* in Australia and a key for their identification is available (SHATTUCK 1999). Ants from the genus *Camponotus* are frequently observed in Australia in a wide range of habitats. Most species forage nocturnally but some may be seen by day. A little honey painted on trees at eye level in late afternoon usually attracts *Camponotus* ants for observation a few hours later. Ants are used for mapping biodiversity and *Camponotus* ants are good candidates for such investigation (AGOSTI & al. 2000). *Camponotus* ants can be readily sampled by pitfall traps or at baits.

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In this paper eight new species of *Camponotus* from Australia are described for the first time. The holotype specimens of the species being described are minor workers and were obtained from pitfall traps. No major workers of *C. fraseri* sp.n. or C. *samueli* sp.n. have been collected although many hours have been spent searching for their nests near where the ants were trapped.

Some *Camponotus* ants are polymorphic while others are dimorphic. In polymorphic species, the workers (sterile females) divide into subcastes ranging in size from the small minor workers to the large major workers. In dimorphic species the workers are either major or minor. Minor workers are the largest caste numerically and travel further from the nest, than other worker castes. Minor workers are most frequently observed on the ground or climbing trees and are most frequently collected in pitfall traps. Only for an hour or two each year, reproductive castes i.e. alate males and females may be observed when they are active in the vicinity of the nest preparing for their nuptial flights. No attempt has been made to describe these alate castes. In Australia, descriptions of minor workers are the most useful for the identification of species and descriptions of the major workers are given when available. The South Australian Museum has acquired a large collection of ants from South Australia as a result of biological surveys conducted by the South Australian Department for Environment and Heritage and other collectors using pitfall traps. These collections have generally been sorted, identified and stored by volunteers. Because the species boundaries of many described species are poorly defined, closely related specimens are often stored with their named relatives. An examination of some drawers of acquisitions has revealed the following new species *Camponotus andyyoungi* sp.n., *Camponotus christmasensis* sp.n., *Camponotus fraseri* sp.n., *Camponotus churchetti* sp.n., *Camponotus judithmorrisae* sp.n., *Camponotus philwardi* sp.n., *Camponotus samueli* sp.n. and *Camponotus woodroffeensis* sp.n. which are described for the first time. They are widespread in South Australia and all are ground nesting. Descriptions, photographs and distribution maps of the new species and comparisons with their nearest relatives are given.

Material and methods

Characters found to be most useful in separating species of *Camponotus* were pilosity on mesosoma, on the underside of head and on scapes and tibiae, form of the mesosoma in lateral view, and the head in front view.

Morphological analysis: Measurements were carried out using a Mitutoyo 209116 micrometer attached to an Olympus XZ microscope fitted with cross hairs at 20 to 80x. Specimens were measured thus: head width = maximum distance between head sides with underside of head horizontal; head length = distance between anterior margin of clypeus and vertex with both in a horizontal plane; frontal carinae width = maximum distance between carinae with underside of head horizontal ignoring any abrupt curvature at posterior ends; pronotal width = maximum width of pronotum in dorsal view. Measurements were transmitted to MS Excel 2000 via Gauge Link Wedge (SPLat Controls Pty. Ltd). Photographs were taken with a Nikon D70S camera and 55 mm Micro-NIKKOR lens and extension tubes. Images were combined with CombineZ5.2 (GNU Public Licence) by Alan Hadley.

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Abbreviations: Measurements

HW = head width mm; HL = head length mm; PW = pronotal width mm; CW = frontal carinae width mm.

Abbreviations: Depositories of type material

ANIC = Australian National Insect Collection, Canberra, Australian Capital Territory; NHMW = Naturhistorisches Museum, Vienna, Austria; SAMA = South Australian Museum, Adelaide, South Australia.

Systematics

Camponotus andyyoungi sp.n. (Figs. 1 - 3)

Holotype: One minor worker pinned in SAMA "S.Aust. Kimba 33°08'S 136°25'E Mallee in sand 25/07/1983 B B Lowery" **Paratypes:** Three minor workers with same data pinned in each of SAMA, ANIC and NHMW.

Other material examined (in SAMA): South Australia: Caralue Bluff 4 km ENE (33°16'S 136°13'E), 28. XI. 2002, leg. South Australian Dept. for Environment & Heritage, Eyre Peninsula Survey; Darke Peak (33°28'S 136°12'E), 16. V 1973, Kimba (33°08'S 136°25'E), 25. VII. 1983, leg. B.B. Lowery; Mosquito Camp Dam 5 km S (26°10'S 134°29'E), 25. XI. 1995, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Mount Bosanquet 8.1 km ESE (33°25'S 136°31'E), 28. XI. 2002, leg. South Australian Dept. Environment & Heritage, Eyre Peninsula Survey; Mount Lindsay 1.9 km WNW (27°02'S 129°52'E), 20. X. 1996, leg. South Australian Dept. for Environment & Heritage, Pitjantjatjara Survey; Mussel Waterhole 1.5 km NE (28°27'S 136°24'E), 5. III. 1996, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Poochera (32°43'S 134°50'E), 15. X. 1995, leg. R. Foster B. Pike; Jumana Eng (33°53'S 135°53'E), 6. XII. 2003, leg. South Australian Dept. for Environment & Heritage, Eyre Peninsula Survey. **Western Australia:** Esperance 160 km NE (33°13'S 123°27'E), 10. XII. 1985, leg. P.S. Ward.

Worker Description:

Major worker. not yet known.

Minor worker. Mesosoma: Dorsum of pronotum, mesonotum and propodeum feebly convex, angle well rounded about 135°, declivity concave, ratio propodeal dorsum / declivity < 1; a few long setae pointing forward on mesosoma; integument on side of mesonotum and propodeum smoothly reticulate, glossy. Node: anterior convex; posterior flat; summit near sharp. Appendages: tibiae with short plentiful setae, inclination to 30°; scapes with plentiful short setae, inclination to 45° Head: a few erect fine setae on under side; setae sparse on head in front view; head sides convex; vertex straight; frontal carinae width < HW/3; maximum head width occurs slightly anterior to eye centre; clypeus anterior margin convex. Colour: reddish yellow.

A member of the *C. rubiginosus* group (McArthur 2007a) in having similar head and mesosoma forms (in front and lateral view, respectively) but distinguished from other members by its absence of any black colour in the minor workers. Most members of this group possess a distinctive coconut odour but this has not been observed with this species.

Distribution: see Fig. 2.

