Ann. Naturhist. Mus. Wien	108 B	103 - 113	Wien, Mai 2007

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

A.J. McArthur*

Abstract

Camponotus ants are common throughout Australia. A recently constructed key identifies 101 named species (McArthur in press). Four new species are described here in memory of the late Stefan Schödl. *Camponotus stefani* sp.n., *Camponotus guidae* sp.n., *Camponotus malleensis* sp.n. and *Camponotus palkura* sp.n. are described for the first time. All are ground nesting. Data and photographs of the new species are provided and related species compared.

Key words: ants, Formicinae, *Camponotus*, *C. stefani* sp.n., *C. guidae* sp.n., *C. malleensis* sp.n., *C. palkura* sp.n.

Zusammenfassung

Ameisen der Gattung *Camponotus* sind in ganz Australien weit verbreitet. Ein Bestimmungsschlüssel zur Identifizierung von 101 Arten wurde kürzlich erstellt (McArthur in press). In Erinnerung an den verstorbenen Stefan Schödl werden in dieser Arbeit vier Arten neu beschrieben. *Camponotus stefani* sp.n., *Camponotus guidae* sp.n., *Camponotus malleensis* sp.n. und *Camponotus palkura* sp.n. werden zum ersten Mal beschrieben. Alle vier Arten haben Bodennester. Daten und Fotos der neuen Arten werden präsentiert und verwandte Arten werden mit ihnen verglichen.

Introduction

Camponotus ants are frequently encountered throughout Australia but the identification of specimens is difficult because of the considerable variation in the size, pilosity, colour and shape within a species. Within a colony there are several sizes and forms representing castes which perform different functions associated with the organisation of the colony. Of the castes, minor workers are the most numerous and most often collected in pitfall traps for ecological surveys. Reproductive castes seldom leave the nest and are not considered here. Major workers have exceptionally large heads with strong muscles for powering their mandibles which are used in defence. The smaller minor workers are involved in food gathering. The distribution of *Camponotus* species is patchy, influenced by soil types, vegetation and rainfall. Over 1400 species and sub species of *Camponotus* have been described world wide (Bolton 1994). Various attempts have been made to split the genus into sub-genera or species groups to help with identification of species, the most recent (Emery 1925) is the most comprehensive but lacking in usefulness. Recently a key has been constructed for identification of 101 species in 23 species groups from Australia (McArthur in press). In the process of testing this key,

* Archie J. McArthur, South Australian Museum, Adelaide, South Australia.
– mcarthur.archie@saugov.sa.gov.au

R. Hutchinson, J.J. Weyland and R.G. Simms recognised some undescribed species. These are the subject of this paper where four new species viz *Camponotus stefani* sp.n., *Camponotus guidae* sp.n., *Camponotus malleensis* sp.n. and *Camponotus palkura* sp.n. are described in memory of the late Stefan Schödl. Data and photographs of the new species and comparisons with their presumed nearest relatives are given.

Material and methods

In the Formicidae collection in the South Australian Museum, specimens from over 5000 Australian localities have been identified as *Camponotus* and although most of these have been given reliable species names, a few could not be identified. These specimens were examined and scored for characters on an Excel spreadsheet and sorted, resulting in finding four previously undescribed species. The most significant of these characters have been transcribed below in the worker descriptions and refer to pilosity, form of the mesosoma in lateral view, and the shape and pilosity of 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 ignoring any abrupt curvature at posterior ends, with underside of head horizontal; pronotal width = maximum width of pronotum in dorsal view. Measurements were transmitted to MS Excel 2000 via George Link Wedge (SPLat Controls Pty. Ltd).

Abbreviations: Measurements

HW = head width in mm

HL = head length in mm

PW = pronotal width in mm

CW = frontal carinae width in 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 stefani sp.n. (Figs. 1 - 4)

Holotype: One minor worker pinned in SAMA "S.Aust. Jamestown 33°12'S 138°36'E 1/06/1983 B B Lowery".

