



***Austromorium*, a new myrmicine ant genus from Australia (Hymenoptera: Formicidae)**

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Abstract

The myrmicine ant genus *Austromorium* is described for two Australian endemic species. One species has been known for some time but its taxonomic placement has been unclear while the second species is newly described. They are thought to be related to *Lordomyrma* and *Austromorium* is tentatively placed within the tribe Stenammini. These are ground-nesting ants although little else is known of their biology. While one species is widespread across semi-arid southern Australia the other is restricted to a narrow band of coastal south-western Western Australia.

Key words: Australia, Formicidae, Hymenoptera, new genus, new species, *Austromorium*

Introduction

The Australian ant *Austromorium flavigaster* (Clark, 1938) is a fairly common and widespread species across much of southern Australia. Unfortunately its taxonomic placement has been unstable, having been placed in three genera since its description as well as being considered unplaced to genus (*incertae sedis* within the subfamily Myrmicinae). However, a detailed morphological examination has revealed that this species, together with its close relative *A. hetericki* sp. n., cannot be placed in any existing genus. Therefore, a new genus, *Austromorium*, is established for these two species. The genus is placed in the tribe Stenammini, while acknowledging that the tribal classification within this subfamily is not as robust as would be hoped for and this placement should be considered tentative until broader studies of the subfamily are undertaken.

Methods and abbreviations

Size and shape characters were quantified and are reported as lengths or indices. Measurements were made with a stereo microscope at various magnifications 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 as a range from minimum to maximum across all measured specimens.

The following measurements and indices are reported.

CI	Cephalic index: HW/HL x 100.
EI	Eye index: EL/HW x 100.
EL	Maximum eye length with eye in full face view.
HL	Maximum head length in full face (dorsal) view, measured from the anterior-most point of the clypeal margin to the posterior-most point of the head proper.
HW	Maximum head width in full face (dorsal) view.
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.
- SI Scape index: $SL/HW \times 100$.
- SL Length of the scape (first antennal segment) excluding the basal neck and condyle.

Collections: ANIC, Australian National Insect Collection, Canberra, A.C.T.; JDMC, Jonathan D. Majer Collection, Curtin University of Technology, Perth, Western Australia; MVMA, Museum Victoria, Melbourne, Victoria.

***Austromorium* gen. n.**

(Figs 1–8)

Type species. *Xiphomyrmex flavigaster* Clark, 1938, here designated.

Diagnosis. Antennae 12 segmented (including the scape) with a 3-segmented club. Antennal scrobes absent. Mandibles with 4 or 5 teeth. Upper surface of the mesosoma forming a uniform arch which is interrupted only by the shallow metanotal groove. Tip of sting broadly flattened and expanded (visible only when the sting is extended).

These ants are superficially similar to workers of *Lordomyrma* and *Tetramorium*. They can be separated from *Lordomyrma* by the lower number of mandibular teeth (4 or 5 in this group, 7 or more in *Lordomyrma*), the relatively smooth mesosomal dorsum and the broad, expanded tip of the sting (which is sharply pointed in *Lordomyrma*). They differ from *Tetramorium* in having the region below the antennal socket rounded rather than ridged, and in lacking a triangular extension on the tip of the sting.

