



## Australian species of the ant genus *Dolichoderus* (Hymenoptera: Formicidae)

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### Abstract

The Australian species of the ant genus *Dolichoderus* are revised. The fauna contains 27 species belonging to four species groups, the *australis* group (5 species, 2 newly described), the *doriae* group (6 species, 2 newly described), the *scabridus* group (6 species, 1 newly described) and the *scrobiculatus* group (10 species, 4 newly described). The former subspecies *niger* Crawley and *rufotibialis* Clark are raised to species-level. The following nine new species are described: *albamaculus* sp. n., *canopus* sp. n., *etus* sp. n., *gordonii* sp. n., *inferus* sp. n., *kathae* sp. n., *omicron* sp. n., *utilus* sp. n. and *semiorbis* sp. n. Four new synonyms are proposed: *armstrongi* McAreavey with *reflexus* Clark, *glauerti* Wheeler with *parvus*

Clark, *occidentalis* Clark with *formosus* Clark and *ruficornis* Santschi with *scabridus* Roger. A neotype is designated for *D. clusor* Forel. The majority of species are found in southern forested areas with only a few species known from arid and tropical regions.

**Key words:** Formicidae, *Dolichoderus*, Australia, new species, key

## Introduction

*Dolichoderus* is a large, diverse genus which occurs throughout the world with the exception of Saharan and sub-Saharan Africa. Within Australia species are found primarily in southern and eastern forested areas, from mallee and savannah woodlands to wet sclerophyll forests, with the genus absent from the north-west and with only a handful of species occurring in the arid habitats of central Australia and in rainforests along the east coast. The Australian species were last reviewed by Clark (1930) but this work is out of date with considerable additional material now available.

In general, workers are diurnal and are general scavengers as well as tending aphids and other Hemiptera for honeydew. They often forage in columns on the ground or on low vegetation and trees. Nests are in soil generally under rocks or in rotten wood. During warm weather, some species of the *doriae* group will move their larvae to the surface of the ground for warmth, forming distinctive “balls” of workers and larvae. While most species have normal, fully winged queens only worker-like ergatoid queens are known for species in the *doriae* and *scabridus* groups.

All of the 27 described species of Australian *Dolichoderus* are endemic to Australia. The species can be divided into four species groups, with two of the four groups (the *doriae* and *scabridus* groups) endemic, one (the *australis* group) also occurring in New Caledonia (represented by the species *D. tricolor*) while the final group, the *scrobiculatus* group, is part of the subgenus *Hypoclinea* which occurs throughout North and South America and Europe eastward into Southeast Asia. Within Australia 12 species are found in the south-east corner while 8 species occur broadly across southern Australia. Four species are restricted to south-west Western Australia while another four are found only in Queensland. South Australia has three species which occur only there while a single species is widespread along the eastern Australian coast. The genus is unknown from northern Australia outside of Queensland. It is also worth noting that numerous species (for example *D. clarki*, *D. etus* and *D. rufotibialis*) have restricted ranges, and even widespread species such as *D. clusor* and *D. formosus* consist of several narrowly distributed disjunct populations. In contrast, other species are quite broadly distributed, occurring across much of southern Australia (*D. omicron*, *D. parvus* and *D. reflexus*) or along the east coast (*D. scrobiculatus*).

A curious distribution pattern emerged while examining material from this group. While it is fairly common to find “outlier” specimens in most groups, specimens which occur significantly outside the main range of a species, these were unusually common in *Dolichoderus*. Normally outliers can be explained as specimen labelling errors or similar processing mistakes, but their presence across several species would seem to indicate that this may not be the case here. For example, outliers have been found in *D. doriae*, *D. extensispinus*, *D. inferus*, *D. parvus*, *D. reflexus*, *D. scrobiculatus* and *D. turneri*. Unfortunately all of these have been “one-off” collections and none confirmed with multiple collections. Given that most of these are from relatively well collected areas it remains to be seen if these outliers are the result of labelling errors, short-lived dispersal events or low density established populations. In any event it is interesting that this phenomenon appears to be common in this group.

From an evolutionary perspective, it seems likely that the *doriae* and *scabridus* groups are derived from the “spiny” *Dolichoderus* of South America, specifically from an ancestor of modern-day species placed previously in the subgenus *Monacis* (currently considered to be a synonym of *Dolichoderus*). This dispersal pattern, from South America into Australia, is the same as observed for *Iridomyrmex* and close relatives (Ward *et al.*, 2009). It would then appear that member(s) of the *scabridus* group dispersed north from Australia into New Guinea and Indonesia, giving rise to species of *Monoceratoclinea* and *Dolichoderus indrapurensis* (previously placed together with species of the *scabridus* group) which share the development of a decorated propodeum and lack pronotal spines (thus making the *doriae* group a less likely ancestor). The subgenus *Karawajewella*, with its single species *Dolichoderus cuspidatus*, would appear to have an independent evolutionary origin, possibly from a *Dolichoderus erectilobus*-like ancestor.

The origins of the *australis* and *scrobiculatus* groups are less clear. Both are part of the subgenus *Hypoclinea*

which is found in North and South America and Europe east to Malaysia and Indonesia. *Hypoclinea* has not been recorded from New Guinea and appears to be absent from this island. Members of the *australis* group are unlike overseas *Hypoclinea* in having a relatively “thin”, unsculptured cuticle and a weakly concave posterior propodeal face. It seems probable that this group arose within the Australian region from a local ancestor and is endemic to this region. On the other hand, members of the *scrobiculatus* group are similar to “typical” *Hypoclinea*, supporting a relatively close relationship with other members of this subgenus. This leaves open the possibility of the Australian fauna being derived from either South America or Southeast Asia. Of these two, the most morphologically similar species occur in Southeast Asia with species such as *Dolichoderus sibiricus* and *Dolichoderus thoracicus* generally resembling Australian species. This would increase the likelihood of a Southeast Asian relationship between these groups.

To summarise, it would appear that the Australian *Dolichoderus* fauna is derived from three sources: 1) the *doriae* and *scabridus* groups from South America through a *Monacis*-like ancestor, 2) the *scrobiculatus* group from Asia through a *Hypoclinea* ancestor and 3) the *australis* group arising within the Australian region, probably from a *scrobiculatus*-like ancestor. A member of the *scabridus* group then dispersed north into New Guinea and Southeast Asia, giving rise to several additional species (those placed in *Monoceratoclinea* as well as *Dolichoderus indrapurensis*). Further detailed study of the world *Dolichoderus* fauna will be necessary to confirm these hypotheses, especially studies using expanded dataset which include molecular data and undertake detailed biogeographic analyses.

## Methods and abbreviations

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:  $HW/HL \times 100$ .

EI: Eye index:  $EL/HW \times 100$ .

EL: Maximum measurable eye length.

HL: Maximum head length in full face (dorsal) view, measured longitudinally from the anterior-most point of the clypeal margin to the posterior-most point of the head proper, using tangential lines where required.

HW: Maximum head width in full face (dorsal) view, excluding the eyes.

ML: Mesosomal length measured from the anterior surface of the pronotum proper (excluding the collar) to the posterior extension of the propodeal lobes (excluding the metapleural flange).

MTL: Maximum length of mid tibia, excluding the proximal part of the articulation which is received into the distal end of the femur.

PronI: Pronotal index:  $PronW/HW \times 100$ .

PronW: Maximum width of pronotum in dorsal view.

SI: Scape index:  $SL/HW \times 100$ .

SL: Length of the scape (first antennal segment) excluding the basal neck and condyle.

Collections: AMSA, Australian Museum, Sydney, Australia; ANIC, Australian National Insect Collection, Canberra, A.C.T., Australia; BMNH, The Natural History Museum, London, U.K.; JDMC, Jonathan D. Majer Collection, Curtin University of Technology, Perth, W.A., Australia; MCSN, Museo Civico di Storia Naturale "Giacomo Doria", Genoa, Italy; MCZC, Museum of Comparative Zoology, Cambridge, Massachusetts, USA; MNHN, Musée National d'Histoire Naturelle, Paris, France; MHNG, Muséum d'Histoire Naturelle, Genève, Switzerland; MVMA, Museum Victoria, Melbourne, Australia; NHMB, Naturhistorisches Museum Basel, Switzerland; NHMW, Naturhistorisches Museum Wien, Vienna, Austria; OUMNH, Oxford University Museum of Natural History, Oxford, U.K.; SAMA, South Australian Museum, Adelaide, Australia; USNM, United States National Museum of Natural History, Washington, D.C., USA; WAMP, Western Australian Museum, Perth, Western Australia; ZMHB, Museum für Naturkunde, Berlin, Germany.

## Diagnosis

The underside of the head near the base of the mandible (anterior hypostoma) with a weak to well-developed flange that is sometimes tooth-like. Spines present or absent on the pronotum and propodeum, or just the propodeum. If spines are absent from the propodeum then the posterior face of the propodeum is weakly convex or flat to distinctly concave. The body smooth to strongly sculptured. The plates on the underside of the body above the front legs (visible only when the front legs are removed) expanded and overlapping along the centre-line of the body (Shattuck, 1992, 1999).

Within Australia *Dolichoderus* can be divided into four species groups. Two of these, the *doriae* and *scabridus* groups, corresponding to the subgenera *Acanthoclinea* and *Diceratoclinea*, have long spines on the pronotum and propodeum (*doriae* group), or just the propodeum (*scabridus* group). These spines do not occur in any other Australian genera of the Dolichoderinae except *Froggattella*. In the *scrobiculatus* group (placed within the subgenus *Hypoclinea*) the rear face of the propodeum is weakly to strongly concave. This is similar to species of *Ochetellus*, but *Dolichoderus* differs in being larger (greater than 3mm in total length) and in having a small flange on the underside of the head near the insertion of the mandible. Also, the metanotal groove in *Dolichoderus* is deeper and broader, and, in many species, the body is more heavily and distinctly sculptured. The final group of *Dolichoderus*, the *australis* group (also within *Hypoclinea*), has the body essentially smooth and the posterior face of the propodeum flat to weakly convex.

## List of Australian species

### *australis* species group

*australis* E. André

*goudiei* Clark

*kathae* **sp. n.**

*parvus* Clark

*glauerti* Wheeler (**syn. n.**)

*rutilus* **sp. n.**

### *doriae* species group

*clarki* Wheeler

*dentatus* Forel

*doriae* Emery

*etus* **sp. n.**

*extensispinus* Forel

*gordoni* **sp. n.**

### *scabridus* species group

*angusticornis* Clark

*inferus* **sp. n.**

*niger* Crawley (**raised to species**)

*rufotibialis* Clark (**raised to species**)

*scabridus* Roger

*ruficornis* Santschi (**syn. n.**)

*ypsilon* Forel

### *scrobiculatus* species group

*albamaculus* **sp. n.**

*canopus* **sp. n.**

*clusor* Forel

*formosus* Clark

*occidentalis* Clark (**syn. n.**)  
*nigricornis* Clark  
*omicron* **sp. n.**  
*reflexus* Clark  
*armstrongi* McAreavey (**syn. n.**)  
*scrobiculatus* (Mayr)  
*semiorbis* **sp. n.**  
*turneri* Forel

### Key to Australian *Dolichoderus* species based on workers

1. Propodeum with elongate spines (Fig. 2) ..... 2
- Propodeum lacking spines (Fig. 1) ..... 13
2. Pronotum with elongate spines (Fig. 5) (*doriae* group) ..... 3
- Pronotum rounded, lacking spines (Fig. 2) (*scabridus* group) ..... 8
3. Pronotal spines directed laterally and dorsally (Fig. 10) ..... *extensispinus*
- Pronotal spines directed anteriorly and approximately parallel to the longitudinal axis of the body (Fig. 7) ..... 4
4. Pronotal spines long, in dorsal view a line drawn between their tips lies anterior of the pronotal collar (Fig. 7) ..... *dentatus*
- Pronotal spines short, in dorsal view a line drawn between their tips intersects the pronotal collar (Fig. 8) ..... 5
5. First gastral tergite with abundant short erect hairs ..... 6
- First gastral tergite generally lacking erect hairs, but occasionally with a few very short, scattered hairs present ..... 7
6. Legs yellow, strongly contrasting with black body; propodeal spines and sometimes antennae dark red to red-brown, lighter in colour than nearby body regions (Fig. 8) ..... *doriae*
- Legs dark brown to black, generally similar in colour to the body or at most slightly lighter in colour than body; tips of propodeal spines and antennae very dark brown to black and similar in colour to nearby body regions (Fig. 5) ..... *clarki*
7. First gastral tergite with abundant appressed very fine pubescence (Fig. 9) ..... *etus*
- First gastral tergite with a few scattered, very small appressed hairs (Fig. 12) ..... *gordoni*
8. In front view, propodeal spines directed upward at angle of greater than 60° to horizontal plane (may be almost vertical), the angle between them approximately 45° (Fig. 2) ..... *angusticornis*
- In front viewed, propodeal spines directed upward at angle of 45° or less to horizontal plane, the angle between them at least 90° (Fig. 21) ..... 9
9. Dorsum of petiolar node angular; when viewed from the front base of propodeal spines narrow, the spines forming a “V” with a narrowly rounded angle between their bases; legs long (Fig. 21) (Western Australia) ..... 10
- Dorsum of petiolar node broad, weakly convex to weakly concave; when viewed from the front, base of propodeal spines broad, the spines forming a “U” with a broad concavity connecting their bases (sometimes this region flat or weakly convex); legs short (Fig. 14) (South Australia and eastward) ..... 12
10. Legs entirely light red or orange (Fig. 27) ..... *ypsilon*
- Femora dark reddish-brown or black, tibiae varying from dark brown to light red ..... 11
11. Legs bicoloured, dark femora contrasting with more lightly coloured tibiae (Fig. 21) ..... *rufotibialis*
- Legs uniformly coloured dark red-brown to reddish-black (Fig. 16) ..... *niger*
12. Legs dark red-brown, at most only slightly lighter in colour than the body (Fig. 14) ..... *inferus*
- Legs yellowish-red, distinctly lighter than the colour of the body (Fig. 23) ..... *scabridus*
13. Posterior face of propodeum weakly concave, separated from the dorsal face by at most a weakly defined angle; sculpturing on head minimal, either essentially absent or consisting of very fine reticulations (Fig. 3) (*australis* group) ..... 14
- Posterior face of propodeum strongly concave, separated from the dorsal face by a distinct carina; sculpturing on head consisting of large, shallow to moderately deep fovea (Fig. 24) (*scrobiculatus* group) ..... 18
14. Head yellowish-red (Fig. 22) ..... 15
- Head dark reddish-brown to black (Fig. 3) ..... 17
15. Dorsum of propodeum falling away posteriorly so that the angle is below the level of the metanotal groove (Fig. 19) ..... *parvus*
- Dorsum of propodeum evenly convex, the angle at approximately the same level as the metanotal groove (Fig. 15) ..... 16
16. Head and dorsum of pronotum finely reticulate, the surfaces matte (Fig. 15) ..... *kathae*
- Head and dorsum of pronotum smooth, the surfaces shiny (Fig. 22) ..... *rutilus*
17. First tergite of gaster with elongate erect hairs but lacking appressed pubescence (Fig. 3) ..... *australis*
- First tergite of gaster with both elongate erect hairs and fine, silvery appressed pubescence (Fig. 13) ..... *goudiei*
18. Pubescence on first gastral tergite abundant, the individual hairs overlapping (Fig. 26) ..... 19
- Pubescence on first gastral tergite sparse, the individual hairs generally not overlapping, or hairs absent (Fig. 20) ..... 21
19. Dorsum of pronotum essentially smooth, the sculpturing at most very fine, the surface shiny; metanotal groove relatively deep (Fig. 6) (SA, southern WA) ..... *clusor*
- Dorsum of pronotum heavily sculptured, the surface dull; metanotal groove relatively weakly developed (Fig. 24) (north-eastern NSW, Qld) ..... 20

20. Gaster similar in colour to body (both dark brown to black) (Fig. 24) ..... *scrobiculatus*  
 -. Gaster much lighter in colour compared to body (body dark brown to black, gaster dull yellow) (Fig. 26) ..... *turneri*  
 21. Tibiae lacking erect hairs (Fig. 25) ..... *semiorbis*  
 -. Tibiae with erect or suberect hairs (Fig. 1) ..... 22  
 22. Dorsum of propodeum elongate (longer than posterior face) and weakly convex, the carina separating dorsal and posterior faces produced as sharp shelf; pale markings present near lower margin of eye (Fig. 1) ..... *albamaculus*  
 -. Dorsum of propodeum shorter (at most approximately the same length as the posterior face) and strongly convex, the carina separating dorsal and posterior faces a narrow carina; without pale markings near lower margin of eyes (Fig. 20) ..... 23  
 23. Dorsum of propodeum highly arched and often with flat or even weakly concave sections; posterior face of propodeum deeply concave and often nearly semicircular; in dorsal view the pronotum with strongly developed shoulders, the area between the shoulders weakly convex to weakly concave (Fig. 20). ..... *reflexus*  
 -. Dorsum of propodeum more weakly and evenly convex, occasionally with a flat or nearly flat section posteriorly; posterior face of propodeum less deeply concave and much less semi-circular; in dorsal view the pronotum with only weakly defined shoulders, the area between the shoulders more strongly convex to flat (Fig. 18). ..... 24  
 24. Gaster yellowish red and lighter in colour than mesosoma (Fig. 18) ..... *omicron*  
 -. Gaster dark brown to black, darker than mesosoma when mesosoma is lightly coloured (similar to mesosoma in colour when entire body dark brown to black) ..... 25  
 25. Head and pronotum weakly and superficially areolate, the overall sculpturing pattern indistinct (Fig. 4) ..... *canopus*  
 -. Dorsum of head and pronotum with large but shallow and closely spaced foveae, the lateral pronotum distinctly striate, the overall sculpturing pattern very distinct (Fig. 17). ..... 26  
 26. Head reddish to reddish-brown and lighter in colour than dark brown to black gaster; mesosoma and gaster with both erect hairs and scattered, appressed pubescence (Fig. 17) ..... *nigricornis*  
 -. Head dark brown to black and similar in colour to gaster; mesosoma and gaster with erect hairs but little or no appressed pubescence (Fig. 11) ..... *formosus*

## Australian species of *Dolichoderus*

### *Dolichoderus albamaculus* sp. n.

(Fig. 1)

**Types.** Holotype worker from Billabong, 26°49'S 114°37'E, Western Australia, 12 August 1984, B.B. Lowery, sand, scrub (ANIC, ANIC32-066614); 7 paratype workers, same data as holotype except ANIC32-061315 (5 in ANIC, 2 in MCZC).

**Diagnosis.** Pale markings present near lower margin of eye; sculpturing on head consisting of large, shallow to moderately deep foveae; pronotum and propodeum lacking spines; posterior face of the propodeum strongly concave, separated from the dorsal face by a distinct carina; dorsum of propodeum weakly convex and elongate (longer than posterior); pubescence on first gastral tergite sparse, the individual hairs generally not overlapping, or hairs absent.

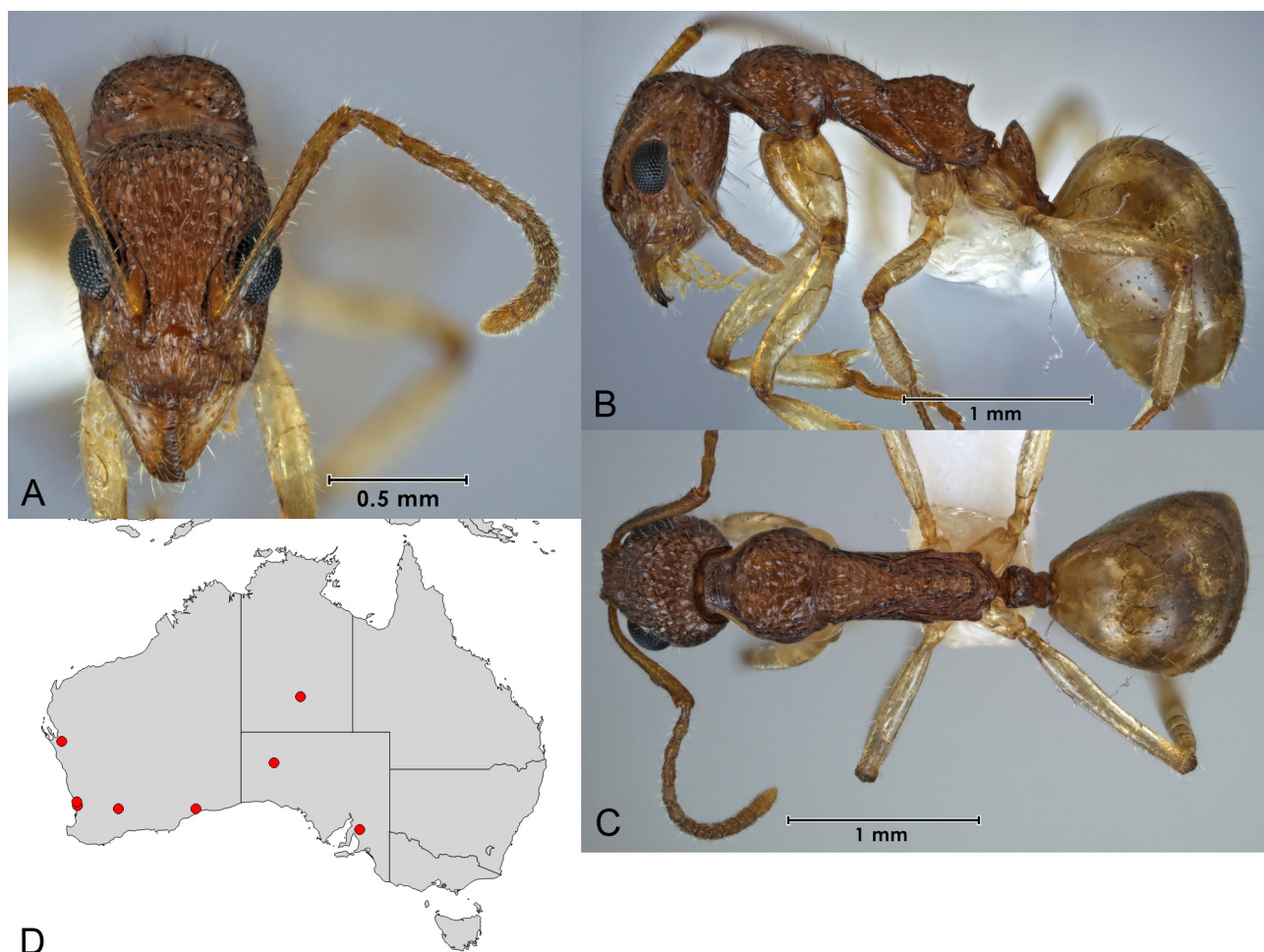
This species is easily confused with *D. semiorbis*. It can be distinguished from this species by the presence of erect or suberect hairs on the tibiae (Fig. 1); and the more distinctive carina protruding upwards separating the dorsal and posterior face of the propodeum (Fig. 1 and Fig. 25).

**Worker description.** See Fig. 1. The available material shows little variation from the imaged specimen.

**Measurements** (n=5). CI 74–79; EI 41–43; EL 0.30–0.34; HL 0.92–1.05; HW 0.72–0.78; ML 1.24–1.53; MTL 0.69–0.83; PronI 68.82–78.05; PronW 0.51–0.61; SI 112–128; SL 0.82–0.99.

**Material examined.** *Northern Territory:* 60km N Alice Springs (Zakharov) (ANIC); *South Australia:* 51km W Emu Junction (Forrest, J.A.) (ANIC); Sevenhill (Lowery, B.B.) (ANIC); *Western Australia:* 0.6km W of Neergabby (Heterick, B.E.) (JDMC); Caiguna RH (Heterick, B.E.) (JDMC); Henderson (Heterick, B.E.) (JDMC); Int. Holland Tr./Norseman Rd. (Heterick, B.E.) (JDMC); The Granites (Mt. Magnet) (Heterick, B.E.) (JDMC).

**Comments.** Although rarely encountered, *D. albamaculus* is widespread across semi-arid southern Australia, occurring from the Western Australian coast to eastern South Australia. It has been found in open scrub and *Acacia* woodland habitats.



**FIGURE 1.** *Dolichoderus albamaculus*, paratype worker (ANIC32-0061315). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

### *Dolichoderus angusticornis* Clark

(Fig. 2)

*Dolichoderus angusticornis* Clark, 1930: 260.

**Types.** 4 worker syntypes (3 (1 missing gaster) in MCZC; 1 in MVMA) from Burracoppin, Western Australia.

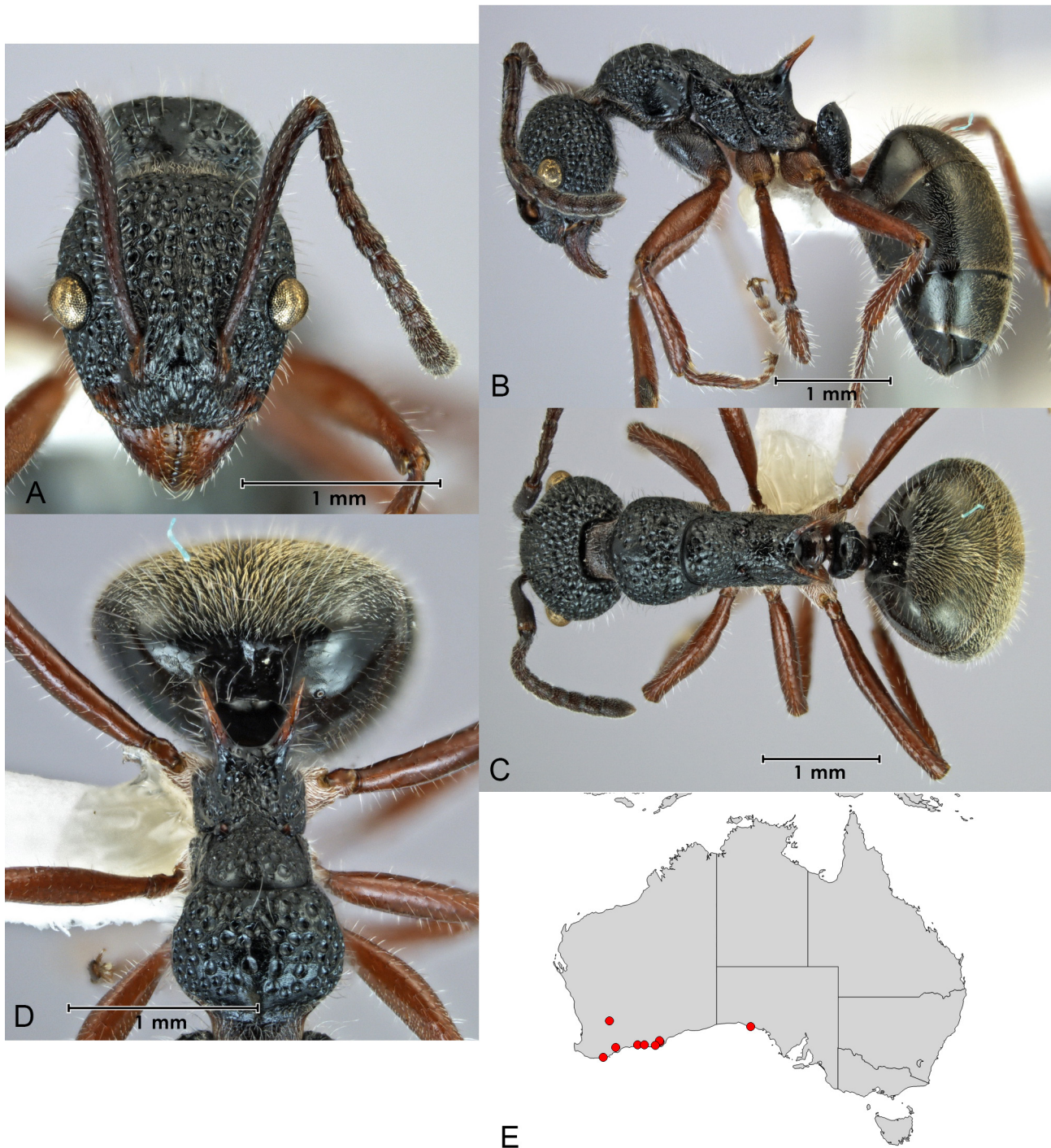
**Diagnosis.** Pronotum rounded, lacking spines, propodeum with elongate spines directed upward at angle of greater than  $60^\circ$  to horizontal plane (may be almost vertical), the angle between them approximately  $45^\circ$ . The presence and angle of the propodeal spines will distinguish this species from all other Australian *Dolichoderus* species.