Paratypes: Six minor workers with same data, two of each pinned in SAMA, ANIC and NHMW.

Other material examined (in SAMA): Australian Capital Territory: Black Mountain Reserve (35° 16' S, 149° 06' E), 6. X. 1995, leg. B.B. Lowery. **New South Wales:** Fowlers Gap (31° 05' S, 141° 44' E), 19.

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

XI. 1979, leg. P.J.M. Greenslade; Sturt National Park (29° 04' S, 141° 15' E), 10. XI. 1979, leg. P.J.M. Greenslade; Trundle (32° 55' S, 147° 42' E), 13. I. 1964, leg. B.B. Lowery. **South Australia:** Adelaide (34° 56' S, 138° 36' E), 31. XII. 1998, leg. A.J. McArthur; Adelaide (34° 56' S, 138° 36' E), leg. B. Heterick; Adelaide (34° 56' S, 138° 36' E), 15. IV. 2001, leg. D. Creevey; Adelaide (34° 56' S, 138° 36' E), 21. II. 2005, leg. J. Weyland; Adelaide (34° 56' S, 138° 36' E), 1. XII. 1993, leg. P. Magarey; Arkaroola (30° 20' S, 139° 22' E), 21. VI. 2001, leg. P.J. Fargher; Carisbrook Reserve (34° 46' S, 138° 45' E), 17. VI. 2001, leg. A.J. McArthur P.J. Fargher; Gluepot (33° 46' S, 140° 11' E), 23. V. 1999, leg. D.F. King; Innamincka (28° 04' S, 140° 43' E), 29. I. 2001, leg. Primary Industries and Resources SA; Jamestown (33° 12' S, 138° 36' E), 1. VI. 1983, leg. B.B. Lowery; Kapunda (34° 21' S, 138° 55' E), 14. X. 1957, leg. R. V. Southcott; Moralana Creek (31° 28' S, 138° 10' E), 1. III. 1970, leg. G. F. Gross; Mundy Dam (26° 32' S, 132° 56' E), 16. VIII. 1998, leg. South Australian Dept. for Environment & Heritage, Pitjantjatara Lands Survey; Oraparinna (31° 22' S, 138° 43' E), 1. VIX. 1971, leg. P.J.M. Greenslade; Paney (32° 41' S, 135° 41' E), 20. X. 2001, leg. South Australian Dept. for Environment & Heritage, E. Eyre Peninsula Survey; Peppermint Gully (33° 25' S, 138° 59' E), 17. III. 2004, leg. South Australian Dept. for Environment & Heritage, Mid North & Yorke Peninsula Survey; Sevenhill (33° 53' S, 138° 38' E), 17. III. 1957, leg. B.B. Lowery; Teatrick (36° 23' S, 140° 52' E), 8. XII. 1995, leg. South Australian Dept. for Environment & Heritage, Box and Bulloak Survey; Scott Creek Conservation Park (35° 04' S, 138° 42' E), 1. VI. 2001, leg. T. Hands. **Victoria:** Inglewood (36° 35' S, 143° 52' E), 1995, leg. S. Hinkley; Patho (36° 00' S, 144° 26' E), leg. H.A. Potter.

Worker description:

Major worker. Mesosoma: in lateral view with a few scattered erect setae; pronotum weakly convex, mesonotum weakly convex but higher anteriorly; metanotum wide, distinct; propodeal dorsum with a slight convexity anteriorly followed by a weak depres-

sion; angle about 170°, well rounded; ratio dorsum/declivity about 1; node on the petiole with anterior face straight, summit blunt, posterior face mostly straight. Head: sides straight, tapering to the front, vertex weakly convex; frontal carinae narrow; frontal area distinct anteriorly; clypeus anterior margin narrow, projecting, widely concave between two teeth; clypeus with sparse flat-lying short white setae, integument reticulate punctate; about 6 teeth on mandibles; median clypeal carina absent; in lateral view, clypeus anterior two thirds flat and separated from convex posterior by an angle; erect setae under head < 5. Appendages: flat-lying indistinct setae on outside of tibiae, about 7 bristles inside in a row; setae on scape flat-lying, indistinct. Colour varies from black to red, legs slightly lighter.