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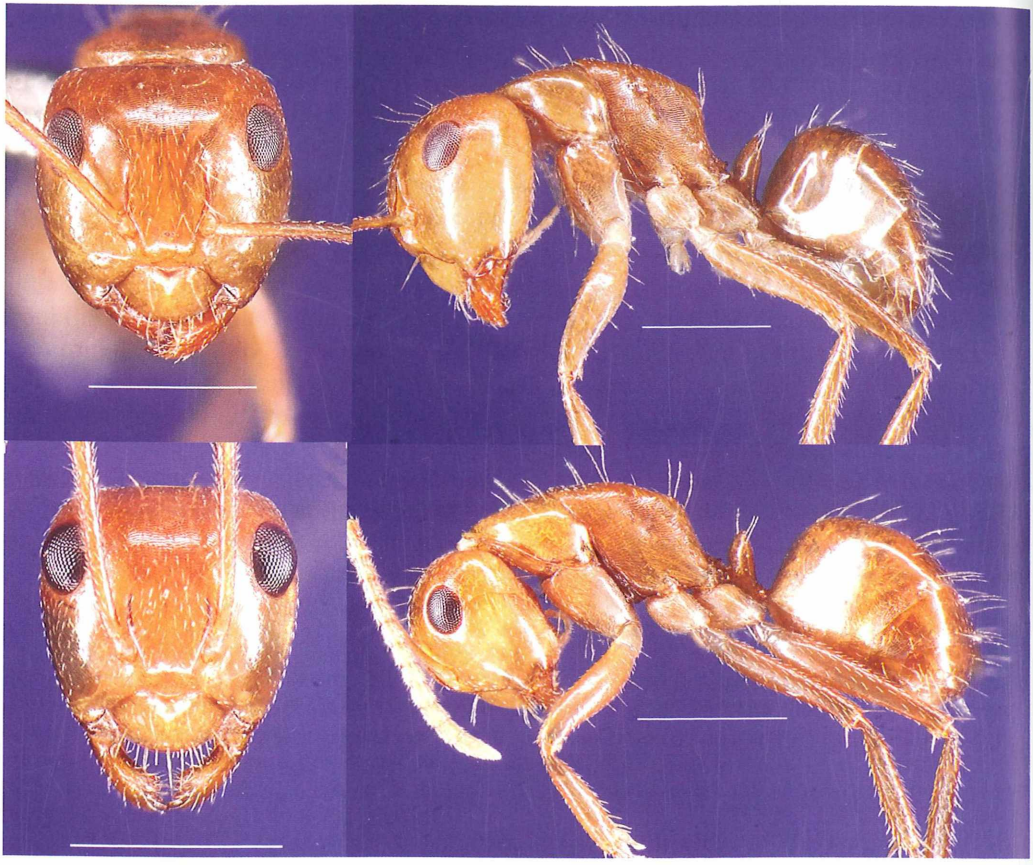
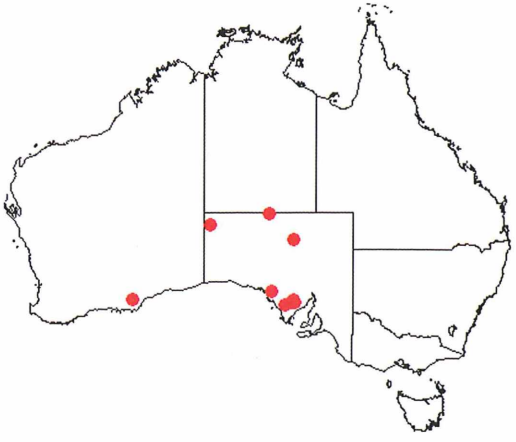


Fig. 1: *C. andyyoungi* sp.n., medium worker above, minor worker below. Scale = 1 mm.



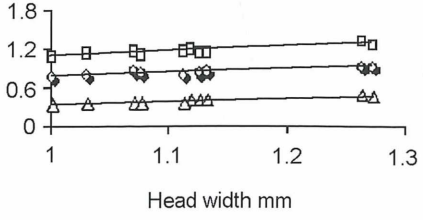


Fig. 3: *C. andyyoungi* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 0.78HW + 0.27 (R2 = 0.82, n = 10);
PW = 0.51HW + 0.25 (R2 = 0.84, n = 10);
CW = 0.44HW - 0.10 (R2 = 0.92, n = 10).

Fig. 2: Collection localities of *C. andyyoungi* sp.n., specimens in SAMA.

Morphometrics: see Fig. 3 (relationship of HL, PW and CW with HW for *C. andyyoungi* sp.n.).

Etymology: Named after Andy Young who collects insects for SAMA.

Camponotus christmasensis sp.n. (Figs. 4 - 6)

Holotype: One minor worker pinned in SAMA "S.Aust. Christmas Rocks 36°21'S 140°21'E 8/11/1992 A J McArthur" **Paratypes:** Three minor workers with same data pinned in each of SAMA, ANIC and NHMW

Other material examined (in SAMA): South Australia: Christmas Rocks (36°21'S 140°21'E), 8. XI. 1992, leg. A.J. McArthur; Coonalpyn Bayree Farm (35°46'S 140°01'E), 22. XI. 1991, leg. J.A. Forrest; Ferries McDonald National Park (35°13'S 139°09'E), 1. VII. 1994, leg. A.J. McArthur S.O. Shattuck; Inman Valley (35°27'S 138°28'E), 25. II. 2000, leg. South Australian Dept. for Environment & Heritage, Sth Mt. Lofty Ra. Survey; Mount Lindsay 6.4 km W (27°02'S 129°49'E), leg. South Australian Dept. for Environment & Heritage, Pitjantjatjara Survey; Ngarkat Conservation Park (35°32'S 140°52'E), 3. III. 2003, leg. A. J. McArthur R. Hutchinson; Nundroo (31°47'S 132°12'E), 5. XI. 1995, leg. R. Foster B. Pike; Stockyard Plain (34°15'S 139°46'E), 5. IV 1996, leg. G.L. Howie. **Western Australia:** Kings Park (31°58'S 115°50'E), 25. VII. 1992, leg. A.J. McArthur; Yanchep (31°33'S 115°41'E), leg. J.D. Majer; Cape Le Grand (34°01'S 122°07'E), 20. VII. 1993, leg. A.J. McArthur W.M. McArthur.

Worker Description:

Major worker. Mesosoma: dorsum of pronotum, mesonotum and propodeum feebly convex, angle well rounded about 135°, declivity concave, ratio propodeal dorsum / declivity about 1; dorsum of mesosoma with a few long erect setae mostly near angle, short flat-lying setae sparse; integument on side of mesonotum and propodeum, reticulate, glossy. Node: anterior mostly straight then convex above, posterior straight, summit rounded. Appendages: tibiae without distinct short setae, with rows of about 6 spines on inside surface; scapes with short flat-lying indistinct setae spaced slightly > their length, more distinct apically. Head: underside in lateral view without pilosity; erect setae sparse in front view; sides convex, tapering to the front; vertex weakly concave; frontal carinae width near HW/3; maximum head width occurs at about eye centres; clypeus anterior margin narrow, projecting with 135° corners, with a notch in the centre. Colour: dark brown, head and limbs lighter.

Minor worker. Mesosoma: Dorsum of pronotum feebly convex; mesonotum feebly convex, sloping down in front; propodeum nearly straight; angle well rounded about 135°; declivity nearly straight, ratio propodeal dorsum / declivity about 2.5; dorsum of mesosoma with a few long erect setae, mostly near angle and plentiful short curved flat-lying setae; integument on side of mesonotum and propodeum finely and sharply striate, glossy. Node: anterior and posterior surfaces mostly straight parallel; summit rounded. Appendages: tibiae with distinct short setae flat-lying spaced > setae length, with a few spines on inside surface; scapes with short flat-lying indistinct setae. Head: underside in lateral view without erect pilosity; erect setae sparse in front view; sides nearly straight tapering to the front; vertex straight; frontal carinae width about HW/3; maximum head width occurs at about eye centres; clypeus anterior strongly projecting with 135° corners, crenulate between. Colour: dark brown, head and limbs lighter.

A member of the *C. claripes* group (McARTHUR 2007a), a close relative of *C. claripes minimus* CRAWLEY, 1922. Both lack erect setae on the underside of the head and have

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Fig. 4: *C. christmasensis* sp.n., major worker above, minor worker below. Scale = 1 mm.

wide frontal carinae. Compared with *C. claripes minimus*, the integument of this species is more finely and sharply striate. Compared with *C. fraseri* sp.n. it lacks short sloping distinctive setae on the scapes.