**Worker description.** See Fig. 2. The available material varies little from the imaged individual.

**Measurements** (n=5). CI 93–97; EI 22–23; EL 0.28–0.30; HL 1.28–1.31; HW 1.21–1.27; ML 1.83–1.98; MTL 1.10–1.21; PronI 71.87–76.86; PronW 0.88–0.97; SI 104–115; SL 1.31–1.44.

**Material examined.** *South Australia:* 5 miles NE of Fowlers Bay (Taylor,R.W.) (ANIC); **Western Australia:** Albany (Greaves,T.) (ANIC); Burracoppin (Cadd,G.) (ANIC); Esperance district (Souza,N.) (JDMC); Junana Rock, 9km NW Mt. Ragged (Taylor,R.W.) (ANIC); Lort River, 44mi. W Esperance (Greaves,T.) (ANIC); nr. Monkey Rock (SE of Jerramungup) (Heterick,B.E.) (JDMC); Mt. Ragged (Feehan,J.E. & Weir,T.A.) (ANIC); Pink Lake (Esperance) (Heterick,B.E.) (JDMC); Thomas River (Greaves,T.) (ANIC); Thomas River, 23 km NW by W of Mt. Arid (Feehan,J.E.) (ANIC).

**Comments.** *Dolichoderus angusticornis* has been collected in dry scrub heath across southern Western Australia and South Australia with workers foraging both day and night.



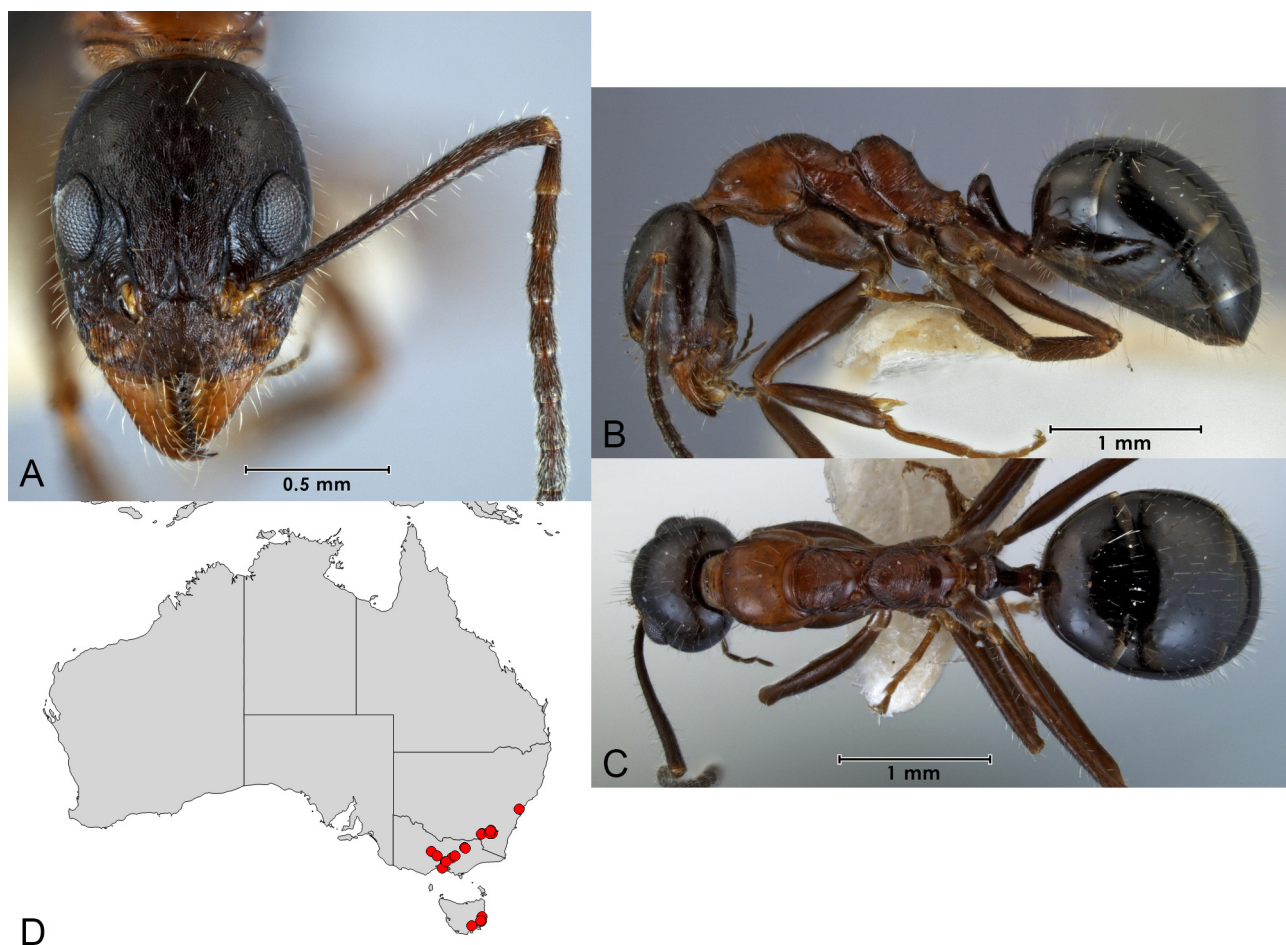
**FIGURE 2.** *Dolichoderus angusticornis*, worker from Thomas River, 23 km NW by W of Mt. Arid, Western Australia (ANIC32-060468). A. Front of head; B. Side of body; C. Top of body; D. Propodeal spines; E. Distribution of material examined.

***Dolichoderus australis* André**  
(Fig. 3)

*Dolichoderus australis* André, 1896: 257.

**Types.** Unspecified material from the Victorian Alps, Victoria (probably MNHN); 1 worker syntype (MHNG) without locality data.





**FIGURE 3.** *Dolichoderus australis*, worker from Mount Aggie, ACT (ANIC32-007977). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Diagnosis.** Sculpturing on head minimal, either essentially absent or consisting of very fine reticulations, reddish-brown to black in colour; pronotum and propodeum lacking spines; posterior face of propodeum with a shallow concavity, separated from the dorsal face by at most a weakly defined angle; first tergite of gaster with elongate erect hairs but lacking appressed pubescence.

This species most closely resembles *D. goudiei*, however *D. goudiei* has appressed pubescence on the first tergite of the gaster which is lacking in this species.

**Worker description.** See Fig. 3. Sculpture on mesonotum and mesopleuron varying from very weakly developed and the surface shiny to moderately strong and the surface matte (the figured individual is intermediate between these extremes). Body colour variable, ranging from reddish to dark red-black. Head colour generally black, occasionally with a reddish tint.

**Measurements** (n=5). CI 77–84; EI 32–37; EL 0.28–0.33; HL 1.08–1.23; HW 0.85–1.01; ML 1.56–1.89; MTL 0.87–1.09; PronL 64.79–72.91; PronW 0.58–0.66; SI 132–140; SL 1.13–1.34.

**Material examined.** *Australian Capital Territory*: 2 miles North of Mount Aggie (Taylor,R.W.) (ANIC); 4km NNE Mt. Aggie (Shattuck,S.O.) (ANIC); Blundells Creek, 3km E of Picadilly Circus (Weir, Lawrence & Johnson) (ANIC); Booroomba Rocks (Shattuck,S.O.) (ANIC); Brindabella Range (Greaves,T.) (ANIC); Lees Creek (Greaves,T.) (ANIC); Lees Spring (Greaves,T.) (ANIC); Mount Aggie (R.W.T; Taylor,R.W.) (ANIC); nr. Picadilly Circus (Shattuck,S.O.; Taylor,R.W.) (ANIC); Picadilly Circus, Brindabella Ra. (collector unknown) (ANIC); Wombat Creek, 6km NE Piccadilly Circus (Weir, Lawrence & Johnson) (ANIC); *New South Wales*: 3km SSW Batlow (Ward,P.S.) (ANIC); Bago State Forest (Greaves,T.) (ANIC); Berowra Waters, Sydney (collector unknown) (ANIC); *Tasmania*: 2km E Darlington jetty, Maria Island (Lowery,B.B.) (ANIC); Darlington, Maria Island (Lowery,B.B.) (ANIC); Freycinet Nat. Pk. (Lowery,B.B.) (ANIC); Kingston (McAreavey,J.) (ANIC); Maria Island

(Lowery,B.B.) (ANIC); Victoria: 37°21'S 146°00'E (Harrington,S.A.) (ANIC); Arthurs Seat (collector unknown; Lowery,B.B.) (ANIC); Heathmont (collector unknown; Dixon,J.E.) (ANIC); Maldon (collector unknown; Goudie,J.C.) (ANIC); Marysville (collector unknown; Clark,J.) (ANIC); Mt. Buffalo (collector unknown; Lowery,B.B.) (ANIC); Mt. Buffalo NP, Eurobin Ck. (Newton,A. & Thayer,M.) (ANIC); Ringwood (Spry,F.P.; Wilson,F.E.) (ANIC); Woodend (collector unknown; Hill,W.F.) (ANIC).

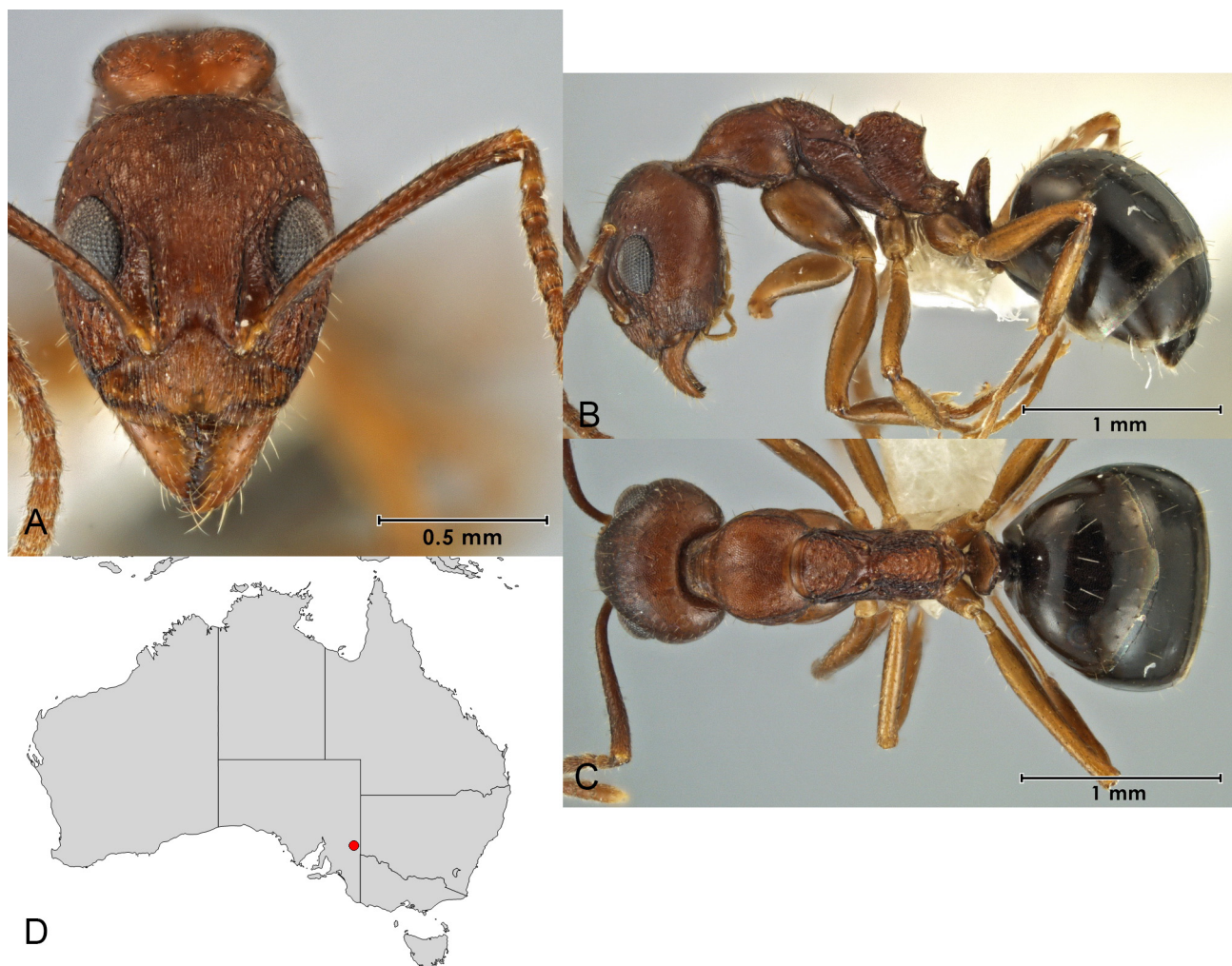
**Comments.** *Dolichoderus australis* shows considerable variation in overall body colour, ranging from reddish to dark red-black. However, numerous intermediate forms between these extremes exist and no other characters could be found which suggest more than a single variable species is present. As such, this colour variation is here considered as being intraspecific.

*Dolichoderus australis* is found in dry to wet forested areas of south-eastern Australia. Nests are in soil under rocks or occasionally in wood. Workers forage on the ground and on low vegetation and are timid, running for cover when disturbed. Its larvae were described by Wheeler and Wheeler (1974).

The records from Maria Island and Coles Bay, Tasmania, are likely introductions which occurred when the jail located in this area was active (B.B. Lowery, pers. comm.). This is based on the lack of additional material from Tasmania even though suitable habitats are abundant and widespread.

### *Dolichoderus canopus* sp. n.

(Fig. 4)



**FIGURE 4.** *Dolichoderus canopus*, holotype worker (ANIC32-000797). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Types.** Holotype worker from 6.5km ENE Canopus Homestead, Danggali Conservation Park, 33°29'S 140°46'E, South Australia, 21 May 1996, T.A. Weir & K. Pullen (ANIC, ANIC32-000797); 1 paratype worker, same data as holotype except ANIC32-0066652 (ANIC).

**Diagnosis.** Pale markings absent from lower margin of the eyes; sculpturing pattern of head and pronotum, although with large fovea, is indistinct; in dorsal view the pronotum with only weakly defined shoulders, with the area between the shoulders convex to flat; pronotum and propodeum lacking spines; dorsum of propodeum weakly and evenly convex, the length shorter (at most approximately the same length) than the posterior face; a narrow, distinct carina separating the dorsal and posterior faces; posterior face of propodeum weakly concave; gaster dark brown to black with sparse pubescence on the first gastral tergite, with hairs generally not overlapping or entirely absent; tibiae with erect or suberect hairs.

This species is most similar to *D. formosus* and *D. nigricornis* but can be distinguished by the weaker sculpturing pattern on the head compared to the distinct sculpturing pattern of *D. formosus* and *D. nigricornis* (Figs 4, 11 and 17).

**Worker description.** See Fig. 4. The two known specimens of this species are nearly identical.

**Measurements** (n=2). CI 85–85; EI 36–37; EL 0.31–0.32; HL 1.01–1.01; HW 0.86–0.86; ML 1.32–1.38; MTL 0.73–0.73; PronI 64.92–68.22; PronW 0.56–0.58; SI 114–117; SL 0.98–1.00.

**Comments.** This species is currently known from only two specimens collected in a berlesate sample consisting of litter from under *Casuarina cristata* trees taken in southern South Australia. Nothing more is known of its biology.

### ***Dolichoderus clarki* Wheeler**

(Fig. 5)

*Dolichoderus tristis* Clark, 1930: 254 (junior primary homonym of *tristis* Mann, 1916: 463, replaced with *Dolichoderus clarki* by Wheeler 1935:69).

*Dolichoderus clarki* Wheeler, 1935: 69 (new replacement name for *Dolichoderus tristis* Clark, 1930: 254).

**Types.** 2 worker syntypes from Bulli (1 in MVMA, 1 in AMSA); 16 worker syntypes from Hampton, near Jenolan Caves (1 in MCZC, 15 in AMSA); additional material from Bondi and Cooma (not examined), New South Wales.

**Diagnosis.** Pronotum and propodeum with elongate spines; pronotal spines short, directed anteriorly, approximately parallel to the longitudinal axis of the body, in dorsal view a line drawn between their tips intersects the pronotal collar; first gastral tergite with abundant short erect hairs and gaster with golden pubescence (less obvious in older specimens); antennae, tips of propodeal spines and legs dark brown to black, at most only slightly lighter in colour than body and generally the same colour as body.

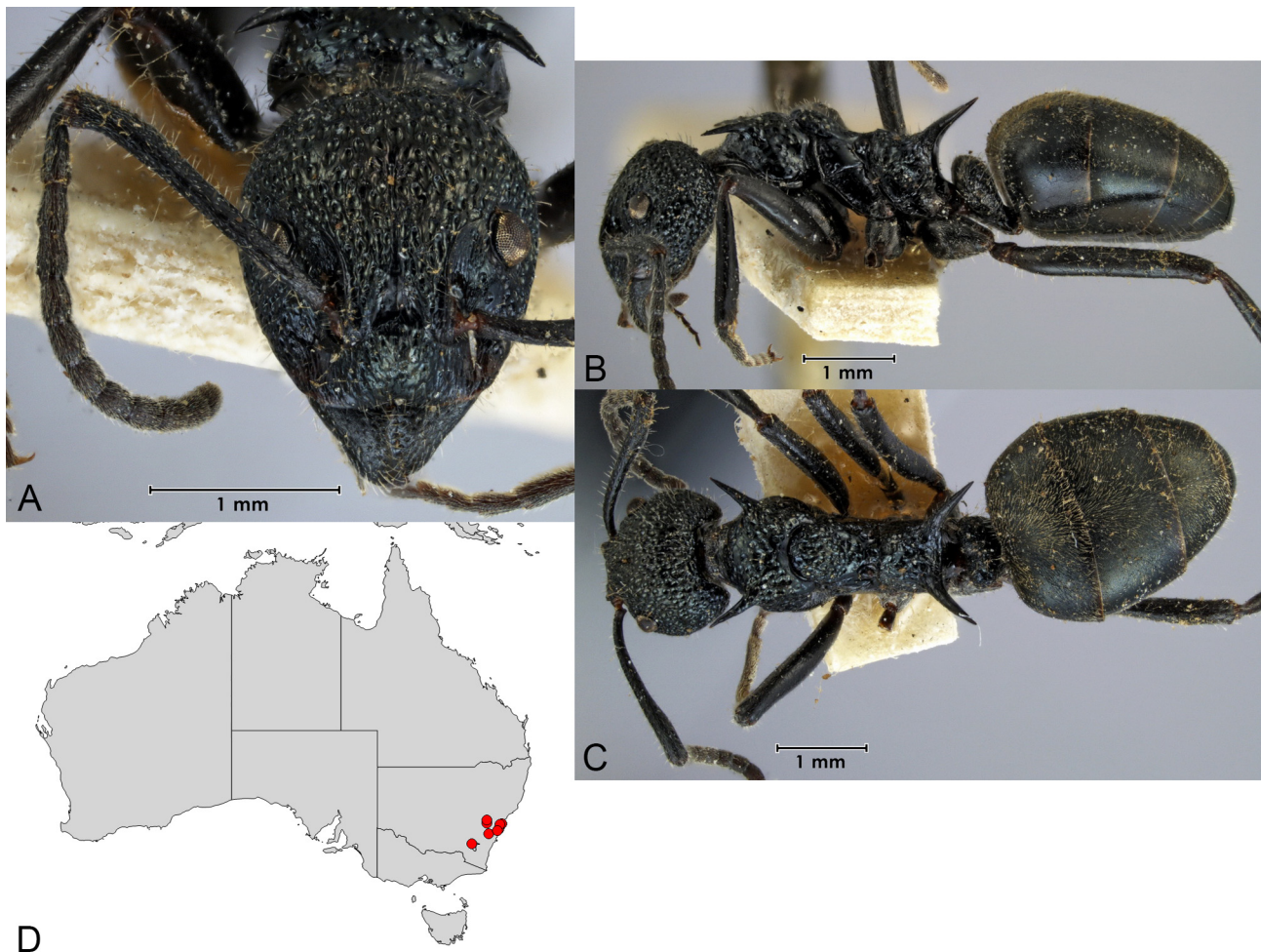
This species most closely resembles *D. doriae* but can be differentiated by the dark coloured legs, in contrast to the yellow legs found in *D. doriae*.

**Worker description.** See Fig. 5. The available material shows slight variation in leg colour, which is most commonly black but in some individuals is slightly lighter (reddish-black). Otherwise all specimens are similar to that figured.

**Measurements** (n=5). CI 95–97; EI 17–19; EL 0.27–0.32; HL 1.65–1.76; HW 1.59–1.69; ML 2.52–2.71; MTL 1.64–1.89; PronI 65.13–77.06; PronW 1.10–1.22; SI 110–115; SL 1.74–1.95.

**Material examined.** *Australian Capital Territory:* Blundells Creek, 3km E of Picadilly Circus (Weir, Lawrence & Johnson) (ANIC); *New South Wales:* Belanglo State Forest (Gush,T.) (ANIC); Como (Schrader,H.P.) (ANIC); Dalrymple Forest, Pymble, Sydney (Lowery,B.B.) (ANIC); Hampton (Musgrave,A.) (ANIC); Kembla (collector unknown) (ANIC); Narrabeen (Froggatt, W.W.) (); Pymble (McAreavey,J.) (ANIC); Royal NP, track just S of Garawarra (Ward,P.S.) (ANIC); Thirroul (Gush,T.) (ANIC); Wallerawang (Lowery,B.B.) (ANIC).

**Comments.** *D. clarki* is found in wet sclerophyll woodlands of central coastal New South Wales and the ACT. Workers forage on the ground and on low vegetation. Its glandular compounds were examined by Cavill and Hinterberger (1960a, 1960b) while notes on its venom and venom apparatus were provided by Blum and Hermann (1978).



**FIGURE 5.** *Dolichoderus clarki*, worker from Pymble, New South Wales (ANIC32-061353). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

***Dolichoderus clusor* Forel**  
(Fig. 6)

*Dolichoderus clusor* Forel, 1907: 285.

**Types.** Neotype worker (here designated, the original holotype (Forel 1907:286) apparently destroyed in ZMHB in WW II) from Perth, Western Australia (ANIC, ANIC32-061187).

**Diagnosis.** Sculpturing on head consisting of large, shallow to moderately deep fovea; dorsum of pronotum essentially smooth and shiny, the sculpturing at most very fine; pronotum and propodeum lacking spines; posterior face of propodeum separated from the dorsal face by a distinct carina, posterior face deeply concave; pubescence on first gastral tergite abundant, the individual hairs overlapping

. This species most closely resembles *D. scrobiculatus* and *D. turneri*; however the smooth sculpturing and shiny surface of the pronotum will distinguish *D. clusor* from both of these. Additionally, *D. clusor* is currently only known from South Australia and Western Australia while *D. scrobiculatus* and *D. turneri* occur in north-eastern New South Wales and Queensland.

**Worker description.** See Fig. 6. Pilosity on first gastral tergite varying from fairly thin to quite abundant and thick. Otherwise similar to the specimen figured.

