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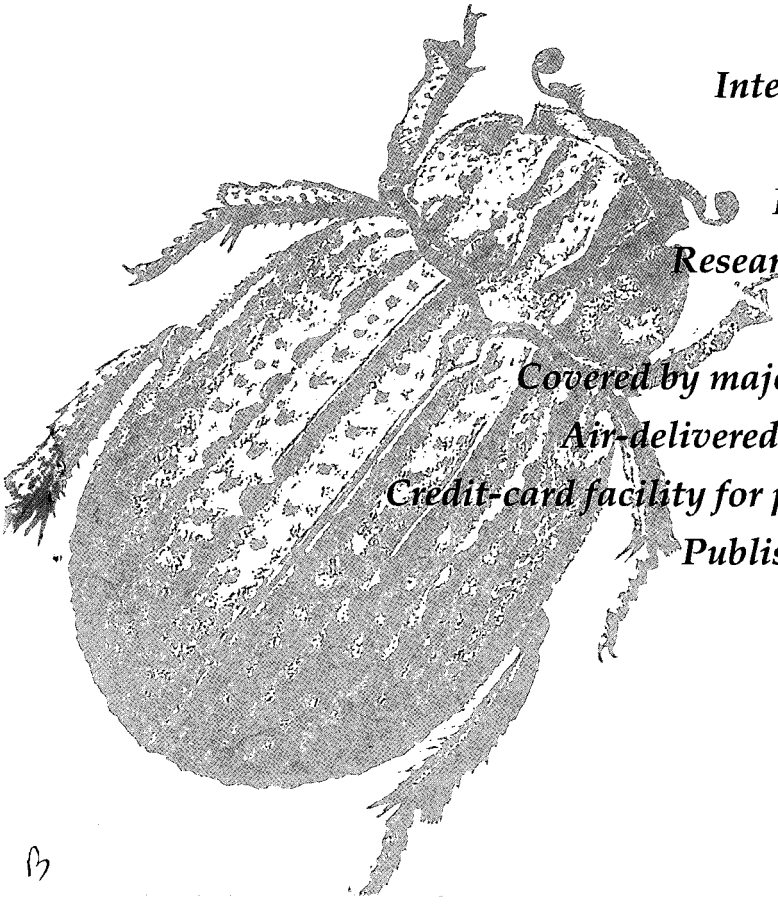

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With my best wishes

Revision of the *Iridomyrmex calvus* Species-group (Hymenoptera : Formicidae)

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Abstract

The *calvus* species-group of the ant genus *Iridomyrmex* Mayr is defined for the first time and revised at the species level. Fifteen species are placed in three complexes within the group, with eleven species newly described. The group consists of the following species: *I. albitarsus* Wheeler; *I. anderseni*, sp. nov.; *I. anteroinclinus*, sp. nov.; *I. argutus*, sp. nov.; *I. calvus* Emery; *I. cappoinclinus*, sp. nov.; *I. cephaloinclinus*, sp. nov.; *I. hesperus*, sp. nov.; *I. mimulus*, sp. nov.; *I. notialis*, sp. nov.; *I. obsidianus* Emery; *I. occiduus*, sp. nov.; *I. prismatis*, sp. nov.; *I. rufoinclinus*, sp. nov.; and *I. viridigaster* Clark. A lectotype is designated for *I. calvus* Emery. A key to species is included and distributions and biologies are summarised.

Introduction

The ant genus *Iridomyrmex* Mayr was recently redefined and its status within the subfamily Dolichoderinae clarified (Shattuck 1992*a*, 1992*b*). Unfortunately, the species-level classification within the genus is currently poorly understood and identifications are difficult. In the present study 15 species of *Iridomyrmex* are examined and grouped together in the newly defined *calvus* group. The group is composed of three complexes and is distributed throughout Australia, as well as New Caledonia, Norfolk Island and Lord Howe Island. Although the group is widespread, most species are infrequently collected and are known from only a limited number of specimens. Morphologically, the species are fairly diverse for members of *Iridomyrmex*, showing variation in overall size and shape, body colour and pilosity. Biologically, little detailed information is available for most species; however, most are probably general predators/scavengers and they are known to occupy a wide range of habitats. Most species nest in soil, although some nest in dead wood or arboreally. Diurnal foraging seems to be the rule, although several species decrease or stop foraging during the middle of the day and restrict activity to nest excavation and maintenance (even during relatively cool weather).

Taxonomic Status of *Iridomyrmex* and Diagnosis of the *Iridomyrmex calvus* Group

For the current status and identification of *Iridomyrmex*, see Shattuck (1992*a*, 1992*b*, 1993). The *I. calvus* group, here proposed for the first time, contains four previously described species together with 11 newly described. The four earlier species have not been closely associated prior to this study. Species placed in the group can be diagnosed by the configuration of the frontal carinae, which are curved throughout their entire length (Fig. 1), and are never sinuate (Figs 2, 3). An apparently related species group containing *I. vicinus* Clark is superficially similar to the *I. calvus* group, but has the frontal carinae arched posteriorly and anteriorly and approximately straight medially, rather than being arched throughout their length.

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Species Complexes of the *I. calvus* Group

Members of the *I. calvus* group form three distinct sets of species, referred to here as the *calvus*, *rufoinclinus* and *viridigaster* complexes. The diagnosis and composition of these complexes are as follows (for definitions of abbreviations, see 'Methods and Abbreviations' below).

calvus complex: petiole strongly inclined anteriorly but with a distinct anterior face (Fig. 11); propodeum generally expanded dorsally into a uniform convex arch (Figs 9, 11), occasionally lower (Fig. 7); overall body size generally smaller than in other complexes (HW < 1·13 mm, SL < 1·02 mm (Fig. 5), PnL + ML + PpL < 1·75 mm, HTL < 1·29 mm). Small to medium, yellowish or brownish species of wetter habitats in southern Australia, Norfolk Island, Lord Howe Island and New Caledonia. Included taxa: *I. albitarsus*, *I. argutus*, *I. calvus*, *I. mimulus*, *I. notialis*, *I. obsidianus*, *I. occiduus*, *I. prismatis*.

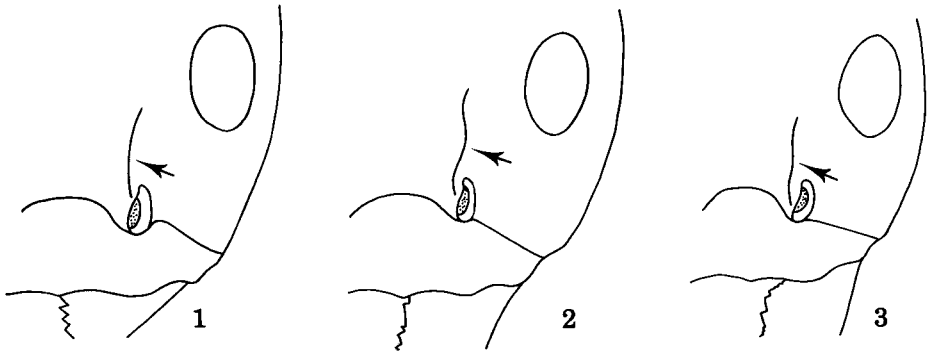
rufoinclinus complex: petiole strongly inclined anteriorly and with the anterior face reduced and sometimes essentially absent (Fig. 29); propodeum generally low and often with the mid-dorsal region approximately flat (Figs 31, 33), higher and rounded in one taxon (Fig. 29); central projection of anterior clypeal margin even with, or more commonly anterior to, an imaginary line drawn between the anterior-most points of the medio-lateral convexities; posterior and lateral surfaces of head (in full face view) with erect hairs; gula and dorsum of mesosoma and petiole with elongate erect hairs; legs with elongate erect hairs present on all surfaces of femora and tibiae; overall body size generally larger than in the *calvus* complex (HW > 1·04 mm, SL > 0·90 mm (Fig. 5), PnL + ML + PpL > 1·75 mm, HTL > 1·30 mm). Large, reddish species of open habitats in northern Australia. Included taxa: *I. anteroinclinus*, *I. cappoinclinus*, *I. cephaloinclinus*, *I. rufoinclinus*.

viridigaster complex: petiole moderately to strongly inclined anteriorly but with a distinct anterior face (Fig. 25); propodeum expanded dorsally into a uniform to weakly angular convex arch (Fig. 23); central projection of anterior clypeal margin posterior to an imaginary line, or less commonly even with a line, between the anterior-most points of the medio-lateral convexities; overall body size generally larger than in the *calvus* complex (HW > 1·07 mm (Fig. 5), PnL + ML + PpL > 1·80 mm, HTL > 1·30 mm). Medium to large, reddish species of the southern arid zone of Australia. Included taxa: *I. anderseni*, *I. hesperus*, *I. viridigaster*.

Methods and Abbreviations

Pilosity Characters

The presence or absence of erect or suberect hairs on the scapes and legs varies among the species within this group. In this study, the regions utilised to determine the presence of erect or suberect hairs



Figs 1–3. *1*, Frontal carinae of *I. notialis* (Queanbeyan, N.S.W.) (*I. calvus* species-group); *2*, Frontal carinae of *I.* sp. (Mt Gunson, SE. of Woomera, S.A.) (*I. discors* species-group); *3*, Frontal carinae of *I.* sp. (Thomas R., 23 km NW. by W. of Mt Arid, W.A.) (*I. hartmeyeri* species-group).

exclude the extreme proximal or distal sections of the segment under consideration. The abundance and distribution of erect pilosity on the head includes only those hairs found on the lateral margin when the head is viewed in full face view (e.g. those shown in Fig. 22). Hairs present on the dorsal surface between the compound eyes and frontal carinae are excluded.

Morphometric Characters

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. All measurements were recorded in thousandths of millimetres, but are expressed here to the nearest hundredth. All head measurements (EL, EW, HL, HW) were taken in full face (dorsal) view without moving the head between measurements. Longitudinal mesosomal length measurements (PnL, ML, PpL) were taken in lateral view, parallel to a line ('measuring axis') drawn between the anterior-most point of the pronotal collar and the posterior-most point of the propodeal process dorsal of the petiolar insertion.

Figures showing the following measurements can be found in Shattuck (1993): EL, EW, HL, HW, ML, PnL, PpL and SL.

CI Cephalic index: HW/HL.