Distribution: see Fig. 5.

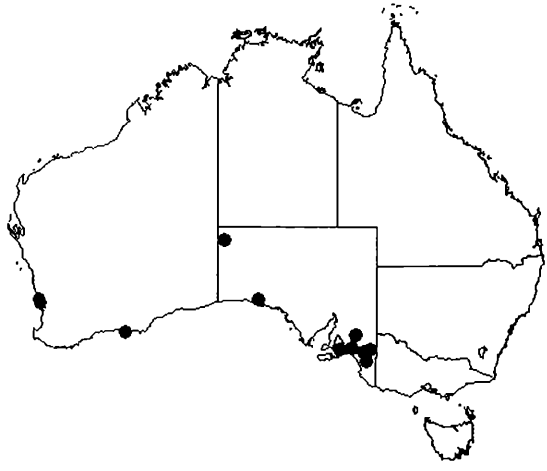
Morphometrics: see Fig. 6 (relationship of HL, PW and CW with HW for *C. christmasensis* sp.n.).

Etymology: Named after Christmas Rocks, a prominent granite outcrop in the south east of South Australia, where this ant is found.

Camponotus churchetti sp.n. (Figs. 7 - 9)

Holotype: One minor worker pinned in SAMA "S.Aust. Taylorville Stn Middle Dam 1.5 km SW 33°54'37"S 140°12'20"E 6-11 October 2001 pitfall TV04 Royal Geographical Society, Bookmark Survey". **Paratype:** One minor worker with same data pinned in NHMW.

Other material examined (in SAMA): New South Wales: Mootwingee Historical Site (31°15'S 142°18'E), 20. IV. 1966, leg. R.H. Mew. **Northern Territory:** Finke 9 km E (25°35'S 134°39'E), 30. IX. 1972, leg. J.E. Feehan; New Crown (25°41'S 134°50'E), 26. IX. 1972, leg. J.E. Feehan. **South Australia:** Anna Creek (28°50'S 136°07'E), 2. X. 1995, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Anna Creek Bore (29°01'S 136°17'E), 6. VII. 1995, leg. South Australian Dept. for Environment & Heritage, L Eyre Sth Survey; Backadinna Hill 12.5 km W (28°54'S 136°10'E), 2. X. 1995, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Billiatt Conservation Park



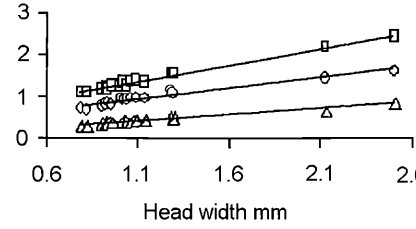


Fig. 6: *C. christmasensis* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 0.77HW + 0.50 (R2 = 0.99, n = 17);
PW = 0.50HW + 0.37 (R2 = 0.96, n = 17);
CW = 0.28HW + 0.10 (R2 = 0.98 n = 17).

Fig. 5: Collection localities of *C. christmasensis* sp.n., specimens in SAMA.

(34°57'S 140°27'E), 21. IV 2005, leg. South Australian Dept. for Environment & Heritage, Sandy Desert Survey; Boolcoomata 5.8 km S (32°01'S 140°32'E), 9. IV 2007, leg. South Australian Dept. for Environment & Heritage, Boolcoomata Survey; Carruthers Hill 10.4 km NE (26°11'S 138°05'E), 29. III. 1998, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Clifton Hills Outstation (26°32'S 139°27'E), 20. XI. 1993, leg. J.A. Forrest D. Hirst; Crown Hill 18.4 km SE (30°02'S 136°20'E), 1. IV 2006, leg. South Australian Dept. for Environment & Heritage, Woomera Survey; Dalhousie Springs Proper (26°27'S 135°28'E), 13. IV. 2002, leg. S. Rathbone; Duck Island 2.8 km WSW (36°15'S 140°05'E), 20. IX. 1995, leg. Nature Conservation Society, Gum Lagoon Survey; Farina 5 km SW (30°06'S 138°15'E), 5. XI. 1994, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Kalabity (31°43'S 139°52'E), 21. XI. 2003, leg. R. Hutchinson; Kangaroo Island Tammar Sanctuary (35°49'S 137°52'E), 1. VII. 2001, leg. G.& R. Churchett; Lake Appadare (28°13'S 139°12'E), 11. IV 1997, leg. Waterhouse Club; Lake Gilles Conservation Park (32°56'S 136°46'E), 21. XI. 1995, leg. B. Pike; Lake Murteree (26°33'S 140°21'E), 30. IV 1998, leg. J.A. Forrest Waterhouse Club; Lake Toontoowaranie (27°06'S 140°10'E), 5. V 1998, leg. J.A. Forrest Waterhouse Club; Manning Res (35°13'S 138°35'E), 5. X. 2001, leg. A.J. McArthur; Maralinga (30°10'S 131°35'E), 21. IV 2005, leg. South Australian Dept. for Environment & Heritage, Sandy Desert Survey; Marpoo Waterhole (27°45'S 140°34'E), 3. VIII. 1991, leg. P & I. Gee; Middle Dam 1.5 km SW (33°55'S 140°12'E), 11. X. 2001, leg. Royal Geographical Society, Bookmark Survey; Motor Car Dam (26°48'S 139°00'E), 28. V 1980, leg. P.J.M. Greenslade; Mount Goodiar (26°38'S 135°37'E), 24. XI. 1995, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Peebinga (34°56'S 140°55'E), 21. X. 1982, leg. R.D. Robinson; Poochera 24 km E (32°43'S 135°05'E), 14. X. 1995, leg. A.J. McArthur C.H. Watts; Tomahawk Dam 3 km N (33°20'S 140°41'E), 26. XI. 1996, leg. J.A. Forrest; Weekeroo 11 km SE (32°22'S 140°07'E), 31. VIII. 1996, leg. South Australian Dept. for Environment & Heritage, North Oleary Plains Survey; Welcome Well 7.7 km E (31°17'S 137°05'E), 14. XI. 1996, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey.

Worker Description:

Major worker. Mesosoma: pronotum strongly convex anteriorly otherwise mostly flat, mesonotum slightly convex, propodeum dorsum feebly convex, angle rounded about 135°, declivity mostly straight; ratio propodeal dorsum / declivity about 1; mesosoma with < 6 long erect setae and a few very short indistinct curved setae; side of mesonotum and propodeum finely reticulate, glossy. Appendages: tibiae with indistinct short setae raised to < 5° and with 2 rows of about 5 spines on the inside surface; scapes with indistinct short flat-lying setae. Node: anterior and posterior surfaces mostly flat, summit

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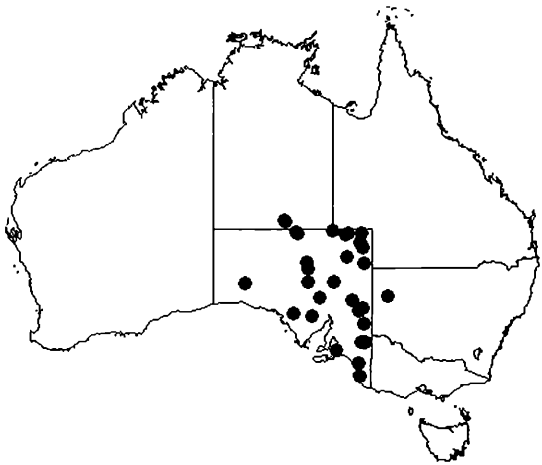
Fig. 7: *C. churchetti* sp.n., major worker above, minor worker below. Scale = 1 mm.

near sharp. Head: underside in lateral view with a few long erect setae; sides in front view nearly straight tapering slightly to the front; vertex straight; frontal carinae < HW/3; maximum head width occurs at eye centres; clypeus finely punctate, anterior margin projecting, bounded by 70° corners with a shallow concavity between. Colour: yellow, head brownish.