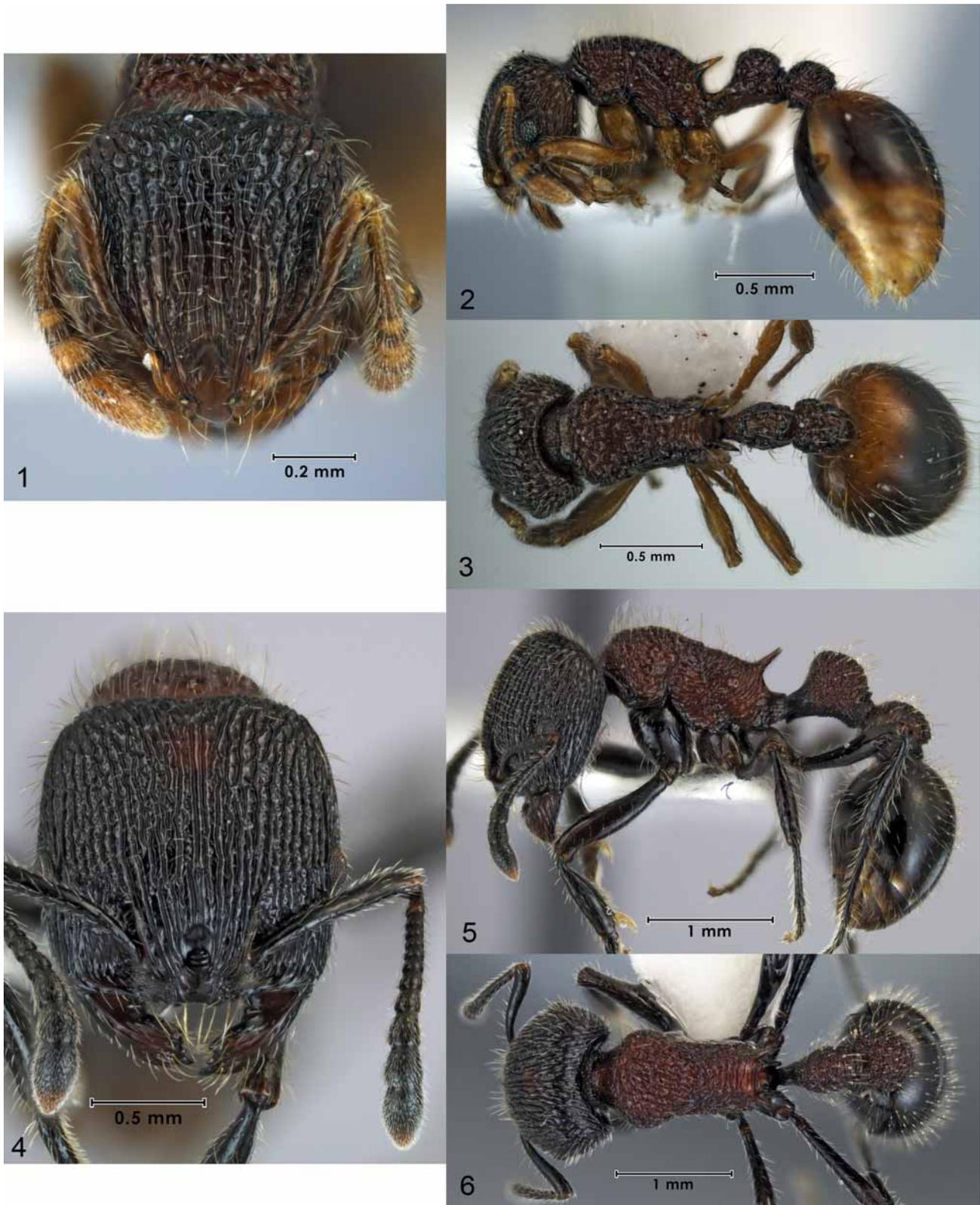
Description. Mandibles triangular, with 4–5 teeth. Palp formula 2,2. Clypeus projecting slightly forward, bicarinate. Frontal lobes narrow but covering antennal insertions. Eyes with 8–18 ommatidia in greatest diameter, located laterally on head at or just anterior of the midpoint of its length. Antennae 12 segmented with a 3-segmented club.

Mesosoma compact to moderately elongate. Dorsal surface of mesosoma forming a continuous flat to weakly convex surface, the metanotal groove weak or essentially absent. Propodeal spines well developed. Propodeal lobes either large and rounded or developed as sharp spines which are 3/4 the length of the propodeal spines. Propodeal spiracle small, located at or before the base of the propodeal spine and well forward of the posterior propodeal face. Tibial spurs absent from middle and hind legs.

Mandibles smooth but overlain with low carinae. Head, mesosoma, petiole and postpetiole distinctly sculptured, legs and gaster smooth. Entire body with elongate erect or suberect hairs, those on scapes and legs sometimes appressed. Anterior clypeal margin with a row of long, curved setae which extend anteriorly about 1/2 the length of the mandibles. Colour yellowish-red to dull red, antennae and legs sometimes lighter.