EL Maximum eye length measured in full face view.

EW Maximum eye width measured in full face view.

HL Maximum head length in full face view, measured from the anterior-most point of the clypeal margin to the midpoint of a line drawn across the posterior margin of the head.

HTL Maximum length of hind tibia, excluding the proximal part of the articulation which is received into the distal end of the hind femur (Fig. 4).

HW Maximum head width in full face view, excluding eyes.

ML Mesonotal length measured from the pronotal–mesonotal suture to the metanotal groove parallel to the measuring axis (see also above).

PnL Pronotal length measured from the anterior edge of the pronotal collar to the pronotal–mesonotal suture parallel to the measuring axis (see also above).

PpL Propodeal length measured from the metanotal groove to the posterior-most point of the petiolar insertion parallel to the measuring axis (see also above).

REL Relative Eye Length: EL/HW.

SI Scape index: SL/HW.

SL Length of the scape (first antennal segment) excluding the basal radicle.

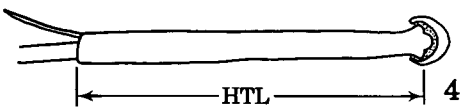


Fig. 4. Method used to determine hind tibial length (HTL) during this study.

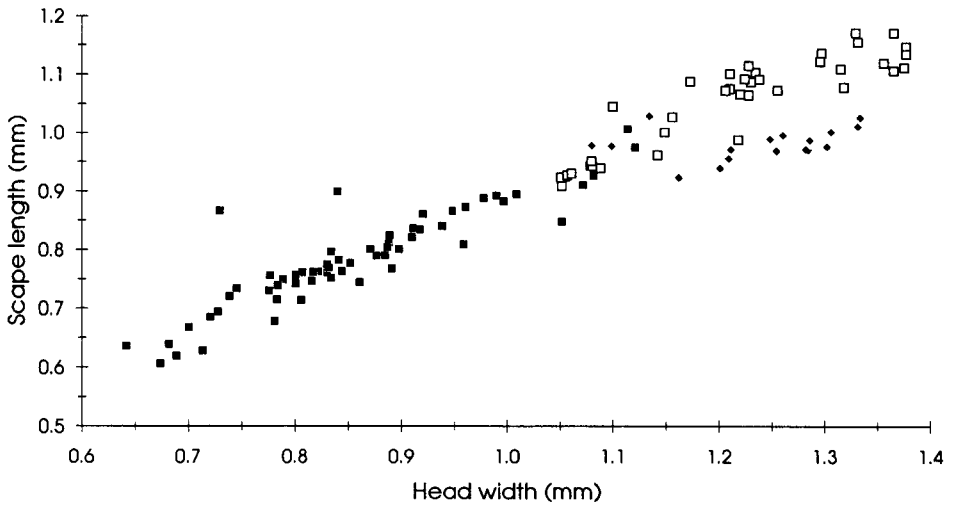


Fig. 5. Distribution of SL and HW measurements (in millimetres) among 16 species and 113 individuals of the *I. calvus* group. ■, *I. calvus* complex; □, *I. rufoinclinus* complex; ◆, *I. viridigaster* complex.

Abbreviations used are as follows:

Collectors: ANA, A. N. Andersen; BBL, B. B. Lowery; JC, J. Clark; JDM, J. D. Majer; JED, J. E. Dowse; JEF, J. E. Feehan; PJMG, P. J. M. Greenslade; PSW, P. S. Ward; RWT, R. W. Taylor; SOS, S. O. Shattuck; TG, T. Greaves.

Collections: ANAC, A. N. Andersen, Darwin, N.T., personal collection; ANIC, Australian National Insect Collection, Canberra, A.C.T.; BMNH, The Natural History Museum, London, U.K.; JDMC, Jonathan D. Majer, Curtin University of Technology, Perth, W.A.; MCSN, Museo Civico de Storia Naturale 'Giacomo Doria', Genoa, Italy; MCZC, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A.; MHNG, Muséum d'Histoire Naturelle, Geneva, Switzerland; MVMA, Museum of Victoria, Abbotsford, Victoria; NHMB, Naturhistorisches Museum, Basel, Switzerland; USNM, United States National Museum of Natural History, Washington, D.C., U.S.A.

Key to Species of the *Iridomyrmex calvus* Group

Based on workers

1. Petiole strongly inclined anteriorly and with the anterior face reduced (sometimes essentially absent) and usually at an oblique angle to the posterior face (Figs 29, 31, 33, 35); propodeum often low and with the mid-dorsal region approximately flat (Figs 31, 33, 35), sometimes higher and rounded (Fig. 29); body generally larger in overall size (see Fig. 5) (*rufoinclinus* complex) 2

   Petiole strongly inclined anteriorly but with a distinct anterior face, which is always parallel or subparallel to the posterior face (Figs 7, 9, 11, 15, 17, 19, 21, 23, 25, 27); propodeum often expanded dorsally into a relatively high convex arch (Fig. 23); body generally smaller in overall size (see Fig. 5) 5

2. Entire head and mesosoma uniformly yellowish-red in colour ..... *I. rufoinclinus*, sp. nov.

   At least the dorsal surface of head (and sometimes entire head or head and pronotum) noticeably infuscated dark reddish brown to black, and distinctly darker in colour than posterior regions of mesosoma 3

3. Infuscation on head limited to a circular area on the dorsum of the head, and with the lateral and ventral regions similar in colour to the posterior mesosoma ..... *I. cappoinclinus*, sp. nov.

   Entire head (including lateral and ventral regions) infuscated and much darker than the posterior regions of the mesosoma 4

4. Mesosoma uniformly yellowish-red to reddish; EW $\leqslant$ 0·19, EL $\leqslant$ 0·33, CI $\leqslant$ 0·98 ..... *I. cephaloinclinus*, sp. nov.

   Mesosoma with the pronotum distinctly infuscated and much darker than the mesonotum and propodeum; EW $\geqslant$ 0·20, EL $\geqslant$ 0·33, CI $\geqslant$ 1·00 ..... *I. anteroinclinus*, sp. nov.

5. Larger species (HL > 1·16 mm, mesosomal length (PnL + ML + PpL) > 1·80 mm) (*viridigaster* complex) 6

   Smaller species (HL < 1·16 mm, mesosomal length (PnL + ML + PpL) < 1·80 mm) (*calvus* complex) 8

6. Dorsum of gaster without erect hairs; HL > 1·39 mm; in lateral profile, the posterior region of the pronotum strongly arched, the central region weakly convex (Fig. 23) ..... *I. anderseni*, sp. nov.

   Dorsum of gaster with erect hairs; HL < 1·39 mm; in lateral profile, the central and posterior regions of the pronotum forming a uniform, gradual arch (Figs 25, 27) 7

7. Erect hairs present on antennal scapes (sometimes reduced to 3 or 4); HW > 1·16 mm, CI $\geqslant$ 0·93, SI < 0·85; known only from New South Wales, Queensland and Victoria ..... *I. viridigaster* Clark

   Erect hairs absent from scapes (except for a few at the extreme tip); HW < 1·14 mm, CI $\leqslant$ 0·92, SI > 0·86; known only from Western Australia ..... *I. hesperus*, sp. nov.

8. Femora and tibiae of middle and hind legs with erect or suberect hairs; in full face view, head with numerous erect hairs on posterior margin 9

   Femora and tibiae of middle and hind legs lacking erect or suberect hairs (sometimes with appressed hairs on the inner (ventral) surface); in full face view, head with at most 2 erect hairs on posterior margin 12

9. Erect hairs absent from scapes (except for a few at the extreme tip); known only from South Australia and Victoria 10

   Erect hairs present on antennal scapes; known only from Western Australia 11

10. Head, mesosoma, petiole and gaster uniformly dark reddish brown to black and with a weak metallic blue iridescence; in full face view, erect hairs present on all lateral surfaces of head (Fig. 20); smaller species (HW < 1·02 mm, HL < 1·12 mm, mesosomal length (PnL + ML + PpL) < 1·70 mm) ..... *I. prismatis*, sp. nov.
Head and mesosoma yellowish red, contrasting with dark reddish brown petiole and gaster, entire body lacking metallic iridescence; in full face view, erect hairs present only on posterior margin, absent laterally (Fig. 14); larger species (HW > 1·02 mm, HL > 1·12 mm, mesosomal length (PnL + ML + PnL) > 1·70 mm) ..... *I. mimulus*, sp. nov.
11. Erect hairs absent from gula; body colour (excluding gaster) yellow and with the head slightly but distinctly darker in colour than mesosoma ..... *I. argutus*, sp. nov.
Erect hairs present on gula; body colour generally dark reddish brown to black, occasionally yellowish red, but always with the head and mesosoma similar in colour ..... *I. occiduus*, sp. nov.
12. Occurring on Lord Howe Island and Norfolk Island ..... *I. albitarsus* Wheeler
Occurring on New Caledonia 13
Widespread on the southern Australian mainland or Tasmania ..... *I. notialis*, sp. nov.
13. Scapes shorter, exceeding posterior margin of head by less than 1·8× their maximum width (SL < 0·85 mm, SI < 1·02); posterior margin of head flat to weakly concave medially (Fig. 10); HTL < 1·10 mm ..... *I. calvus* Emery
Scapes longer, exceeding posterior margin of head by more than 2·2× their maximum width (SL > 0·86 mm, SI > 1·03); posterior margin of head convex (Fig. 12); HTL > 1·10 mm ..... *I. obsidianus* Emery

Iridomyrmex albitarsus Wheeler

(Figs 6, 7)

Iridomyrmex albitarsus Wheeler, 1927: 147.

Material Examined

Types. 27 worker, 2 queen and 9 male syntypes, Norfolk Island (22 workers, 2 queens and 8 males in MCZC; 3 workers in USNM; 2 workers and 1 male in MVMA).

Other material (in ANIC). **Lord Howe Island:** locality not given (W. J. Fellowes); Erskine Valley (RWT). **Norfolk Island:** Anson Bay Reserve, 29°01'S.,167°55'E. (JEF); Rocky Point Reserve, 29°03'S., 167°55'E. (JEF; T. A. Weir, L. Hill and I. D. Naumann).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: femora and tibiae of middle and hind legs lacking erect or suberect hairs; head finely punctate anterior to compound eyes, weakly coriarious posteriorly, with the entire head capsule weakly shiny; propodeal dorsum relatively low and rounded (Fig. 7); known only from Lord Howe Island and Norfolk Island. *I. albitarsus* is similar to *I. notialis*, although they are allopatric; they may be separated by the lack of erect hairs on the pronotum (Fig. 7) [hairs generally present in *I. notialis* (Fig. 17)] and first gastral tergite. Additionally, *I. albitarsus* differs from *I. notialis* in the generally darker body colour.