Minor worker. Mesosoma: Pronotum feebly convex, mesonotum slightly convex in front otherwise straight; metanotum indistinct; propodeum dorsum mostly straight; angle rounded, about 150°; declivity mostly straight; mesosoma with < 6 long erect setae and a few short curved setae; side of mesonotum and propodeum finely reticulate. Node: anterior and posterior surfaces mostly flat meeting at the summit at about 45°. Appendages: tibiae with indistinct short flat-lying setae and with 2 rows of about 5 spines on the inside surface; scapes with indistinct short flat-lying setae. Head: underside in lateral view with a few long erect setae; sides in front view straight nearly parallel; vertex straight with an occipital carina; frontal carinae very narrow < HW/3; maximum head width occurs near mandibles; eyes large and bulging; clypeus anterior margin projecting, convex. Colour: yellowish.

This species is a member of the *C. maculatus* group (McArthur 2007a) because minor workers possess an occipital carina and the sides of the head are feebly tapering to the rear. Its closest relative is *C. tricoloratus* Clark, 1941. In minor workers of *C. tricoloratus* the length of the node is greater than its height and the anterior margin of the



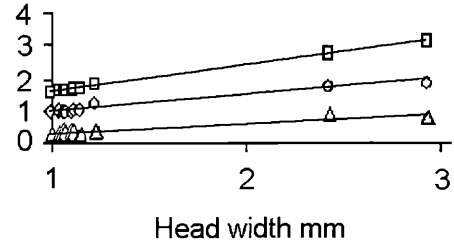


Fig. 9: *C. churchetti* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 0.83HW + 0.73 (R2 = 0.99, n = 11);
PW = 0.50HW + 0.40 (R2 = 0.96, n = 11);
CW = 0.30HW - 0.02 (R2 = 0.95, n = 11).

Fig. 8: Collection localities of *C. churchetti* sp.n., specimens in SAMA.

clypeus is wide and straight whereas in this species the length of the node is less than its height and the margin of the clypeus is convex.

Distribution: see Fig. 8.

Morphometrics: see Fig. 9 (relationship of HL, PW and CW with HW for *C. churchetti* sp.n.).

Etymology: Named after Graham Churchett a naturalist and collector for SAMA.

Camponotus fraseri sp.n. (Figs. 10 - 12)

Holotype: One minor worker pinned in SAMA "S. A. Marino CP 35°03'S 138°31'E honey 11 pm 2/11/2003 J Fraser N Skinner" **Paratypes:** Three minor workers with same data pinned in each of SAMA, ANIC and NHMW.

Other material examined (in SAMA): South Australia: Disher Hill 1.4 km ESE (35°03'S 139°05'E), 7. X. 2002, leg. South Australian Dept. for Environment & Heritage, East Mt. Lofty Range Survey; Eringa 8.1 km ENE (26°15'S 134°48'E), 8. V 2005, leg. Royal Geographical Society, Bookmark Survey; Hallett Cove (35°05'S 138°30'E), 25. IX. 1994, leg. A.J. McArthur; Jupiter Creek (35°09'S 138°46'E), 1. V 1993, leg. A.J. McArthur; Kuitpo 4.5 km SSW (35°16'S 138°40'E), 3. III. 2000, leg. South Australian Dept. for Environment & Heritage, Sth Mt. Lofty Ra. Survey; Marino NP (35°03'S 138°31'E), 2. XI. 2003, leg. J. Fraser N. Skinner; Marino NP (35°03'S 138°31'E), 3. XI. 2001, leg. J. Fraser N. Skinner; Mount Brown 6.1 km SSW (32°34'S 137°59'E), 25. X. 1995, leg. Nature Conservation Society.

Worker Description:

Major worker. not yet known.

Minor worker. Mesosoma: dorsum of pronotum, mesonotum and propodeum evenly convex, angle well rounded about 150°; declivity mostly straight, ratio propodeal dorsum / declivity nearly 2; erect setae and short flat-lying setae on mesosoma sparse; integument on side of mesonotum and propodeum sharply striate. Node: anterior mostly straight, convex above; posterior flat; summit blunt. Appendages: tibiae with plentiful

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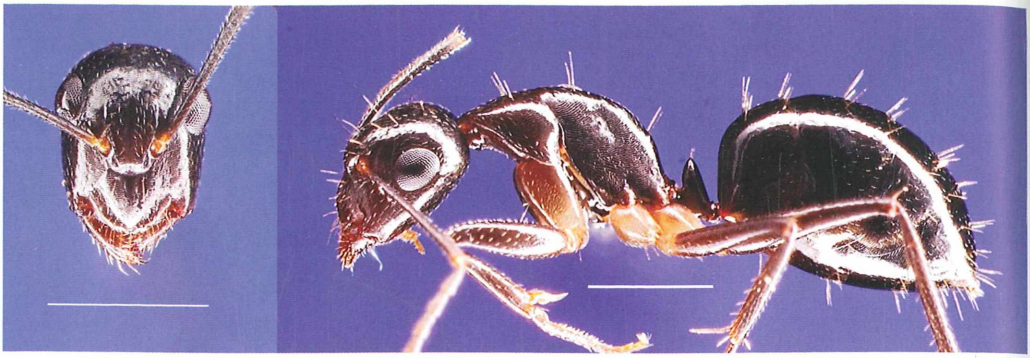


Fig. 10: *C. fraseri* sp.n., minor worker. Scale = 1 mm.

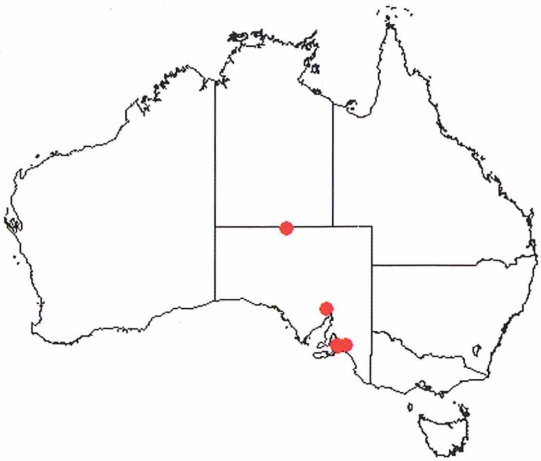


Fig. 11: Collection localities of *C. fraseri* sp.n., specimens in SAMA.

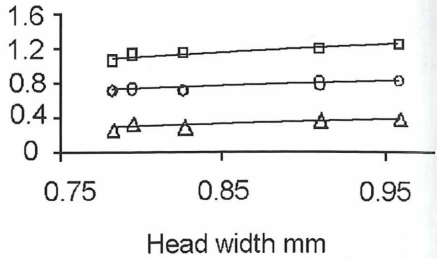


Fig. 12: *C. fraseri* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 0.91HW + 0.36, (R2 = 0.92, n =5);
PW = 0.68HW + 0.15, (R2 = 0.87, n =5);
CW = 0.48HW - 0.10, (R2 = 0.84, n =5).

short setae raised to 20°; scapes with plentiful short setae raised to 30°. Head: underside in lateral view without erect setae; in front view, setae sparse; sides straight, parallel; vertex convex; frontal carinae width < HW/3; maximum head width occurs at eye centres; clypeus anterior margin projecting, convex. Colour: dark brown, limbs and front of head lighter.