Comments. *Austromorium flavigaster* (Clark), the only known representative of this genus before this study, was originally described in the genus *Xiphomyrmex*. When Bolton (1976) synonymised *Xiphomyrmex* with *Tetramorium* he questioned the generic placement of *flavigaster* and, on the advice of R. W. Taylor, transferred it in the genus *Chelaner*. Bolton was justified in removing *A. flavigaster* from *Tetramorium* as this species (1) lacks a dorsal lamellate appendage on the tip of sting shaft, (2) the anterolateral portions of the clypeus are low and rounded, not raised into a shield-wall around the antennal insertion, and (3) the mandibles have four teeth while six or more are found in *Tetramorium* (Bolton, 2003). Unfortunately, the placement of *flavigaster* in *Chelaner* (which was subsequently synonymised with *Monomorium* by Bolton (1987)) is also unsupportable. As pointed out by Heterick (2001), *flavigaster* lacks the central clypeal seta found in *Monomorium* while it possesses elongate, spine-like propodeal lobes, a feature absent from Australian *Monomorium*. Unfortunately Heterick (2001) could not determine an obvious generic placement for this species and considered it *incertae sedis* within the subfamily Myrmicinae, suggesting that it will likely need to

be placed in a new genus. This follows Shattuck (1999), who similarly could not place this species within an existing genus and treated it as belonging to an undescribed genus.



FIGURES 1–3. *A. flavigaster* Clark, worker: Fig. 1, front of head; Fig. 2, lateral view of body; Fig. 3, dorsal view of body.

FIGURES 4–6. *A. hetericki* sp. n., worker: Fig. 4, front of head; Fig. 5, lateral view of body; Fig. 6, dorsal view of body.

As noted by Heterick (2001, 2009), *flavigaster* shares a number of similarities with at least some members of the tribe Stenammini as defined by Bolton (2003) and while acknowledging the poor tribal understanding within this subfamily, this species seems best placed within this tribe as we currently understand it. It differs from most members of the tribe as follows: from *Adelomyrmex*, *Baracidris*, *Lachnomyrmex* and *Tetheamyrmex* by the 3-segmented rather than 2-segmented antennal club; from *Ancyridris* by the lack of elongate spines on the dorsum of the petiolar node; from *Calyptomyrmex* by the short, rounded rather than forked clypeus; from *Cyphoidris*, *Dacatinops*, *Indomyrma* and *Lasiomyrma* by the 12-segmented rather than 11-segmented antennae; from *Dacatria* and *Proatta* by the smooth rather than protuberant or spined mesosomal dorsum; from *Dicroaspis* by the short, rounded rather than forked clypeus and the 12-segmented rather than 11-segmented antennae; from *Rostromyrmex* by the short, rounded rather than rostrum-like clypeus and the 12-segmented rather than 9-segmented antennae; from most *Stenamma* by the 3-segmented rather than 4-segmented antennal club; and from *Vollenhovia* by the elongate petiolar peduncle and lack of subpetiolar plate.

Austromorium flavigaster is most similar to species of *Lordomyrma* or *Rogeria*, with both of these genera also occurring in the Australian region. Heterick (2009) recognised this similarity and provisionally placed *A. flavigaster* in *Rogeria* based on the diagnosis provided by Bolton (2003). However, using the more detailed diagnosis provided by Kugler (1994), *flavigaster* differs from species of *Rogeria* in having (1) the anterior margin of the clypeus projecting slightly further anteriorly, (2) a posterior clypeal extension which is broader, causing the frontal lobes to be more broadly separated and (3) a smaller and more anteriorly placed propodeal spiracle which is more than 3x its diameter from the posterior propodeal face. Combined, these characters suggest that *flavigaster* does not belong in *Rogeria*.

Finally, *flavigaster* can be separated from species of *Lordomyrma* by the (1) reduced number of palp segments (2,2 vs. 4,3, 3,3 or 3,2), (2) broadly spatulate sting tip (at most only slightly expanded in *Lordomyrma*), (3) fewer mandibular teeth (4–5 vs. 7–9) and (4) absence or at most weak development of a metanotal groove (present to varying degrees in *Lordomyrma*). The lack of scrobes will separate *flavigaster* from some but not all species of *Lordomyrma* as this character is variable within *Lordomyrma* (Sarnat, 2006; Taylor, 2009).