Description

Pigment colour of head, mesothorax, propodeum and legs dark reddish brown, anterior regions of head and clypeus sometimes slightly lighter, scapes and mandibles yellowish red; tarsi yellowish red basally, gradually fading to yellowish distally. Erect or suberect hairs absent from lateral margin of head (in full face view), scapes, mesosomal dorsum, legs, petiolar node, and first two gastral tergites. Head capsule with fine, small punctures anteriorly and weak coriarious sculpturing posteriorly; dorsal and lateral regions of mesosoma with both fine, small punctures and weak coriarious sculpturing forming an indistinct, continuous mosaic pattern. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

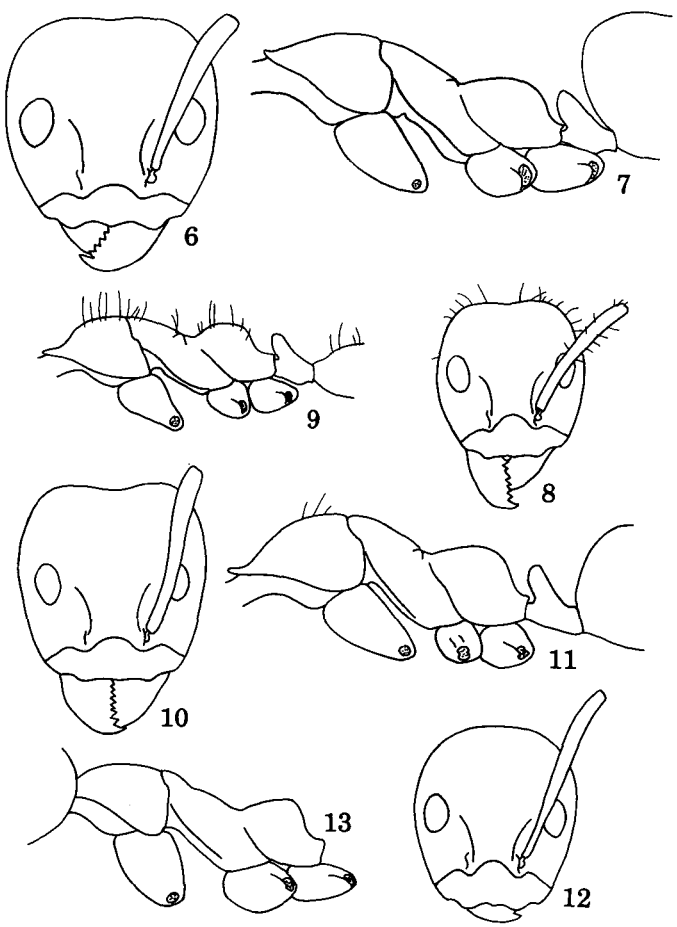
Measurements

Worker ($n = 5$). CI 0·91–0·96; EL 0·21–0·23; EW 0·12–0·14; HL 0·90–1·00; HTL 1·00–1·10; HW 0·83–0·96; ML 0·38–0·44; PnL 0·47–0·51; PpL 0·45–0·51; REL 0·23–0·26; SI 0·84–0·91; SL 0·75–0·81.

Comments

Iridomyrmex albitarsus is known only from Lord Howe and Norfolk Islands. Morphologically, it is most similar to *I. notialis*, and the separation of these two species is based on consistently darker body colour in *I. albitarsus* compared with the slightly lighter reddish brown colour of *I. notialis*, and the difference in erect pilosity found on the pronotum and gaster (but pilosity is variable in *I. notialis*—see the discussion of that species for more details).

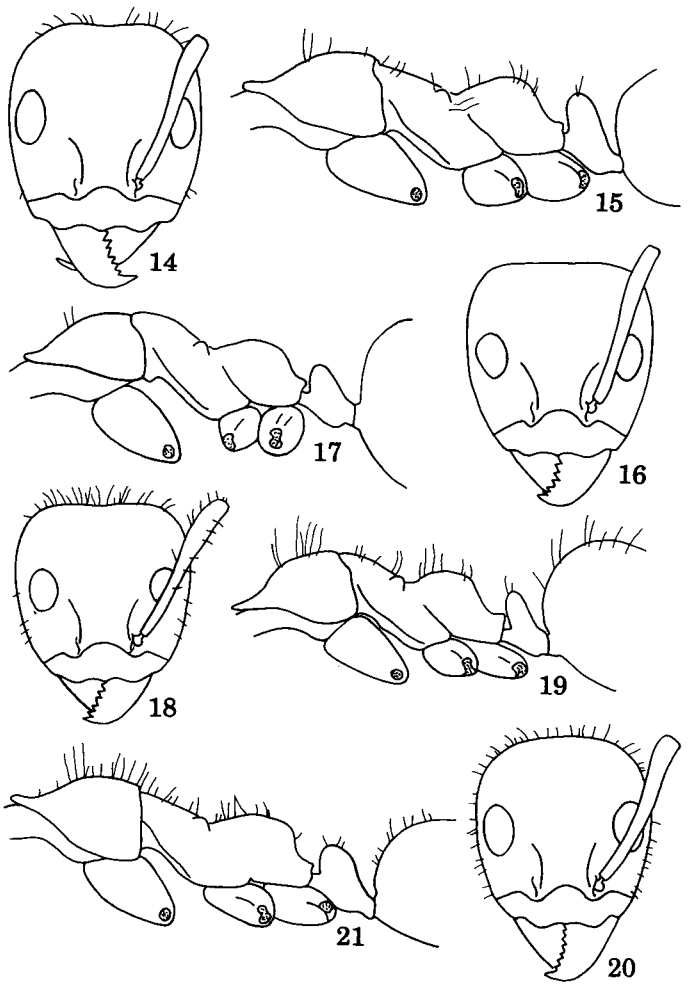
It is possible that *I. albitarsus* is actually conspecific with *I. notialis*. However, it seems unlikely that there is significant gene flow between the populations on Lord Howe and



Figs 6–13. Species of the *Iridomyrmex calvus* complex. *6*, *I. albitarsus* (Rocky Point, Norfolk I.), full face view; *7*, *I. albitarsus* (Rocky Point, Norfolk I.), lateral view of mesosoma; *8*, *I. argutus* (holotype), full face view; *9*, *I. argutus* (holotype), lateral view of mesosoma; *10*, *I. calvus* (Mt Dzumac, New Caledonia), full face view; *11*, *I. calvus* (Mt Dzumac, New Caledonia), lateral view of mesosoma; *12*, *I. obsidianus* (Mt Do, New Caledonia), full face view; *13*, *I. obsidianus* (Mt Do, New Caledonia), lateral view of mesosoma.

Norfolk Islands and those on continental Australia and Tasmania. Additionally, the Lord Howe Island and Norfolk Island populations are very similar, more so than either is to mainland populations. For these reasons, *I. albitarsus* is considered to be present on both Lord Howe and Norfolk Islands, and to be a distinct species from mainland populations of *I. notialis*.

Given the distance separating Lord Howe Island and Norfolk Island, it is surprising that the populations from these two islands are so similar and have not diverged in any externally observable traits. One possible explanation for this is that the species previously occurred on only one of the islands and has only recently arrived at the other, possibly by human intervention. This hypothesis is indirectly supported by the lack of early collection records from Lord Howe Island. Wheeler (1927) examined the ant faunas of both Lord Howe and Norfolk Islands; he described *I. albitarsus* from specimens collected on Norfolk Island, but did not record the species from Lord Howe Island. Although this is only weak evidence, it does not exclude the possibility of a recent transfer of this species between the two islands.



Figs 14–21. Species of the *Iridomyrmex calvus complex. 14, I. mimulus* (holotype), full face view; *15, I. mimulus* (holotype), lateral view of mesosoma; *16, I. notialis* (paratype), full face view; *17, I. notialis* (paratype), lateral view of mesosoma; *18, I. occiduus* (paratype), full face view; *19, I. occiduus* (paratype), lateral view of mesosoma; *20, I. prismatis* (holotype), full face view; *21, I. prismatis* (holotype), lateral view of mesosoma.

Iridomyrmex anderseni, sp. nov.

(Figs 22, 23, 38)

Material Examined

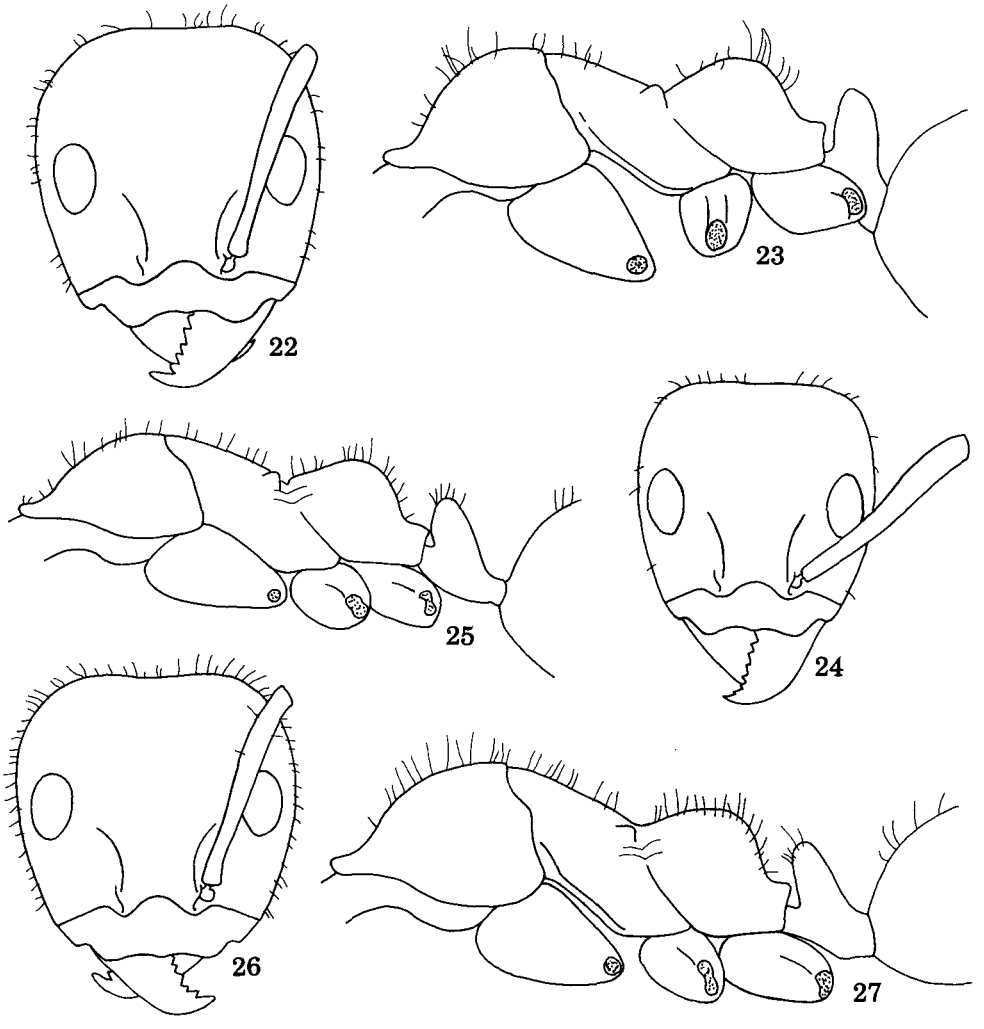
Holotype. Worker, South Australia, Olympic Dam [*c.* 33°28′S.,140°40′E.], 1990, J. Read (ANIC, type no. 7988).