A member of the *C. claripes* group (McArthur 2007a), a close relative of *C. claripes minimus* Crawley, 1922. Both lack erect setae on the underside of the head and have wide frontal carinae. The distinctive short sloping setae present on the scapes of this species are absent in *C. claripes minimus*.

Distribution: see Fig. 11.

Morphometrics: see Fig. 12 (relationship of HL, PW and CW with HW for *C. fraseri* sp.n.).

Etymology: Named after Jack Fraser a volunteer worker at Marino Conservation Park.

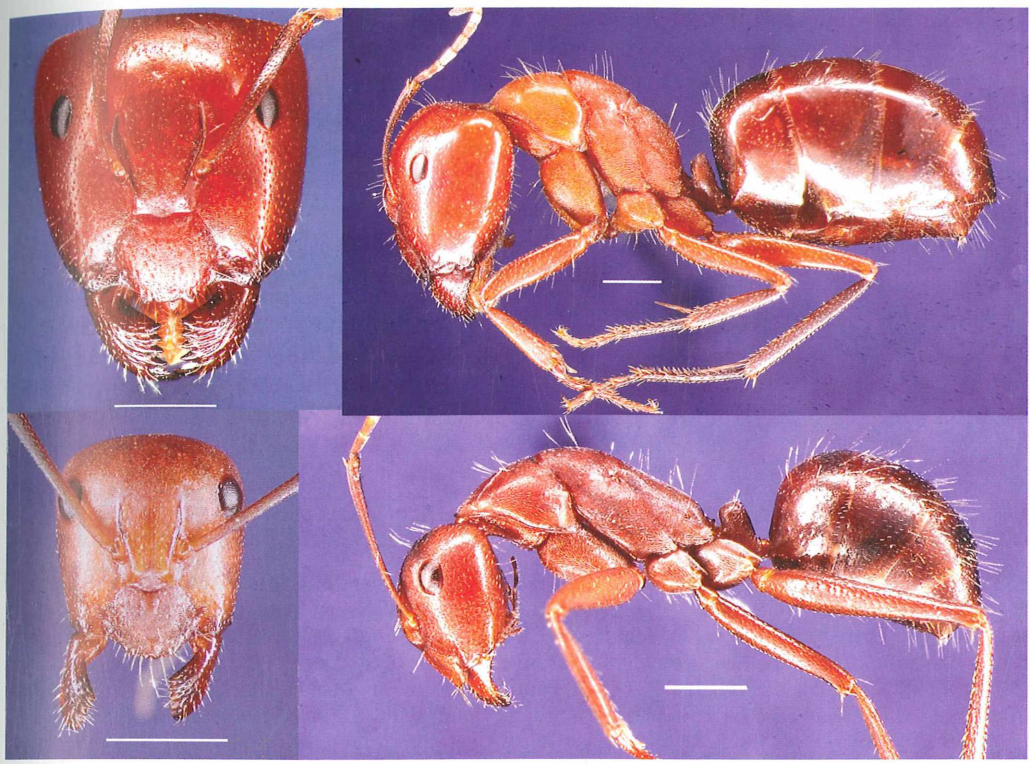
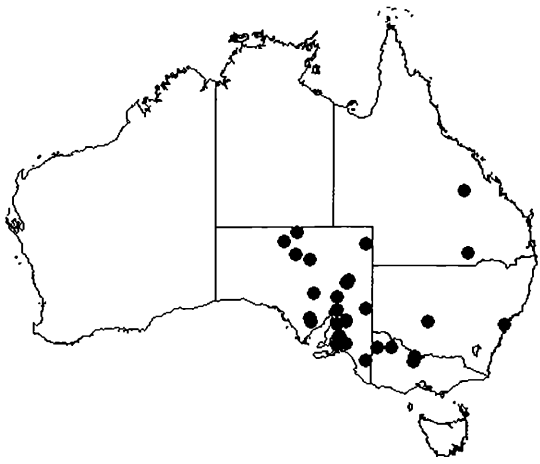


Fig. 13: *C. judithmorrisae* sp.n., major worker above, minor worker below. Scale = 1 mm.

Camponotus judithmorrisae sp.n. (Figs. 13 - 15)

Holotype: One minor worker pinned in SAMA "S.Aust. Hallett Cove 35°05'S 138°30'E pitfalls 16 – 23 Nov 97 A J McArthur". **Paratypes:** Three minor workers with same data pinned in each of SAMA, ANIC and NHMW.

Other material examined (in SAMA): New South Wales: Hillston (33°29'S 145°32'E), 10. XII. 1961, leg. B.B. Lowery; Northbridge (33°48'S 151°13'E), 30. IX. 1994, leg. M. Greeves. Queensland: Emerald (23°31'S 148°10'E), leg. K. Schneider; St George (28°03'S 148°35'E), 16. I. 1966, leg. B.B. Lowery. **South Australia:** Balcanoona 14 km NW (30°27'S 139°12'E), 24. X. 1993, leg. Nature Conservation Society; Barossa Res. (34°39'S 138°50'E), 3. XI. 2000, leg. South Australian Dept. for Environment & Heritage, Sth. Mt. Lofty Ra. Survey; Bull Dam 2.5 km NW (32°31'S 140°50'E), 2. X. 1992, leg. South Australian Dept. for Environment & Heritage, South Oleary Plains Survey; Chain Of Ponds (34°49'S 138°50'E), 9. XI. 1997, leg. S. Barker; Freeling Heights 2.8 km NNE (30°08'S 139°24'E), 23. X. 1999, leg. South Australian Dept. Environment & Heritage, Flinders Ranges Survey; Gammon Hill 5.7 km SSE (30°28'S 139°02'E), 23. X. 1999, leg. South Australian Dept. for Environment & Heritage, Flinders Ranges Survey; Hallett Cove (35°05'S 138°30'E), 23. XI. 1997, leg. A.J. McArthur; Hallett Cove (35°05'S 138°30'E), 15. XI. 1956, leg. H.M. Cooper; Joy Dam 3.2 km SW (28°12'S 135°19'E), 20. IX. 1996, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Kimba 12.7 km NNW (33°03'S 136°22'E), 28. XI. 2002, leg. South Australian Dept. Environment & Heritage, Eyre Peninsula Survey; Kirby Nob 2.9 km SSE (27°33'S 140°53'E), 9. XI. 1996, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Mainwater Creek (30°23'S 139°10'E), 1. VII. 1989, leg. A.J. McArthur P.J. Fargher; Mangalo 8.7 km NNE (33°28'S 136°39'E), 28. XI. 2002, leg. South Australian Dept. Environment & Heritage, Eyre Peninsula Survey; Marsella Hill 1 km WSW (31°14'S 136°54'E), 14. XI. 1996, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Memory Bore 1.6 km W (26°42'S



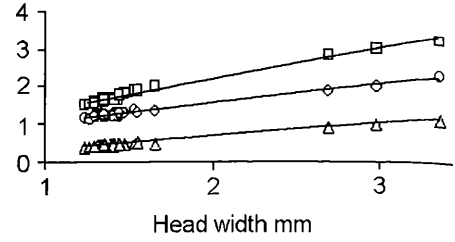


Fig. 15: *C. judithmorrisae* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 0.82HW + 0.53 (R2 = 0.98, n = 26);
PW= 0.49HW + 0.55 (R2 = 0.98, n = 26);
CW= 0.33HW - 0.01 (R2 = 0.99, n = 26).