As a result of this analysis, it seems clear that *flavigaster* cannot be placed in any existing genus and is best placed in a new genus, *Austromorium*, as proposed here.

Key to species of *Austromorium* based on workers

1. Body smaller (HW < 0.85mm), gaster banded (honey yellow anteriorly and posteriorly, brown medially), propodeal lobes developed as sharp spines posteriorly (widespread across southern Australia) *flavigaster*
- . Body larger (HW > 1.30mm), gaster uniformly coloured dark brown, propodeal lobes large and rounded posteriorly (restricted to coastal plain between approximately Geraldton and Perth, Western Australia)..... *hetericki*

Austromorium flavigaster (Clark)

(Figs 1–3, 7)

Xiphomyrmex flavigaster Clark, 1938: 366 (combination in *Chelaner* by Bolton, 1976; combination in *Monomorium* by Taylor, 1987; unplaced to genus by Shattuck, 1999; *incertae sedis* in Myrmicinae by Heterick, 2001; combination in *Rogeria* by Heterick, 2009).

Types. Syntype workers from Reevesby Island, South Australia (MVMA, examined).

Diagnosis. Body yellowish-red to reddish-brown, much lighter in colour than *hetericki*, the gaster banded light brown-dark brown-light brown (rather than being dull red with a uniformly coloured gaster), sculpturing areolate-rugose (rather than rugose), dorsal face of propodeum similar in length to posterior face (rather than much longer), propodeal lobes developed as sharp spines (rather than rounded posteriorly), ventral surface of

petiole lacks a small tooth anteriorly, and petiolar node with distinct anterior and dorsal faces (rather than having the dorsal and posterior faces forming a continuous surface). In addition, *flavigaster* is much smaller than *hetericki* (HW < 0.85mm vs. HW > 1.30mm).

Description. Mandibles triangular, with 4–5 teeth. Palp formula 2,2. Clypeus projecting slightly forward, bicarinate. Frontal lobes narrow but covering antennal insertions, posterior sections converging slightly. Eyes with 8–10 ommatidia in greatest diameter, located laterally on head at the midpoint of its length. Sides and vertex of head flat, connected by a broad, rounded curve. Antennae 12 segmented with a 3-segmented club.

Mesosoma compact. Anterior face of pronotum rising almost vertically from the collar and rounding gradually into the dorsal surface. Mesonotum and dorsal surface of propodeum forming a continuous surface separated by a weak metanotal groove. Dorsal face of propodeum approximately the same length as the posterior face. Propodeal spines well developed. Propodeal lobes developed as sharp spines which are 3/4 the length of the propodeal spines. Propodeal spiracle small, located level with the base of the propodeal spine, approx. 3x its diameter from the posterior propodeal face. Tibial spurs absent from middle and hind legs.

Petiolar peduncle about half as long as petiolar node. Venter of petiole flat anterior and lacking a subpetiolar process; posterior sectioned angled ventrally relative to anterior section. Node with distinct anterior, dorsal and posterior faces, the anterior and dorsal faces approximately the same length, the posterior face much shorter causing the dorsal face to slope rearward. Postpetiole with a low process ventrally. Postpetiolar node with distinct anterior, dorsal and posterior faces, the dorsal face weakly convex.

Mandibles smooth but overlain with weak, low carinae. Head areolate-rugose with the dorsal surface of the head between the eyes tending towards costate. Mesosoma, petiole and postpetiole areolate-rugose. Legs and gaster smooth. Entire body with elongate erect or suberect hairs, those on the scapes and legs shorter and more appressed. Anterior clypeal margin with a row of long, curved setae which extend anteriorly about 1/2 the length of the mandibles.

Colour yellowish-red to reddish-brown, antennae and legs lighter. Gaster generally banded with the anterior section of the first tergite and the terminal segments paler than the posterior section of the first tergite.

Measurements. Worker (n=8): CI 88–96, EI 15–18, EL 0.10–0.14, HL 0.71–0.87, HW 0.65–0.81, ML 0.77–0.99, MTL 0.38–0.47, SI 75–81, SL 0.52–0.62.