Worker Diagnosis

A member of the *viridigaster* complex with the following characteristics: in lateral profile, posterior region of pronotum strongly arched, central region weakly convex (Fig. 23); scapes and dorsum of gaster without erect hairs; HL > 1·39 mm, SL > 1·02 mm.

Description

Pigment colour of head, mesothorax, propodeum and legs reddish brown, anterior regions of head and clypeus, scapes and pronotum slightly lighter, lateral areas of mesosoma



Figs 22–27. Species of the *Iridomyrmex viridigaster* complex. *22*, *I. anderseni* (holotype), full face view; *23*, *I. anderseni* (holotype), lateral view of mesosoma; *24*, *I. hesperus* (holotype), full face view; *25*, *I. hesperus* (holotype), lateral view of mesosoma; *26*, *I. viridigaster* (Patho, Vic.), full face view; *27*, *I. viridigaster* (Patho, Vic.), lateral view of mesosoma.

immediately dorsal of coxae and coxae slightly darker; petiole and gaster dark reddish brown. Elongate (greater than maximum scape width), pale erect hairs present on posterior margin of head and dorsal surfaces of mesosoma; shorter pale erect hairs present on all lateral surfaces of head (including posterior) and dorsal angle of petiolar node; short pale suberect hairs present on all surfaces of legs; scape and dorsum of gaster without erect hairs; psammophore weakly developed, setae straight. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *viridigaster* complex.

Measurements

Holotype. CI 0·95; EL 0·32; EW 0·18; HL 1·40; HTL 1·50; HW 1·33; ML 0·55; PnL 0·76; PpL 0·72; REL 0·24; SI 0·77; SL 1·03.

Comments

This distinctive species is known from only a single specimen collected in eastern South Australia (Fig. 38). Nothing is known of its biology.

Iridomyrmex anteroinclinus, sp. nov.

(Figs 28, 29, 37)

Material Examined

Holotype. Worker, Western Australia, King Edward River, Kimberley region, 15°08′50″S., 126°08′40″E., June 1988, A. N. Andersen (ANIC, type no. 7989).

Paratypes. 1 worker, Western Australia, Cape Bernier, Kimberley region, 14°07′S.,127°31′E., June 1988 (ANA) (ANAC); 1 worker, Western Australia, Mining Camp, Mitchell Plateau, 14°49′S., 125°50′E., 9–19.v.1983, I. D. Naumann and J. C. Cardale (ANIC).

Worker Diagnosis

A member of the *rufoinclinus* complex with the following characteristics: head, pronotum and fore legs infuscated and varying from light to dark reddish brown, remainder of mesosoma and petiole reddish and distinctly lighter in colour; propodeum moderately high and convex (Fig. 29); CI $\geqslant$ 1·00.

Description

Pigment colour of head dark reddish brown; mandibles and scapes reddish brown, lighter than remainder of head; pronotum, fore legs and coxae of middle and hind legs varying from similar in colour to the head to light reddish brown; mesonotum, propodeum, petiole and femora and tibiae of middle and hind legs reddish, lighter in colour than pronotum; gaster dark reddish brown. Elongate (greater than maximum scape width), pale erect hairs present on posterior surfaces of head and dorsal surfaces of mesosoma, petiole and gaster; shorter pale erect hairs present on lateral margin of head and all leg segments; scape with scattered erect hairs; psammophore hairs weakly developed. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *rufoinclinus* complex.

Measurements

Holotype. CI 1·02; EL 0·37; EW 0·23; HL 1·35; HTL 1·70; HW 1·38; ML 0·66; PnL 0·89; PpL 0·78; REL 0·27; SI 0·81; SL 1·12.

Worker ($n=2$). CI 1·00; EL 0·33; EW 0·20; HL 1·22–1·38; HTL 1·45–1·70; HW 1·22–1·38; ML 0·59–0·61; PnL 0·76–0·90; PpL 0·68–0·79; REL 0·24–0·27; SI 0·81–0·84; SL 0·99–1·15.

Comments

Iridomyrmex anteroinclinus is known from only three independently collected individuals from the Kimberley region of northern Western Australia (Fig. 37). All collection sites are in *Eucalyptus* woodland areas. Nothing is known of the biology of this species.

Iridomyrmex argutus, sp. nov.

(Figs 8, 9, 36)

Iridomyrmex sp. 23 (ANIC).—Majer, 1978: 328.

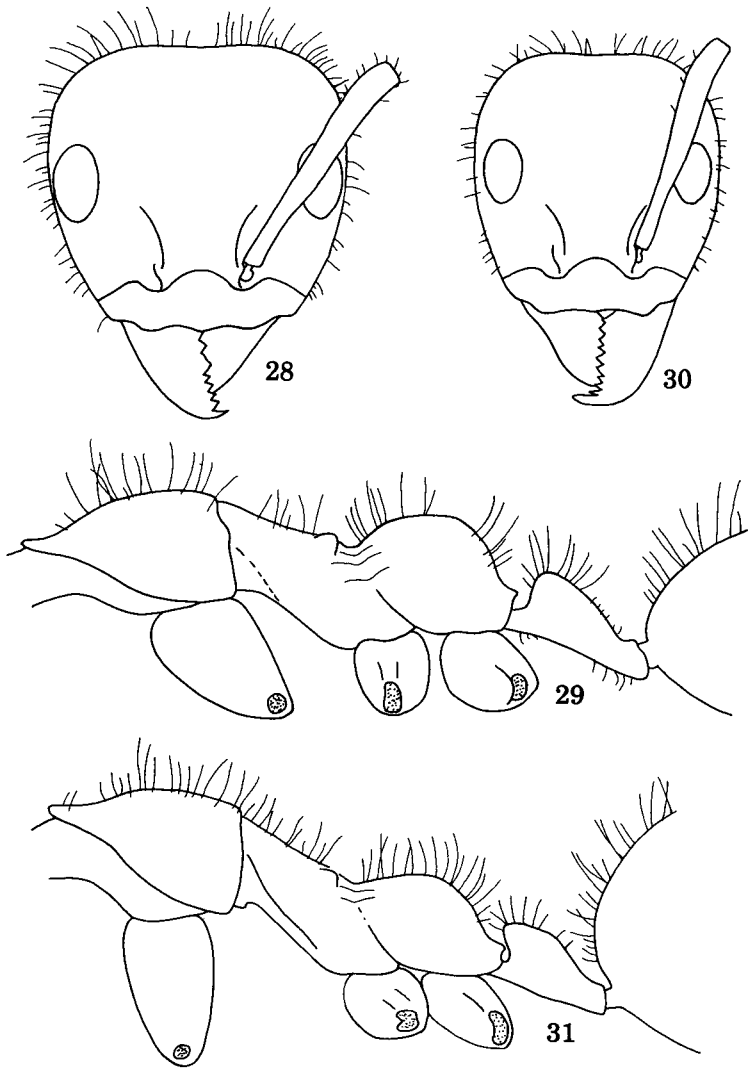
Material Examined

Holotype. Worker, Western Australia, Dwellingup [*c.* 32°43'S.,116°04'E.], 24.xi.1975, J. D. Majer (ANIC, type no. 7990).

Paratype. 1 worker, same data as holotype (ANIC).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: scapes and femora and tibiae of middle and hind legs with erect or suberect hairs; erect hairs absent from gula;



Figs 28–31. Species of the *Iridomyrmex rufoinclinus* complex. *28*, *I. anteroinclinus* (holotype), full face view; *29*, *I. anteroinclinus* (holotype), lateral view of mesosoma; *30*, *I. cappoinclinus* (paratype), full face view; *31*, *I. cappoinclinus* (paratype), lateral view of mesosoma.

head and mesosoma yellowish with the head slightly but distinctly darker than the pronotum. *Iridomyrmex argutus* is most similar to, and sympatric with, *I. occiduus*, but may be separated by the absence of erect hairs on the gula and the contrasting colour between the head and mesosoma.

Description

Pigment colour of head, mesosoma, legs and petiole yellow, with the head slightly darker; gaster dark reddish brown. Erect or suberect hairs present on lateral margin of head posterior to the compound eyes (in full face view), scapes, mesosomal dorsum, middle and hind femora and tibiae, petiolar node, and first gastral tergite. Head capsule and mesosoma smooth, without sculpture, very shiny. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

Measurements

Holotype. CI 0·92; EL 0·19; EW 0·11; HL 0·74; HTL 0·82; HW 0·68; ML 0·29; PnL 0·40; PpL 0·37; REL 0·28; SI 0·94; SL 0·64.

