New species, new status and new synonymy for *Camponotus* from Australia (Hymenoptera: Formicidae)

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Abstract

Four subspecies of *Camponotus* ants are raised to species rank viz. *Camponotus claripes* r. *elegans* FOREL, 1902 to *Camponotus elegans* FOREL, 1902; *Camponotus claripes* ssp. *marcens* FOREL, 1907 to *Camponotus marcens* FOREL, 1907; *Camponotus claripes* r. *minima* CRAWLEY, 1922 to *Camponotus minimus* CRAWLEY, 1922 and *Camponotus nigroaeneus* ssp. *xuthus* EMERY, 1925 to *Camponotus xuthus* EMERY, 1925. *Camponotus claripes* ssp. *piperatus* WHEELER, 1933 is synonymised with *Camponotus claripes* MAYR, 1876; and *Camponotus nigroaeneus* ssp. *divus* FOREL, 1907 is synonymised with *Camponotus nigroaeneus* (SMITH, 1858). The status of other subspecies of *Camponotus claripes* viz. *Camponotus claripes* var. *inverallensis* FOREL, 1910, *Camponotus claripes* var. *nudimalis* FOREL, 1913 and *Camponotus claripes* ssp. *orbiculatopunctatus* VIEHMEYER, 1925 have not been considered here because of the scarcity of material available. *Camponotus triodiae* sp.n. is described for the first time. Its habitat is the arid northern South Australia.

Key words: Ant, Formicinae, *Camponotus claripes*, *Camponotus nigroaeneus*, *Camponotus triodiae*, new species, new status, new synonymy.

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Introduction

The genus *Camponotus* was described by Gustav MAYR in 1862 and included six species from Australia. Today over 1400 species of *Camponotus* have been described from the world (BOLTON & al. 2007) and a key for identifying 101 of these from Australia has been published (MCARTHUR 2007). *Camponotus* workers are frequently encountered foraging on the ground and on trees. The minor workers travel long distances from the nest in search of food whereas the larger major workers stay closer to the nest to protect it. Dimensions of *Camponotus* major workers may be up to three times larger than those of minor workers. Some taxa are polymorphic, i.e., there is a gradual increase in size from the smallest minor to the largest major worker in a colony. Other taxa are dimorphic, i.e., there are no medium sized workers in a colony, the workers consist of two size groups – major workers and minor workers. Thus there is a wide variation in size, form and colour in Australian *Camponotus* ants from one nest. There is also variation between populations of the same species. The variation in eye length, tibia length and colour in specimens of *Camponotus terebrans* LOWNE, 1865 collected along a north-south traverse was shown to be significant but a molecular study supports only a single species being present (MCARTHUR & al. 1998). Just how much variation is acceptable morphologically in a "species" is of concern to taxonomists. WARD (2007) criticised some earlier authors for the proliferation of "subspecies" and "varieties" in many ant genera. For example, *Camponotus claripes piperatus* WHEELER, 1933 was the seventh subspecies since the original description of *Camponotus claripes* by MAYR in 1876. There is no justification for this given our current understanding of the evolutionary process.

Material and methods

The South Australian Museum has a large collection of pinned *Camponotus* from South Australia. Many of these were collected in fauna surveys conducted by the South Australian Department for Environment and Heritage and others were donated by a host of local naturalists.


Acronyms in material sections. CP = Conservation Park, NP = National Park, RGS = Royal Geographical Society, SADEH = South Australian Department for Environment and Heritage.

Morphological analysis. Characters found to be most useful in defining species boundaries in *Camponotus* are: pilosity on the dorsum of mesosoma, scapes, tibiae, and the underside of head and genae; form of the mesosoma in lateral view, form of the head in frontal view, particularly the anterior margin of the clypeus, curvature of sides of head and the width of the frontal carinae.
Measurements in millimetres. Most measurements of type material were carried out using a calibrated eyepiece graticule. Other measurements were carried out using a Mitutoyo 209116 micrometer attached to an Olympus XZ microscope fitted with cross hairs at 20 to 50× magnification. Specimens were measured thus: EL = eye length = maximum eye length; FCW = frontal carinae width = maximum distance between carinae with underside of head horizontal ignoring any abrupt curvature at posterior ends; HL = head length = maximum distance between anterior margin of clypeus and vertex with both in one horizontal plane; HT = head thickness = maximum distance between anterior and posterior surfaces in side view with posterior in strict vertical aspect; HW = head width = maximum distance between head sides with underside of head horizontal, eyes excluded; PW = pronotal width = maximum width of pronotum in dorsal view; TL = tibia length = length of mid-tibia in horizontal position. The ratio PD / D is derived from the two measurements: length of propodeal dorsum measured from the centre of the angle to the mesosoma suture and from the centre of the angle to the extremity of the declivity. The above measurements were transmitted to MS Excel 2000 via Gauge Link Wedge (SPLat Controls Pty. Ltd). Photographs were taken with a Nikon D70S camera, 55 mm Micro-NIKKOR lens and extension tubes. Images were combined with CombineZS.2 (GNU Public Licence) by Alan Hadley.