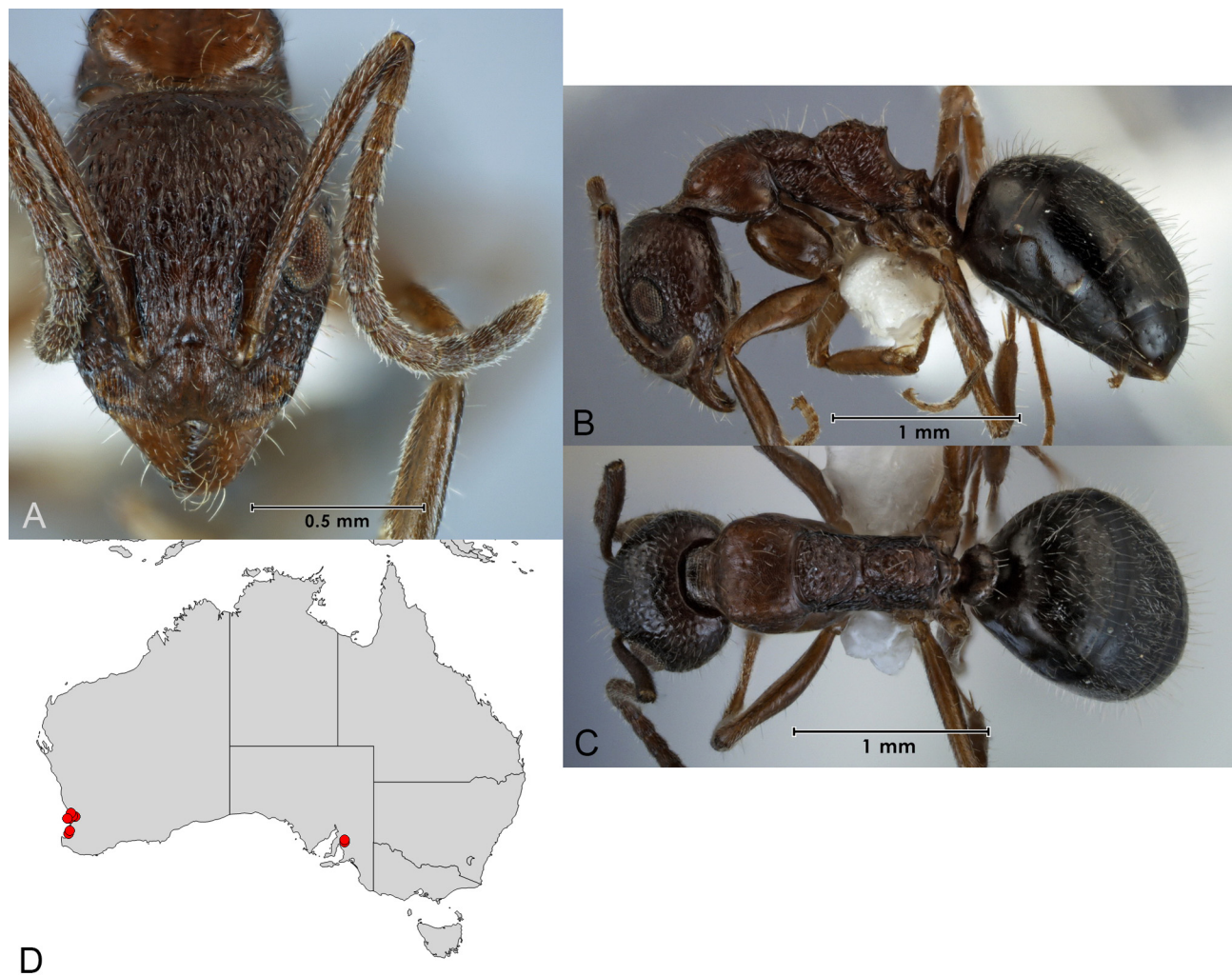
**Measurements** (n=5). CI 83–88; EI 29–35; EL 0.26–0.29; HL 0.94–1.04; HW 0.78–0.91; ML 1.25–1.46; MTL 0.69–0.75; PronI 63.77–68.87; PronW 0.53–0.63; SI 108–118; SL 0.89–1.00.

**Material examined.** *South Australia:* 4km SW Auburn (Greenslade,P.J.M.) (ANIC); Clare (McAreavey,J.M.)

(ANIC); *Western Australia*: 15mi. N Bunbury (Douglas,A.M. & Douglas,M.J.) (ANIC); Australind (Heterick,B.E.) (JDMC); Bunbury (Lowery,B.B.) (ANIC); Carabooda (Heterick,B.E.) (JDMC); Dawesville (Heterick,B.E.) (JDMC); Hope Valley (Heterick,B.E.) (JDMC); Kings Park (Lowery,B.B.) (ANIC); Kingsley (Knowles,D.G.) (JDMC); Mundaring (Clark,J.; Lowery,B.B.) (ANIC); Perth (Clark,J.) (ANIC); Reabold Hill (Majer,J.D.) (JDMC); Rottneest Is. (Delane,P.) (JDMC); Swan River (Clark,J.) (ANIC).

**Comments.** There is some variation in the abundance of pilosity on the first gastral tergite, which varies from fairly thin to quite abundant and thick. In general South Australian material is hairier than specimens found in Western Australia. However, this variation is continuous and shows a geographic pattern, suggesting that it is intraspecific rather than interspecific.

*Dolichoderus clusor* has been collected in *Banksia* woodlands (Heterick, 2009) and dry sclerophyll where it forages on tree trunks. It is currently known from two widely disjunct populations, one near Perth, Western Australia and the other in the general vicinity of Adelaide, South Australia.

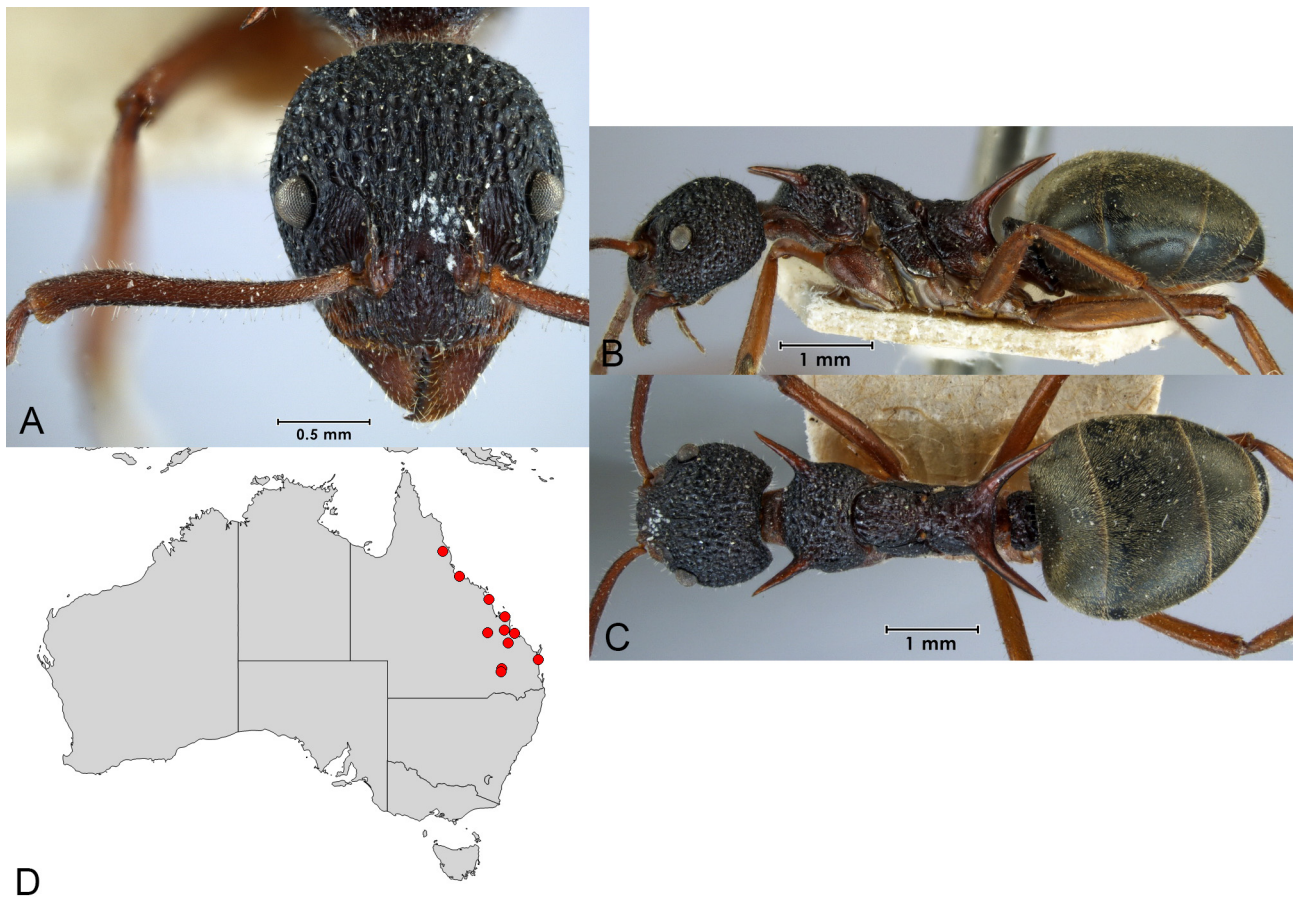


**FIGURE 6.** *Dolichoderus clusor*, neotype worker from Perth, Western Australia (ANIC32-061187). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

***Dolichoderus dentatus* Forel**  
(Fig. 7)

*Dolichoderus doriae dentata* Forel, 1902: 461 (raised to species by Clark, 1930: 255).

**Types.** 45 worker syntypes from Mackay [approx. 21°09'S 149°11'E] (1 in NHMB, 5 in MCZC, 3 in ANIC, 36 in MHNG), Queensland.



**FIGURE 7.** *Dolichoderus dentatus*, syntype worker (ANIC32-015067). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Diagnosis.** Pronotum and propodeum with elongate spines; the long pronotal spines are directed anteriorly and approximately parallel to the longitudinal axis of the body; in dorsal view a line drawn between their tips lies anterior of the pronotal collar.

The long, anteriorly directed pronotal spines will distinguish this species from all other Australian *Dolichoderus* species.

**Worker description.** See Fig. 7. Always similar to the figured individual although body colour can be more reddish and less red-black, and legs can sometimes be slightly lighter yellow-red.

**Measurements** (n=5). CI 95–104; EI 16–19; EL 0.26–0.32; HL 1.59–1.71; HW 1.60–1.70; ML 2.49–2.63; MTL 1.66–1.76; PronI 67.27–67.27; PronW 1.08–1.21; SI 104–114; SL 1.77–1.82.

**Material examined.** *Queensland:* Atherton (Bourne,E.H.) (ANIC); Condamine (Geary,N.) (ANIC); Cooloola National Park, Melita (Greenslade,P.J.M.) (ANIC); Cooloola, Burwilla (Greenslade,P.J.M.) (ANIC); Cooloola, Warrawonga (Greenslade,P.J.M.) (ANIC); Dawes, 20mi. SE Biloela (Lowery,B.B.) (ANIC); Expedition Range, Blackdown Tbl'd (Kohout,R.J.) (ANIC); Gladstone (Lowery,B.B.) (ANIC); Mackay (Turner,G.) (ANIC); Miles (Lowery,B.B.) (ANIC); Mt. Morgan (Cudmore,F.A.) (ANIC); Shoalwater Bay, Townshend Is. (Greenslade,P.J.M. & CHT) (ANIC); Townsville (Conleth,S.; Lowery,B.B.) (ANIC).

**Comments.** *Dolichoderus dentatus* is found in dry sclerophyll woodlands and savannah of eastern Queensland from the Atherton Tablelands south to Cooloola Recreation Area, Great Sandy National Park. Its glandular compounds were examined by Cavill and Hinterberger (1960a, 1960b) while notes on its venom and venom apparatus were provided by Blum and Hermann (1978).

***Dolichoderus doriae* Emery**

(Fig. 8)

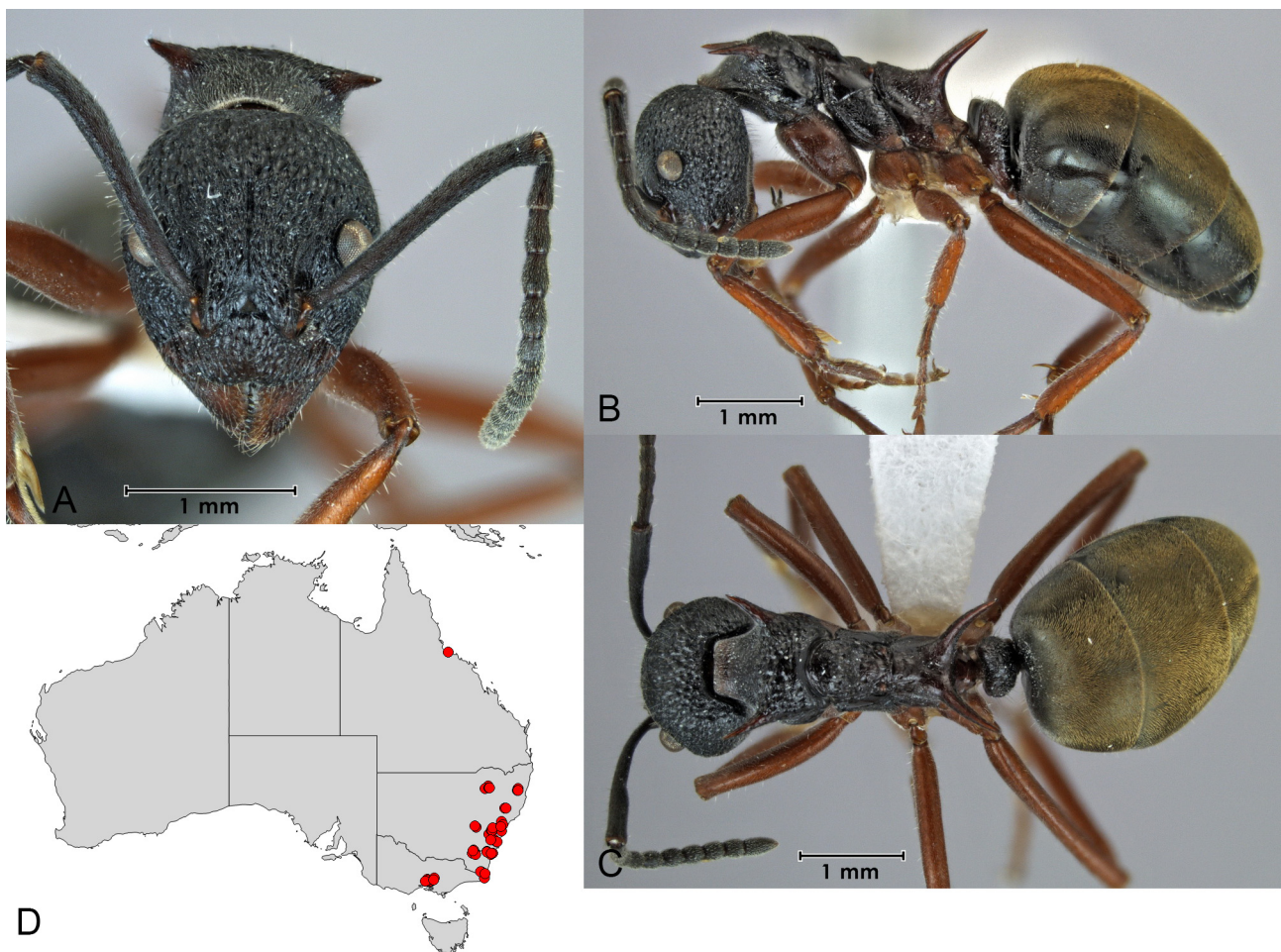
*Dolichoderus doriae* Emery, 1887: 252.

**Types.** 2 worker syntypes from the Blue Mountains (specific locality not given) (MCSN); 1 worker syntype from Mt. Victoria [approx. 33°35'S 150°15'E] (MVMA), New South Wales.

**Diagnosis.** Pronotum and propodeum with elongate spines; pronotal spines are short and directed anteriorly and approximately parallel to the longitudinal axis of the body, in dorsal view a line drawn between their tips intersects the pronotal collar; first gastral tergite with abundant short erect hairs and gaster with golden pubescence (less obvious in older specimens); propodeal spines and sometimes antennae are lighter in colour than nearby body regions, ranging from dark red to red-brown; legs yellow, strongly contrasting with black body.

This species differs from *D. extensispinus* by having anteriorly directed pronotal spines and from other members of the *doriae* group (except *D. clarki*) by the abundant short erect hairs on the first gastral tergite. It most closely resembles *D. clarki* but can be differentiated by the yellow coloured legs, in contrast to the dark legs found in *D. clarki*.

**Worker description.** See Fig. 8. Sculpturing on mesosoma always present but varying in development from covering the entire surface to more weakly developed and with limited areas of nearly smooth integument (similar to figured individual). Propodeal spines varying in length (sometimes slightly longer than shown) and spread (occasionally much narrower than as figured). Propodeal spines and sometimes antennae lighter in colour than nearby body regions, ranging from dark red to red-brown.



**FIGURE 8.** *Dolichoderus doriae*, worker from Dawsons Spring, Mt. Kaputar National Park, New South Wales (ANIC32-037799). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Measurements** (n=5). CI 93–98; EI 16–20; EL 0.27–0.31; HL 1.63–1.81; HW 1.55–1.71; ML 2.54–2.76; MTL 1.65–1.83; PronI 67.50–74.11; PronW 1.05–1.20; SI 106–118; SL 1.77–1.91.

**Material examined.** *Australian Capital Territory*: Blundells (Greaves,T.) (ANIC); Blundells [Blundells Flat] (Fuller) (ANIC); Brindabella Range (Greaves,T.) (ANIC); nr. Picadilly Circus (Taylor,R.W.) (ANIC); Orroral River crossing (collector unknown) (ANIC); Tidbinbilla Nature Res, Koala Enclosure (Shattuck,S.O.) (ANIC); Wombat Creek, 6km NE Piccadilly Circus (Weir,T.A., Lawrence,J. & Johnson) (ANIC); *New South Wales*: 3km W Kioloa, Dangerboard Road (Shattuck,S.O.) (ANIC); 4km NE Mt. Wog Wog, 17km SE Bombala (Margules,C.R.) (ANIC); 4km NE Mt. Wog Wog, 17km SE Bombala (Greenslade,P.J.M.) (ANIC); 5km S Mongarlowe (Shattuck,S.O.) (ANIC); 75km E Armidale (Greenslade,P.J.M.) (ANIC); 7km W Jamberoo (Ward,P.S.) (ANIC); 7mi. W Calga, nr. Gosford (Lowery,B.B.) (ANIC); 9km NE Batemans Bay, West Side Hwy 1, ca. 0.5km N Durras Rd. (Shattuck,S.O.) (ANIC); Belanglo State Forest (Gush,T.) (ANIC); Colo Vale (Dyce,A.; Greaves,T.) (ANIC); Dalrymple Forest, Pymble, Sydney (Lowery,B.B.) (ANIC); Dam Road & Higgins Creek, Kioloa State Forest (Shattuck,S.O.) (ANIC); Dawsons Spring, Mt. Kaputar (Giles,E.T.) (ANIC); Dawsons Spring, Mt. Kaputar National Park (Shattuck,S.O.) (ANIC); Devils Hole, Barrington Tops, 7km NNE of Mt. Polblue (Key,K.H.L.) (ANIC); East Boyd State Forest, Goanna Rd., 56km SE Bombala (Lambkin,C. & Starick,N.) (ANIC); Forest Reefs (Lea) (SAMA); Galston Gorge, nr. Hornsby (Greaves,T.) (ANIC); Green Camp, Mt. Kaputar National Park (Shattuck,S.O.) (ANIC); Hornsby (Wheeler,W.M.) (SAMA); Jamberoo (Ward,P.S.) (ANIC); Kanangra-Boyd National Park (Ward,P.S.) (ANIC); Katoomba (Wheeler; Wheeler,W.M.) (ANIC, SAMA); Killarney Gap, Narrabri (Room,P.M.) (ANIC); Kurrajong (Taylor,F.H.) (ANIC); Leura (Wheeler, W.M.) (SAMA); Mangrove Mt. (Taylor,R.W.) (ANIC); Mongarlowe (Billen,J.) (ANIC); Mt. Conobolas, nr. Orange [Canobolas] (Taylor,R.W.; Taylor,R.W. & Bartell,R.J.) (ANIC); Mt. Coryah, Narrabri (Room,P.M.) (ANIC); Mt. Tomah (Shattuck,S.O.) (ANIC); Mt. Wilson, Blue Mountains (Lowery,B.B.) (ANIC); N Mt. Yulludunida, Narrabri (Room,P.M.) (ANIC); New England Nat. Pk, Bullock Ck. (Taylor,R.W.) (ANIC); New England Nat. Pk. (Lowery,B.B.) (ANIC); New England National Park, Pt. Lookout (Taylor,R.W.) (ANIC); Stewarts Brook State Forest (Gush,T.) (ANIC); The Gib, Bowral (Lowery,B.B.) (ANIC); Wog Wog, 24km SE Bombala (Shattuck,S.O.) (ANIC); Yango Creek (Ward,P.S.) (ANIC); *Queensland*: Townsville (Hill,G.F.) (ANIC); *Victoria*: Bayswater (Hill,G.F.) (ANIC); Ferntree Gully (Clark,J.; Greaves,T.; Spry,F.P.) (ANIC); Greensborough (McAreavey,J.) (ANIC); Mallacoota (Miller,V.H.) (ANIC); Melbourne (Hill,G.F.) (SAMA); Moroka (collector unknown) (ANIC); Mt. Ben Cairn (Greaves,T.) (ANIC); Narbethong (Lowery,B.B.) (ANIC); Ringwood (Spry,F.P.) (ANIC); Warrandyte (Greaves,T.) (ANIC); Woori Yallock (Thorn,L.B.) (ANIC).

**Comments.** *Dolichoderus doriae* occurs in forested areas ranging from dry sclerophyll to wet sclerophyll in eastern New South Wales, the ACT and southern Victoria. Nests are most commonly in soil under and along the edges of stones and branches on the ground or occasionally in rotten wood or in debris at the base of trees. During warmer weather workers and brood commonly form balls on the surface of the ground near nest entrances. Workers forage in trails on the ground and on tree trunks.

This is one of the better studied Australian species of *Dolichoderus*. These studies include: Forel (1902) (male description), Clark (1934) (queen (ergatoid) description), Wheeler and Wheeler (1966) (larval description), Dazzini Valcurone and Fanfani (1982) (glandular systems) and Fanfani and Dazzini Valcurone (1991) (metapleural gland).

There is a single record of this species from Townsville, Queensland, some 1200km north of the main range of this taxon. This collection shows typical morphology for the species and is probably a labelling error as no other records from this northern region are known.

### ***Dolichoderus etus* sp. n.**

(Fig. 9)

**Types.** Holotype worker from hills to west of Mudgee, approx. 32°36'S, 149°35'E, New South Wales, 1 September 1963, B.B. Lowery (ANIC, ANIC32-066501); large number of paratype workers, same data as holotype except ANIC32-061390 (most in ANIC, 2 in MCZC).

**Diagnosis.** Pronotum and propodeum with elongate spines; the short pronotal spines are directed anteriorly and approximately parallel to the longitudinal axis of the body, in dorsal view a line drawn between their tips



intersects the pronotal collar; the first gastral tergite generally lacking hairs but with abundant appressed fine pubescence and occasionally a few very short, scattered hairs present.

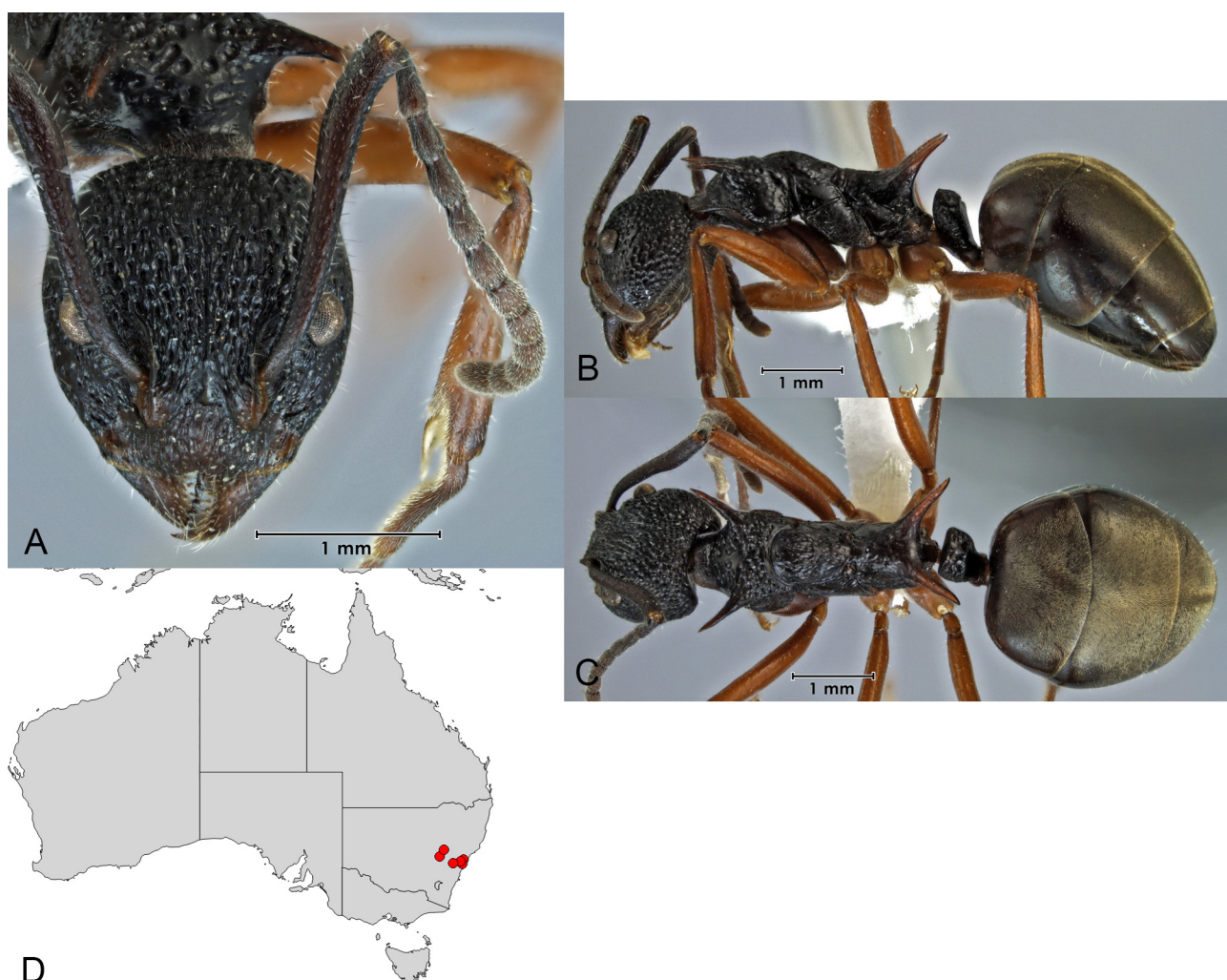
*Dolichoderus etus* can be distinguished from all other Australian *Dolichoderus* species by its short, anteriorly directed pronotal spines combined with the general lack of erect hairs and the presence of very fine pubescence on the first gastral tergite.

**Worker description.** See Fig. 9. Other than slight variation in the intensity of leg colour, sometimes even within a single individual, all specimens are similar to the figured individual.

**Measurements** (n=5). CI 90–99; EI 17–20; EL 0.30–0.35; HL 1.73–1.91; HW 1.65–1.82; ML 2.73–2.93; MTL 1.84–2.11; PronI 66.21–69.32; PronW 1.13–1.21; SI 113–125; SL 1.99–2.15.