Material examined. **Australia:** *Australian Capital Territory:* Black Mountain (Barnett,N.J.; Moran,R.J.; Taylor,R.W.); Black Mountain, eastern foothills (Lowery,B.B.); Mount Ainslie (Brooks,C.G.; Lowery,B.B.; Taylor,R.W.); Mount Ainslie, nr. lookout (Brooks,C.G.). *New South Wales:* Gladstone (Harvey,M.S.); Mairjimmy SF, 12km N Finley (Lowery,B.B.); Queanbeyan, Mt. Jerrabomberra (Taplin,I.C.). *Queensland:* Mt. Nebo (Hammond,J.). *South Australia:* Aldgate, Adelaide (Lowery,B.B.); Back Ck. Gorge (Greenslade,P.J.M. & Kirkby,C.A.); Belair (Greenslade,P.J.M.); Bridgewater (Greenslade,P.J.M.); Coorong, Banff LB (Greenslade,P.J.M.); Coorong, Banff LE (Greenslade,P.J.M.); Coorong, Coolatoo LK (Greenslade,P.J.M.); Coorong, Keith, 17km NE Coorong (Greenslade,P.J.M.); Coorong, Salt Ck. [Coorong NP] (Greenslade,P.J.M.); Englebrook (Greenslade,P.J.M. & Kirkby,C.A.); Glen Osmond (Greenslade,P.J.M. & Kirkby,C.A.); Kangaroo Is., 3mi. S Rocky R. (Greenslade,P.J.M.); Kangaroo Is., Dudley Pen. (Greenslade,P.J.M. & Forrest,J.); Mt. Barker (Greenslade,P.J.M.); Mt. Lofty (Greenslade,P.J.M. & Kirkby,C.A.); Mt. Lofty Ranges (Greenslade,P.J.M. & Hutson); Reedy Creek, Murrumbong (Britton & Dawkins); Reevesby Island (Clark,J.); Rocky River, Kangaroo Island (Greenslade,P.J.M.); Sevenhill (Lowery,B.B.); Victor Harbour (Greenslade,P.J.M.). *Tasmania:* Meander (Lowery,B.B.). *Victoria:* Studley Park, Kew (Lowery,B.B.). *Western Australia:* 13km SE Mt. Ragged, Cape Arid Natl Pk (Shattuck,S.O.); Boranup Drive, 4km NW Karridale (Lawrence,J.F. & Lawrence,N.); Green Head (collector unknown); Two People Bay (Springett,J.); Yanchep (collector unknown).

Comments. These ants are general scavengers which nest in the soil, often at the base of trees. They occur in southern New South Wales, A. C. T., Victoria, south-east South Australia and south-west Western Australia. Most collections have been from dry sclerophyll with a limited number from mallee.

***Austromorium hetericki* sp. n.**

(Figs 4–6, 8)

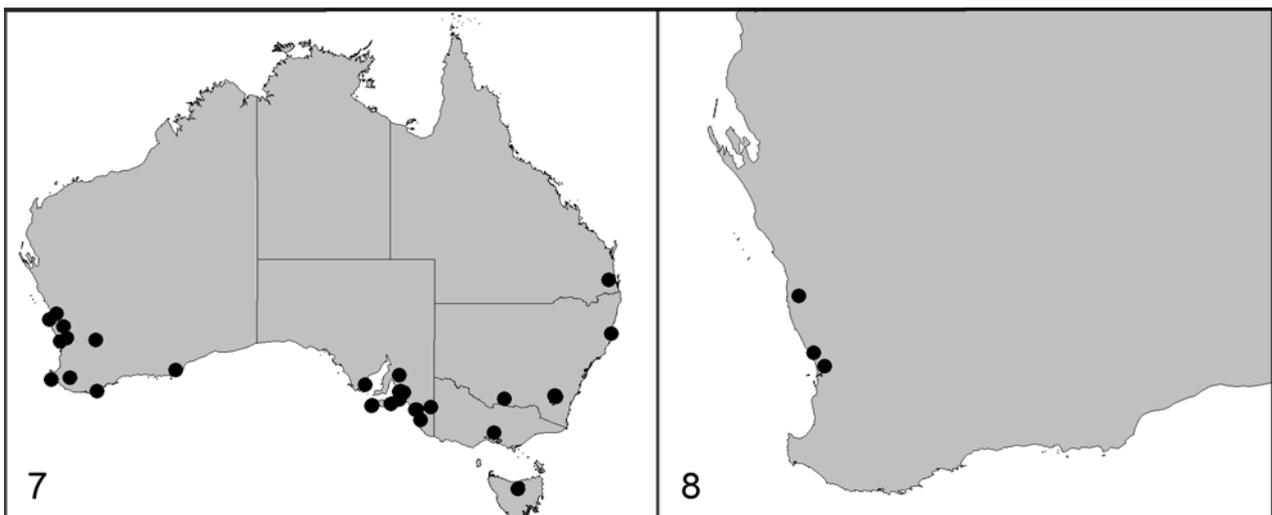
Types. Holotype worker from Lexia, 31°46'48S°115°56'49"E, 9 October 2005, B.E.Heterick, *Banksia* open woodland, *Adenanthos* understory, white quartz sand (ANIC). One paratype worker, same data as holotype (JDMC).