Regression analysis was undertaken where adequate material was available; the significance of a and b in \( y = ax + b \) (where \( x = \text{head width} \)) was shown (Gould 1966).

**Systematics**

*Camponotus claripes claripes Mayr, 1876* (Figs. 1 - 3)

*Camponotus claripes Mayr, 1876.*

*Camponotus claripes ssp. piperatus Wheeler, 1933, syn. n.*


Fig. 1: *Camponotus claripes*, major worker above, minor worker below; left: frontal view of head; right: habitus, lateral.

pes piperatus


Morphometrics: See Fig. 2.

Notes: There is no specific difference between *C. claripes piperatus* and the typical *C. claripes*. One syntype of *C. claripes piperatus* is a specimen with a swollen gaster due to the presence of a parasite (WHEELER 1933).

Distribution: See Fig. 3.

Camponotus claripes FOREL, 1902

**Type material examined**: 3 syntypes (GMNH): 1 major and 2 minor workers "C. claripes* elegans* Froggatt Aust Wallsend Forel".


Notes: There is no specific difference between *C. claripes* and the typical *C. claripes* Forel. See Fig. 2. There is no specific difference between *C. claripes piperatus* and the typical *C. claripes*. One syntype of *C. claripes piperatus* is a specimen with a swollen gaster due to the presence of a parasite (WHEELER 1933). See Fig. 3.
Fig. 4: *Camponotus elegans*, major worker above, minor worker below; left: frontal view of head; right: habitus, lateral.


Morphometrics: See Fig. 5.

Comparative notes: Camponotus elegans stat.n. has an elongate mesosoma as shown in Fig. 4 whereas in C. claripes it is higher, as shown in Fig. 1.

Distribution: See Fig. 6.

Camponotus marcens FOREL, 1907 stat.n. (Figs. 7, 8)

Camponotus claripes marcens FOREL, 1907a.

Type material examined: 2 syntypes (GMNH): 1 major and 1 minor worker "Forel Typus Hamburg SW Aust Exp 1905 Stat 101 Mundaring Weir 9 VII".


Camponotus marcens Crawley, 1922 stat.n. (Figs. 9 - 11)
Camponotus claripes r. minima Crawley, 1922.

**Type material examined:** 2 syntypes (OUM): 1 major and 1 minor worker "Cotype 122 Mundaring WA".


**Morphometrics** (Type material, GMNH): Major worker HW 2.85, HL 3.00, PW 1.90, FCW 1.0, HT 2.00, EL 0.55, TL 1.90. Minor worker HW 1.10, HL 1.60, PW 1.00, FCW 0.4, HT 0.90, EL 0.35, TL 1.70.

**Comparative notes:** Camponotus marcens stat.n. has the sides of its head converging posteriorly in the minor worker as shown in Fig. 7 whereas in C. claripes the sides are parallel as shown in Fig. 1.

**Distribution:** See Fig. 8.

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Fig. 7: Camponotus marcens, major worker above, minor worker below; left: frontal view of head; right: habitus, lateral.

Fig. 8: Collection localities of C. marcens, specimens in SAMA.
Fig. 9: *Camponotus minimus*, major worker above, minor worker below; left: frontal view of head; right: habitus, lateral.


Fig. 10: *Camponotus minimus*. Graph with HW at x axis and □ = HL, Δ = FCW at y axis. HL = 0.87 * HW + 0.37 (R² = 0.98, n = 20); FCW = 0.31 * HW + 0.09 (R² = 0.97, n = 20).

Fig. 11: Collection localities of *C. minimus*, specimens in SAMA.


Fig. 12: *Camponotus nigroaeneus*, medium worker above, minor worker below; left: frontal view of head; right: habitus, lateral.

Fig. 13: Collection localities of *C. nigroaeneus*, specimens in SAMA.
Morphometrics: See Fig. 10.

Comparative notes: Camponotus minimus stat.n. lacks erect setae on the underside of the head, has wide frontal carinae with FCW > HW / 3 and is polymorphic as shown in Fig. 11, whereas C. claripes has plentiful erect setae on the underside of the head, has narrower frontal carinae with FCW < HW / 3 and is dimorphic as shown in Fig. 3.

Distribution: See Fig. 11.