Worker ($n = 1$). CI 0·91; EL 0·18; EW 0·10; HL 0·70; HTL 0·80; HW 0·64; ML 0·28; PnL 0·37; PpL 0·32; REL 0·28; SI 0·99; SL 0·64.

Comments

Nothing is known of the biology of *I. argutus*. The only known specimens were collected from a pitfall trap.

Iridomyrmex calvus Emery

(Figs 10, 11)

Iridomyrmex calvus Emery, 1914: 419.

Material Examined

Types. Lectotype worker and 3 worker paralectotypes from Prony, New Caledonia, here designated (MCSN); 1 queen paralectotype from Tao, 3 worker paralectotypes from Canala, and 13 worker paralectotypes from Prony, New Caledonia (in NHMB, Baroni Urbani 1977); 1 queen and 14 worker paralectotypes from Oubatche, New Caledonia (8 workers and 1 queen in MHNB, Baroni Urbani 1977; 6 workers in MHNG).

Other material (in ANIC). **New Caledonia:** 2 km SW. of Yaté Village, 400 m, 22°10'S.,166°54'E. (PSW); Mt Do summit, 1000 m (G. Monteith and D. Cook); Mt Dzumac, 800–1000 m (G. Monteith and D. Cook); Riviere Bleue (H. Franz); Riviere des Pirogues (headwaters), 350–400 m (G. Monteith and D. Cook); Yahove, *c.* 1500 ft (T. Schoener).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: femora and tibiae of middle and hind legs lacking erect or suberect hairs; head smooth anteriorly, smooth to very weakly punctate and/or coriarious posteriorly, with the entire head capsule shiny; scapes exceeding the posterior margin of the head by less than 1·8× their maximum width (SL < 0·85 mm, SI < 1·02) (Fig. 10); known only from New Caledonia. *Iridomyrmex calvus* is most similar to *I. obsidianus*, but may be separated by the shorter antennal scapes and less convex posterior margin of the head (compare Figs 10 and 12).

Description

Pigment colour of body varying from reddish brown to reddish black; clypeus, mandibles and scapes slightly lighter; tarsi yellowish (either entirely, or distal segments only). Erect or suberect hairs absent from lateral margin of head (in full face view), scapes, middle and hind femora and tibiae, petiolar node, and first gastral tergite (excluding extreme posterior margin). Erect hairs present or absent on pronotum and mesonotum. Head capsule smooth anteriorly, smooth to very weakly punctate and/or coriarious posteriorly, with the entire

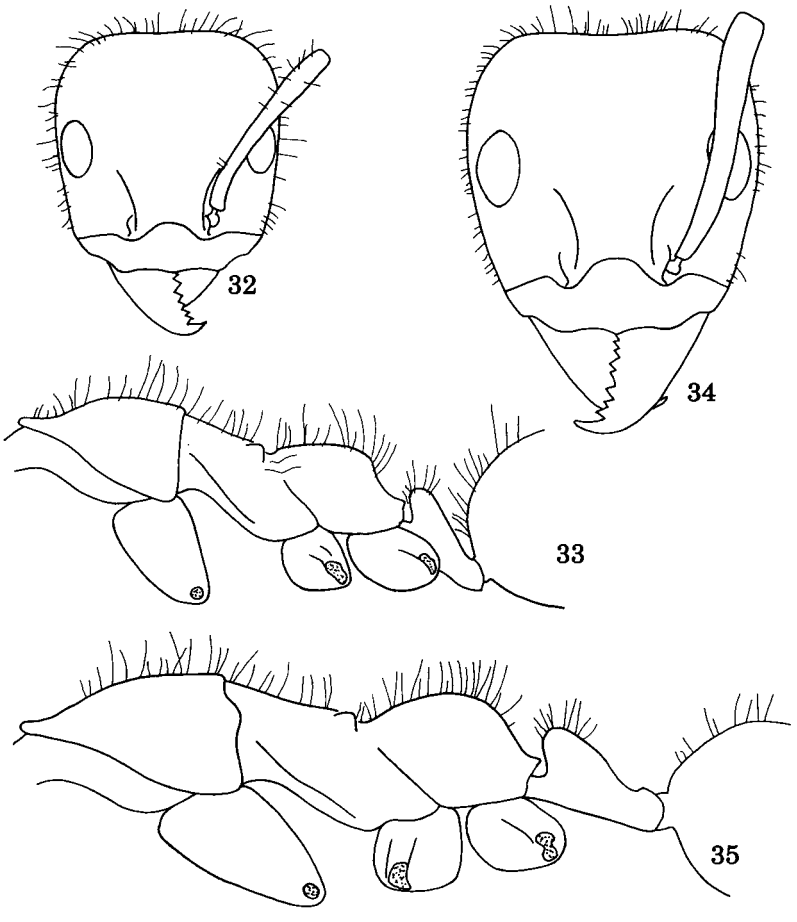
head surface shiny; lateral regions of mesosoma with at most very weak sculpturing and shiny, dorsal regions with slightly stronger (but still weak) sculpturing and less shiny. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

Measurements

Worker ($n = 8$). CI 0·93–0·97; EL 0·16–0·20; EW 0·10–0·12; HL 0·77–0·96; HTL 0·86–1·09; HW 0·72–0·91; ML 0·31–0·47; PnL 0·41–0·50; PpL 0·37–0·48; REL 0·22–0·23; SI 0·89–0·97; SL 0·69–0·84.

Comments

Iridomyrmex calvus is limited to New Caledonia. Little is known of its biology, although one collection consisted of foragers on an *Agathis* trunk (P. S. Ward, personal communication).



Figs 32–35. Species of the *Iridomyrmex rufoinclinus* complex. *32*, *I. cephaloinclinus* (holotype), full face view; *33*, *I. cephaloinclinus* (holotype), lateral view of mesosoma; *34*, *I. rufoinclinus* (holotype), full face view; *35*, *I. rufoinclinus* (holotype), lateral view of mesosoma.

Iridomyrmex cappoinclinus, sp. nov.

(Figs 30, 31, 37)

Material Examined

Holotype. Worker, Northern Territory, 73 km S. of Alice Springs, 24°15'S.,133°26'E., 22.i.1991, S. O. Shattuck (SOSC # 2116) (ANIC, type no. 7991).

Paratypes. 13 workers, same data as holotype (ANAC, ANIC, BMNH, MCZC).

Other material (in ANIC). **South Australia:** 120 km NE. of Macumba HS, Simpson Desert (PJMG); Purni Bore, SW. Simpson Desert (PJMG).

Worker Diagnosis

A member of the *rufoinclinus* complex with the following characteristics: dorsal surface of head with an infuscated dark reddish brown to brown-black spot which does not reach the lateral margin in full face view, remainder of head, entire mesosoma and petiole reddish; propodeum low and flattened dorsally (Fig. 31); CI $\leqslant$ 0·97.

Description

Pigment colour of dorsal surface of head (from posterior margin anteriorly between compound eyes to posterior clypeal margin, and central clypeus) and all coxae dark reddish brown; remainder of head (including scapes, mandibles and outer margin of clypeus), mesosoma, femora, tibiae and petiole yellowish to reddish; gaster dark reddish brown. Elongate (greater than maximum scape width), pale erect hairs present on posterior surface of head and dorsal surfaces of mesosoma, petiole and gaster; shorter pale erect hairs present on lateral margin of head and all leg segments; scape with scattered erect hairs; psammophore well developed. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *rufoinclinus* complex.

Measurements

Holotype. CI 0·93; EL 0·31; EW 0·18; HL 1·32; HTL 1·70; HW 1·23; ML 0·59; PnL 0·83; PpL 0·76; REL 0·25; SI 0·89; SL 1·09.

Worker ($n = 6$). CI 0·93–0·97; EL 0·32–0·33; EW 0·18–0·20; HL 1·26–1·36; HTL 1·67–1·79; HW 1·21–1·30; ML 0·58–0·65; PnL 0·72–0·86; PpL 0·71–0·77; REL 0·25–0·27; SI 0·88–0·90; SL 1·07–1·14.

Comments

Iridomyrmex cappoinclinus is known from three collections made in arid areas. The type series was collected from the summit of a low sand dune covered with *Acacia* and *Triodia*. The nest was in loose sand and consisted of a single entrance in a slight depression (*c.* 2 cm deep by 8 cm diameter). Individual workers were actively carrying soil from within the nest but surface foraging was not observed. The other collections were from a *Triodia*-covered area, and a dune vegetated with *Acacia*.

Iridomyrmex cephaloinclinus, sp. nov.

(Figs 32, 33, 37)

Material Examined

Holotype. Worker, Western Australia, Pretty Pool (Caravan Park), Port Hedland, 20°18'44"S., 118°38'14"E., 26.iv.1992, S. O. Shattuck (SOSC #3219) (ANIC, type no. 7992).

Paratypes. 75 workers, same data as holotype (ANIC, BMNH, MCZC).

Other material (in ANIC). **Queensland:** 25 km S. of Woodstock (PJMG). **Western Australia:** 11 miles WSW. of Nita HS, SSW. of Broome (R. S. McInnes and JED); 50 km N. of Carnarvon, 24°26'S.,113°59'E. (SOS); 70 km S. of Exmouth (B. Heterick) (JDMC); Karratha (JDM).

Worker Diagnosis

A member of the *rufoinclinus* complex with the following characteristics: entire head infuscated dark reddish brown to black, mesosoma and petiole reddish; propodeum low and flattened dorsally (Fig. 33); CI $\leqslant$ 0·98.

Description

Pigment colour of head dark reddish brown to black; mandibles varying from reddish to reddish brown; scapes yellowish to reddish, lighter than remainder of head; mesosoma, petiole, and middle and hind femora and tibiae yellowish red to reddish; fore femur and tibia and all coxae light reddish brown to reddish brown; gaster dark reddish brown. Elongate (greater than maximum scape width), pale erect hairs present on posterior surface of head and dorsal surfaces of mesosoma, petiole and gaster; shorter pale erect hairs present on lateral margin of head and all leg segments; scape with scattered erect to subdecumbent hairs; psammophore well developed. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *rufoinclinus* complex.

Measurements

Holotype. CI 0·96; EL 0·28; EW 0·17; HL 1·13; HTL 1·36; HW 1·08; ML 0·42; PnL 0·74; PpL 0·66; REL 0·26; SI 0·88; SL 0·95.