Minor worker. Mesosoma: in lateral view covered with plentiful white short flat-lying setae with a few scattered erect setae; pronotum weakly convex; mesonotum weakly convex, higher anteriorly; metanotum indistinct; propodeal dorsum with a slight convexity anteriorly; angle about 170°, well rounded; ratio dorsum/declivity about 4; node on the petiole elongate, with anterior face straight, summit straight, inclined upward, posterior face mostly straight. Head: sides straight, parallel; vertex weakly convex; frontal carinae narrow; frontal area distinct anteriorly; clypeus anterior margin projecting, convex, crenulate; clypeus with plentiful flat-lying short white setae, reticulate; 8 visible teeth on mandibles; median clypeal carina distinct; erect setae under head < 5. Appendages: flat-lying indistinct setae on outside of tibiae, about 7 bristles inside in a row; setae on scape, flat-lying indistinct. Colour varies from black to red (from the same nest), legs slightly lighter.

The species is presumed dimorphic due to the absence of medium workers in the SAMA collection. The presumed nearest relative *C. extensus* MAYR, 1876 has short setae on its scape raised to about 45°.

Distribution: see Fig. 2.

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

Biology: Nest is in soil with high clay content, entrance to nest is a small circular hole scarcely larger than major worker's head. Common in Adelaide parklands. Frequently seen foraging on trees in day time. Figure 4 shows a habitat.

Etymology: Named after the late Stefan Schödl in recognition of his contribution to myrmecology.

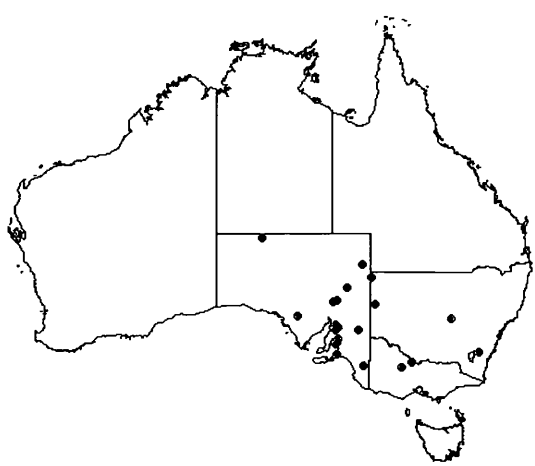

Fig. 2: Collection localities of *C. stefani* sp.n., specimens in SAMA.

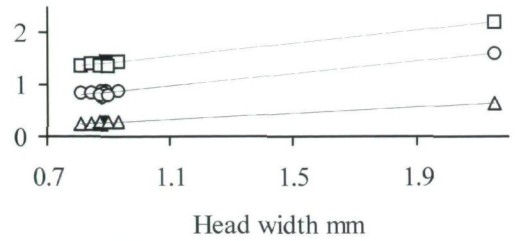

Fig. 3: *C. stefani* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.

HL = 0.6427HW + 0.8411 (R2 = 0.99, n = 10);
PW = 0.6116HW + 0.3079 (R2 = 0.97, n = 10);
CW = 0.2893HW + 0.0169 (R2 = 0.99, n = 10).

Fig. 4: The author pointing to the entrance to the nest of *C. stefani* sp.n. in the City of Adelaide Parklands.

Camponotus guidae sp.n. (Figs. 5 - 7)

Holotype: One minor worker pinned in SAMA "S.Aust. McLaren Flat 2.5 km N 35°12'S 138°35'E 1/08/1991 A.J. McArthur".

Paratypes: Six minor workers with same data, two of each pinned in SAMA, ANIC and NHMW.

