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Turneria rosschinga sp.n. (Hymenoptera: Formicidae), a new dolichoderine ant from Australia

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Abstract

The Australian species of the dolichoderine ant genus *Turneria* FOREL, 1895 are reviewed. *Turneria rosschinga* sp.n. is described as new and additional distribution records for *T. bidentata* FOREL, 1895, the only other species of the genus known from Australia, are provided. *Turneria rosschinga* sp.n. is restricted to cooler regions of south-eastern Australia and is the only member of the genus found in temperate areas. It has been found foraging arboreally and is likely twig-nesting as are other species of *Turneria*.

Key words: Australia, Formicidae, Hymenoptera, *Turneria*, new species, *Turneria rosschinga*.

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Introduction

The ant subfamily Dolichoderinae is taxonomically very diverse in Australia, with representatives of 15 of the world's 26 genera being found there. Additionally, a recent phylogenetic study has found a large Australian-based radiation within the subfamily, with nine genera apparently having arisen within the Australian continent (WARD & al. 2010). Here I review one of these genera, *Turneria* FOREL, 1895, describing a second Australian species and provide distribution information on the previously known species, *T. bidentata* FOREL, 1895. This builds on the earlier revision undertaken by SHATTUCK (1990). *Turneria rosschinga* sp.n. is known from eastern New South Wales and Tasmania and is likely present in eastern Victoria although it is yet to be encountered there. The species has been collected only four times, and each time only a single worker has been found. This makes it among the most infrequently encountered ants known from Australia. Three of the collections were from pitfall traps while one worker was found foraging on a *Eucalyptus* trunk among workers of *Anonychomyrma* DONISTHORPE, 1947.

Methods

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 × 100.
EI Eye index: EL / HW × 100.
EL Maximum eye length with eye in full face view.
HL Maximum head length in full face (dorsal) view, measured from anterior-most point of clypeal margin to posterior-most point of head proper.
HW Maximum head width in full face (dorsal) view.
ML Mesosomal length measured from anterior surface of pronotum proper (excluding the collar) to posterior extension of propodeal lobes.
MTL Maximum length of mid tibia, excluding proximal part of articulation which is received into distal end of femur.
SI Scape index: SL / HW × 100.
SL Length of scape (first antennal segment) excluding basal neck and condyle.

Collections. ANIC, Australian National Insect Collection, Canberra, A.C.T.; TERC, Tropical Ecosystems Research Centre, CSIRO, Darwin, N.T.

Diagnosis of *Turneria*

The recent recognition of *Turneria rosschinga* has required that the definition of *Turneria* as proposed by SHATTUCK (1990, 1999) is expanded slightly. This species differs from other members of the genus in several characters which were previously thought to be diagnostic for the genus (such as the presence of protuberances on the propodeum). This re-evaluation has also resulted in the discovery of an additional character which unites all known species, namely the close approximation of the antennal carinae and inner margins of the eyes. Because of these changes the following updated diagnosis for *Turneria* has been prepared.

Workers of *Turneria* may be recognized among the Dolichoderinae by their elongate compound eyes, broadly convex to concave anterior clypeal margin which lacks a central angle or projection, the close approximation of the

Figs. 1 - 4: *Turneria bidentata*, worker: (1) nest in small twig (near Cairns, Queensland); (2) front of head; (3) lateral view of body; (4) dorsal view of body (photographs by S. Shattuck, copyright CSIRO).

posterior terminus of the frontal carinae to the inner margins of the compound eyes and the dorsal placement of the propodeal spiracle near the propodeal angle. Additionally, most species lack pilosity on the dorsum of the head and mesosoma (present in *T. rosschinga*), generally have protuberances at the propodeal angle (lacking in *T. rosschinga*) and with the posterior propodeal face concave (short and flat in *T. rosschinga*). In all known species the petiolar scale is present, inclined anteriorly and nodiform, and the sculpture is weakly (integument shiny) to moderately (integument subopaque) imbricate.