**Material examined.** *New South Wales*: Asquith (Schrader,H.P.) (ANIC); Calga (Lowery,B.B.) (ANIC); Maroota State Forest (Gush,T.) (ANIC); Ophir nr. Orange (Taylor,R.W.) (ANIC); Pymble (Mercovich,C.) (ANIC); Wentworth Falls, Blue Mts. (Lowery,B.B.) (ANIC).

**Comments.** *Dolichoderus etus* is interesting in that while it is known from a fairly restricted region of eastern and coastal New South Wales it is found in forested habitats ranging from dry to wet sclerophyll. It is curious that a species with an apparently broad habitat range should be so geographically restricted. Nests are in soil under rocks.

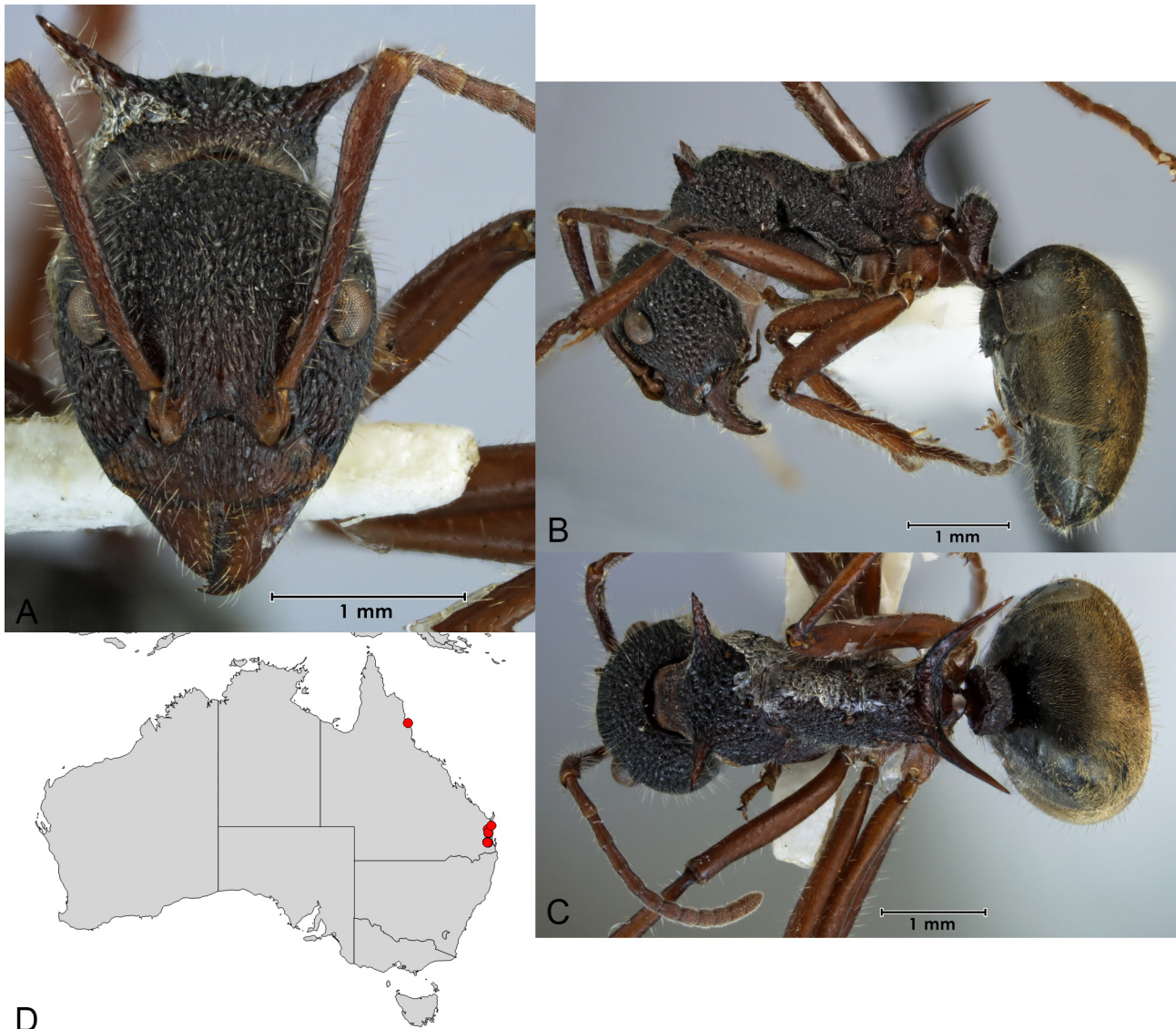


**FIGURE 9.** *Dolichoderus etus*, paratype worker (ANIC32-061390). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

### *Dolichoderus extensispinus* Forel

(Fig. 10)

*Dolichoderus doriae extensispina* Forel, 1915: 76 (raised to species by Clark 1930:256).



**FIGURE 10.** *Dolichoderus extensispinus*, worker from Boombana National Park, Brisbane, Queensland (ANIC32-061379). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Types.** 24 worker syntypes from Blackall Range, Queensland (2 in NHMB, 2 in ANIC, 1 in USNM, 19 in MHNG).

**Diagnosis.** Pronotum and propodeum with elongate spines; pronotal spines directed laterally and dorsally. The presence of pronotal spines directed laterally and dorsally will distinguish *D. extensispinus* from all other Australian *Dolichoderus* species.

**Worker description.** See Fig. 10. The available material shows little morphological variation from the figured specimen.

**Measurements** (n=5). CI 90–94; EI 21–22; EL 0.36–0.42; HL 1.84–2.06; HW 1.65–1.92; ML 2.72–3.07; MTL 2.02–2.25; PronI 61.36–66.81; PronW 1.07–1.25; SI 106–115; SL 1.90–2.07.

**Material examined.** *Queensland:* 15km ESE Gympie (Shattuck,S.O.) (ANIC); Blackall Range (Mjoberg) (ANIC); Blackall Range (Lea,A.M.) (SAMA); Blackall Range (Borch,C.H.) (ANIC); Boombana NP, Brisbane (Taylor,R.W.) (ANIC); Brisbane, Gold Cr. Res. (Lowery,B.B.) (ANIC); Cairns (Bourne,E.H.) (ANIC); Cooloola, Como Forestry HQ (Greenslade,P.J.M.) (ANIC); Cooran Plateau nr. Traveston (Taylor,R.W. & Kohout,R.) (ANIC); Mapleton (Hacker,H.) (ANIC); Mt. Nebo (Lowery,B.; Lowery,B.B.) (ANIC).

**Comments.** *Dolichoderus extensispinus* occurs in forests ranging from dry sclerophyll to rainforest in a restricted region of south-eastern Queensland. It nests under stones and forages on low vegetation and trees. There is a single specimen, collected many years ago, labelled as being from Cairns, some 2000kms north of the main

range of this species. Given that the species has not been collected in this area since this record should be considered suspect and it is unlikely that this species occurs there.

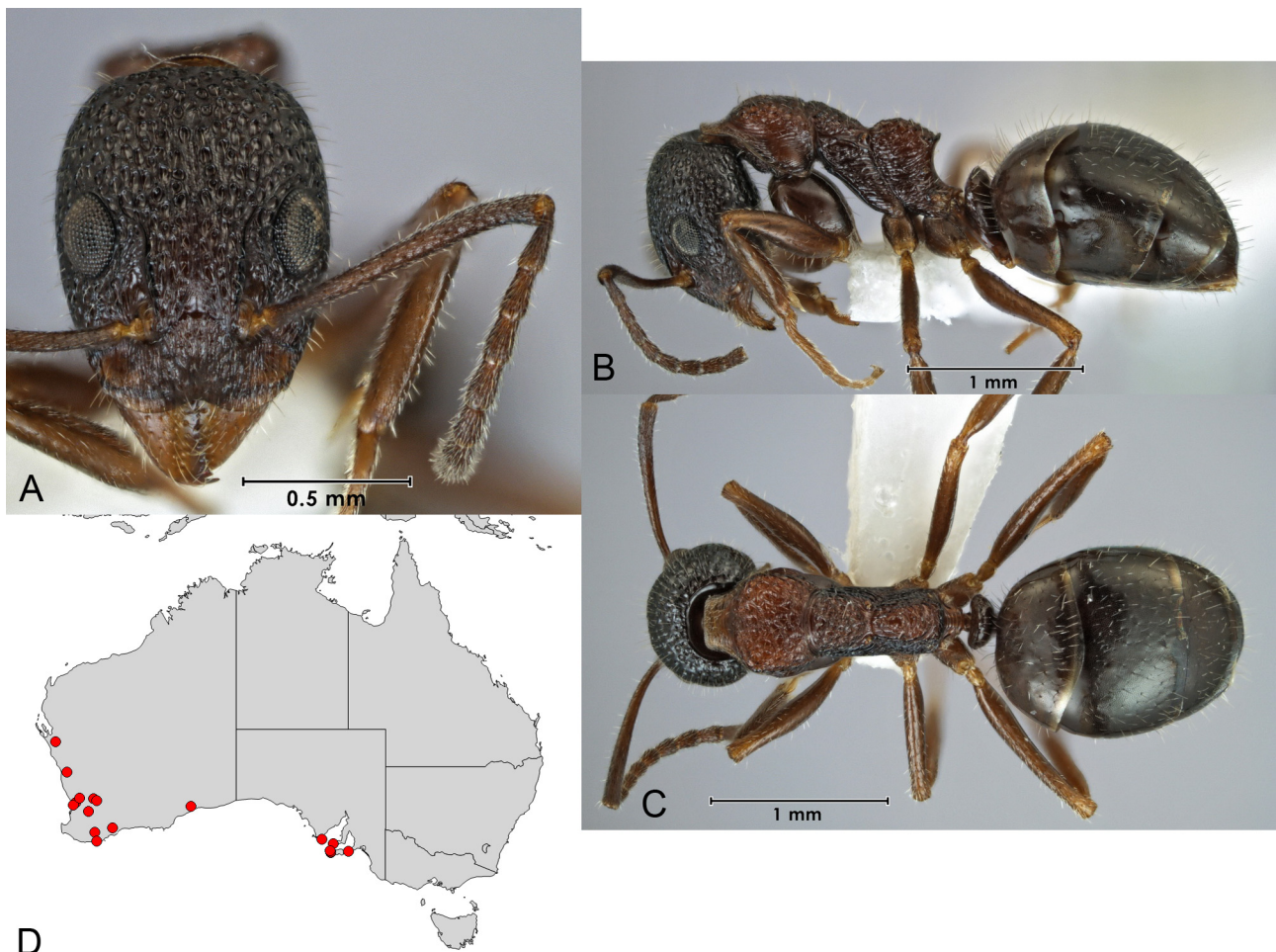
***Dolichoderus formosus* Clark**

(Fig. 11)

*Dolichoderus formosus* Clark, 1930: 265.

*Dolichoderus occidentalis* Clark, 1930: 268 (**new synonym**).

**Types.** *Dolichoderus formosus*: 7 worker syntypes from Mundaring [approx. 31°54'S 116°10'E] (3 in MCZC, 3 in WAMP, 1 in MVMA); 1 worker and 1 queen syntype from Hovea [approx. 31°53'S 116°06'E] (MVMA); additional material from Armadale and Mt. Dale [approx. 32°08'S 116°18'E], Western Australia. *Dolichoderus occidentalis*: Holotype worker from Albany [approx. 35°00'S 117°52'E], Western Australia (MVMA).



**FIGURE 11.** *Dolichoderus formosus*, worker from Armadale, Western Australia (ANIC32-061196). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Diagnosis.** Pale markings absent from lower margin of the eyes; head dark brown to black and similar in colour to gaster; sculpturing pattern of head and pronotum, with large but shallow and closely spaced foveae; in dorsal view the pronotum with only weakly defined shoulders, with the area between the shoulders more strongly convex to flat; pronotum and propodeum lacking spines; dorsum of propodeum weakly and evenly convex, the length shorter (at most approximately the same length) than the posterior face, with a narrow carina separating the dorsal and posterior faces; posterior face of propodeum weakly concave, separated from the dorsal face by a distinct carina; mesosoma with erect hairs but few to no appressed pubescence; gaster dark brown to black with little or no pubescence; tibiae with erect or suberect hairs.

*Dolichoderus formosus* is similar to *D. canopus*, but is distinguishable by the large, shallow and closely spaced foveae on the dorsum of the head and pronotum, which are distinctly striate on the lateral pronotum. This species most closely resembles *D. nigricornis* but can be distinguished by having the head colour similar to the gaster (dark brown to black) compared to the lighter coloured head (reddish to reddish-brown) and dark gaster (dark brown to black) in *D. nigricornis*, and in lacking appressed pubescence from the mesosoma and gaster.

**Worker description.** See Fig. 11. Body colour varying from red to black with mandibles, antennae and legs varying from reddish-brown to brown. Sculpturing ranging from smooth and shiny to weakly matte. Otherwise similar to that figured.

**Measurements** (n=5). CI 78–84; EI 28–32; EL 0.25–0.27; HL 1.05–1.15; HW 0.84–0.95; ML 1.43–1.60; MTL 0.76–0.86; PronI 70.85–76.37; PronW 0.59–0.70; SI 112–123; SL 1.02–1.11.

**Material examined.** *South Australia*: Cape Borda, Kangaroo Island (Lowery,B.B.) (ANIC); Kangaroo Is., 2km S Ravine des Casoars (Greenslade,P.J.M.) (ANIC); Kangaroo Is., N of Breakneck R. (Greenslade,P.J.M.) (ANIC); Kangaroo Is., S Breakneck R. (Greenslade,P.J.M.) (ANIC); Lincoln NP (Lowery,B.B.) (ANIC); Yorke Peninsula, Innes Nat. Park (Greenslade,P.J.M.) (ANIC); *Western Australia*: 1km SE of Brookton (Heterick,B.E.) (JDMC); 1km W of Nalya (Heterick,B.E.) (JDMC); 30km N of Eneabba (Heterick,B.E.) (JDMC); 7.5km SE of Brookton (Heterick,B.E.) (JDMC); Albany (Clark,J.) (ANIC); Armadale (Clark,J.) (ANIC); Bungulla (Greaves,T.) (ANIC); Caiguna RH (Heterick,B.E.) (JDMC); Chittering Valley Rd. (Heterick,B.E.) (JDMC); Dryandra SF (Norwood,C.) (JDMC); Jacup Nth Rd. (Heterick,B.E.) (JDMC); Mundaring (Clark,J.) (ANIC); Nerren Nerren Station (WAM/CALC) (JDMC); Stirling Range (Lowery,B.B.) (ANIC); Whicher Range (Jacobs,M.) (JDMC).

**Comments.** *Dolichoderus formosus* occurs in two distinct regions, one in south-western Western Australia, the other in south-central coastal South Australia. It is found in mallee and scrub habitats and nests under rocks.

### ***Dolichoderus gordonii* sp. n.**

(Fig. 12)

**Types.** Holotype worker from Fletcher, 28°46'S 151°51'E, Queensland, E. Sutton (ANIC, ANIC32-066637); 18 paratype workers, same data as holotype except ANIC32-061389 (15 in ANIC, 3 in MCZC).

**Diagnosis.** Pronotum and propodeum with elongate spines; the short pronotal spines are directed anteriorly and approximately parallel to the longitudinal axis of the body, in dorsal view a line drawn between their tips intersects the pronotal collar; the first gastral tergite generally lacking hairs, but with a few scattered, very small appressed hairs.

This species is most similar to *D. etus* and *D. doriae*. They differ in that *D. gordonii* lacks fine pubescence on the first gastral tergite but has a few scattered, very small appressed hairs. In addition, the overall colour of the body is a lighter red-brown, rather than a dark brown-black. Additionally, variation in pronotal spine length is displayed between *D. gordonii* and *D. etus*. *Dolichoderus gordonii* appears to have shorter, straighter pronotal spines, whereas *D. etus* has long spines with a distinct curve near the base of the spine. Spine length between *D. gordonii* and *D. doriae* appear similar.

**Worker description.** See Fig. 12. All available material is similar to the figured individual.

**Measurements** (n=5). CI 99–100; EI 17–19; EL 0.27–0.31; HL 1.60–1.66; HW 1.59–1.64; ML 2.46–2.61; MTL –1.75–1.71; PronI 67.30–71.06; PronW 1.07–1.15; SI 103–108; SL 1.64–1.77.

**Comments.** This species is known from a single collection from a forested area of extreme south-eastern Queensland. Nothing is known concerning its biology.

### ***Dolichoderus goudiei* Clark**

(Fig. 13)

*Dolichoderus goudiei* Clark, 1930: 264.

**Types.** Holotype worker and 6 paratype workers from Maldon [approx. 37°00'S 144°04'E], Victoria (holotype and 3 paratypes in MVMA, 1 paratype in BMNH, 2 paratypes in WAMP); 2 worker paratypes without locality data (MCZC).

**Diagnosis.** Sculpturing on head minimal, either essentially absent or consisting of very fine reticulations; colour of head reddish-brown to black; pronotum and propodeum lacking spines; posterior face of propodeum weakly concave, separated from the dorsal face by at most a weakly defined angle; first tergite of gaster with elongate, erect hairs, and fine, silvery appressed pubescence.

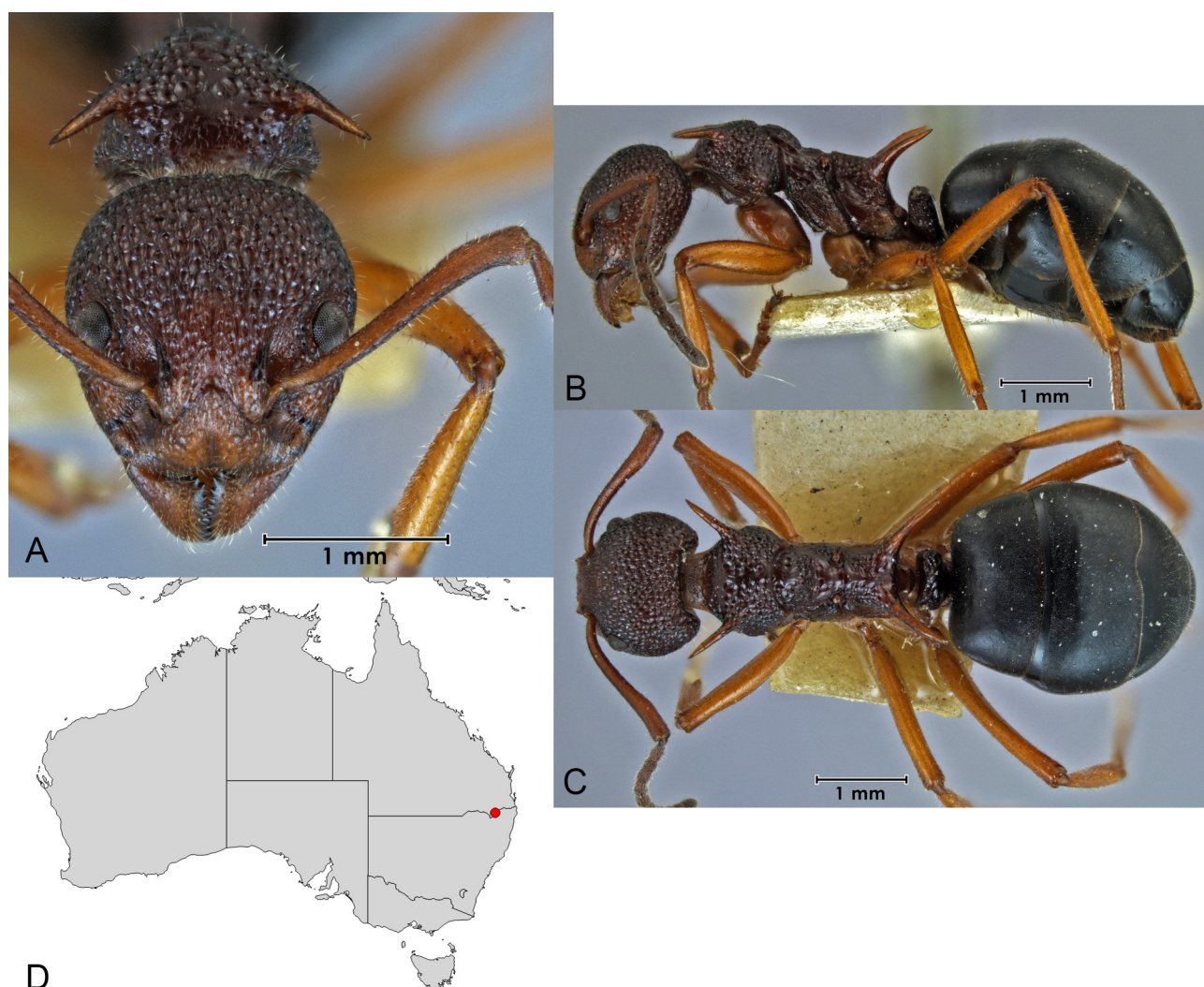
This species most closely resembles *D. australis*, however *D. goudiei* has appressed pubescence on the first tergite of the gaster, which *D. australis* lacks (both species have elongate, erect hairs on the first gastral tergite).

**Worker description.** See Fig. 13. All specimens similar to the figured individual.

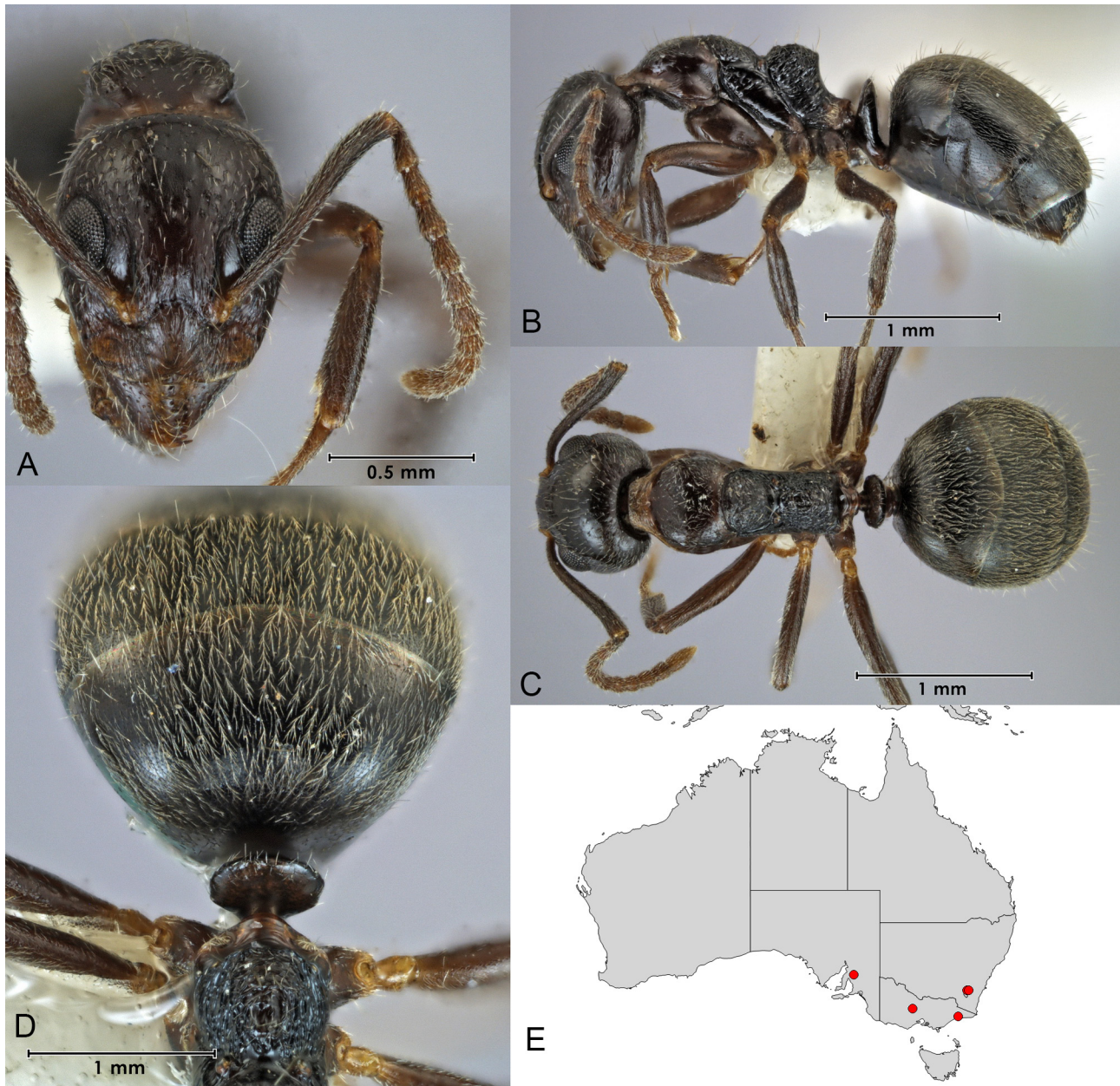
**Measurements** (n=5). CI 86–89; EI 33–36; EL 0.28–0.30; HL 0.93–0.99; HW 0.80–0.88; ML 1.22–1.34; MTL 0.68–0.76; PronI 62.27–63.34; PronW 0.50–0.56; SI 108–110; SL 0.88–0.96.

**Material examined.** *Australian Capital Territory*: Capital Hill (Lowery,B.B.) (ANIC); Kowen (Greaves,T.; L.W.) (ANIC); *South Australia*: Sevenhill (collector unknown; Lowery,B.B.) (ANIC); *Victoria*: 7mi. W Newmerella (Gross,G.F.) (SAMA); Maldon (Goudie,J.C.) (ANIC). **New Zealand**: Auckland Airport (Quarantine Inspection Service) (ANIC).

**Comments.** *Dolichoderus goudiei* occurs in dry sclerophyll and savannah woodlands across south-eastern Australia from the ACT to south-eastern South Australia. It has been found foraging on low vegetation and tree trunks. It was intercepted in New Zealand on orchid blooms shipped from Sydney, but has not become established there (Don, 2007).



**FIGURE 12.** *Dolichoderus gordonii*, worker from Fletcher, Queensland (ANIC32-061389). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.