Other material examined (in SAMA): South Australia: Hatherleigh Hills (37° 26' S, 140° 07' E), 27. X. 1992, leg. A.J. McArthur; Innes National Park (35° 13' S, 136° 52' E), 1. I. 1990, leg. S. Morrison; McLaren Flat 2.5 km N (35° 12' S, 138° 35' E), 1. VIII. 1991, leg. A.J. McArthur; Monarto (35° 03' S, 139° 07' E), 10. XII. 2005, leg. C.G. Watts; Piccaninny Road (37° 28' S, 140° 09' E), 8. I. 1992, leg. A.J. McArthur; Rockleigh (34° 59' S, 139° 01' E), 7. X. 2002, leg. South Australian Dept. for Environment & Heritage, E. Mt. Lofty Ranges Survey; Western River (35° 41' S, 136° 36' E), 15. III. 1995, leg. T. Herbert; Woakwine Cutting (37° 23' S, 140° 03' E), 31. III. 1997, leg. A.J. McArthur & P.J. Fargher; Woakwine Range (37° 16' S, 139° 56' E), 1. I. 2003, leg. A.J. McArthur & A.A. Simpson.

Fig. 5: *C. guidae* sp.n., major worker above, minor worker below. Scale = 1 mm.

Worker description:

Major worker. Mesosoma: in lateral view, with a few scattered erect setae, glossy; pronotum convex; mesonotum weakly convex; metanotum a trench; propodeal dorsum convex anteriorly then mostly straight; propodeal angle indistinct about 170°; ratio dorsum/declivity indistinct, about 1; node on the petiole with anterior face straight, summit sharp, posterior face straight. Head: sides convex, tapering to the front; vertex straight; width greatest behind eyes; frontal area indistinct; frontal carinae much wider at the centre than at the front; clypeus anterior margin projecting, bounded by obtuse corners with a weak concavity between; clypeus surface near nude; median clypeal carina distinct; erect setae under head < 10. Appendages: flat-lying setae on outside of tibiae raised to < 10°, flat-lying setae on scape indistinct. Colour varies from dark brown to black, legs much lighter and yellowish.

Minor worker. Mesosoma: in lateral view, with a few scattered erect setae, glossy; forms a uniform convexity; propodeal angle indistinct; node on the petiole with anterior face straight, summit sharp, posterior face straight. Head: sides convex parallel; vertex straight; width greatest at eyes; frontal area indistinct; frontal carinae mostly parallel; clypeus anterior margin projecting, convex; clypeus surface near nude; median clypeal carina distinct; erect setae under head < 10. Appendages: flat-lying setae on outside of tibiae raised to < 10°; flat-lying setae on scape indistinct. Colour varies from dark brown to black, legs much lighter and yellowish.

The species is presumed dimorphic due to the absence of medium workers in the SAMA collection. The presumed nearest relative *C. simpsoni* McArthur, 2003 has short setae on its scape raised to about 45°.

Distribution: see Fig. 6.

Morphometrics: see Fig. 7 (relationship of HL, PW and CW with HW in *C. guidae* sp.n.).

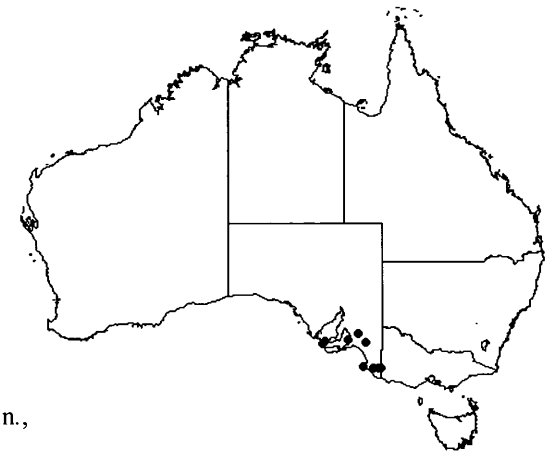

Fig. 6: Collection localities of *C. guidae* sp.n., specimens in SAMA.