Worker ($n = 10$). CI 0·92–0·98; EL 0·26–0·33; EW 0·16–0·19; HL 1·11–1·35; HTL 1·31–1·67; HW 1·05–1·32; ML 0·42–0·64; PnL 0·70–0·86; PpL 0·65–0·80; REL 0·25–0·27; SI 0·82–0·89; SL 0·91–1·13.

Comments

Iridomyrmex cephaloinclinus is known from six collections, five occurring in western Western Australia and one in central coastal Queensland (Fig. 37). Even with this wide distribution, however, the species is morphologically fairly uniform and there is no evidence that two species, one western and one eastern, are involved. In fact, the Western Australian collections show noticeable variation in most of the metric characters, with the single Carnarvon specimen being consistently larger than any of the individuals collected at Port Hedland (compare the holotype measurements, which are approximately average for this entire nest series, with the larger values listed under 'Measurements—Worker' above). Additionally, the Queensland individual is intermediate between these extremes in most measurements analysed, and does not show any significant deviations from the 'Diagnosis' or 'Description' given above. It is assumed that *I. cephaloinclinus* is distributed continuously across northern Australia, and that additional collections are likely to be made in north-central and/or north coastal Australia.

Iridomyrmex hesperus, sp. nov.

(Figs 24, 25, 38)

Material Examined

Holotype. Worker, Western Australia, Coalmine Beach, 34°59′S.,116°44′E., Walpole-Nornalup National Park, 25.x–3.xi.1984, J. and N. Lawrence (ANIC, type no. 7993).

Paratypes. 1 worker, same data as holotype; 1 worker, Western Australia, Junana Rock, 33°23′S., 123°24′E., 9 km NW. of Mt Ragged, 26.x.1977, R. W. Taylor # 77.667 (ANIC).

Worker Diagnosis

A member of the *viridigaster* complex with the following characteristics: in lateral profile, central and posterior regions of pronotum forming a uniform, gradual arch (Fig. 25); scapes without erect hairs; HW < 1·14 mm; CI < 0·93; SI > 0·85. *Iridomyrmex hesperus* is the only species of the *viridigaster* complex known from Western Australia.

Description

Pigment colour of mesosoma and petiole varying from yellowish red to reddish, with dorsal regions infuscated with dark reddish brown to black; posterior regions of head dark reddish brown, anterior margin of clypeus, scapes and pronotum slightly lighter; legs reddish brown; gaster dark reddish brown. Short (less than maximum scape width), pale erect hairs present on all lateral surfaces of head (sometimes reduced laterally), and on dorsum of mesosoma, petiole and gaster; short, pale suberect to decumbent hairs present on all surfaces of legs; scape without erect hairs; psammophore well developed, with curved setae. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *viridigaster* complex.

Measurements

Holotype. CI 0·91; EL 0·30; EW 0·17; HL 1·18; HTL 1·36; HW 1·08; ML 0·56; PnL 0·65; PpL 0·67; REL 0·28; SI 0·91; SL 0·98.

Worker ($n=2$). CI 0·91–0·92; EL 0·30–0·31; EW 0·17; HL 1·18–1·23; HTL 1·36–1·50; HW 1·08–1·13; ML 0·53–0·58; PnL 0·65–0·71; PpL 0·67–0·72; REL 0·27–0·28; SI 0·89–0·91; SL 0·98–1·03.

Comments

One of the two known collections of *I. hesperus* was made in mallee vegetation. Nothing more is known of the biology of this species.

Iridomyrmex mimulus, sp. nov.

(Figs 14, 15, 36)

Material Examined

Holotype. Worker, South Australia, Lake Eyre (South) [*c.* 29°30'S.,137°10'E.], 22.ix.1980, H. Heatwole (ANIC, type no. 7994).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: femora and tibiae of middle and hind legs with erect or suberect hairs; scapes without erect or suberect hairs (except at extreme tip); head and mesosoma yellowish red, without metallic blue iridescence. *Iridomyrmex mimulus* is morphologically most similar to *I. prismatis*, but may be separated from it by the lighter body colour, lack of iridescence, lack of erect hairs on the lateral margin of the head (compare Figs 14 and 20), and the larger size (see 'Key to Species' above for details).

Description

Pigment colour of head and mesosoma light yellowish red, with the dorsum of the head slightly infuscated; legs, petiole and gaster reddish brown, distinctly darker than head and mesosoma. Erect or suberect hairs present on posterior margin of head (in full face view), mesosomal dorsum, middle and hind femora and tibiae, petiolar node, and first gastral tergite; erect or suberect hairs absent from scapes. Head capsule finely punctate anteriorly, very weakly coriarious posteriorly, and weakly shiny; mesosoma finely punctate and weakly shiny. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

Measurements

Holotype. CI 0·93; EL 0·30; EW 0·17; HL 1·14; HTL 1·25; HW 1·05; ML 0·45; PnL 0·69; PpL 0·59; REL 0·28; SI 0·81; SL 0·85.

Comments

Iridomyrmex mimulus is superficially similar to a small individual of the *I. purpureus* or *I. discors* groups (see Shattuck 1993). However, the frontal carinae are uniformly convex,

as discussed above under 'Diagnosis of the *Iridomyrmex calvus* Group', and so it is placed within the *I. calvus* group. Nothing is known of the biology of this species.

Iridomyrmex notialis, sp. nov.

(Figs 16, 17, 36)

Material Examined

Holotype. Worker, South Australia, Port Adelaide [*c.* 34°50′S.,138°30′E.], 15.ix.1972, B. B. Lowery (ANIC, type no. 7995).

Paratypes. 144 workers, same data as holotype (62 pointed, 82 in alcohol as ANIC Ant Vial # 63.31) (ANIC, BMNH, MCZC).

Other material (in ANIC except where noted). **New South Wales:** 'Kapunda', N. of Nyngan (PJMG); Queanbeyan (G. Moore). **Northern Territory:** Ormiston Gorge (M. E. McKaige) (ANAC). **South Australia:** Coolatoo, Coorong Natl Pk (PJMG); Hindmarsh R., Victor Harbor (PJMG); Moockra Tower (PJMG); Napperby, Flinders Ranges (PJMG); Oraparinna, Flinders Ranges (PJMG); Rocky R., Kangaroo I. (PJMG). **Tasmania:** locality not given (N. M. Hudson); Launceston (V. V. Hickman). **Victoria:** 15 km WNW. of Yaapeet, Wyperfeld Natl Pk, 35°42′S.,141°52′E. (ANA) (ANAC); French I. (ANA) (ANAC); nr Anglesea, 38°23′S.,144°10′E. (ANA) (ANAC); Rotamah I., 19 km S. of Bairnsdale (ANA) (ANAC). **Western Australia:** Albany Hwy, 20 km N. of Williams (B. Heterick) (JDMC); Denmark (collector unknown); Kings Park (BBL); Lake Powell, SW. of Albany (B. Heterick) (JDMC); Thomas R., 23 km NW. by W. of Mt Arid, 33°51′S.,123°00′E. (JEF); Yokinup Bay, Cape Arid Natl Pk (A. H. Burbidge) (ANAC).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: femora and tibiae of middle and hind legs lacking erect or suberect hairs; head finely punctate anterior to compound eyes, weakly coriarious posteriorly, with the entire head capsule weakly shiny; propodeal dorsum relatively low and rounded (Fig. 17). *Iridomyrmex notialis* is most similar to *I. albitarsus* (which is known to occur only on Lord Howe and Norfolk Islands). For separation see 'Worker Diagnosis' under that species.

Description

Pigment colour of head, mesothorax, propodeum and femora varying from light to dark reddish brown; anterior regions of head, clypeus, and mandibles slightly to distinctly lighter; scapes (especially basal region) yellowish to yellowish red; tibiae sometimes slightly lighter than mesosoma; tarsi dark basally, fading to yellowish or yellowish red distally. Erect or suberect hairs absent from lateral margin of head (in full face view), scapes, dorsum of mesothorax and propodeum, legs, and petiolar node; erect hairs present or absent on pronotum and dorsum of gaster. Head capsule with fine, small punctures anteriorly and weak coriarious sculpturing posteriorly; dorsal and lateral regions of mesosoma with both fine, small punctures and weak coriarious sculpturing forming an indistinct, continuous mosaic pattern. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

Measurements

Holotype. CI 0·94; EL 0·22; EW 0·13; HL 0·92; HTL 1·01; HW 0·87; ML 0·39; PnL 0·47; PpL 0·42; REL 0·26; SI 0·92; SL 0·80.

Worker ($n=9$). CI 0·93–0·97; EL 0·20–0·24; EW 0·13–0·15; HL 0·84–1·14; HTL 0·95–1·28; HW 0·78–1·11; ML 0·36–0·54; PnL 0·43–0·56; PpL 0·40–0·57; REL 0·22–0·27; SI 0·89–0·97; SL 0·76–1·01.

Comments

Iridomyrmex notialis is one of the most widespread species in the *calvus* group. It ranges from Tasmania and central New South Wales west to South Australia, as well as Western Australia. Morphologically it is fairly uniform throughout its range, although it does show variation in overall body colour (varying from light to dark reddish brown) and size, and

in the development of erect hairs on the pronotum and the first gastral tergite, which vary in number from 0 to 6. No geographic pattern could be found in any of these characters to suggest that more than one species is involved, although the amount and quality of available material makes a critical analysis difficult.

Little is known of the biology of *I. notialis*. The only available information is that the type series, collected at Port Adelaide, was found in a dead mangrove branch, and that several of the Victorian collections were made on low vegetation (A. N. Andersen, personal communication).

Iridomyrmex obsidianus Emery

(Figs 12, 13)

Iridomyrmex obsidianus Emery, 1914: 419.

Material Examined

Types. 2 worker syntypes from Mt Humborldt, 1600 m, New Caledonia (1 individual in MCSN; 1 individual in NHMB, Baroni Urbani 1977).

Other material (in ANIC). **New Caledonia:** Mt Do summit, 1020 m (G. Kuschel).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: femora and tibiae of middle and hind legs lacking erect or suberect hairs; head smooth anteriorly, very weakly punctate posteriorly, with the entire head capsule shiny; scapes exceeding the posterior margin of the head by more than 2·2× their maximum width (SL>0·86 mm, SI>1·03) (Fig. 12); known only from New Caledonia. *Iridomyrmex obsidianus* is most similar to *I. calvus*, but may be separated by the longer antennal scapes and the more convex posterior margin of the head (compare Figs 12 and 10).