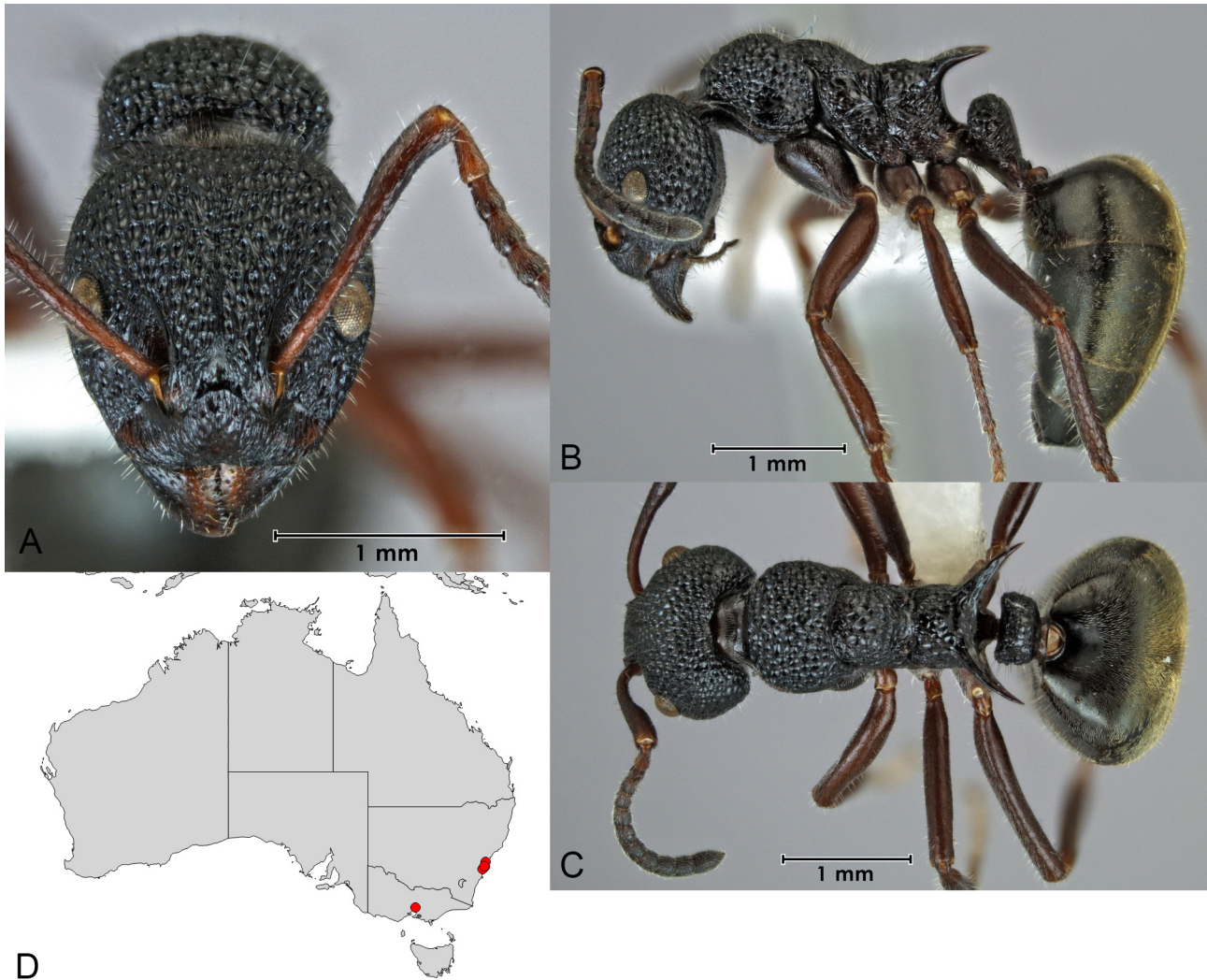
**FIGURE 13.** *Dolichoderus goudiei*, worker from Maldon, Victoria (ANIC32-060605). A. Front of head; B. Side of body; C. Top of body; D. First gastral tergite; E. Distribution of material examined.

***Dolichoderus inferus* sp. n.**

(Fig. 14)

**Types.** Holotype worker from Gordon, Sydney, 33°45'S 151°09'E, New South Wales, 21 September 1974, P.S. Ward, PSWC#92, foraging on *Eucalyptus* trunk in dry sclerophyll (ANIC, ANIC32-066605); 3 paratype workers, same data as holotype except ANIC32-060583 (ANIC); 6 paratype workers, same data as holotype except 15 September 1974, PSWC#47, ex. dead branch on sandstone ledge, in dry sclerophyll ANIC32-060584 (3 in ANIC, 3 in MCZC).

**Diagnosis.** Pronotum rounded, lacking spines, propodeum with elongate spines directed upward at angle of 45° or less to horizontal plane, the angle between them at least 90°; base of propodeal spines forming a "U" with a broad concavity connecting their bases (sometimes this region flat or weakly convex); dorsum of petiolar node broad; legs short and dark red-brown in colour, at most only slightly lighter in colour than the body.



**FIGURE 14.** *Dolichoderus inferus*, paratype worker (ANIC32-060583). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

This species is similar to *D. ypsilon*, *D. rufotibialis* and *D. niger* but can be distinguished from these by its dorsally broad petiolar node (rather than angular); and the broad "U" formed at the base of the propodeal spines rather than a narrowly angled "V" when viewed from the front. It is most similar to *D. scabridus* which also has a broad petiolar node, and "U" at the base of the propodeal spines, but differs in having dark red-brown legs rather than yellowish-red.

**Worker description.** See Fig. 14. The available material shows little variation from this pattern.

**Measurements** (n=5). CI 92–97; EI 20–22; EL 0.28–0.31; HL 1.44–1.54; HW 1.33–1.42; ML 1.96–2.12; MTL 1.14–1.21; PronL 73.48–74.79; PronW 1.00–1.05; SI 100–105; SL 1.38–1.46.

**Material examined.** *New South Wales*: Mt. Keira (Sundholm,A.) (ANIC); Royal N.P. (Ward,P.S.) (ANIC); Royal National Park, above Garie Beach (Lowery,B.B.) (ANIC); *Victoria*: Greensborough (McAreavey,J.) (ANIC).

**Comments.** *Dolichoderus inferus* is most common in dry sclerophyll habitats but extends into wet sclerophyll as well. Foragers have been encountered primarily on low vegetation and trees and a nest was found in a dead branch. While most specimens have been encountered in the general vicinity of Sydney, there is a single collection from southern Victoria, some 700kms to the south-east. These specimens are morphologically inseparable from the Sydney population and appear to represent the same species. The current status of this species in Victoria is uncertain given that it has only been found a single time.

***Dolichoderus kathae* sp. n.**

(Fig. 15)

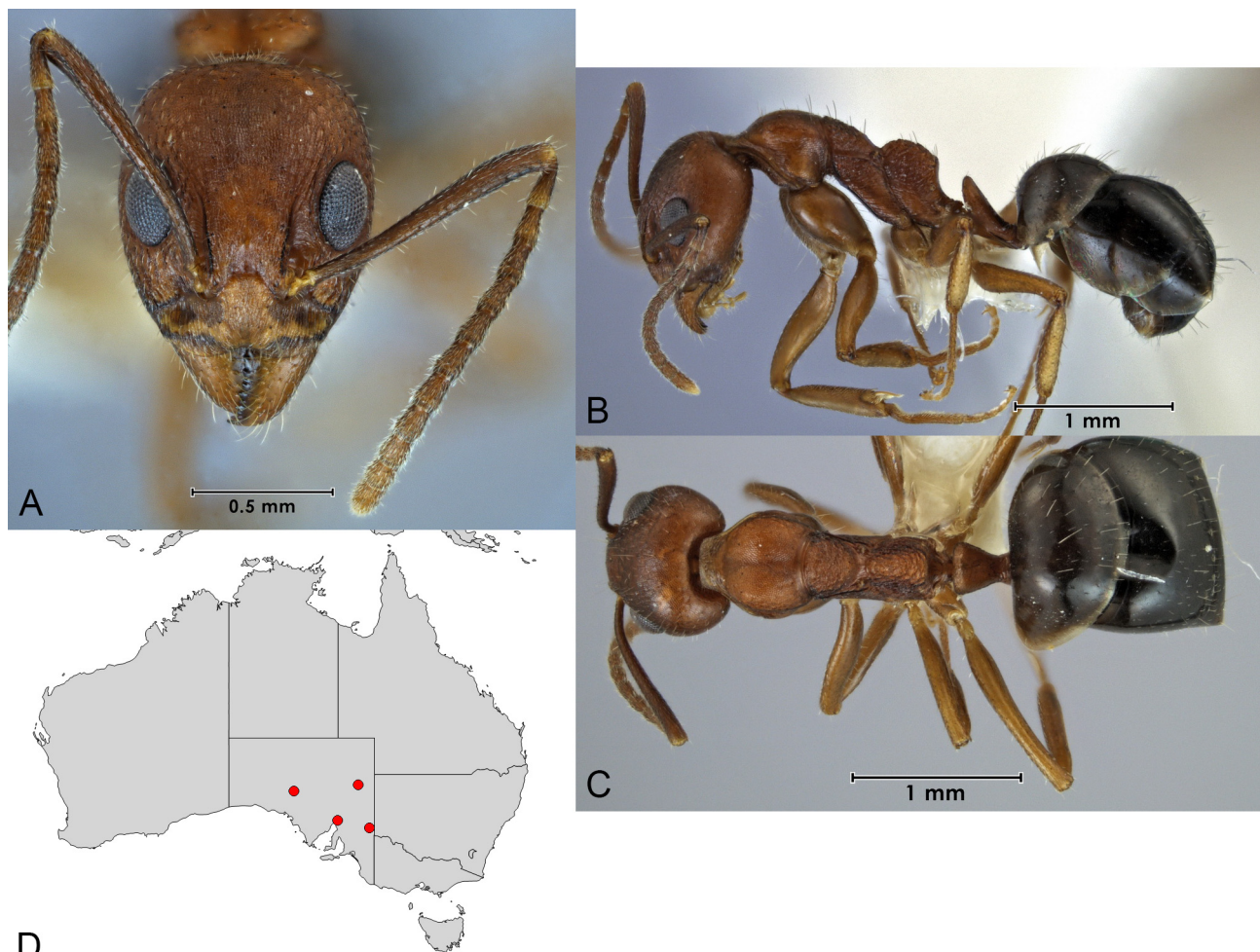
**Types.** Holotype worker and 1 paratype worker from Mambray Creek Camp Ground, Mt. Remarkable National Park, 32°49'48"S 138°01'48"E, 30 March 1992, S.O. Shattuck (ANIC, holotype ANIC32-063770, paratype ANIC32-066583).

**Diagnosis.** Sculpturing on head minimal, either essentially absent or consisting of very fine reticulations; head yellowish-red in colour; pronotum and propodeum lacking spines; dorsum of pronotum finely reticulate, the surfaces matte; dorsum of propodeum evenly convex, the angle at approximately the same level as the metanotal groove; posterior face of propodeum weakly concave, separated from the dorsal face by at most a weakly defined angle.

*Dolichoderus kathae* is similar to *D. rutilus* but differs in having the head and dorsum of the pronotum finely reticulate and matte while these areas are smooth and shiny in *D. rutilus*. It is also similar to *D. parvus*, differing primarily in the shape of the propodeum. In *D. kathae* (and *D. rutilus*), the angle of the propodeum is relatively high, the dorsal surface being uniformly convex. In *D. parvus* the angle is relatively low as the dorsal surface drops posteriorly relative to the metanotal groove, giving the surface an asymmetrical appearance.

**Worker description.** See Fig. 15. Sculpturing on the katapisternum (pleuron of the mesothorax) varying from smooth to longitudinally striate, but otherwise all specimens similar to that figured.

**Measurements** (n=5). CI 84–89; EI 34–36; EL 0.30–0.32; HL 1.01–1.07; HW 0.86–0.92; ML 1.39–1.51; MTL 0.74–0.79; PronL 61.72–64.91; PronW 0.53–0.59; SI 111–116; SL 1.00–1.03.



**FIGURE 15.** *Dolichoderus kathae*, holotype worker (ANIC32-063770). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined (coordinates of specimen from Northern Territory not available).



**Material examined.** *Northern Territory*: Moolawatana (Donnellan,S.) (SAMA); *South Australia*: 5km E Gibraltar Rocks, N Tarcoola (Greenslade,P.J.M.) (ANIC); Olympic Dam (Matthews,E.G. & Watts,C.) (ANIC).

**Comments.** *Dolichoderus kathae* has been collected from *Callitris* woodlands. It is known from a limited number of collections across semi-arid South Australia.

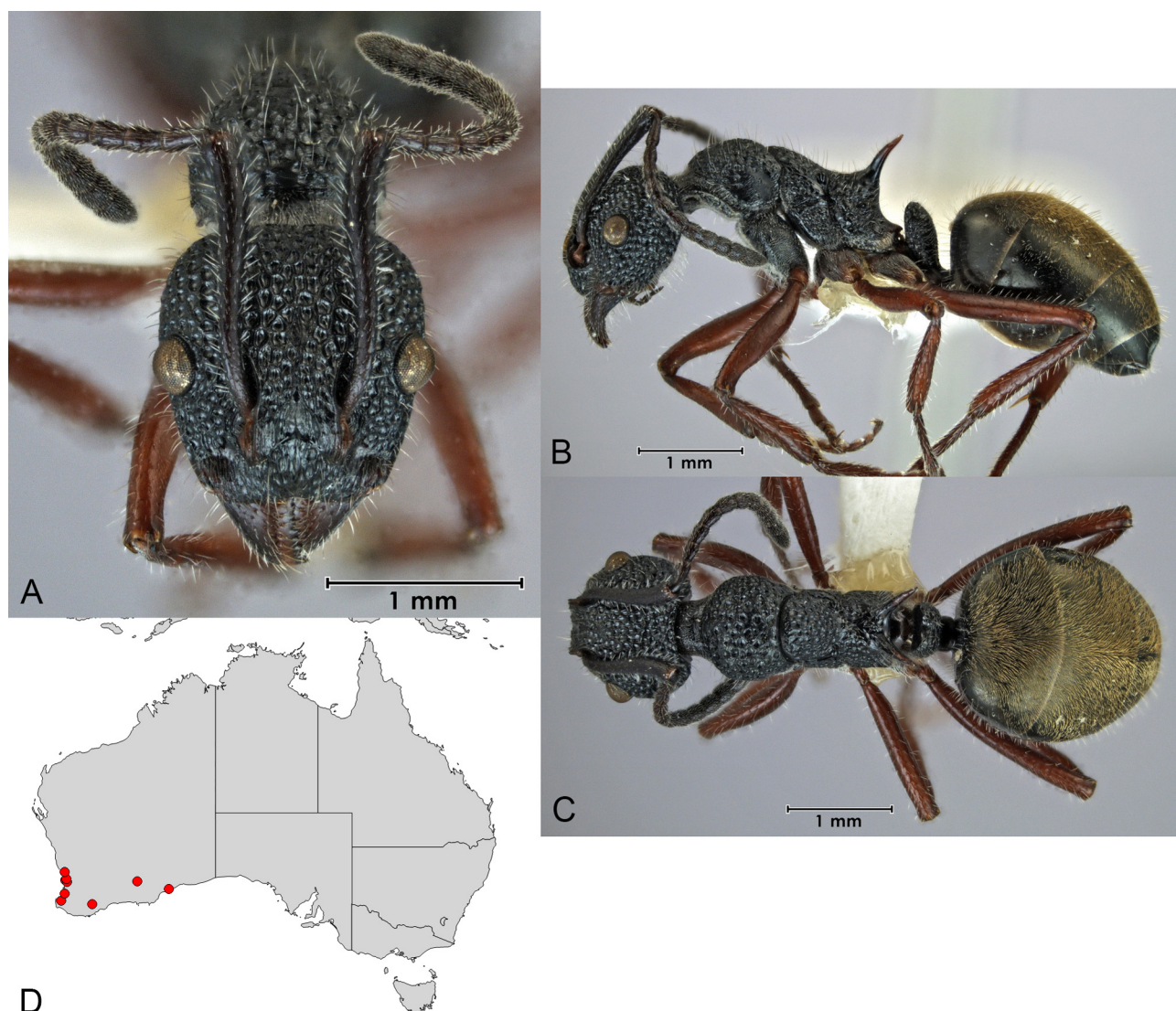
***Dolichoderus niger* Crawley (raised to species)**

(Fig. 16)

*Dolichoderus ypsilon nigra* Crawley, 1922: 25.

**Types.** Holotype worker and 17 paratype workers from Kelmscott [approx. 32°08'S 116°00'E], Western Australia (holotype and 14 paratypes in OUMNH, 1 paratype in NHMB, 2 paratypes in MHNG); 3 worker paratypes from Western Australia (specific locality not given) (BMNH).

**Diagnosis.** Pronotum rounded, lacking spines; propodeum with elongate spines which are directed upward at an angle less than 45° to the horizontal plane, in dorsal view the spines with an angle of at least 90° between their bases and this region forming a "V" with a narrowly rounded angle; dorsum of petiolar node angular; legs long and uniformly coloured dark red-brown to reddish-black.



**FIGURE 16.** *Dolichoderus niger*, worker from 5km S Borden, Western Australia (ANIC32-063766). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

This species most closely resembles *D. rufotibialis* but can be distinguished by the uniformly coloured legs in *D. niger* compared to the bi-coloured legs found in *D. rufotibialis*, with its dark femora and lightly coloured tibiae.

**Worker description.** See Fig. 16. Morphologically uniform except leg colour varying from red-brown to reddish-black (the figured individual has lighter coloured legs compared to most available material), and pilosity on first gastral tergite mostly dense (as figured) but occasionally noticeably more sparse.

**Measurements** (n=5). CI 90–99; EI 22–25; EL 0.29–0.32; HL 1.27–1.43; HW 1.20–1.39; ML 1.76–2.11; MTL 1.13–1.35; PronI 71.56–78.84; PronW 0.87–0.99; SI 109–117; SL 1.36–1.51.

**Material examined.** *Western Australia:* 0.6km W of Neergabby (Heterick,B.E.) (JDMC); 26mi. ENE Norseman (Taylor,R.W.) (ANIC); 5km S Borden (Shattuck,S.O.) (ANIC); Armadale (Clark,J.) (ANIC); Beechboro (Lowery,B.B.) (ANIC); Binningup (Heterick,B.E.) (JDMC); Caiguna RH (Heterick,B.E.) (JDMC); Canning Vale (Heterick,B.E.; Knowles,D.G.) (JDMC); Perth (Clark,J.; Rossbach,M.) (ANIC, JDMC); Toolinna (Brooker,M.G.) (ANIC); Whicher Range (Heterick,B.E.) (JDMC).

**Comments.** *Dolichoderus niger* is restricted to low mallee and scrub habitats across southern Western Australia. It has been collected only a handful of times, including in relictual native woodlands in the Perth metropolitan area (Heterick, 2009).

### ***Dolichoderus nigricornis* Clark**

(Fig. 17)

*Dolichoderus nigricornis* Clark, 1930: 264.

**Types.** 6 worker syntypes (1 in MCZC; 5 in MVMA) from Tammin [approx. 31°38'S 117°29'E], Western Australia.

**Diagnosis.** Head reddish to reddish-brown and lighter in colour than dark brown to black gaster; sculpturing pattern of head and pronotum, with large but shallow and closely spaced foveae compared to the indistinct sculpturing pattern of *D. canopus*; pale markings absent from lower margin of the eyes; pronotum and propodeum lacking spines; in dorsal view the pronotum with only weakly defined shoulders, with the area between the shoulders more strongly convex to flat; dorsum of propodeum weakly and evenly convex, the length shorter (at most approximately the same length) than the posterior face, with a narrow carina separating the dorsal and posterior faces; posterior face of propodeum weakly concave, separated from the dorsal face by a distinct carina; mesosoma with both erect hairs and scattered appressed pubescence; gaster dark brown to black with scattered appressed pubescence; tibiae with erect or suberect hairs.

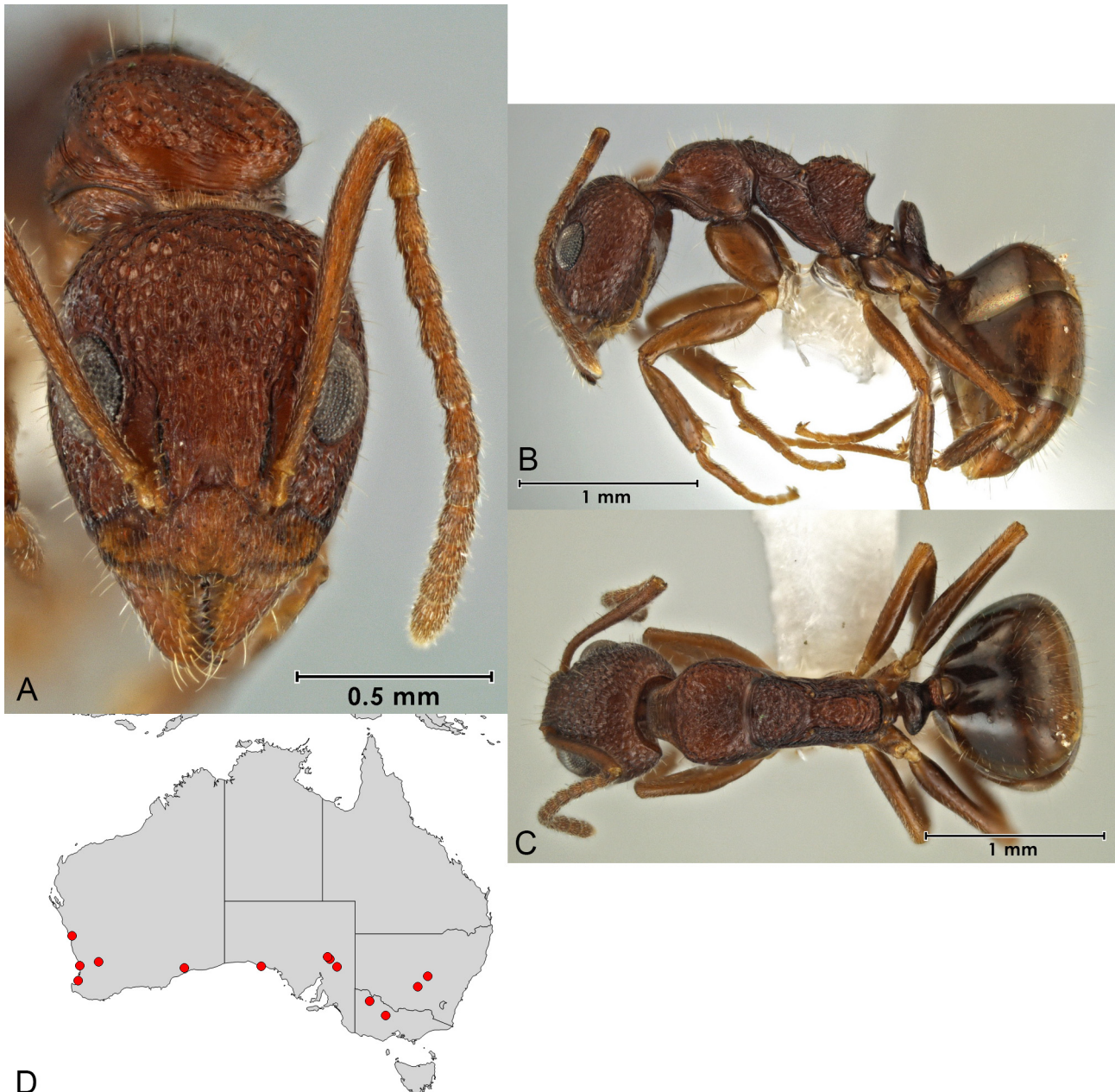
This species is most similar to *D. formosus* but can be distinguished from *D. formosus* by having a head lighter in colour (reddish to reddish-brown) than the gaster (dark brown to black) compared to the similar coloured head and gaster (dark brown to black) in *D. formosus*, and in having scattered appressed pubescence on the mesosoma and gaster.

**Worker description.** See Fig. 17. The available specimens show minor variation in leg colour, which varies from yellowish-red to reddish-brown, but otherwise all material is similar to the individual figured.

**Measurements** (n=5). CI 79–89; EI 31–35; EL 0.26–0.29; HL 0.92–1.03; HW 0.78–0.90; ML 1.25–1.41; MTL 0.67–0.75; PronI 67.26–71.66; PronW 0.53–0.61; SI 107–122; SL 0.91–1.00.

**Material examined.** *New South Wales:* 23mi. W West Wyalong (Lowery,B.B.) (ANIC); Trundle (Lowery,B.B.) (ANIC); *South Australia:* 15km WSW Blinman, Flinders Ra. (Greenslade,P.J.M.) (ANIC); Fowlers Bay (McAreevey,J.) (ANIC); Koonamore (Greenslade,P.J.M.) (ANIC); Oraparinna, Flinders Ranges (Greenslade,P.J.M.) (ANIC); *Victoria:* 20km S Ouyen (Shattuck,S.O.) (ANIC); Englewood Floral Reserve (collector unknown) (MVMA); *Western Australia:* Bunbury (Lowery,B.B.) (ANIC); Irwin (Ward,P.S.) (ANIC); Reabold Hill, Perth (Majer,J.D.) (ANIC); Tammin (collector unknown; Clark,J.) (ANIC).

**Comments.** *Dolichoderus nigricornis* is one of the more widespread species, occurring across much of southern Australia. It is known from dry sclerophyll and riparian woodlands where it forages on trees. Nests are in soil under rocks.