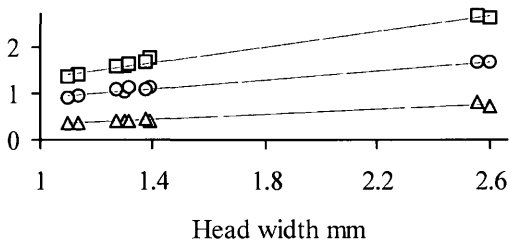

Fig. 7: *C. guidae* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.

HL = 0.8213HW + 0.5121 (R2 = 0.98, n = 10);
PW = 0.4749HW + 0.4433 (R2 = 0.98, n = 10);
CW = 0.2784HW + 0.0447 (R2 = 0.98, n = 10).

Etymology: From Latin guida = guide, named after Guides Australia (formally Girl Guides) who administer the property "Douglas Scrub" where the species was found.

Camponotus malleensis sp.n. (Figs. 8 - 10)

Holotype: One minor worker pinned in SAMA "S.Aust. Ngarkat CP Border Track 35°46'S 140°57'E 24/03/2000 J A Forrest D Hirst".

Paratypes: Six minor workers with same data, two of each pinned in SAMA, ANIC and NHMW.

Other material examined (in SAMA): South Australia: Billiatt Conservation Park (34° 57' S, 140° 27' E), 18. XI. 1996, leg. J.A. Forrest; Cambrai 34 km E (34° 39' S, 139° 39' E), 28. X. 2000, leg. T. Steggles; Ceduna 10 km NW (32° 04' S, 133° 36' E), 29. X. 1995, leg. R. Foster & B. Pike; McLaren Flat 2.5 km N (35° 12' S, 138° 35' E), 1. VIII. 1991, leg. A.J. McArthur; Ngarkat Conservation Park (35° 33' S, 140° 52' E), 2. III. 2003, leg. A.J. McArthur & R. Hutchinson; Ngarkat Conservation Park Border Track (35° 46' S, 140° 57' E), 24. III. 2000, leg. J.A. Forrest & D. Hirst.

Worker description:

Major worker. Mesosoma: in lateral view with plentiful erect setae; dorsum uniformly weakly convex; metanotum shallow, indistinct; propodeal angle rounded, about 150°; ratio dorsum/declivity about 1.5; node on the petiole with anterior face convex, summit blunt, posterior face straight. Head: sides convex, tapering to the front; vertex straight, head width greatest anterior to eye level, anterior frontal area distinct; frontal carinae wide; clypeus anterior margin projecting with a strong concavity; median clypeal carina

Fig. 8: *C. malleensis* sp.n., major worker above, minor worker below. Scale = 1 mm.

indistinct; plentiful erect setae under head. Appendages: indistinct flat-lying setae on outside of tibiae and scape. Colour: yellowish brown, head darker, legs lighter.

Minor worker. Mesosoma: in lateral view, with plentiful erect setae on mesosoma and on node on the petiole, uniformly weakly convex; metanotum indistinct; propodeal angle rounded, about 150°; ratio dorsum/declivity about 2; declivity straight; node on the petiole with anterior face convex, summit convex, posterior face straight. Head: sides straight, weakly tapering to the front; vertex weakly convex; head width greatest at eye level; frontal area indistinct; frontal carinae wide; clypeus anterior margin projecting with a strong concavity; median clypeal carina distinct; plentiful erect setae under head. Appendages: distinct flat-lying setae on outside of tibiae; setae on scape raised to about 5°. Colour: mesosoma yellowish brown, head darker, legs lighter.

The species is presumed dimorphic due to the absence of medium workers in the SAMA collection. The presumed nearest relative *C. scotti* McArthur, 2003 has sparse long erect setae on its mesosoma.

Distribution: see Fig. 9.

Morphometrics: see Fig. 10 (relationship of HL, PW and CW with HW in *C. malleensis* sp.n.).