Fig. 14: Collection localities of *C. judithmorrisae* sp.n., specimens in SAMA.

135°31'E), 24. XI. 1995, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Monarto 4.4 km N (35°01'S 139°07'E), 7. X. 2002, leg. South Australian Dept. for Environment & Heritage, East Mt. Lofty Range Survey; Mount Bryan East 2.7 km ESE (33°25'S 139°03'E), 17. III. 2004, leg. South Australian Dept. for Environment & Heritage, Mid North & Yorke Peninsula Survey; Orroroo (32°44'S 138°37'E), 20. X. 1996, leg. R. Grund; Para Wirra Rec. Park (34°45'S 138°49'E), 3. X. 2000, leg. South Australian Dept. for Environment & Heritage, South Para Survey; Rawnsley Park 2.8 km SW (31°40'S 138°35'E), 1. XI. 2005, leg. South Australian Dept. for Environment & Heritage, Rawnsley Bluff Survey; Sevenhill (33°53'S 138°38'E), 25. II. 1957, leg. B.B. Lowery; Todmorden (27°17'S 134°31'E), 25. IX. 1996, leg. South Australian Dept. for Environment & Heritage, Stony Desert Survey; Ulooloo 20 km E (33°20'S 139°08'E), 3. IV 1972, leg. P.J.M. Greenslade; William Creek (28°55'S 136°21'E), 31. VII. 1991, leg. P & I. Gee; Wolseley 0.8 km ENE (36°22'S 140°54'E), 15. XII. 1995, leg. South Australian Dept. for Environment & Heritage. **Victoria:** Big Desert (35°25'S 141°40'E), 11. X. 1981, leg. R.D. Robinson; Kamarooka Forest (36°32'S 144°24'E), 1. I. 1995, leg. S. Hinkley; Patho (36°00'S 144°26'E), leg. H.A. Potter; Sea Lake (35°30'S 142°51'E), leg. J.C. Goudie.

Worker Description:

Major worker. Mesosoma: Dorsum of pronotum, mesonotum, metanotum and propodeum evenly convex, angle well rounded 135° declivity straight, ratio propodeal dorsum / declivity about 2, metanotum bounded by two distinct sutures about 0.3mm apart; > 20 long erect setae scattered on mesosoma, with indistinct very fine white short setae; integument on side of mesonotum and propodeum very finely reticulate. Node: anterior surface mostly straight and parallel with posterior, posterior straight, summit blunt. Appendages: tibiae with flat-lying short setae, rows of about 10 spines on inside surfaces; scapes setae indistinct. Head: underside in lateral view with a few long straight erect setae, a few long curved setae near mouth; in front view a few erect setae on sides; sides mostly straight, tapering to the front; vertex nearly flat swollen; frontal carinae width < 1/3 HW; maximum head width occurs at eye centres; clypeus anterior margin projecting with a shallow concavity between two blunt teeth at corners. Colour: red, gaster black.

Minor worker. Mesosoma: dorsum of pronotum straight, mesonotum convex, propodeum mostly straight, angle well rounded 135°; declivity straight; ratio propodeal

dorsum / declivity about 3; > 20 long erect setae scattered on mesosoma, with indistinct very fine white short setae; integument on side of mesonotum and propodeum very finely reticulate. Node: thick, anterior and posterior surfaces nearly straight and parallel, summit feebly convex. Appendages: tibiae with flat-lying short setae, rows of about 10 spines on inside surface; scapes setae indistinct. Head: underside in lateral view with a few long erect setae, a few long curved setae near mentum; a few erect setae on sides in front view; sides feebly convex tapering to the front; vertex feebly convex; frontal carinae width < 1/3 HW; maximum head width occurs at eye centre; clypeus anterior margin projecting, convex, crenulate. Colour: red, gaster black.

A member of the *C. ephippium* group (McARTHUR 2007a), with the form of the mesosoma of minor workers in lateral view appearing between *C. ephippium* SMITH, 1858 and *C. capito* MAYR, 1876. Its vertex is convex, its propodeal dorsum nearly straight whereas in *C. ephippium* it is flat and concave respectively. Its colour is distinctive - mostly bright red with a darker gaster.

Distribution: see Fig. 14.

Morphometrics: see Fig. 15 (relationship of HL, PW and CW with HW for *C. judithmorrisae* sp.n.).

Etymology: Named after Judith Morris, a benefactor of the South Australian Museum.

Camponotus philwardi sp.n. (Figs. 16 - 18)

Holotype: One minor worker pinned in SAMA "N.S.W. Eccleston Up. Allyn Valley 32°16'S 151°30'E in rotten log 5/10/1995 P S Ward 1314" **Paratypes:** Three minor workers with same data pinned in each of SAMA, ANIC and NHMW.

Other material examined (in SAMA): Australian Capital Territory: Mount Gingera (35°34'S 148°47'E), 2. I. 1966, leg. R.H. Mew. **New South Wales:** Eccleston (32°16'S 151°30'E), 5. XI. 1995, leg. P.S. Ward; Tumut 44 miles E (35°18'S 149°00'E), 30. XII. 1965, leg. R.H. Mew. **South Australia:** Sevenhill (33°53'S 138°38'E), 21. II. 1957, leg. B.B. Lowery. **Victoria:** Colac (38°21'S 143°35'E), 18. V 1992, leg. A.J. McArthur.

Worker Description:

Major worker. Mesosoma: pronotum nearly flat with lateral margins in front, mesonotum abruptly rising anteriorly, otherwise feebly convex; metanotum with distinct transverse edges; propodeum dorsum straight; angle rounded, about 135°; declivity mostly straight; pronotum and mesonotum with a few scattered long erect setae, propodeum with a few near angle; flat-lying short setae sparse; side of mesonotum and propodeum finely and densely reticulate. Node: anterior lower half straight upper half convex, posterior mostly straight, summit convex. Appendages: tibiae with flat-lying short setae spaced about equal to their length; scapes with flat-lying short setae spaces about = length with some a little longer raised to 45° Head: underside in lateral view with a few long erect setae; in front view finely punctate with plentiful short erect setae on cheeks; sides convex; vertex straight; frontal carinae width about HW/3; maximum head width occurs at eye centres; clypeus anterior margin feebly projecting with a central concavity. Colour: head and gaster brown otherwise brownish yellow.

Minor worker. as for major worker.