**FIGURE 17.** *Dolichoderus nigricornis*, worker from Irwin, Western Australia (ANIC32-061209). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

***Dolichoderus omicron* sp. n.**

(Fig. 18)

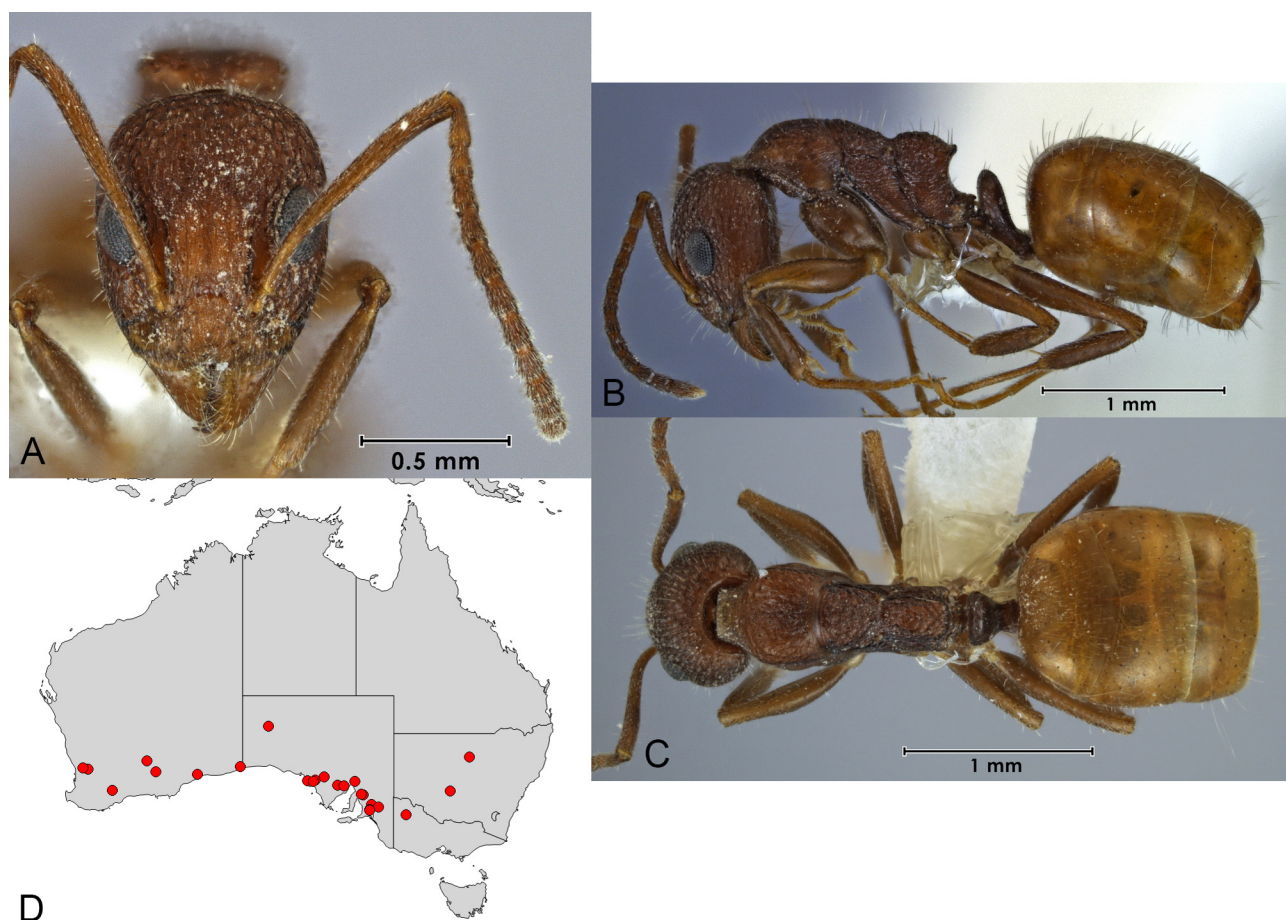
**Types.** Holotype worker from Poochera, "Freightline site" just south of village, 32°43'S 134°50'E, South Australia, 10–13 November 1981, R.W. Taylor & R.J. Bartell, nocturnal foragers, mallee woodland (ANIC, ANIC32-066601); 5 paratype workers, same data as holotype except ANIC32-061292 (ANIC); 6 paratype workers from Poochera, "Rubbish dump site" just north of village, 32°43'S 134°50'E, South Australia, 10–13 November 1981, R.W. Taylor & R.J. Bartell, diurnal collection, mallee woodland (ANIC32-061295, 3 in ANIC, 3 in MCZC); 1 paratype worker from the Poochera area, "*Nothomyrmecia* original site", 32°43'S 134°50'E, South Australia, 13–17 November 1977, R.W. Taylor & P.S. Ward, diurnal (ANIC, ANIC32-061294); 2 paratype workers from Poochera, "collected in CSIRO enclosure", 32°43'S 134°50'E, South Australia, October–November, 1984, R.W. Taylor & R.J.

Bartell, mallee woodland (ANIC, ANIC32-061291); 1 paratype worker from Poochera, site "X" 2km S of village, 32°43'S 134°50'E, South Australia, 6–15 November 1982, R.W. Taylor & R.J. Bartell, mallee woodland (ANIC, ANIC32-061293).

**Diagnosis.** Pale markings absent from lower margin of the eyes; pronotum and propodeum lacking spines; in dorsal view the pronotum with only weakly defined shoulders, with the area between the shoulders more strongly convex to flat; dorsum of propodeum weakly and evenly convex, the length shorter (at most approximately the same length) than the posterior face, with a narrow carina separating the dorsal and posterior faces; posterior face of propodeum weakly concave, separated from the dorsal face by a distinct carina; gaster yellowish red and lighter in colour than the mesosoma; with sparse pubescence on the first gastral tergite and hairs generally not overlapping or entirely absent; tibiae with erect or suberect hairs.

This species is most similar to *D. canopus* but can be distinguished by having a gaster yellowish red and lighter in colour than the mesosoma whereas *D. canopus* has a gaster which is at least similar in colour if not darker than the mesosoma.

**Worker description.** See Fig. 18. Available specimens uniform and similar to the figured individual except in showing moderate variation in body colour, which varies from light reddish-brown to brown (as illustrated), and leg colour, which ranges from yellow-red to reddish-brown (as illustrated).



**FIGURE 18.** *Dolichoderus omicron*, worker from Eucla, Western Australia (ANIC32-063771). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Measurements** (n=5). CI 82–87; EI 31–34; EL 0.24–0.28; HL 0.87–0.99; HW 0.72–0.86; ML 1.14–1.34; MTL 0.61–0.71; PronI 66.49–70.16; PronW 0.49–0.59; SI 112–119; SL 0.85–0.96.

**Material examined.** *New South Wales*: 7mi. S Hillston (Lowery,B.B.) (ANIC); Bogan River (Armstrong,J.) (ANIC); *South Australia*: 10km S Yardea HS, Gawler Ranges (Greenslade,P.J.M.) (ANIC); 11mi. E Kimba (Greenslade,P.J.M.) (ANIC); 53km E Vokes Hill, Victoria Desert (Greenslade,P.J.M.) (ANIC); Blyth (Lowery,B.B.) (ANIC); Brookfield [Brookfield Conservation Park] (Greenslade,P.J.M.) (ANIC); Cambrai

(Greenslade,P.J.M.) (ANIC); Ferries-McDonald Reserve, Monarto Sth. [Monarto South] (Greenslade,P.J.M.) (ANIC); Goondooloo (Crozier,R.C.) (ANIC); Inkster, SW Poochera (Casperon,K.) (ANIC); Mambrey Creek, S Flinders Ranges (Greenslade,P.J.M.) (ANIC); Monarto Stn (Greenslade,P.J.M.) (ANIC); Poochera (Taylor,R.W. & Bartell,R.J.) (ANIC); Poochera area (Taylor,R. & Ward,P.) (ANIC); Sevenhill (Lowery,B.B.) (ANIC); Sinclair Gap (Barker,S.) (SAMA); Streaky Bay (Lowery,B.B.) (ANIC); *Victoria*: Wyperfeld National Park., Duttuck Tk. (Harvey,M.S. & Roberts,B.E.) (ANIC); *Western Australia*: 11 mi. E Pingrup (Greaves,T.) (ANIC); 19mi. NNW Widgiemooltha (Taylor,R.W.) (ANIC); 26mi. ENE Norseman (Taylor,R.W.) (ANIC); 3km S Wundowie (Ward,P.S.) (ANIC); Caiguna (Lowery,B.B.) (ANIC); Eucla (Shattuck,S.O.) (ANIC); York (Douglas,A.M. & Douglas,M.J.) (ANIC).

**Comments.** *Dolichoderus omicron* is found in semi-arid open forested areas such as mallee woodlands and broombrush thickets across most of southern Australia. It forages during the day in columns primarily on the ground and nests in soil under rocks.

### ***Dolichoderus parvus* Clark**

(Fig. 19)

*Dolichoderus parvus* Clark, 1930: 263.

*Dolichoderus glauerti* Wheeler 1934: 147 (**new synonym**).

**Types.** *Dolichoderus parvus*: 27 worker syntypes from Sea Lake [approx. 35°30'S 142°51'E], Victoria (15 in MCZC, 3 in USNM, 1 in MVMA, 8 in SAMA). *Dolichoderus glauerti*: 18 worker and 3 male syntypes from City of York Bay, Rottnest Island, Western Australia (9 workers in MCZC, 3 workers in ANIC, 3 males in USNM, 3 workers in MVMA, 3 workers in WAMP).

**Diagnosis.** Colour of head yellowish-red; sculpturing on head minimal, either essentially absent or consisting of very fine reticulations; pronotum and propodeum lacking spines; posterior face of propodeum weakly concave, separated from the dorsal face by at most a weakly defined angle; propodeum falling away posteriorly so that the angle is below the level of the metanotal groove.

Although very similar to *D. kathae* and *D. rutilus*, the shape of the dorsal propodeal surface will distinguish this species from others in the *australis* group.

**Worker description.** See Fig. 19. Sculpturing on the katapisternum (pleuron of the mesothorax) and propodeum varying from smooth to longitudinally striate. In other respects the available material is similar to that figured.

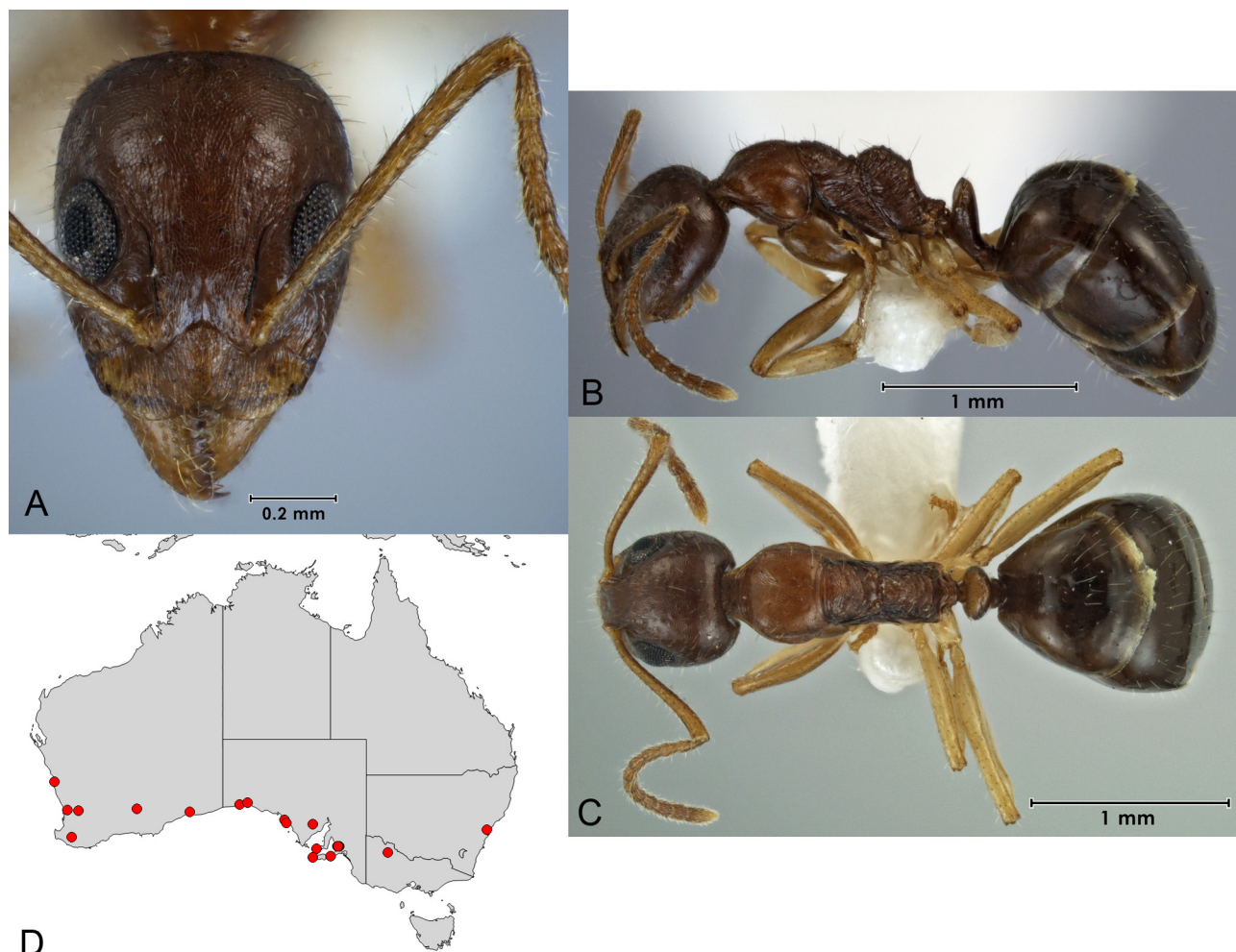
**Measurements** (n=5). CI 79–84; EI 33–37; EL 0.28–0.30; HL 0.93–1.12; HW 0.76–0.88; ML 1.23–1.57; MTL 0.66–0.86; PronI 64.40–71.18; PronW 0.49–0.62; SI 116–125; SL 0.91–1.07.

**Material examined.** *New South Wales*: Berowra Waters, Sydney (Lowery,B.B.) (ANIC); *South Australia*: 11mi. E Kimba (Greenslade,P.J.M.) (ANIC); 41km WbyS Nullarbor (collector unknown) (ANIC); 41km WbyS Nullarbor (Taylor,R.W.) (ANIC); Belair (Greenslade,P.J.M.) (ANIC); Bridgewater (Greenslade,P.J.M.) (ANIC); Calca (Lowery,B.B.) (ANIC); Englebrook, Nat. T. Reserve (Lee,K.E.) (ANIC); H.K. Fry Reserve [on Heath Road, Crafers] (Wood,T.G.) (ANIC); Kangaroo Is., Breakneck Creek (Taylor,R.W.) (ANIC); Kangaroo Is., Breakneck R. (Greenslade,P.J.M.) (ANIC); Kangaroo Is., Remarkable Rocks (Greenslade,P.J.M.) (ANIC); Kangaroo Is., West Bay (Greenslade,P.J.M.) (ANIC); Mt. Lofty (Greenslade,P.J.M.; Lowery,B.B.; McAreavey,J.) (ANIC); Streaky Bay (Lowery,B.B.) (ANIC); Yorke Peninsula, Innes Nat. Park (Greenslade,P.J.M.) (ANIC); *Victoria*: Sea Lake (Goudie,J.C.) (ANIC); *Western Australia*: 23km ESE of Cocklebiddy (Taylor,R.W.) (ANIC); 40km S Dongara (Lowery,B.B.) (ANIC); Kwinana (Heterick,B.E.) (JDMC); Kalamunda (Greaves,T.) (ANIC); Kensington (Cranley,L.) (JDMC); Redross Goldmine (60km S of Kambalda) (Walliss,S.) (JDMC); Westdale Rsvd (Heterick,B.E.) (JDMC).

**Comments.** *Dolichoderus parvus* was described from Sea Lake, Victoria while *D. glauerti* was established based on specimens from Rottnest Island, Western Australia, located approx. 2500km to the west. However, based on currently available material there is little separating these forms. Material from the west does show, on average, slightly more extensive sculpturing on the katapisternum (pleuron of the mesothorax) and propodeum and a larger body size while eastern specimens tend to be smoother and slightly smaller. However, the differences are slight, all forms can be found in all areas and numerous intermediate forms exist, making separation based on these

characters highly problematic. Additionally, no other characters could be found suggesting that more than a single variable species is involved. Because of this *D. glauerti* is here treated as a synonym of *D. parvus*.

*Dolichoderus parvus* occurs in drier regions with mallee, heath and dry sclerophyll habitats, primarily along southern coastal regions. It forages at night on low vegetation and nests under rocks. There is also a single collection from the Sydney area, approximately 800kms east of the next nearest record. These specimens match other *D. parvus* material and there is little doubt they belong to this species. However, the occurrence of this species in eastern New South Wales is in need of confirmation.



**FIGURE 19.** *Dolichoderus parvus*, worker from Kalamunda, Western Australia (ANIC32-061179). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

### *Dolichoderus reflexus* Clark

(Fig. 20)

*Dolichoderus reflexus* Clark, 1930: 261.

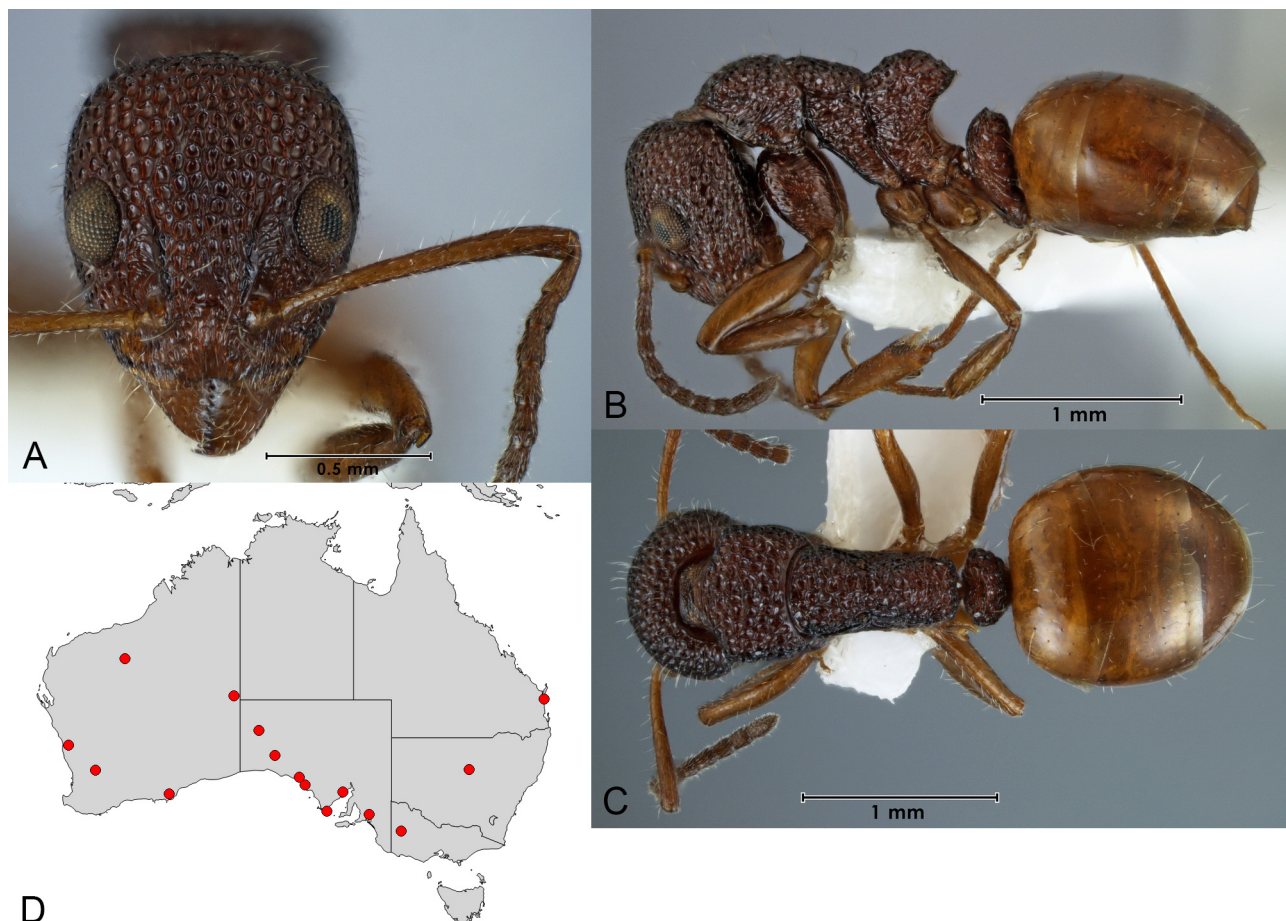
*Dolichoderus armstrongi* McAreavey, 1949: 17 (**new synonym**).

**Types.** *Dolichoderus reflexus*: 2 worker syntypes from Myponga, South Australia (1 in MCZC, 1 in MVMA); additional material from Murray Bridge [approx. 35°07'S 139°16'S] and Mt. Lofty [approx. 34°59'S 138°43'E], South Australia. *Dolichoderus armstrongi*: Holotype worker and 40 paratype workers (McAreavey 1949:18) from Nyngan [approx. 31°34'S 147°12'E], New South Wales (holotype and 16 paratypes in ANIC, 2 paratypes in USNM).

**Diagnosis.** Pale markings absent from lower margin of the eyes; pronotum and propodeum lacking spines; in dorsal view the pronotum with strongly developed shoulders, with the area between the shoulders weakly convex

to weakly concave; dorsum of propodeum highly arched and often with flat or even weakly concave sections; posterior face of propodeum, deeply concave often nearly semicircular; separated from the dorsal face by a distinct carina; gaster with sparse pubescence on the first gastral tergite and hairs generally not overlapping or entirely absent; tibiae with erect or suberect hairs.

This species is morphologically similar to *D. nigricornis* and some individual can be difficult to separate. This is especially the case where the dorsal face of the propodeum is relatively low and the posterior face relatively shallow. However, in these cases, especially for specimens from South Australia, the humeral angles are much stronger in this species while they are more rounded and less angular in *D. nigricornis*.



**FIGURE 20.** *Dolichoderus reflexus*, holotype worker (ANIC32-007964). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Worker description.** See Fig. 20. Humeral angles more pronounced in eastern material, less so in Western Australian material. Dorsal propodeal surface varying from angular with flat anterior and flat to weakly concave posterior sections to evenly convex. Petiolar node varying from relatively thin with a distinctly angular dorsum and weakly sculptured to relatively thick with a broadly rounded dorsum and heavily sculptured. Head always dark, body generally yellow-red, but sometimes dark red-brown and similar in colour to head. Gaster ranging from yellowish-red to red-black.

**Measurements** (n=5). CI 84–91; EI 27–32; EL 0.23–0.27; HL 0.85–1.02; HW 0.71–0.91; ML 1.08–1.43; MTL 0.56–0.68; PronI 76.66–81.26; PronW 0.56–0.74; SI 103–113; SL 0.80–0.94.

**Material examined.** *New South Wales:* Nyngan (Armstrong, J.) (ANIC); *Queensland:* Cooloola, Kabali E (Greenslade, P.J.M.) (ANIC); *South Australia:* Lincoln NP (Lowery, B.B.) (ANIC); Little Pine Hill, c.32mi. SW Whyalla (Britton, E.B.) (ANIC); Murray Bridge (Elston, A.H.) (ANIC); Ooldea (Lea, A.M.) (SAMA); Streaky Bay (Lowery, B.B.) (ANIC); Vokes Hill (Herridge, J.) (SAMA); Wittelbee Pt, 10km SE of Ceduna (Herridge, J.A.) (SAMA); *Victoria:* Salt Lake track, Little Desert National Park (Shattuck, S.O.) (ANIC); *Western Australia:* 15km W of Eneabba (Dunn, R.) (JDMC); 35km N Mt. Aloysius (Feehan, J.E.) (ANIC); 3mi. SbyW Mt. Ragged

(Taylor,R. W.) (ANIC); Bungulla (Greaves,T.) (ANIC); Eneabba (Bisevac,L.) (JDMC); Ethel Creek (Varris,P.A.) (JDMC).

**Comments.** This widespread species shows variation in a number of characters. The humeral angles are more pronounced in eastern material and less so in Western Australian material. The curvature of the dorsal propodeal surface varies from angular with flat anterior and flat to weakly concave posterior sections to evenly convex. However no obvious geographic pattern was detected for this variation and it appears to be intraspecific.

Based on gaster colour specimens can largely be divided into pale forms and dark forms. However, while dark forms are always distinct, the pale forms show considerable variation and some individuals approach the colour found in dark forms; no geographic pattern was found with all colour forms found in all areas. Additionally, the size and sculpturing pattern of the petiolar node varies considerably. In some specimens the node is relatively thin, with a distinctly angular dorsum and weak sculpturing. In other individuals the node is relatively thick with a broadly rounded dorsum and heavy sculpturing. As with the last character, no geographic pattern was noted and all forms occur in all regions. Even the type series of *D. armstrongi* has workers with both types of petiole, strongly suggesting that this variation is intraspecific rather than interspecific. Taken together, the variation in these characters is interpreted as supporting a single widespread and slightly variable species. However, it should be noted that there are relatively few specimens available for study, especially given the broad geographic range of this taxon, and this conclusions drawn here should be re-examined as additional material becomes available.

*Dolichoderus reflexus* is a mallee woodland species that nests in soil with craters at their entrances. It is widespread across much of southern Australia but is nowhere common. Workers forage on low vegetation. While most records are from western localities, there are two records, collected a year apart, from south-eastern Queensland, some 850kms from the next closest record.

### ***Dolichoderus rufotibialis* Clark (raised to species)**

(Fig. 21)

*Dolichoderus ypsilon rufotibialis* Clark, 1930: 259.

**Types.** 18 worker syntypes from Albany [approx. 35°00'S 117°52'E], Western Australia (11 (1 missing head) in MCZC, 6 in USNM, 1 in MVMA).

**Diagnosis.** Pronotum rounded, lacking spines; propodeum with elongate spines directed upward at angle of 45° or less to horizontal plane, the angle between them at least 90°; dorsum of petiolar node angular, base of propodeal spines forming a "V" with a narrowly rounded angle connecting their bases; legs long and bicoloured.

This species most closely resembles *D. niger* and *D. ypsilon* but can be distinguished by the dark femora and lightly coloured tibiae of *D. rufotibialis* compared to the uniformly coloured legs in *D. niger* (dark-brown) (Fig. 16) and *D. ypsilon* (light red or orange) (Fig. 27).