Etymology: Named after Mallee the name of a growth form of *Eucalyptus* (Myrtaceae) the ant's habitat.

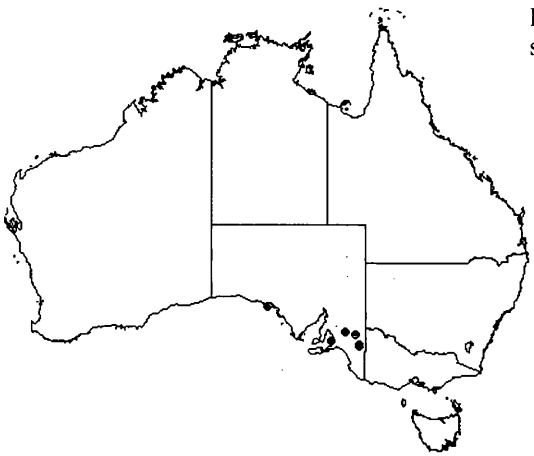

Fig. 9: Collection localities of *C. malleensis* sp.n., specimens in SAMA.

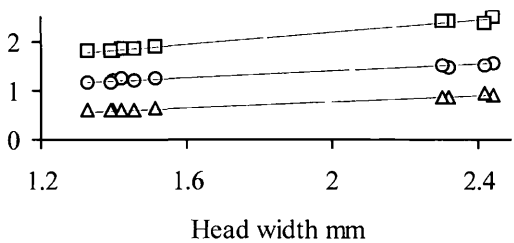

Fig. 10: *C. malleensis* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.

HL = 0.6034HW + 0.9849 (R2 = 0.98, n = 10);
PW = 0.3149HW + 0.7655 (R2 = 0.99, n = 10);
CW = 0.3028HW + 0.1747 (R2 = 0.99, n = 10).

Camponotus palkura sp.n. (Figs. 11 - 13)

Holotype: One minor worker pinned in SAMA "S.Aust. Streaky Bay 32°48'S 134°13'E 3/10/1957 B B Lowery".

Paratypes: Six minor workers with same data, two of each pinned in SAMA, ANIC and NHMW.

Other material examined (in SAMA): South Australia: Browns Beach (35° 11' S, 136° 52' E), 24. XII. 2001, leg. J. Berentson; Calpatanna Waterhole Conservation Park (32° 59' S, 134° 22' E), 27. XI. 1995, leg. R. Foster & B. Pike; Ceduna 15 km E (32° 08' S, 133° 51' E), 28. X. 1995, leg. R. Foster & B. Pike; Innes National Park (35° 13' S, 136° 52' E), 25. IV. 2003, leg. G. L. Howie; Innes National Park (35° 13' S, 136° 52' E), 1. XI. 1990, leg. S. Morrison; Nundroo 7 km SW (31° 50' S, 132° 09' E), 5. XI. 1995, leg. R Foster; Penong (31° 56' S, 133° 01' E), 4. XI. 1995, leg. R. Foster & B. Pike; Pinkawillinie Conservation Park (33° 07' S, 136° 06' E), 17. IV. 1996, leg. J. Mugford; Poochera Cemetry (32° 43' S, 134° 50' E), 13. X. 1995, leg. A.J. McArthur & C.H. Watts; Streaky Bay (32° 48' S, 134° 13' E), 3. X. 1957, leg. B.B. Lowery; Warrenben Conservation Park (34° 57' S, 139° 72' E), 4. IV. 2004, leg. R. Hutchinson.

Worker description:

Major worker. Mesosoma: in lateral view, erect setae plentiful except on propodeal anterior dorsum which is nearly nude; an even convexity from the anterior of the pronotum to the propodeal angle; metanotum distinct, narrow; propodeal angle about 160°; ratio dorsum/declivity about 2; node on the petiole with anterior face convex, summit sharp, posterior face convex. Head: sides convex, with the anterior half tapering to the

Fig. 11: *C. palkura* sp.n., major worker above, minor worker below. Scale = 1 mm.

front; vertex straight; frontal carinae diverging; frontal area diamond shape; clypeus anterior margin projecting, straight; clypeus integument glossy; median clypeal carina indistinct; plentiful long erect setae under head. Appendages: outside of tibiae with indistinct flat-lying setae raised to about 5°, about 9 bristles in a row inside; setae on scape flat-lying, indistinct. Colour varies from yellow to reddish yellow.