Camponotus nigroaeneus (SMITH, 1858) (Figs. 12, 13)

Formica nigroaenea SMITH, 1858.
Formica nigroaenea: LOWNE 1865: worker described.
Camponotus nigroaeneus: MAYR 1862: combination in Camponotus.
Camponotus nigroaeneus ssp. divus FOREL, 1907b, syn.n.

Type material examined: Holotype of C. nigroaeneus (BMNH): major worker "Holotype BM 11 625 Melbourne Vic". 1 syntype of C. nigroaeneus divus (MHNG): 1 medium worker "Typus Mt.Victoria NSW".


**Morphometrics:** Holotype of *C. nigroaeneus*, (major worker), HW 2.2, HL 2.10, PW 1.90, FCW 0.80, HT 1.5, TL 1.55. Syntype of *C. nigroaeneus divus* (medium worker), HW 1.1, HL 1.5, PW 1.0, FCW 0.60, HT 0.8, TL 1.4.

**Distribution:** See Fig. 13.

*C. triodiae* sp.n. (Figs. 14 - 18)

**Type material examined:** Holotype (SAMA): pinned minor worker “S. Aust. Uno Stn. 4.4Km NW Harris Bluff 32° 40'16''S 136° 43'08''E 11 Nov 2008 From burrow P Hudson & P Fennell”. One major worker (paratype) from same nest mounted on same pin. Paratypes with same labels pinned in SAMA, ANIC and NHMW. SAMA has 10 specimens in alcohol.


**Worker description:** Major worker. Mesosoma in profile: dorsum of pronotum mostly flat with feebble anterior-lateral margins, mesonotum flat anteriorly and posteriorly with a convexity between, metanotum about 0.2 mm long, bounded anteriorly and posteriorly by fine troughs, propodeal dorsum straight short, propodeal angle well rounded about 135°, declivity long mostly straight with slight central angle, PD / D ~ 5; dorsum of mesosoma with < 5 long erect reddish setae, short decumbent setae very sparse; integument on side of mesonotum and propodeum, reticulate, side of head smooth glossy. Petiolar node: anterior face feebly convex, posterior face straight, summit sharp. Tibiae without distinct short setae, with > 10 erect spines on posterior surface; scapes with distinct short setae raised to 30°. Head: underside in lateral view with 0 to 3 long erect setae; erect setae sparse in frontal view; sides feebly convex, strongly tapering anteriorly; vertex straight; FCW < HW / 3; maximum head width at about eye centres; clypeus anterior margin projecting, crenate with 135° corners, feebly concave between. Colour: mostly black, legs lighter. Minor worker. Mesosoma in profile: dorsum of pronotum mostly flat with strong anterolateral margins, mesonotum convex, metanotum indistinct, propodeal dorsum straight and short, propodeal angle well rounded about 135°, declivity long mostly straight with a central 170° an-
Fig. 19: Camponotus xuthus, minor worker; left: frontal view of head; right: habitus, lateral.

Morphometrics: See Fig. 15.

Comparative notes: Closely related to C. michaelseni FOREL, 1907 from Western Australia, C. triodiae sp.n. is distinguished by its scapes having plentiful short setae raised up to about 30° whereas in C. michaelseni the scapes have indistinct short decumbent setae.

Distribution: See Fig. 16.

Biology: These ants have been found associated with bushes of Triodia species commonly known as spinifex in northern South Australia. The ant constructs a tube made from vegetation and red soil as shown in Figs. 17, 18.

Camponotus xuthus EMERY, 1925 stat.n. (Figs. 19, 20)
Camponotus nigroaeneus var. xuthus FOREL, 1915 – unavailable name.
Camponotus nigroaeneus ssp. xuthus EMERY, 1925.

Type material examined: 2 syntypes (MHNG): 1 major and 1 minor worker “Typus Kimberley Dist”.


Worker description: Major worker. Head sides anterior two thirds straight and parallel, posterior third convex tapering anteriorly. Vertex mostly flat in front view and swollen in lateral view. Clypeus anterior margin median section strongly concave and bounded by two teeth. Pro-

Fig. 20: Collection localities of C. xuthus, specimens in SAMA.


Morphometrics: Syntype major worker, HW 2.5, HL 2.7, PW 1.0, FCW 1.0, HT 0.8, TL 2.0; syntype minor worker, HW 1.5, HL 1.8, PW 1.90, FCW 0.70, HT 1.1, TL 1.8.

Comparative notes: The integument of the gaster in C. xuthus stat.n. is not hidden by pubescence and the ant is brown whereas C. nigroaeneus has distinct short whitish
decumbent setae (pubescence) which hide the gaster and is mostly black.

**Distribution:** See Fig. 20.

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**Zusammenfassung**


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