Diagnosis. Body dull red, much darker than *flavigaster*, the gaster uniform in colour (rather than being yellowish-red to reddish-brown with a bicoloured gaster), sculpturing rugose (rather than areolate-rugose), dorsal face of propodeum much longer than posterior face (rather than similar in length), propodeal lobes rounded posteriorly (rather than developed as sharp spines), ventral surface of petiole with a small tooth anteriorly, and petiolar node with dorsal and posterior faces forming a continuous surface (rather than with distinct and separate faces). In addition, *hetericki* is much larger than *flavigaster* (HW > 1.30mm vs. HW < 0.85mm).

Description. Mandibles triangular, with 4–5 teeth. Clypeus projecting slightly forward, bicarinate. Frontal lobes narrow but covering antennal insertions, diverging throughout their length. Eyes with 15–18 ommatidia in greatest diameter, located laterally on head slightly anterior of the midpoint of its length. Sides of head weakly convex, the vertex flat, the two surfaces connected by a narrow, rounded curve. Antennae 12 segmented with a 3-segmented club.

Mesosoma moderately elongate. Anterior face of pronotum rising strongly from the collar and rounding gradually into the dorsal surface. Posterior pronotum, mesonotum and dorsal surface of propodeum forming a continuous flat surface, the metanotal groove essentially absent. Dorsal face of propodeum noticeably longer than the posterior face. Propodeal spines well developed. Propodeal lobes large and rounded posteriorly (lacking sharp angles). Propodeal spiracle small, located anterior of the base of the propodeal spine, approx. 6x its diameter from the posterior propodeal face. Tibial spurs absent from middle and hind legs.

Petiolar peduncle about 1/3 as long as petiolar node. Venter of petiole gently concave across its length, with a small tooth anteriorly. Node with distinct anterior, dorsal faces, the dorsal face gradually curving into the indistinct posterior face, the anterior and dorsal faces approximately the same length. Venter of postpetiole flat. Postpetiolar node with the anterior and dorsal faces forming a continuous curve, the posterior face separate and very short.



FIGURES 7–8. Distribution of material examined during this study: Fig. 7, *A. flavigaster*; Fig. 8, *A. hetericki*.

Mandibles smooth but overlain with weak, ill-defined carinae. Head costate but tending towards rugose posteriorly, the individual carinae fairly widely separated and the underlying integument roughly sculptured (but the pattern ill-defined). Mesosoma, petiole and postpetiole rugose, the rugae running roughly transverse

on the anterior pronotum, propodeum, petiole and postpetiole, and longitudinal on the posterior pronotum and mesonotum. Legs and gaster smooth. Entire body with elongate erect or suberect hairs. Anterior clypeal margin with a row of long, curved setae which extend anteriorly about 1/2 the length of the mandibles.

Colour dull red, the head and legs dull red to red-black, gaster always red-black and uniformly coloured.

Measurements. Worker (n=2). CI 96–97, EI 15–16, EL 0.21–0.23, HL 1.41–1.44, HW 1.35–1.40, ML1.48–1.59, MTL 0.81–0.83, SI 66–68, SL 0.92–0.93.

Comments. *Austromorium hetericki* is confined to a narrow coastal strip from Perth northwards to about Geraldton, Western Australia, where it is found in woodland and heathland habitats. Little else is known about its biology.

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