Minor worker. Mesosoma: in lateral view, erect setae plentiful except on propodeal anterior dorsum which is nearly nude; an even convexity from the anterior of the pronotum to the propodeal angle; metanotum distinct and narrow; angle about 160°; ratio dorsum/declivity about 3; node on the petiole with anterior face convex, summit sharp, posterior face convex. Head: sides straight and parallel; vertex convex; frontal carinae mostly parallel, close together; frontal area a diamond shape; clypeus anterior margin projecting, convex; clypeus integument glossy; median clypeal carina distinct; plentiful long erect setae under head. Appendages: with indistinct flat-lying setae on outside of tibiae raised to <5°, about 9 bristles in a row inside; setae on scape flat-lying, indistinct. Colour: mostly yellow.

The species is presumed dimorphic due to the absence of medium workers in the SAMA collection. The presumed nearest relative *C. tricoloratus* CLARK, 1941 has sparse long erect setae on its mesosoma.

Distribution: see Fig. 12.

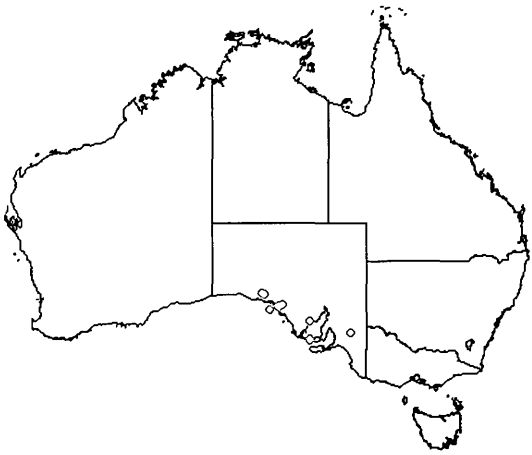

Fig. 12: Collection localities of *C. palkura* sp.n., specimens in SAMA.

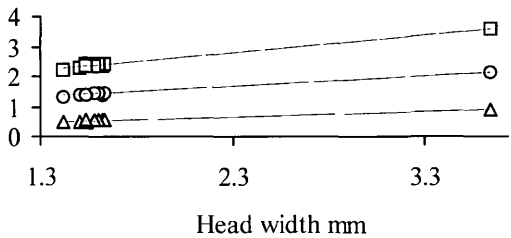

Fig. 13: *C. palkura* sp.n.: □ = head length mm, ○ = pronotal width mm, △ = maximum frontal carinae width mm.

HL = 0.5835HW + 1.4443 (R2 = 0.98, n = 10);
PW = 0.3536HW + 0.8661 (R2 = 0.97, n = 10);
CW = 0.1892HW + 0.2337 (R2 = 0.98, n = 10).

Morphometrics: see Fig. 13 (relationship of HL, PW and CW with HW in *C. palkura* sp.n.).

Etymology: named from the word palkura = yellowish in the Pangkala Aboriginal language of Eyre Peninsula, South Australia.

References

Bolton B., 1995: A New General Catalogue of the Ants of the World. – Harvard University Press, Cambridge, U.S.A., 504 pp.

Emery C., 1925: Hymenoptera. Fam. Formicidae. Subfam. Formicinae. – In: Wytsman, P. (ed.): Genera Insectorum: 1-302. – Louis Desmet-verteneuil: Bruxelles, fascicule 183.

McArthur A.J., in press: A key to *Camponotus* Mayr of Australia. – Memoirs of the American Entomological Institute Vol. 77.