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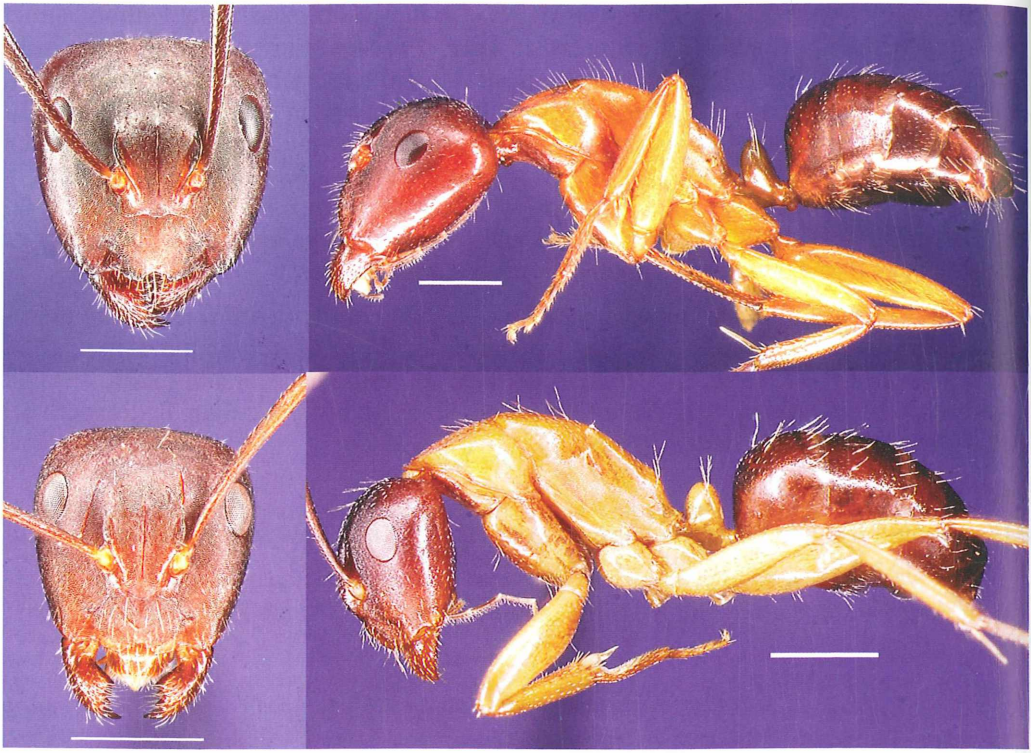


Fig. 16: *C. philwardi* sp.n., major worker above, minor worker below. Scale = 1 mm.

A member of the *C. ephippium* group (McArthur 2007a), with the form of the mesosoma of minor workers in lateral view appearing between *C. ephippium* Smith, 1858 and *C. capito* Mayr, 1876. Its vertex is convex, its propodeal dorsum nearly straight whereas in *C. ephippium* it is flat and concave respectively. Its anterior clypeal margin has a distinctive concavity.

Distribution: see Fig. 17.

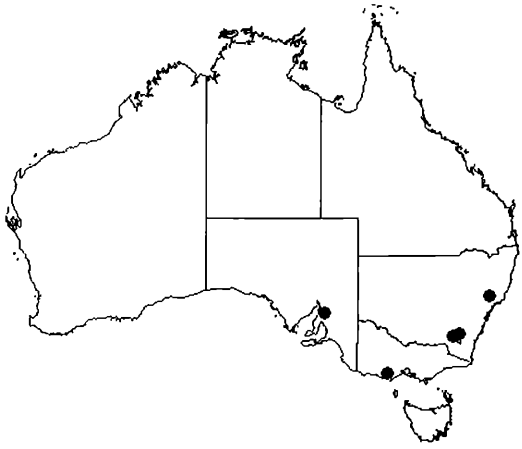
Morphometrics: see Fig. 18 (relationship of HL, PW and CW with HW for *C. philwardi* sp.n.).

Etymology: Named after P.S. Ward for his contribution to Myrmecology.

Camponotus samueli sp.n. (Figs. 19 - 21)

Holotypes: One minor worker pinned in SAMA "S. Aust. Ngarkat Conservation Park 35°38'S 140°47'E pitfalls 20/3 to 15/3/03 A J McArthur Site F". **Paratypes:** Three minor workers with same data pinned in each of SAMA, ANIC and NHMW.

Other material examined (in SAMA): Northern Territory: Alice Springs (23°42'S 133°52'E), 11. VII. 1992, leg. J. Mugford. **South Australia:** Beetaloo (33°13'S 138°13'E), 20. VII. 1972, leg. P.J.M. Greenslade; Belair (35°00'S 138°38'E), 26. III. 1994, leg. A.J. McArthur; Breakneck River (35°55'S 136°38'E), 10. I. 1973, leg. P.J.M. Greenslade; Camel Yard Spring 1.5 km S (30°40'S 139°05'E), 25. III. 1999, leg.



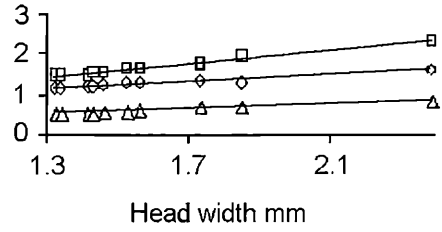


Fig. 18: *C. philwardi* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 0.83HW + 0.36 (R2 = 0.99, n=10);
PW = 0.39HW + 0.64 (R2 = 0.95, n=10);
CW = 0.30HW + 0.11 (R2 = 0.98, n=10).

Fig. 17: Collection localities of *C. philwardi* sp.n., specimens in SAMA.

South Australian Dept. Environment & Heritage, Flinders Ranges Survey; Flinders Island (33°43'S 134°31'E), 1. II. 1997, leg. A.A. & M.L. Simpson; Hambidge Conservation Park (33°24'S 135°55'E), 28. VIII. 2000, leg. T. Hands; Inneston 3.3 km WSW (35°17'S 136°52'E), 21. X. 2004, leg. South Australian Dept. Environment & Heritage, Mid North & Yorke Peninsula Survey; Jimmy's Well (35°51'S 140°18'E), 18. III. 1992, leg. J.A. Forrest E.G. Matthews; Messent Conservation Park (36°05'S 139°47'E), 17. XII. 1994, leg. H. Owens; Munyaroo Conservation Park (33°20'S 137°18'E), 30. IX. 2002, leg. Scientific Exploration Group, Munyaroo Survey; Munyaroo Conservation Park (33°22'S 137°20'E), 30. IX. 2002, leg. J. Berentson; Ngarkat Conservation Park (35°46'S 140°58'E), 30. III. 2000, leg. J.A. Forrest; Ngarkat Conservation Park (35°45'S 140°25'E), 11. IV 2003, leg. J. Samuel White; Ngarkat Conservation Park (35°45'S 140°25'E), 11. IV 2003, leg. J. Samuel White; Ngarkat Conservation Park (35°38'S 140°47'E), 20. IV 1999, leg. A.J. McArthur; Ngarkat Conservation Park (35°38'S 140°47'E), 12. IV. 2004, leg. J. Samuel White; Ngarkat Conservation Park (35°45'S 140°25'E), 2. I. 2002, leg. A.J. McArthur; Port Germein (33°01'S 138°00'E), 30. IV 2000, leg. T. Steggles; Warbla Cave 8 km SSW (31°36'S 129°05'E), 29. X. 2004, leg. Waterhouse Club; Yelpawaralinna Waterhole (27°08'S 138°42'E), 25. XI. 1993, leg. J.A. Forrest; Yumbarra Conservation Park (31°39'S 133°33'E), 27. IX. 1988, leg. J.A. Forrest.

Worker Description:

Major worker. not yet known.