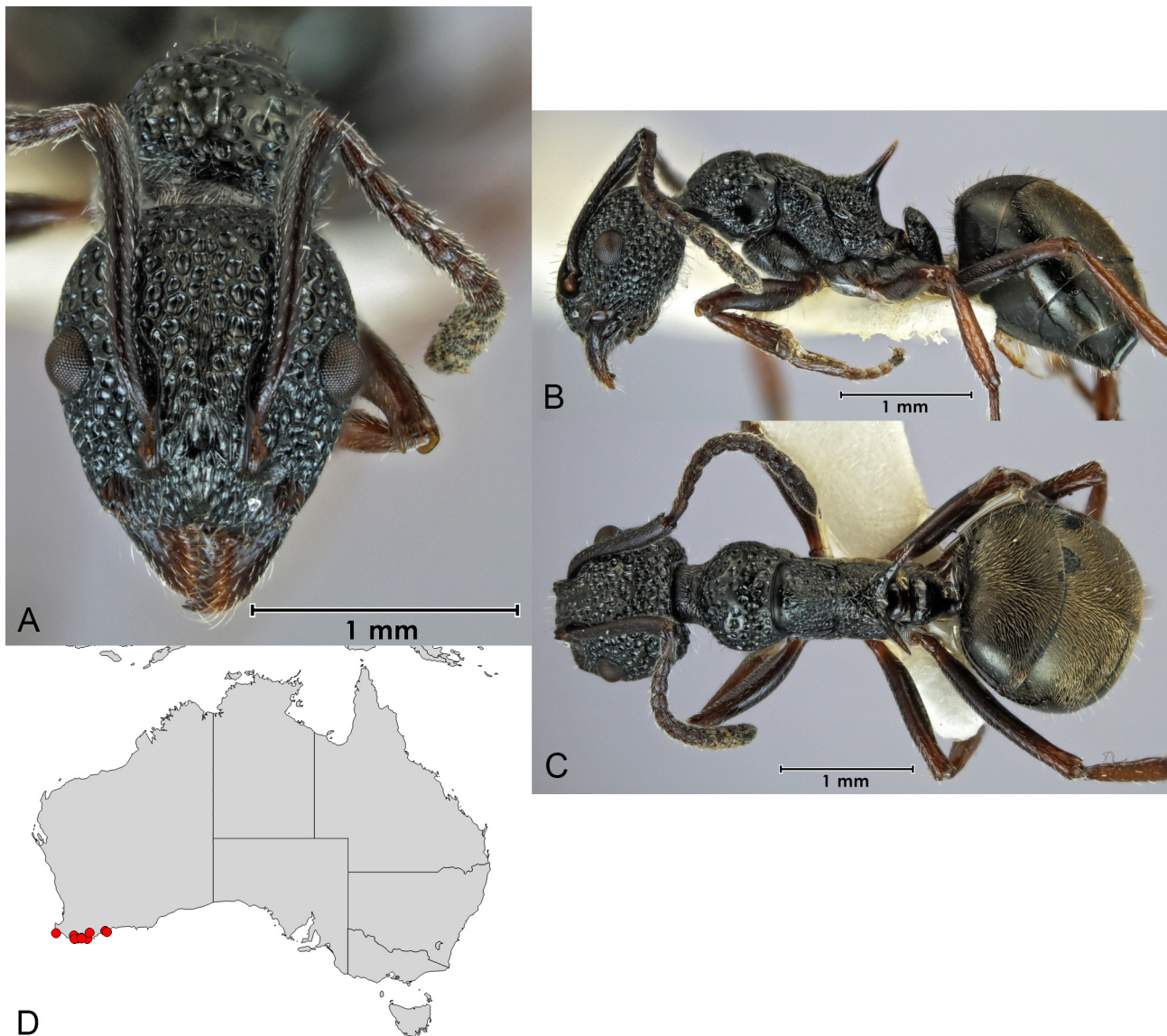
**Worker description.** See Fig. 21. All specimens are morphologically similar to the figured individual.

**Measurements** (n=5). CI 92–98; EI 23–24; EL 0.26–0.31; HL 1.19–1.43; HW 1.10–1.23; ML 1.59–2.11; MTL 0.99–1.35; PronI 70.36–75.71; PronW 0.77–0.99; SI 106–117; SL 1.17–1.51.

**Material examined.** *Western Australia:* 11mi. NNE Denmark (Britton,E.B.) (ANIC); 6mi. N Denmark (Lowery,B.B.) (ANIC); 7km NE Walpole (Ward,P.S.) (ANIC); Albany (Greaves,T.) (ANIC); Bremer Bay (Heterick,B.E.) (JDMC); Coalmine Bch., Walpole Nornalup NP (Lawrence,J. & Lawrence,N.) (ANIC); Denmark (Greaves,T.) (ANIC); Gold Holes, Stirling Range (Taylor,R.W.) (ANIC); Kenton nr. Mt. Mehniup (Taylor,R.W.) (ANIC); N Walpole, small granite mt. N Mt. Frankland (Taylor,R.W.) (ANIC); Nornalup (Majer,J.D.) (JDMC); nr. Pemberton (Springett,J.) (ANIC); Peppermint Grove (Heterick,B.E.) (JDMC).

**Comments.** *Dolichoderus rufotibialis* is found in open forested habitats such as dry sandy sclerophyll and heath of coastal south-western Western Australia. Foraging is on the ground with nests under rocks and logs.





**FIGURE 21.** *Dolichoderus rufotibialis*, worker from Kenton nr. Mt. Mehniup, Western Australia (ANIC32-060511). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

***Dolichoderus rutilus* sp. n.**  
(Fig. 22)

**Types.** Holotype worker from Innes National Park, Yorke Peninsula, approx. 35°13'S 136°52'E, South Australia, 26 January 1976, P.J.M. Greenslade (ANIC, ANIC32-061185); 1 paratype worker, same data as holotype except 28 January 1976 (ANIC, ANIC32-061184); 1 paratype worker from Spalding Cove, Port Lincoln, approx. 34°47'S 135°58'E, South Australia, 2 February 1973, P.J.M. Greenslade (ANIC, ANIC32-061186).

**Diagnosis.** Head yellowish-red; sculpturing on head minimal, either essentially absent or consisting of very fine reticulations; pronotum and propodeum lacking spines; posterior face of propodeum weakly concave, separated from the dorsal face by at most a weakly defined angle; dorsum of pronotum smooth, the surfaces shiny. Dorsum of propodeum evenly convex, the angle at approximately the same level as the metanotal groove.

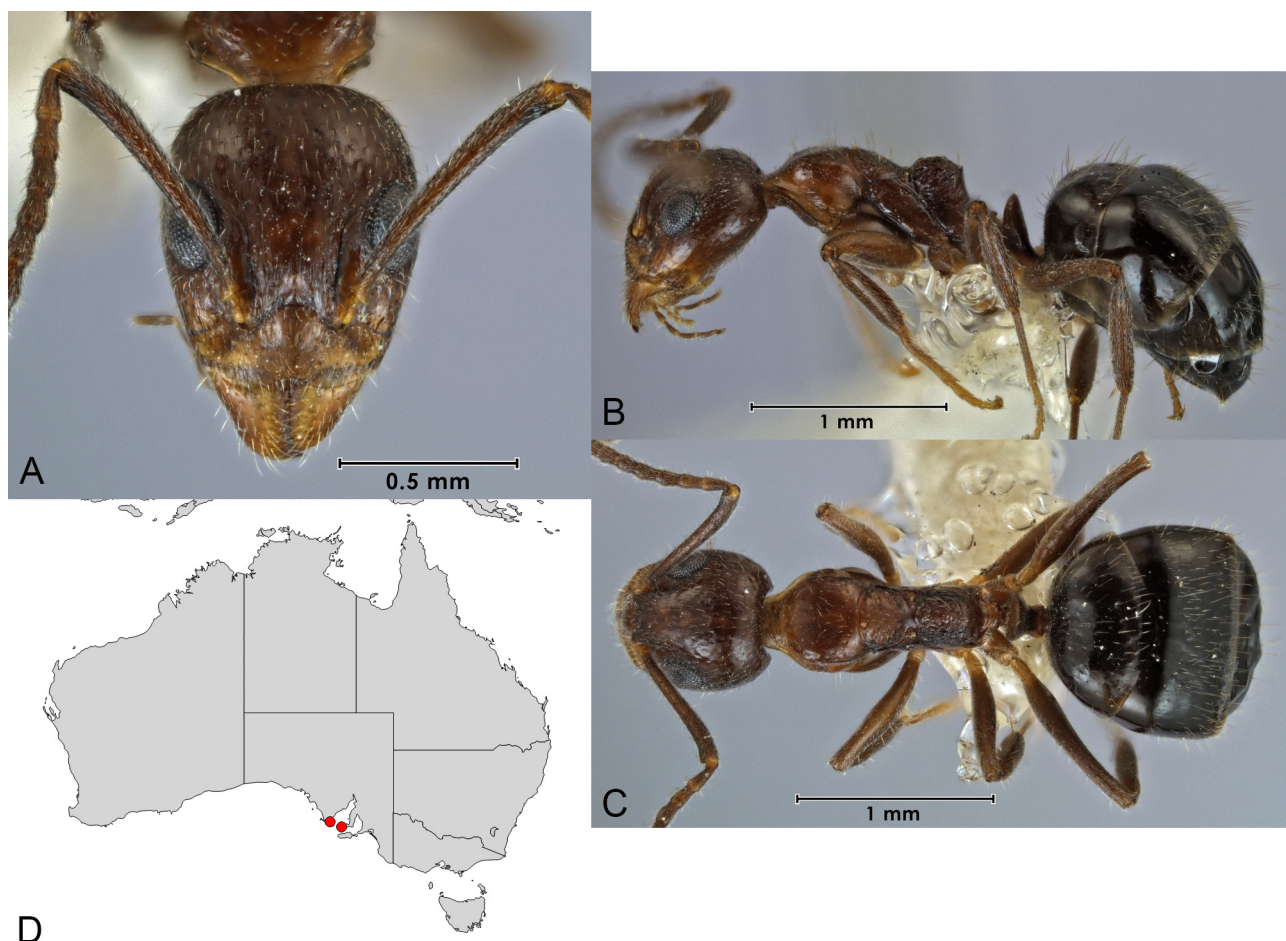
This species differs from *D. kathae* in that the surfaces of the head and dorsum of the pronotum of *D. rutilus* are smooth and shiny; whereas the surfaces of the head and dorsum of the pronotum of *D. kathae* are finely reticulate and matte.

This species is morphologically similar to *D. kathae* and *D. parvus*; for a discussion of differences see **Comments** under *D. kathae*.

**Worker description.** See Fig. 22. All specimens closely match the one figured.

**Measurements** (n=3). CI 86–88; EI 33–34; EL 0.25–0.28; HL 0.87–0.97; HW 0.75–0.85; ML 1.18–1.29; MTL 0.64–0.70; PronI 61.50–62.76; PronW 0.46–0.53; SI 108–113; SL 0.85–0.93.

**Comments.** This rare species is known from only three specimens collected from two locations, one near Port Lincoln and the other at the tip of Yorke Peninsula, South Australia. Nothing is known of its biology.



**FIGURE 22.** *Dolichoderus rutilis*, holotype worker (ANIC32-061185). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

### ***Dolichoderus scabridus* Roger**

(Fig. 23)

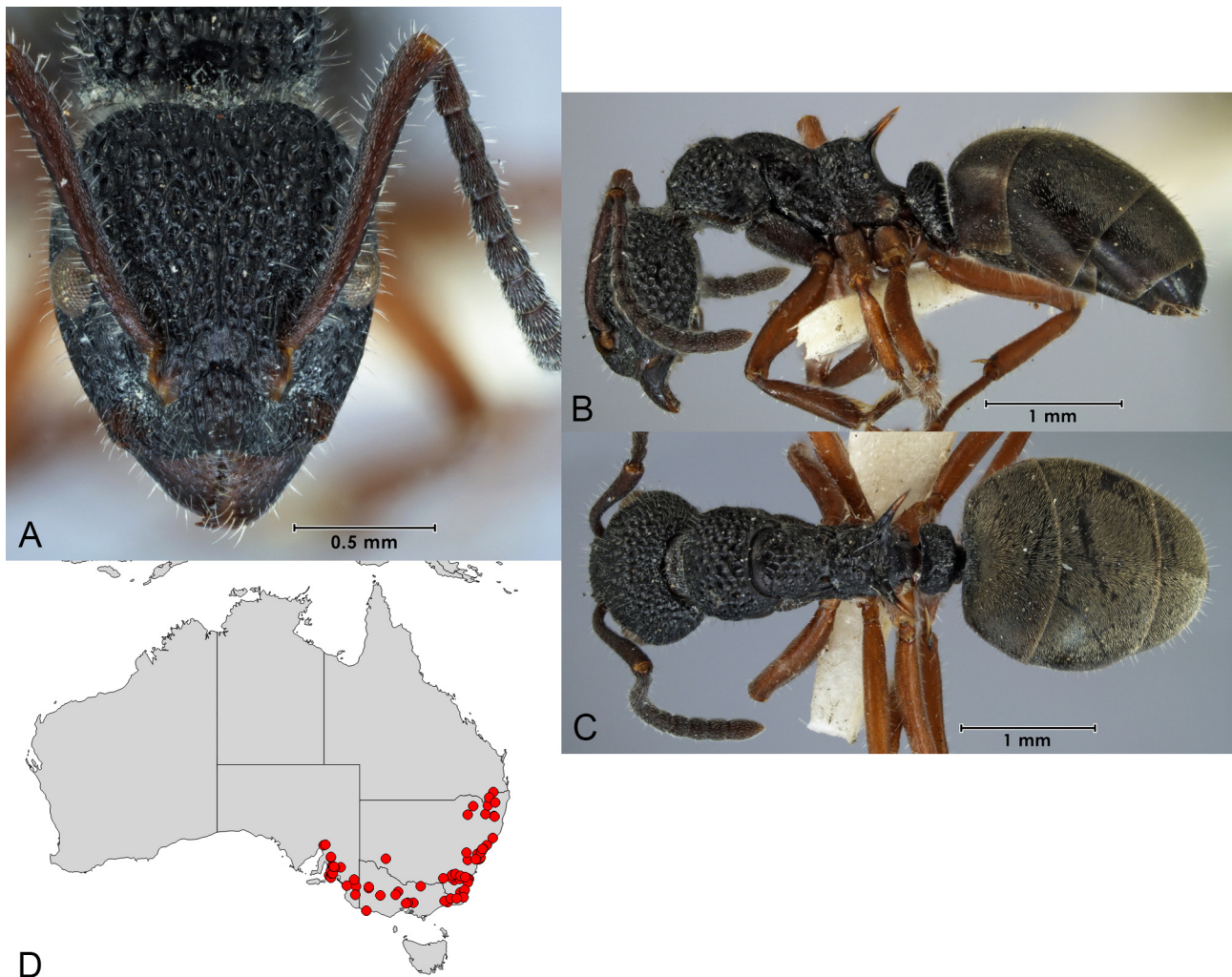
*Dolichoderus scabridus* Roger, 1862: 244.

*Polyrhachis foveolatus* Lowne, 1865: 334 (junior synonym of *scabridus* by Mayr 1876:80).

*Dolichoderus scabridus ruficornis* Santschi, 1916: 175 (**new synonym**).

**Types.** *Dolichoderus scabridus*: "Several" worker syntypes from Australia (specific locality not given) (Roger 1862:244, probably in BMNH). *Polyrhachis foveolatus*: Unspecified material from Sydney, New South Wales (BMNH). *Dolichoderus scabridus ruficornis*: 3 worker syntypes from Australia (specific locality not given) (NHMB).

**Diagnosis.** Pronotum rounded, lacking spines; propodeum with elongate spines directed upward at angle of 45° or less to horizontal plane, the angle between them at least 90°; dorsum of petiolar node broad, base of propodeal spines forming a "U" with a broad concavity connecting their bases (sometimes this region flat or weakly convex); legs yellowish-red in colour, distinctly lighter than the colour of the body.



**FIGURE 23.** *Dolichoderus scabridus*, worker from Tantawangalo Mts., New South Wales (ANIC32-008003). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

This species is most similar to *D. inferus* but differs in having yellowish-red legs. This species is also similar to *D. ypsilon*, *D. rufotibialis* and *D. niger*, but in *D. scabridus* (and *D. inferus*) the petiolar node is broad rather than angular, and the bases of the propodeal spines form a broad "U" rather than a narrowly angled "V" when viewed from the front.

**Worker description.** See Fig. 23. All specimens very similar to that figured with the exception of the antennal scape colour, which varies from red to dark reddish-brown.

**Measurements** (n=5). CI 93–100; EI 19–24; EL 0.26–0.33; HL 1.34–1.47; HW 1.26–1.47; ML 1.89–2.10; MTL 1.10–1.22; PronI 68.58–74.77; PronW 0.91–1.04; SI 95–106; SL 1.30–1.46.

**Material examined.** *Australian Capital Territory*: 9 Km East of Mount Gudgenby, Namadgi National Park (Lepschi,B.J.) (ANIC); Black Mountain (Shattuck,S.O.; Taylor,R.W.) (ANIC); Black Mountain, near CSIRO site (Shattuck,S.O.) (ANIC); Black Mt., Site 1 (Barnett,N.J.) (ANIC); Blundells (Greaves,T.) (ANIC); Blundells [Blundells Flat] (Bruce,W.A.; Greaves,T.) (ANIC); Lees Creek (Greaves,T.) (); Lees Spring (Greaves,T.) (ANIC); nr. Picadilly Circus (Taylor,R.W.) (ANIC); Uriarra [Forest] (collector unknown; Greaves,T.; Greaves,T. & F.G.H.) (ANIC); Woods Reserve, nr. Gibraltar Falls (Naumann,I.D.) (ANIC); *New South Wales*: 2 mi. S of Guyra (Greaves,T.) (ANIC); 23km NW Batemans Bay (Shattuck,S.O.) (ANIC); 2mi. S Guyra (Greaves,T.) (ANIC); 38km SEbyS Mungo (Shattuck,S.O.) (ANIC); 3km SW Morrisset (Gush,T.) (ANIC); 4 mi. S of Deepwater (Greaves,T.) (ANIC); 4.5km N Batemans Bay (Shattuck,S.O.) (ANIC); 4km NE Mt. Wog Wog, 17km SE Bombala (Margules,C.R.) (ANIC); 4km NE Mt. Wog Wog, 17km SE Bombala (Greenslade,P.J.M.) (ANIC); 4mi. S Deepwater (Greaves,T.) (ANIC); 8km SE Ebor (Taylor,R.W.) (ANIC); 9km NE Batemans Bay, West Side Hwy 1,

ca. 0.5km N Durras Rd. (Shattuck,S.O.) (ANIC); Acacia Plat. (Armstrong,J.) (ANIC); Acacia Plateau (Armstrong,J.) (ANIC); Bago Forest (Greaves,T.) (ANIC); Bago Forest, Batlow (Greaves,T.) (ANIC); Bago State Forest (Greaves,T.) (ANIC); Bark Hut, Mt. Kaputar Nat. Pk. (Shattuck,S.O.) (ANIC); Batemans Bay (Billen,J.) (ANIC); Bega (Smith) (ANIC); Botany Bay (Schrader,H.P.) (ANIC); Brisbane Water National Park (Gush,T.) (ANIC); Bundeena (Ward,P.S.) (ANIC); Clyde Mountain, Eastern fall (Colless,D.H.) (ANIC); Clyde Mountain, Western fall (Colless,D.H.) (ANIC); Como (collector unknown; Nicholson) (ANIC); Congo, 8km SE by E of Moruya (Upton,M.S.) (ANIC); Cowan (Taylor,R.W.) (ANIC); Dawsons Spring, Mt. Kaputar National Park (Shattuck,S.O.) (ANIC); East Boyd State Forest, Goanna Rd., 56km SE Bombala (Lambkin,C. & Starick,N.) (ANIC); Ebor (Lowery,B.B.) (ANIC); Governor, Mt. Kaputar, Narrabri (Room,P.M.) (ANIC); Gwydir Hwy, 5km E Warialda (Reichel,H.L.M.) (ANIC); Leumeah (Lowery,B.B.) (ANIC); Lidsdale S.F., Lithgow (York,A.) (ANIC); Maroota State Forest (Gush,T.) (ANIC); Menai (collector unknown; Freeland,J.) (ANIC); Mount Ku-ring-gai (Lowery,B.B.) (ANIC); Mumbulla State Forest (Gush,T.) (ANIC); nr. Georges River, Leumeah (Imai,H.T.) (ANIC); Olney State Forest (Gush,T.) (ANIC); Runnyford Ck., Nelligen (collector unknown; Liepa,Z.) (ANIC); South Black Ra., Tallaganda National Park., 14.5km fr. Hoskinstown (Lambkin,C. & Starick,N.) (ANIC); Sydney (Lea) (ANIC); Tantawangalo Mts. (collector unknown; Hill,G.F.) (ANIC); Tomago (Jackson,G.P.) (ANIC); Wang Wauk State Forest (Gush,T.) (ANIC); Whiporie, 55km S Casino (York,A.) (ANIC); Wild Cattle Flat (collector unknown) (ANIC); Woronora (Bason,M.L. & Coutman,J.J.) (ANIC); *Queensland*: Girraween Nat. Park, Bald Rock Creek Camping Area (Shattuck,S.O.) (ANIC); Girraween NP, nr. The Pyramids (Reichel,H.L.M.) (); *South Australia*: Alligator Gorge, Flinders Ra. (Greenslade,P.J.M.) (ANIC); Belair (Greenslade,P.J.M.) (ANIC); Belair Nat. Pk. (Greenslade,P.J.M.) (ANIC); Bordertown (McArthur,A.J.) (SAMA); Bridgewater (Baker,G.F.; Baker,G.H.; Greenslade,P.J.M.) (ANIC); Clare (McAreavey,J.M.) (ANIC); Cleland, Mt. Lofty Ra. (Yeatman,E.) (ANIC); Coorong-Keith, 5km SSW Bunbury (Greenslade,P.J.M.) (ANIC); Cox Scrub National Park (McArthur,A.J.) (SAMA); Gawler, Hale National Park. (Greenslade,P.J.M. & Forrest,J.) (ANIC); Hale National Park. (Greenslade,P.J.M.) (ANIC); Jupiter Creek, 4km W Echunga (Shattuck,S.O.) (ANIC); Kangaroo Creek Reservoir near Athelstone (Lowery,B.B.) (ANIC); Kuitpo (Greenslade,P.J.M.) (ANIC); Long Gully, Belair National Park (McQuillan,P.B.) (SAMA); Mt. Bold Reservoir, SE of Adelaide (Ward,P.S.) (ANIC); Mt. Crawford Forest Reserve (Tuckwell,R.) (SAMA); Mt. Lofty (Greenslade,P.J.M. & Kirkby,C.A.) (ANIC); Mt. Remarkable (Greenslade,P.J.M.) (ANIC); Mt. Remarkable Summit (Greenslade,P.J.M.) (ANIC); Mt. Remarkable, Flinders Ranges (Greenslade,P.J.M.) (ANIC); Myponga (collector unknown; Elston,A.H.) (ANIC); Ngarkat Conservation Park, between Bucks camp well and Box Flat (Mathews,E.G. & Forrest,J.A.) (SAMA); Ngarkat Conservation Park, between north boundary and 12km NW (Forrest,J.A.) (SAMA); Para Wirra Recreation Park (Gross,G.F.) (SAMA); Para Wirra [as Parrawirra] (Greenslade,P.J.M.) (ANIC); Roachdale Reserve, near Williamstown (Szent-Ivány,J.J.H.) (SAMA); S Flinders Ra., Black Hill (Greenslade,P.J.M.) (ANIC); Sevenhill (Lowery,B.B.) (ANIC); Victor Harbour (Greenslade,P.J.M.) (ANIC); *Victoria*: 50km NNE Orbost nr. Goongerah, Bendoc-Bonang S.F., Bonang Highway (Lambkin,C. & Starick,N.) (ANIC); Bendigo (Froggatt,W.W.; McAreavey,J.) (ANIC); Buchan (collector unknown) (ANIC); Coburg (collector unknown; Spry,F.P.) (ANIC); Coopracambra NP, 26km NNE Cann River (Lambkin,C. & Starick,N.) (ANIC); Greensborough (McAreavey,J.) (ANIC); Kiata (C.H.B.) (ANIC); Maldon (Goudie,J.C.) (ANIC); Portland (Lowery,B.B.) (ANIC); Riddell (collector unknown; Hill,G.F.) (ANIC); Ryans Lookout, Warby Range State Park (Shattuck,S.O.) (ANIC); Salt Lake track, Little Desert National Park (Shattuck,S.O.) (ANIC); Stawell (C.H.B.) (ANIC); Youngs Creek, 12km N Orbost [Young Creek] (Colless,D.H. & Liepa,Z.) (ANIC).

**Comments.** *Dolichoderus ruficornis* was established as a subspecies of *D. scabridus*. Its type specimens differ from typical *D. scabridus* in having the antennal scapes red rather than dark reddish-brown. No other differences could be found between these two forms during this study and given the minor overall differences in antennal colour both forms are here considered to belong to a single species. It should be noted, however, that the *D. ruficornis* form predominates at lower elevations in South Australia although it has also been found in Victoria (a single collection from Greensborough) while the *D. scabridus* form from South Australia is generally found at higher elevation sites in the Flinders Ranges. Across Victoria and New South Wales the *D. scabridus* form predominates.

*Dolichoderus scabridus* is one of the most frequently encountered species within the genus, occurring from north-eastern New South Wales south and west to the Adelaide, South Australia region. It is found in a wide range of forested habitats ranging from mallee and spinifex on sand through dry sclerophyll to wet sclerophyll; they have

also been found in pine plantations. Workers forage in columns on the ground, on rotten logs and on tree trunks. Nests occur in rotten branches, logs and stumps on the ground, under bark and in soil under rocks.

The following literature has examined this taxon: Clark (1930) (male description), Wheeler and Wheeler (1951) (larval description), Cavill and Hinterberger (1960a) (glandular compounds), Cavill and Hinterberger (1960b) (glandular compounds), Crozier (1970) (karyotype), Wheeler and Wheeler (1974) (larva); Imai, Crozier and Taylor (1977) (karyotype), Blum and Hermann (1978) (venom and venom apparatus) and Freeland *et al.* (1982) (behaviour, morphology).

### ***Dolichoderus scrobiculatus* (Mayr)**

(Fig. 24)

*Hypoclinea scrobiculata* Mayr, 1876: 80.

**Types.** 7 worker syntypes from Peak Downs [approx. 22°56'S 148°05'E], Queensland (3 in MHNG, 4 in NHMW).

**Diagnosis.** Pronotum and propodeum lacking spines; posterior face of propodeum strongly concave, separated from the dorsal face by a distinct carina; sculpturing on head consisting of large, shallow to moderately deep fovea; pubescence on first gastral tergite abundant, the individual hairs overlapping; dorsum of pronotum heavily sculptured, the surface dull; gaster similar in colour to body (both dark brown to black).

This species resembles *D. clusor* and *D. turneri*. It can be distinguished from *D. clusor* by the presence of heavy sculpturing on the pronotum and from *D. turneri* by the similarly coloured gaster and body (both being dark brown to black in *D. scrobiculatus* while in *D. turneri* the gaster is lighter in colour than the body).