Description

Pigment colour of body reddish black; scapes, femora and tibiae slightly lighter; tarsi yellowish. Erect or suberect hairs absent from lateral margin of head (in full face view),

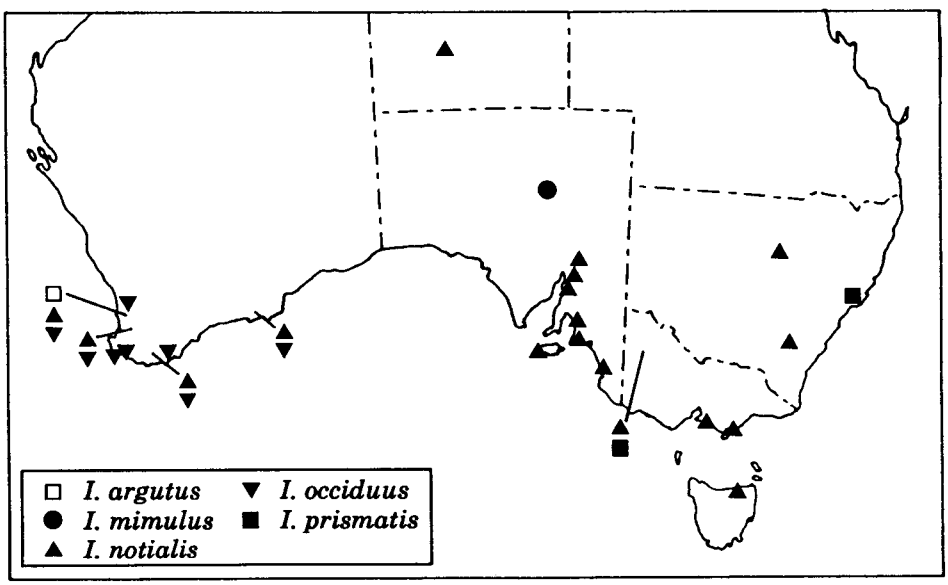


Fig. 36. Distribution of mainland Australian *I. calvus* complex material examined during this study (map does not include species found on Lord Howe I., New Caledonia or Norfolk I.).

scapes, middle and hind femora and tibiae, mesosomal dorsum, petiolar node, and first gastral tergite (excluding extreme posterior margin). Head capsule smooth anteriorly, very weakly punctate and coriarious posteriorly, with the entire head surface shiny; mesosoma with at most very weak sculpturing and shiny. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

Measurements

Holotype. CI 0·93; EL 0·21; EW 0·13; HL 0·90; HTL 1·24; HW 0·84; ML 0·42; PnL (not observable); PpL 0·49; REL 0·25; SI 1·07; SL 0·90.

Worker ($n=1$). CI 0·86; EL 0·18; EW 0·12; HL 0·85; HTL 1·19; HW 0·73; ML 0·39; PnL 0·47; PpL 0·41; REL 0·25; SI 1·19; SL 0·87.

Comments

Iridomyrmex obsidianus is known from only 3 individuals, the 2 type specimens and one worker which was collected from sifted litter.

Iridomyrmex occiduus, sp. nov.

(Figs 18, 19, 36)

Iridomyrmex sp. 20 (ANIC).—Majer, 1978: 328; Majer, 1980*a*: 6; Majer, 1980*b*: 13–16; Majer, 1980*c*: 16.

Iridomyrmex sp. J.D.M. 84.—Rossbach and Majer, 1983: 87.

Material Examined

Holotype. Worker, Western Australia, Jarrahdale [*c.* 34°54′S.,117°55′E.], 23.iii.1975, A. M. and M. J. Douglas (ANIC, type no. 7996).

Paratypes. 32 worker, 3 queen and 7 male paratypes, same data (and nest series) as holotype; 15 worker, 7 queen and 4 male paratypes, same data (but different nest series) as holotype. Numerous larvae and male pupae from the non-holotype nest series are stored in alcohol in ANIC Ant Vial 27.113.

Other material (in ANIC). **Western Australia:** 10 miles NW. of Pemberton (RWT); 11 miles N. of Denmark (RWT); 15 miles NE. of Albany (TG); 30 km N. of Esperance, 33°49′S.,122°14′E. (RWT); Albany (W. B. Bernard); Augusta (JDM); Dwellingup (JDM); Karragullan (B. Heterick) (JDMC); Mundaring (JC; TG); nr Stirling Dam (B. Heterick) (JDMC).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: scapes and femora and tibiae of middle and hind legs with erect or suberect hairs; erect hairs present on gula; head and mesosoma generally dark reddish brown, occasionally yellowish red, but always with the head and pronotum similar in colour. *Iridomyrmex occiduus* is most similar to *I. argutus*, but may be separated by the presence of erect hairs on the gula and the uniform colour of the head and mesosoma.

Description

Pigment colour of entire body generally dark reddish brown to black, occasionally yellowish red. Erect or suberect hairs present on entire lateral margin of head (in full face view) (although shorter and less abundant on sides near compound eyes), scapes, mesosomal dorsum, middle and hind femora and tibiae, petiolar node, and first gastral tergite. Head capsule and mesosoma smooth, without sculpture, very shiny. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

Measurements

Holotype. CI 0·96; EL 0·20; EW 0·12; HL 0·85; HTL 0·98; HW 0·82; ML 0·40; PnL 0·46; PpL 0·41; REL 0·24; SI 0·93; SL 0·76.

Worker ($n = 14$). CI 0·92–0·99; EL 0·17–0·21; EW 0·10–0·14; HL 0·71–0·90; HTL 0·75–1·00; HW 0·67–0·89; ML 0·29–0·42; PnL 0·36–0·51; PpL 0·33–0·45; REL 0·23–0·27; SI 0·86–0·95; SL 0·61–0·78.

Comments

Iridomyrmex occiduus is known from numerous collections from south-western Western Australia. The available biological data indicate that a wide range of habitats is utilised, varying from dry sclerophyll woodlands to marri forests. Nesting sites are in soil under objects on the ground (R. W. Taylor, personal communication) and in dead wood (J. D. Majer, personal communication).

As conceived here, *I. occiduus* shows considerable variation in size and colour. The only morphological pattern observable within the available material is a weak trend for smaller individuals to be lighter in colour when compared with larger individuals. However, it is thought that these specimens are conspecific because (i) some of the larger individuals are also relatively pale in colour, (ii) all metric characters examined are more or less continuous across all size classes, and (iii) no other characters could be found that vary significantly within these collections.

Iridomyrmex prismatis, sp. nov.

(Figs 20, 21, 36)

Iridomyrmex sp. 13.—Andersen and Yen, 1992: 214.

Material Examined

Holotype. Worker, Victoria, *c.* 15 km WNW. of Yaapeet [35°42′S.,141°52′E. (Andersen and Yen 1992)], Wyperfeld National Park, 2.xi.1979, A. L. Yen (ANIC, type no. 7997).

Paratypes. 1 worker, same data as holotype; 2 workers, same data as holotype except Oct. 1982, A. B. Wellington.

Other material (in ANIC). **New South Wales:** Hawks Nest, Myall Lakes (PJMG).

Worker Diagnosis

A member of the *calvus* complex with the following characteristics: femora and tibiae of middle and hind legs with erect or suberect hairs; scapes without erect or suberect hairs (except at extreme tip); head and mesosoma dark reddish brown to black and with a weak metallic blue iridescence. *Iridomyrmex prismatis* is morphologically most similar to *I. mimulus*, but may be separated from it by the darker body colour, presence of iridescence, presence of erect hairs on the lateral margin of the head (compare Figs 20 and 14), and the smaller size (see 'Key to Species' above for details).

Description

Pigment colour of entire body dark reddish brown to black, except anterolateral regions of head near the mandibular insertions and lateral clypeus, scapes and legs, which are slightly to distinctly lighter. Darker regions of body with a weak but distinct blue metallic iridescence. Erect or suberect hairs present on all lateral surfaces of head (in full face view), mesosomal dorsum, middle and hind femora and tibiae, petiolar node, and first gastral tergite; erect or suberect hairs absent from scapes. Head capsule finely but densely punctate anteriorly, densely punctate to weakly coriarious posteriorly, and shiny; mesosoma a mosaic of finely but densely punctate and weakly coriarious regions, and shiny. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *calvus* complex.

Measurements

Holotype. CI 0·90; EL 0·25; EW 0·14; HL 0·90; HTL 1·03; HW 0·82; ML 0·35; PnL 0·55; PpL 0·50; REL 0·31; SI 0·92; SL 0·75.

Worker ($n=5$). CI 0·90–0·94; EL 0·25–0·29; EW 0·14–0·18; HL 0·90–1·09; HTL 1·03–1·24; HW 0·82–1·00; ML 0·35–0·46; PnL 0·55–0·63; PpL 0·50–0·60; REL 0·28–0·31; SI 0·87–0·94; SL 0·75–0·89.

Comments

Iridomyrmex prismatis is known from two widely separated localities, one in western Victoria, the other in central-coastal New South Wales. Only stray foragers have been collected and little is known of this species' biology.

Iridomyrmex prismatis is similar to members of the *rufoinclinus* complex in the shape of the petiole (especially the posterior elongation). However, it is here placed in the *calvus* complex on the basis of the anterior petiolar shape, smaller body size and darker colour.

Iridomyrmex rufoinclinus, sp. nov.

(Figs 34, 35, 37)

Material Examined

Holotype. Worker, Northern Territory, Edith Falls, Katherine Gorge National Park, 14°10′57″S., 132°11′13″E., 10.v.1992, S. O. Shattuck (SOSC #3484) (ANIC, type no. 7998).

Paratypes. 30 workers, same data as holotype (ANIC, BMNH, MCZC).

Other material (in ANIC). **Northern Territory:** 24 km SE. of Katherine (PJMG); Bessie Spring, 8 km ESE. of Cape Crawford, 16°40′S.,135°51′E. (JEF); Howard R. (W. L. Brown); Kapalga, Kakadu Natl Pk (ANA, SOS); nr Sleisbeck, Kakadu Natl Pk (ANA). **Queensland:** 12 km SE. of Mingela (PJMG); 35 miles SSW. of Nebo (JED); 5 km E. of Pentland (BBL); Cape Upstart (BBL); Cloncurry, 20°42′S.,140°30′E. (D. Rackemann); Lawn Hill (ANA); Quilpie (J. Smith); Sandringham (PJMG); Tinaroo Creek, Mareeba (BBL).