Minor worker. Mesosoma: dorsum of pronotum and mesonotum feebly convex, dorsum of propodeum and declivity uniformly convex without any angle between them; < 5 erect setae on each of pronotum, mesonotum and propodeum, short curved setae distinct on dorsum; integument on side of mesonotum and propodeum smoothly reticulate, glossy. Node: anterior and posterior surfaces mostly straight, summit nearly sharp. Appendages: tibiae with distinct short setae, spaced about equal to length of setae, inclination 0° to 5°; scapes with distinct short setae spaced about equal to length of setae, inclination 0° to 5° more distinct apically. Head: underside in lateral view with a few long erect setae; on sides in front view a few erect setae; sides straight tapering to the front; vertex convex; frontal carinae width < 1/3 HW; maximum head width occurs posterior to eye centres; clypeus anterior margin convex, projecting. Colour: mostly yellow.

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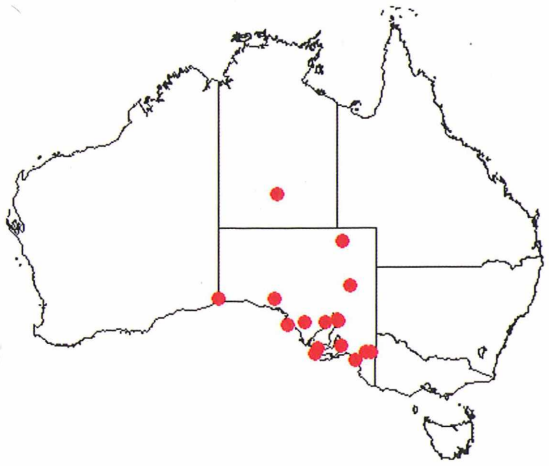
Fig. 19: *C. samueli* sp.n., minor worker. Scale = 1 mm.



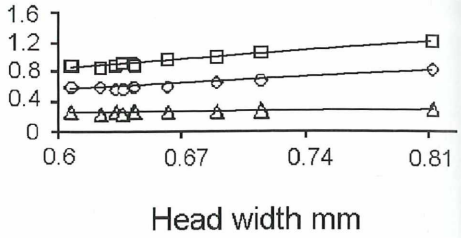


Fig. 21: *C. samueli* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 1.69HW - 0.17 (R2 = 0.96, n = 10);
PW = 1.23HW - 0.21 (R2 = 0.92, n = 10);
CW = 0.21HW + 0.11 (R2 = 0.65, n = 10).

Fig. 20: Collection localities of *C. samueli* sp.n., specimens in SAMA.

A member of the *C. gibbinotus* group (McArthur 2007a), distinguished by HL > HW. One of the smallest *Camponotus*, the overall length of minor workers as low as 3 mm.

Distribution: see Fig. 20.

Morphometrics: see Fig. 21 (relationship of HL, PW and CW with HW for *C. samueli* sp.n.).

Etymology: Named after John Samuel White a collector for SAMA and volunteer worker at Ngarkat Conservation Park.

Camponotus woodroffeensis sp.n. (Figs. 22 - 24)

Holotype: One minor worker pinned in SAMA "S.Aust. Mt. Woodroffe 26°18'S 132°15'E 1000m in Spinifex near rocky creek 6/09/1973 B B Lowery". **Paratypes:** One minor worker with same data pinned in NHMW.

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Other material examined (in SAMA): South Australia: Beachport (37°29'S 140°00'E), 17. V. 1993, leg. A.J. McArthur; Morialta Reserve (34°56'S 138°36'E), 30. III. 1969, leg. B.B. Lowery; Mount Hoare 5 km SSE (27°06'S 129°42'E), 26. IX. 2001, leg. Waterhouse Club; Mt. Woodroffe (26°19'S 131°44'E), 6. IX. 1973, leg. B.B. Lowery; Musgrave Ranges (26°18'S 132°15'E), 5. IX. 1973, leg. B.B. Lowery; Sevenhill (33°53'S 138°38'E), 3. VII. 1957, leg. B.B. Lowery; South Para Reservoir (34°42'S 138°52'E), 24. II. 1976, leg. P.J.M. Greenslade.

Worker Description:

Major worker. Mesosoma: pronotum convex more so anteriorly; mesonotum feebly convex; metanotum a shallow wide trough; propodeum dorsum feebly convex; angle well rounded, 135°; declivity concave below; ratio propodeal dorsum / declivity about 1; mesosoma with < 10 long erect setae, flat-lying short setae sparse; side of mesonotum and propodeum finely reticulate. Node: anterior and posterior surface mostly flat; summit sharp. Appendages: tibiae, with short setae raised to about 5°, rows of about 5 spines on inside surface; scapes with short setae raised to about 5°, more distinct apically. Head: underside in lateral view without long erect setae; sides straight near parallel but tapering feebly to the front; vertex straight, swollen; frontal carinae wide, about = HW/3; maximum head width occurs at eye centres; clypeus anterior margin projecting, two blunt teeth forming corners with a deep concavity between. Colour: dark brown, limbs lighter.

Minor worker. Mesosoma: dorsum evenly convex, angle well rounded 150°; declivity mostly straight; ratio propodeal dorsum / declivity about 2; mesosoma with < 10 long

Fig. 22: *C. woodroffeensis* sp.n., major worker above, minor worker below. Scale = 1 mm.

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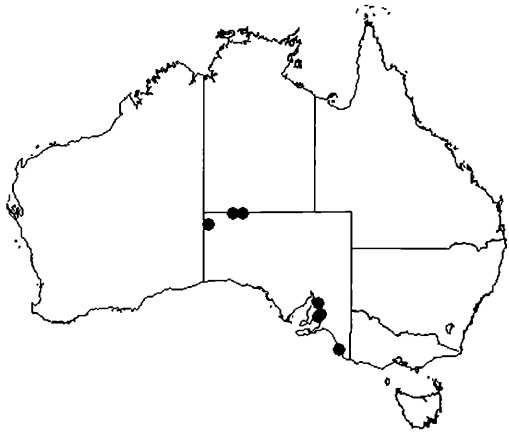

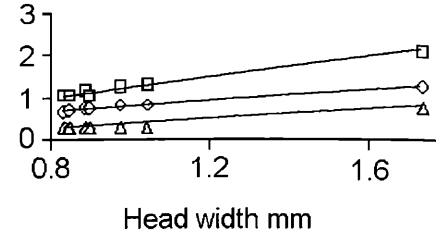

Fig. 24: *C. woodroffeensis* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.
HL = 1.18HW + 0.07 (R2 = 0.98, n = 7);
PW = 0.59HW + 0.21 (R2 = 0.98, n = 7);
CW = 0.50HW - 0.14 (R2 = 0.96, n = 7).

Fig. 23: Collection localities of *C. woodroffeensis* sp.n., specimens in SAMA.

erect setae; flat-lying short setae sparse; integument on side of mesonotum and propodeum finely reticulate. Node: anterior and posterior surface mostly flat; summit sharp. Appendages: tibiae with short setae raised to about 5°, rows of about 5 spines on inside; scapes with short setae raised to about 5°, more distinct apically. Head: underside in lateral view without erect setae; sides straight tapering feebly to the front; vertex convex; frontal carinae < HW/3; maximum head width posterior to eye centres; clypeus anterior margin projecting, wide, convex. Colour: brownish yellow, gaster darker, legs lighter.

A member of the *C. claripes minimus* group (McArthur 2007a). In the minor worker (in front view) its head sides are convex whereas in *C. claripes minimus* they are nearly straight, its eyes are very large.

Distribution: see Fig. 23.

Morphometrics: see Fig. 24 (relationship of HL, PW and CW with HW for *C. woodroffeensis* sp.n.).

Etymology: Named after Mount Woodroffe in the north of South Australia from where the ant was collected by Rev. B.B. Lowery SJ, now deceased.

Acknowledgements

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