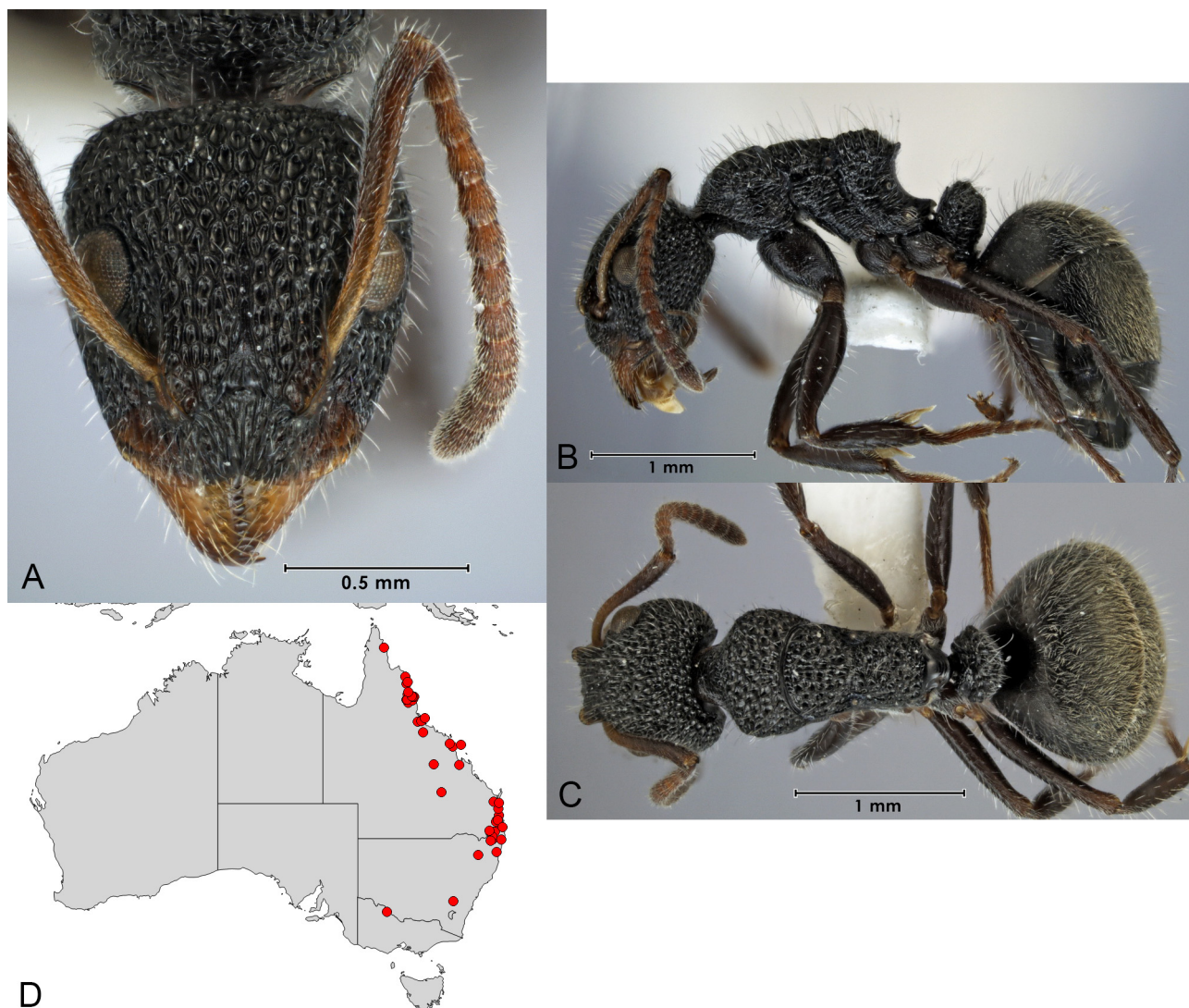
**Worker description.** See Fig. 24. All known specimens closely resemble the figured individual.

**Measurements** (n=5). CI 94–96; EI 26–28; EL 0.26–0.29; HL 1.04–1.12; HW 0.98–1.07; ML 1.39–1.51; MTL 0.79–0.85; PronI 74.95–80.10; PronW 0.76–0.84; SI 96–100; SL 0.94–1.03.

**Material examined.** *New South Wales*: 25km NW Kyogle (Greenslade,P.J.M.) (ANIC); 4mi. S Woodburn, SW of Ballina (Liepa,Z.) (ANIC); 55km S Grafton (Greenslade,P.J.M.) (ANIC); 55km SSW Casino (Greenslade,P.J.M.) (ANIC); 5km SW Urbenville (Greenslade,P.J.M.) (ANIC); Acacia Plat. (Armstrong,J.) (ANIC); Round Mountain, Cabarita (Lowery,B.B.) (ANIC); Tabulam (collector unknown) (ANIC); Tabulam, on Clarence R., 36m. W of Lismore (Kearney,E.) (ANIC); Urbenville (Armstrong,J.) (ANIC); Whiporie, 55km S Casino (York,A.) (ANIC); Yarrowyck Mt. (collector unknown) (ANIC); Yarrowyck Mt., New England District? (Frazier,C.W.) (ANIC); *Queensland*: 1km NW Seaforth (Gillison,A.) (ANIC); 3.5 km SW by S Mt. Baird (Feehan,J.E.) (ANIC); 3.5km SW Seaforth (Gillison,A.) (ANIC); 45km NW Townsville (Greenslade,P.J.M.) (ANIC); 4km S Mingela (Lowery,B.B.) (ANIC); 60km N Townsville (Lowery,B.B.) (ANIC); 6km SSW North Tamborine, Witches Falls National Park (Shattuck,S.O.) (ANIC); Blair Athol Mine (Houston,W.) (ANIC); Bribie Island (collector unknown; Hacker,H.) (ANIC); Cairns (Wheeler) (SAMA); Cairns district (Lea,A.M.) (SAMA); Carnarvon Gorge National Park (Shattuck,S.O.) (ANIC); Cooloola (Greenslade,P.J.M.) (ANIC); Cooloola, Kabali E (Greenslade,P.J.M.) (ANIC); Cooloola, Kabali W (Greenslade,P.J.M.) (ANIC); Cooloola, Mt. Bileuilam [Mt. Bilewilam] (Greenslade,P.J.M.) (ANIC); Cooloola, Noosa R. (Greenslade,P.J.M.; Greenslade,P.J.M. & Plowman,K.) (ANIC); Cooloola, Warrawonga (Greenslade,P.J.M.) (ANIC); Cooloola, Wide Bay (Greenslade,P.J.M.) (ANIC); Goodna (Lowery,B.B.) (ANIC); Gordonvale (collector unknown; Burns,A.N.) (ANIC); Herberton (collector unknown; Mjoberg) (ANIC); Iron Range (Taylor,R.W. & Feehan,J.) (ANIC); James Cook University Campus, N of Cairns (Shattuck,S.O.) (ANIC); Kuranda (Greaves,T.; Lowery,B.B.; Wheeler) (ANIC); Lorna Vale nr. Marlborough (Kohout,R.J.) (ANIC); Mackay (Turner) (ANIC); Mossman (Geeves,N.) (ANIC); Mt. Coot-tha (Lowery,B.) (ANIC); Mt. Coot-tha, Brisbane (Lowery,B.B.) (ANIC); Mt. Molloy (Lowery,B.B.) (ANIC); Mulgrave Forestry Road (Ward,P.S.) (ANIC); nr. Parada (Taylor,R.W. & Feehan,J.; Taylor,R.W. & Feehan,J.E.) (ANIC); Paluma (Gray,M.) (ANIC); Penrith Island, Great Barrier Reef (Heatwole,H.) (ANIC); Perigian Beach (Kohout,R.J.) (ANIC); Rocky Islet, Great Barrier Reef (Heatwole,H.) (ANIC); Sanford, Brisbane (Lowery,B.B.) (ANIC); SF 958 Bauple (House,A.P.N. & Vanderwoude,C.) (ANIC); Shiptons Flat (Feehan,J.E.) (ANIC); W Burleigh [Burleigh Heads] (Liepa,Z.) (ANIC); Wacol, Brisbane (Lowery,B.B.) (ANIC); Yarrabah Mission nr. Cairns (Taylor,R.W.) (ANIC); *Victoria*: Swan Hill (collector unknown; Taylor,F.H.) (ANIC).

**Comments.** *Dolichoderus scrobiculatus* is the only species of the genus common in the Australian wet tropics,

being found from Cape York Peninsula south to north-eastern New South Wales. It occurs in savannah woodlands to rainforests and nests in tussocks and under rocks. Workers commonly forage on low vegetation. The two southern outlier records, from southern New South Wales and Victoria, were made many years ago and now collections have been made since. The status of this species in these areas seems doubtful.



**FIGURE 24.** *Dolichoderus scrobiculatus*, worker from Perigian Beach, Queensland (ANIC32-061238). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

***Dolichoderus semiorbis* sp. n.**

(Fig. 25)

**Types.** Holotype worker from Eneabba South Nature Reserve, 29°56.33'S 115°16.27'E, April 2004, R. Dunn, pitfall trap, 1.5m shrubland, deep sand on sand dune (ANIC, ANIC32-059627).

**Diagnosis.** Sculpturing on head consisting of large, shallow to moderately deep fovea; pronotum and propodeum lacking spines; posterior face of propodeum strongly concave, separated from the dorsal face by a distinct carina; pubescence on first gastral tergite sparse, if present hairs not overlapping; tibiae lacking erect hairs.

This species most closely resembles *D. albamaculus* however it lacks erect hairs on its tibiae, and although possesses a distinct carina on the posterior face of the propodeum, it does not form a lip that projects vertically above the dorsum as it does in *D. albamaculus*. This species can be distinguished from *D. omicron*, *D. canopus*, *D. nigricornis* and *D. formosus* by the lack of erect hairs on its tibiae, and can be distinguished from *D. clusor*, *D.*

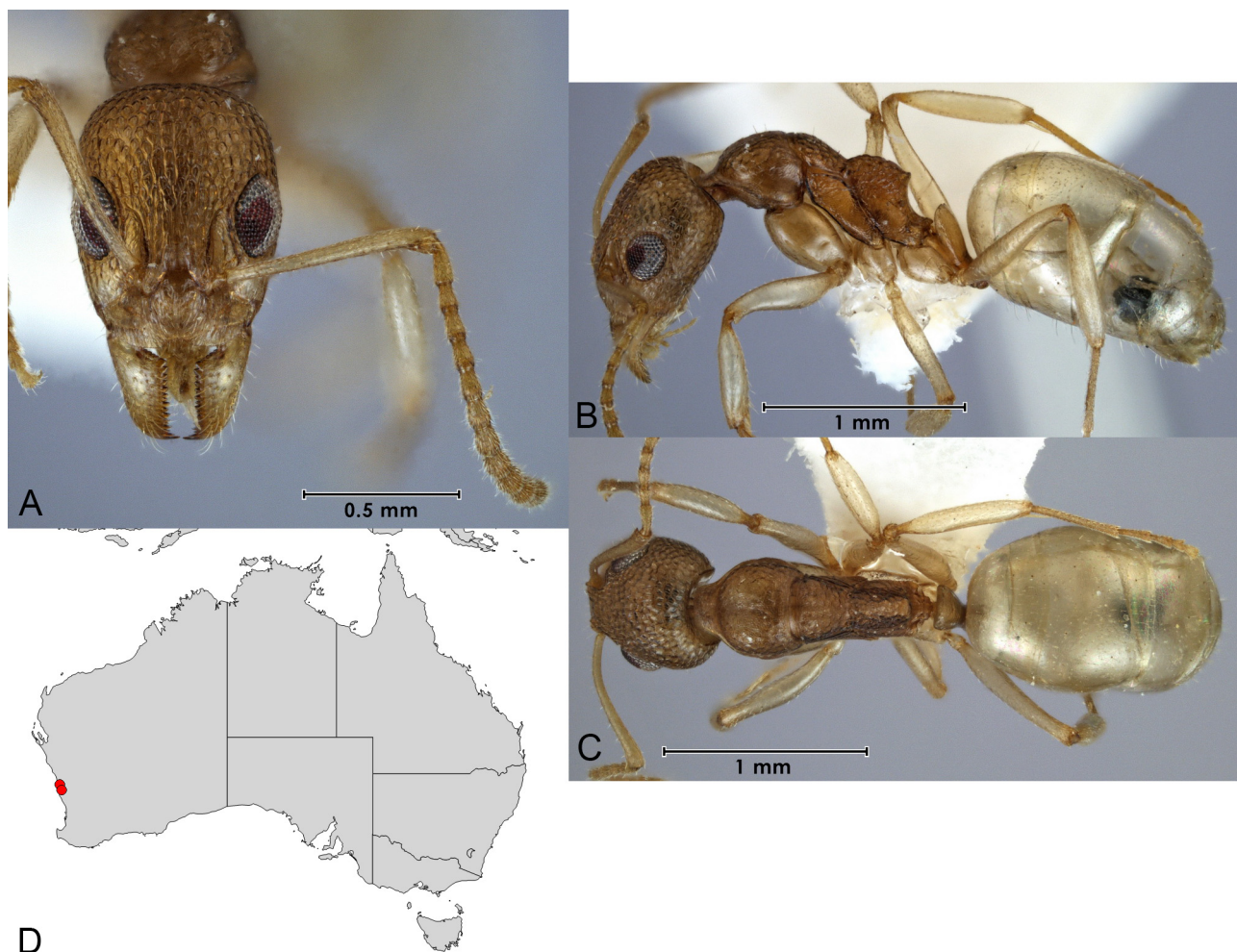
*scrobiculatus*, and *D. turneri* (which have abundant pubescence on the first gastral tergite) by the sparse or absent pubescence on the first gastral tergite.

**Worker description.** See Fig. 25. All known specimens show little difference from the one figured.

**Measurements** (n=1). CI 78; EI 41; EL 0.28; HL 0.86; HW 0.67; ML 1.14; MTL 0.59; PronI 71; PronW 0.47; SI 105; SL 0.70.

**Material examined.** *Western Australia*: Eneabba (Sartori, M. & Stone, R.) (JDMC); Eneabba Region (Gove, A. & McCoy, N.) (JDMC).

**Comments.** *Dolichoderus semiorbis* is known from a few specimens collected in low shrubland on a sand dune along the Western Australian coast.



**FIGURE 25.** *Dolichoderus semiorbis*, holotype worker (ANIC32-059627). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

### ***Dolichoderus turneri* Forel**

(Fig. 26)

*Dolichoderus turneri* Forel, 1902: 462.

**Types.** 20 worker syntypes from Mackay [approx. 21°09'S 149°11'E], Queensland (1 in NHMB, 1 in MCZC, 3 in ANIC, 15 in MHNG).

**Diagnosis.** Sculpturing on head consisting of large, shallow to moderately deep fovea; pronotum and propodeum lacking spines; dorsum of pronotum heavily sculptured, the surface dull; posterior face of propodeum strongly concave, separated from the dorsal face by a distinct carina; first gastral tergite with abundant pubescence,

the individual hairs overlapping; gaster much lighter in colour (dull yellow) compared to body (dark brown to black).

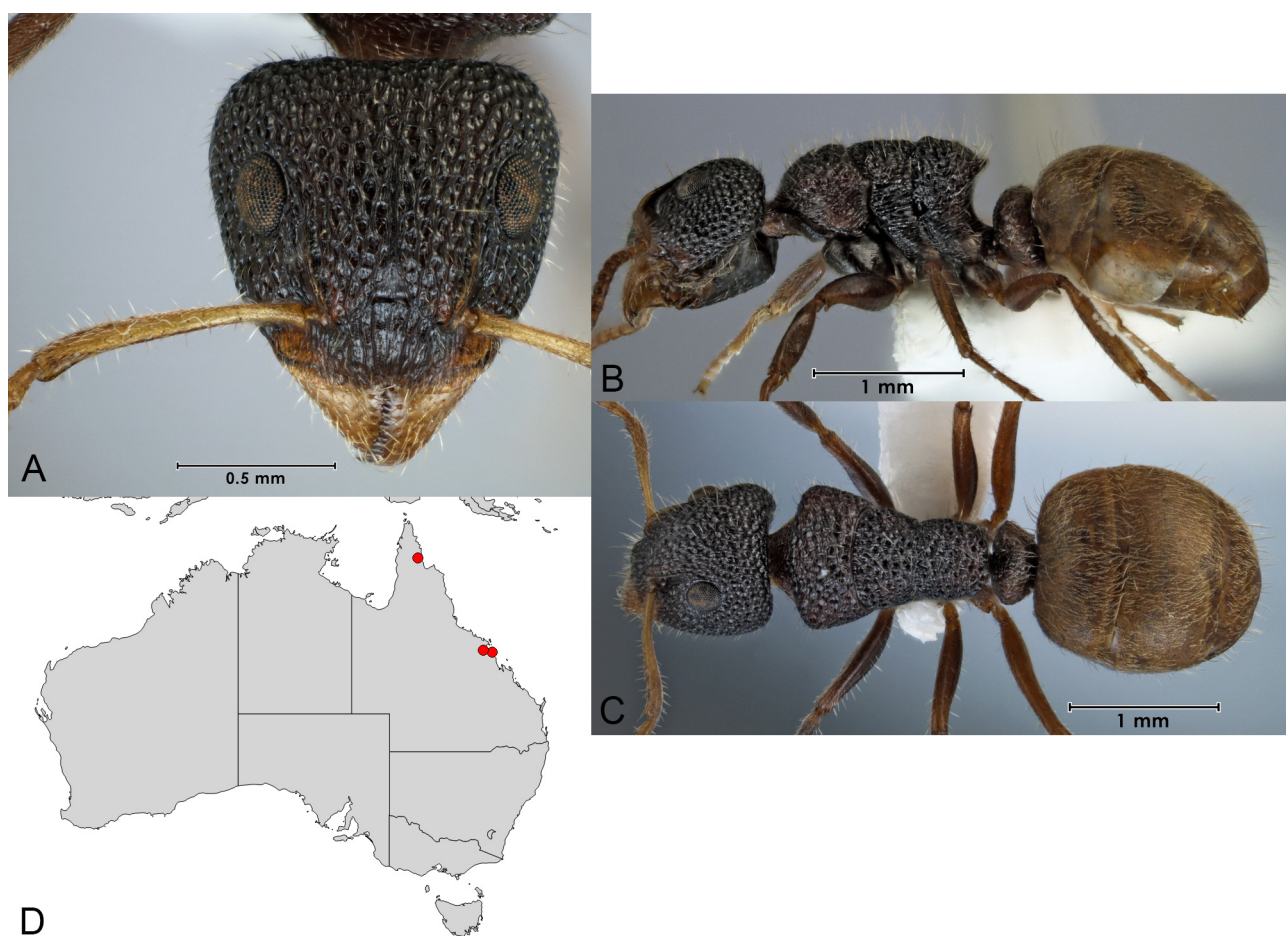
This species is easily confused with *D. scrobiculatus* but differs in having a distinctively lighter coloured gaster (dull yellow) than the rest of the body (dark brown) whereas the entire body of *D. scrobiculatus* is uniformly coloured dark brown to black.

**Worker description.** See Fig. 26. The known specimens are morphologically uniform and show minimal variation.

**Measurements** (n=5). CI 95–107; EI 22–26; EL 0.25–0.27; HL 1.05–1.08; HW 1.01–1.15; ML 1.37–1.45; MTL 0.77–0.84; PronI 78.89–89.97; PronW 0.81–1.03; SI 78–97; SL 0.89–0.98.

**Material examined.** *Queensland*: 15km WNW Bald Hill, McIlwraith Ra. (Naumann,I.D.) (ANIC); Eungella Nat. Pk., Mackay (Lowery,B.B.) (ANIC); Mackay (collector unknown; Turner,G.) (ANIC).

**Comments.** *Dolichoderus turneri* occurs in dry sclerophyll woodlands along coastal Queensland. It is an uncommon species and has been collected only a handful of times.



**FIGURE 26.** *Dolichoderus turneri*, worker from Mackay, Queensland (ANIC32-061285). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

### *Dolichoderus ypsilon* Forel

(Fig. 27)

*Dolichoderus scabridus ypsilon* Forel, 1902: 461 (raised to species by Forel, 1907: 284, Clark, 1930: 258).

**Types.** 4 worker syntypes from Perth [approx. 31°57'S 115°51'E], Western Australia (1 in ANIC, 3 in MHNG); 1 worker syntype from Lion Hill [approx. 31°53'S 116°12'E], South Australia (MCZC).

**Diagnosis.** Pronotum rounded, lacking spines; propodeum with elongate spines directed upward at angle of

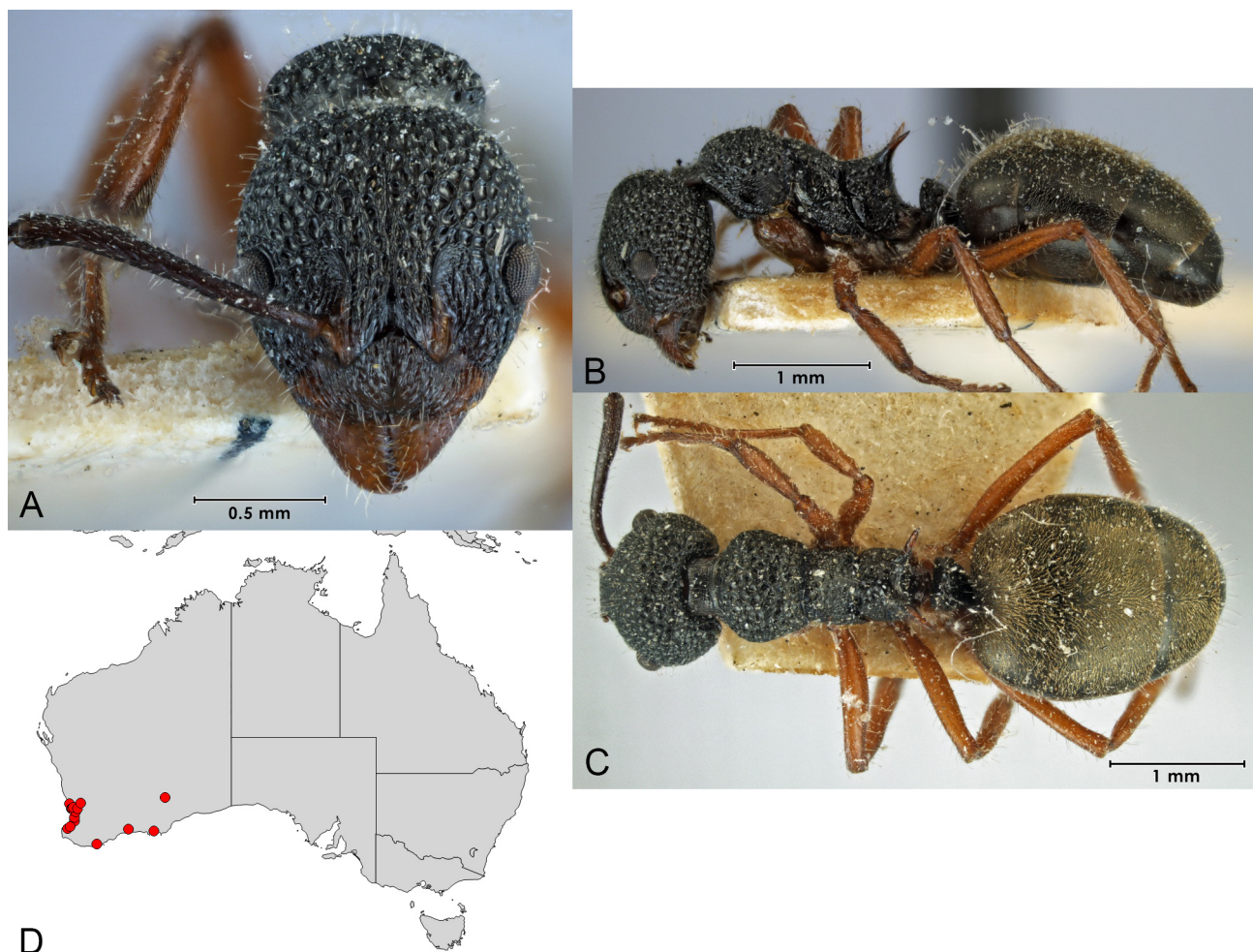


45° or less to horizontal plane, the angle between them at least 90°; dorsum of petiolar node angular, base of propodeal spines forming a "V" with a narrowly rounded angle connecting their bases; legs entirely light red or orange.

This species can be distinguished from *D. inferus* and *D. scabridus* by the dorsum of its petiolar node being angular rather than broad, and the base of the propodeal spines forming a narrowly angled "V" rather than a broad "U" when viewed from the front. Additionally, *D. ypsilon* can be distinguished from *D. rufotibialis* and *D. niger* by the distinctive colour of its entirely red or orange legs.

**Worker description.** See Fig. 27. Generally as figured but with legs more yellow (slightly less red) in some individuals. Also, a few specimens have the sculpturing on the mesosomal dorsum reduced medially, this region being nearly smooth (sculpturing is as figured laterally in these individuals).

**Measurements** (n=5). CI 92–96; EI 20–25; EL 0.21–0.29; HL 1.14–1.29; HW 1.05–1.22; ML 1.60–1.81; MTL 0.95–1.15; PronI 69.93–74.15; PronW 0.76–0.90; SI 109–118; SL 1.22–1.36.



**FIGURE 27.** *Dolichoderus ypsilon*, syntype worker (ANIC32-015061). A. Front of head; B. Side of body; C. Top of body; D. Distribution of material examined.

**Material examined.** *Western Australia:* 28mi. ESE Ravensthorpe (Greaves,T.) (ANIC); 32km S Dwellingup (Naumann,I.D. & Cardale,J.C.) (ANIC); 45mi. E Esperance (Lowery,B.B.) (ANIC); 9mi. W Zanthus (Taylor,R.W.) (ANIC); Alcoa via Jarrahdale (collector unknown) (JDMC); Armadale (Clark,J.) (ANIC); Australind (Heterick,B.E.) (JDMC); Beechboro (Lowery,B.B.) (ANIC); Boyanup (collector unknown) (ANIC); Canning Reservoir, 11km E Armadale (Weir,T.A.) (ANIC); Dwellingup (Majer,J.D.) (ANIC, JDMC); Gleneagle (Springett,J.) (ANIC); Hope Valley (Heterick,B.E.) (JDMC); Jarrahdale (Douglas,A.M. & Douglas,M.J.) (ANIC); Kalamunda (Greaves,T.) (ANIC); Kings Park (Lowery,B.B.) (ANIC); Ludlow (Clark,J.) (ANIC); Mt. Cooke (Heterick,B.E.) (JDMC); Mundaring (Clark,J.) (ANIC); nr. Mundaring (Springett,J.) (ANIC); Perth (Chase;

Clark, J.; Greaves, T.) (ANIC); Pinjarrah- Williams Rd. (Heterick, B.E.) (JDMC); Pink Lake (Esperance) (Heterick, B.E.) (JDMC); Swan River (Clark, J.) (ANIC); Yanchep (Greaves, T.) (ANIC); Yarra Rd. (off Brookton Hwy) (Heterick, B.E.) (JDMC).

**Comments.** This species is restricted to south-west Western Australia. The male was described by Forel (1907).

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