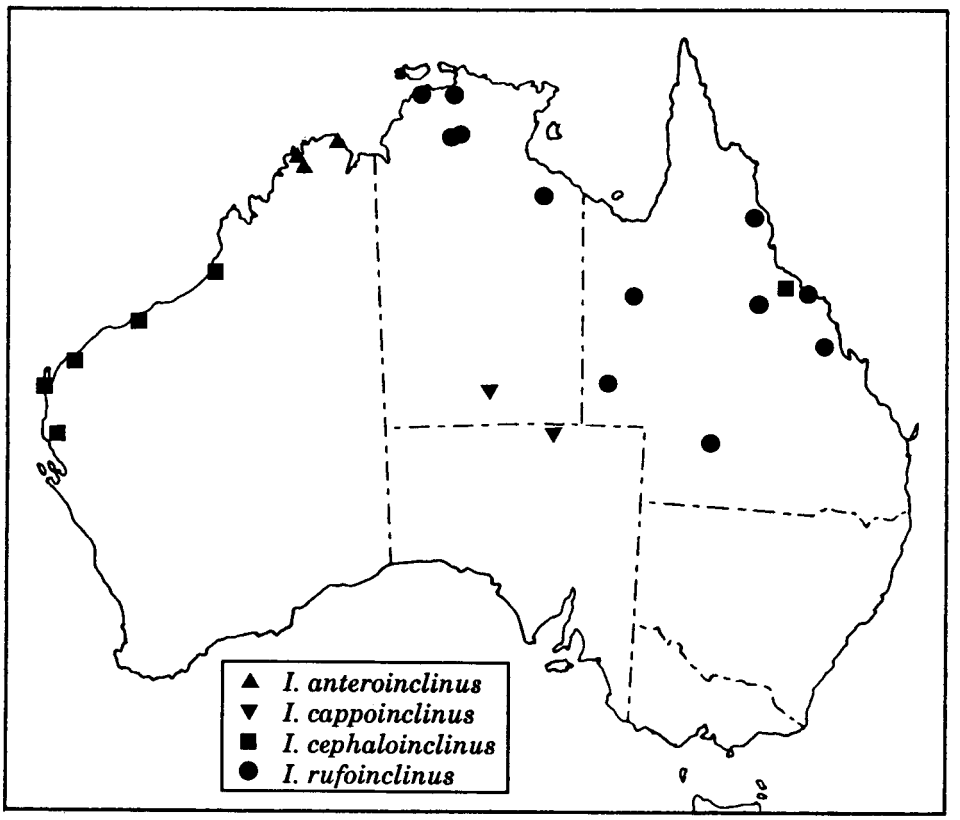


Fig. 37. Distribution of *I. rufoinclinus* complex material examined during this study.

Worker Diagnosis

A member of the *rufoinclinus* complex with the following characteristics: head, mesosoma and petiole yellowish red to reddish and similar in colour; propodeum low and flattened dorsally (Fig. 35); CI $\leqslant$ 0·98.

Description

Entire body (except gaster) yellowish red to reddish, legs and dorsum of petiole often weakly infuscated with reddish brown and slightly darker than mesosoma; gaster dark reddish brown. Elongate (greater than maximum scape width), pale erect hairs present on posterior surface of head and dorsal surfaces of mesosoma, petiole and gaster; shorter pale erect hairs present on lateral margin of head and all leg segments; scape with or without scattered erect to subdecumbent hairs; psammophore well developed. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *rufoinclinus* complex.

Measurements

Holotype. CI 0·95; EL 0·35; EW 0·19; HL 1·44; HTL 1·81; HW 1·37; ML 0·67; PnL 0·92; PpL 0·81; REL 0·26; SI 0·86; SL 1·18.

Worker ($n = 10$). CI 0·91–0·98; EL 0·31–0·37; EW 0·18–0·20; HL 1·20–1·44; HTL 1·60–1·80; HW 1·10–1·38; ML 0·55–0·70; PnL 0·70–0·92; PpL 0·66–0·81; REL 0·25–0·28; SI 0·81–0·95; SL 0·96–1·18.

Comments

This is the most well-known species in the *rufoinclinus* complex, and the second most widely distributed after *I. cephaloinclinus*. It occurs from the Darwin region east and south to Mareeba and south-western Queensland (Fig. 37). The limited available collection data suggest that it occurs in wooded areas.

The type series was collected from a riparian woodland area approximately 20 m from the lake below Edith Falls. Foraging occurred throughout the day, although activity levels were reduced during the middle of the day. A single, loosely formed foraging column was found that extended approximately 15 m before being lost in heavy shrubs. The nest consisted of a low, thin asymmetrical disc of loose soil with a single entrance hole. The only other collections of *I. rufoinclinus* for which collection notes are known were made at Kapalga, Kakadu National Park. These specimens occurred in savanna woodland, and individuals were often found foraging on low vegetation (personal observation; A. N. Andersen, personal communication).

Iridomyrmex viridigaster Clark

(Figs 26, 27, 38)

Iridomyrmex viridigaster Clark, 1941: 87.

Material Examined

Holotype. Worker, Victoria, Patho [*c.* 36°02'S.,144°26'E.], 19.xii.1936, H. A. Potter, bearing a red 'Type' label (MVMA).

Paratypes. 2 workers, same data as holotype, bearing a blue 'PARATYPE' label (ANIC). In addition, there are 5 workers in MVMA and 2 workers in ANIC that bear identical collection labels to the holotype and paratypes, but lack paratype labels, and 5 workers in ANIC with collection labels similar to the holotype and paratypes but lacking the date, and also lacking paratype labels. The original description does not indicate the number of specimens examined and there is no direct evidence to suggest that these non-type labelled specimens are actually part of the type series. Until additional information becomes available, the type material of this species is here considered to be restricted to the holotype and 2 paratypes, all of which bear type labels.

Other material (in ANIC). **New South Wales:** 5 km W. of Broken Hill (PJMG); Bogan R. (J. Armstrong); Broken Hill (BBL); Hay (BBL); 'Kapunda', N. of Nyngan (PJMG); Moulamein

(BBL); Nyngan (J. Armstrong). **Northern Territory:** Kunoth Paddock, nr Alice Springs (PJMG). **Queensland:** 16 km W. of Cunnamulla (PJMG). **South Australia:** 7 km NW. of Morgan (PJMG); 2 km NE. of Koonamore (PJMG).

Worker Diagnosis

A member of the *viridigaster* complex with the following characteristics: in lateral profile, central and posterior regions of pronotum forming a uniform, gradual arch (Fig. 27); scapes generally with short erect hairs (Fig. 26) (sometimes absent); dorsum of gaster with elongate pale erect hairs (Fig. 27); HW > 1·15 mm, HL < 1·39.

Description

Pigment colour of anterior regions of head, clypeus, mandibles, scapes, posterior and ventral pronotum, and anterior mesonotum yellowish red to reddish; remainder of head and mesosoma, and petiole, gaster and legs infuscated dark reddish brown to black (occasionally head and pronotum only weakly infuscated and only slightly darker than nearby regions). Elongate, pale erect hairs present on all lateral surfaces of head (lateral hairs slightly shorter), and dorsum of mesosoma, petiole and gaster; short, pale suberect hairs present on all surfaces of legs; scape generally with erect to suberect hairs, sometimes without hairs; psammophore well developed, hairs on gula weakly curved, those on mandibles distinctly curved. For additional characters, see 'Worker Diagnosis', 'Key' and the definition and discussion of the *viridigaster* complex.

Measurements

Worker ($n = 13$). CI 0·93–0·99; EL 0·30–0·33; EW 0·15–0·19; HL 1·23–1·38; HTL 1·34–1·52; HW 1·16–1·33; ML 0·47–0·65; PnL 0·71–0·80; PpL 0·64–0·72; REL 0·24–0·27; SI 0·75–0·80; SL 0·93–1·01.

Comments

Iridomyrmex viridigaster is the most common and widespread species in the *viridigaster* complex (Fig. 38). Most collections have been made in drier areas, although detailed information is lacking. Unfortunately, almost all of the available specimens have come from pitfall traps or are hand-collected strays and very few have come from nests. This has limited the amount of information available for this species.

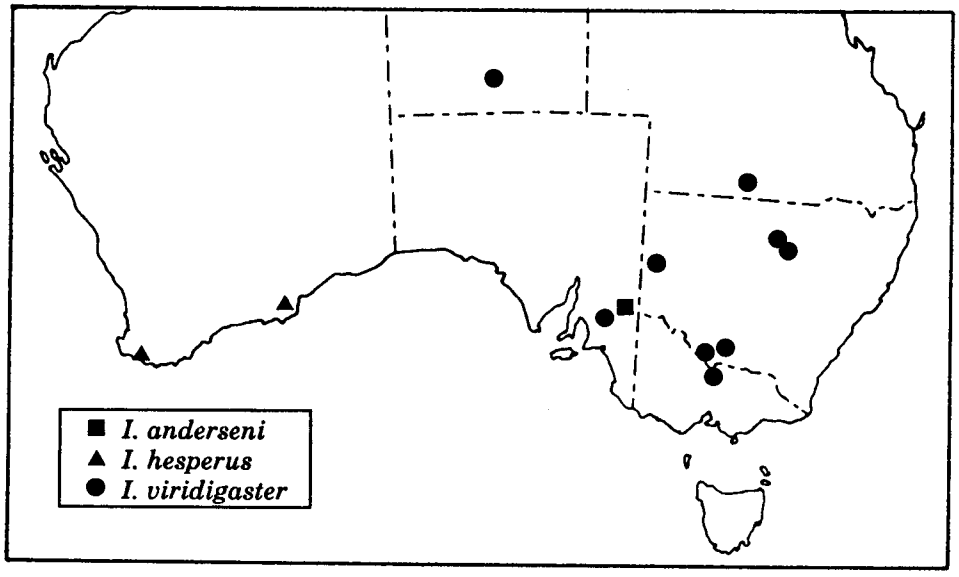


Fig. 38. Distribution of *I. viridigaster* complex material examined during this study.

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