***Turneria bidentata* FOREL, 1895** (Figs. 1 - 7)
Turneria bidentata FOREL, 1895: 419.

Material examined. Australia: New South Wales: Tumbulgum on Tweed R., leg. B.B. Lowery (ANIC); Whiporie, 55 km S Casino, leg. A. York (ANIC). Northern Territory: Fogg Dam, Darwin Region, leg. H. Reichel (TERC); Howard Springs NP, Darwin Region, leg. B. Hoffmann (TERC); Nhulunbuy, Arnhem Land, leg. B. Hoffmann (TERC); nr. Yirrkala, NE Arnhem Land, Crazy Ant Survey [Yirrkala Mission], leg. B. Hoffmann & W. Saul (TERC); Rocky Bay near Yirrkala, leg. B. Hoffmann (TERC); Workshop Jungle, Fogg Dam, Darwin, leg. H.L.M. Reichel (ANIC). Queensland: 12 km ENE Daintree, leg. P.S. Ward (ANIC); 1 km NW Cape Tribulation, leg. P.S. Ward (ANIC); 1 km NW Cape Tribulation, leg. A.L. Wild (ANIC); 1 mi. E East Palmerston School, leg. R.W. Taylor (ANIC); 6 km SSE Atherton, leg. P.S. Ward (ANIC); 6 km SSE Atherton, Wongabel State Forest, Botanical Walk, leg. S.O. Shattuck (ANIC); Cairns, leg. B.B. Lowery (ANIC); Cairns, leg. R.W. Taylor (ANIC); Cape Tribulation, leg. S. Boulter (TERC); Cape Tribulation, leg. A.N. Andersen (TERC); Cape Tribulation, Oliver Creek, leg. Monteith, Sheridan & Thompson (ANIC); Cooper Creek nr. Daintree, leg. J.E. Feehan (ANIC); Dunk Island, leg. A. Andersen (TERC); Giru, leg. B.B. Lowery (ANIC); Green Island, leg. P.S. Ward (ANIC); Innisfail, leg. A.N. Andersen (TERC); James Cook University Campus, N of Cairns, leg. S.O. Shattuck (ANIC); Koala Park, Burleigh Heads, leg. B.B. Lowery (ANIC); Lake Eacham, leg. B.B. Lowery (ANIC); Long Island, Whitsundays, leg. B. Hoffmann (TERC); Low Islet, Great Barrier Reef, leg. H. Heatwole (ANIC); Mackay, leg. M.G. Turner (ANIC); Mackay, leg. R.E. Turner (ANIC); Mareeba, leg. A.N. Andersen (TERC); Mt. Jim Crow National Park, leg. P.S. Ward (ANIC); Palmerston National Park [Palmerstone Nat. Park], leg. B.B. Lowery (ANIC); Picnic Bay, Magnetic Island, leg. B.B. Lowery (ANIC); Russell River at Bellenden Ker Landing, leg. Earthwatch, Queensland Museum (ANIC); Wongabel State Forest, 6 km SSE Atherton, leg. S.O. Shattuck (ANIC); Wongabel State Forest, 6 km SSE Atherton, leg. P.S. Ward (ANIC).

Comments. The material of *Turneria bidentata* studied by SHATTUCK (1990) during his revision of *Turneria* was limited to only a handful of collections. Since then considerably more material has become available. This new material extends the known distribution of the species to the Top End of the Northern Territory and into extreme north-eastern New South Wales (Fig. 5). It has also been confirmed that this is a twig-nesting species that is actually

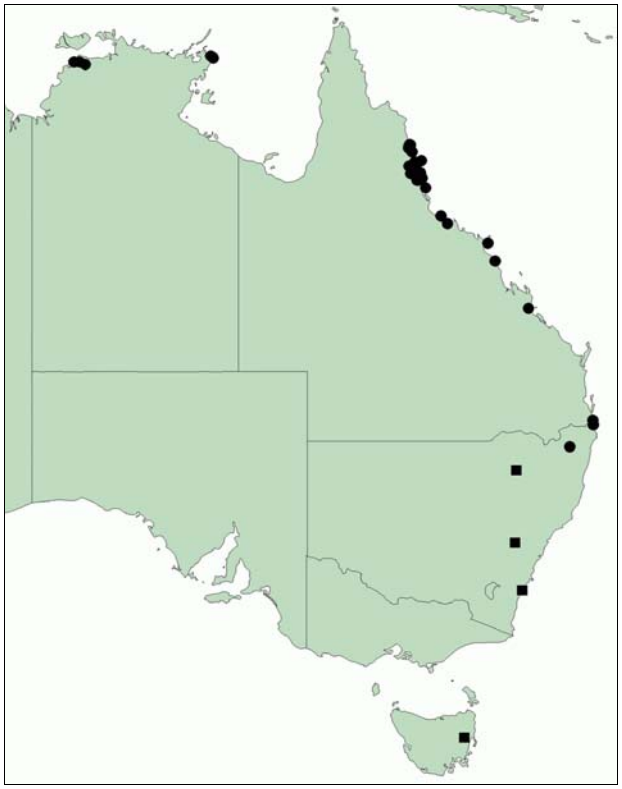


Fig. 5: Distribution of material examined during this study; *Turneria bidentata*, circles; *T. rosschinga* sp.n., squares.

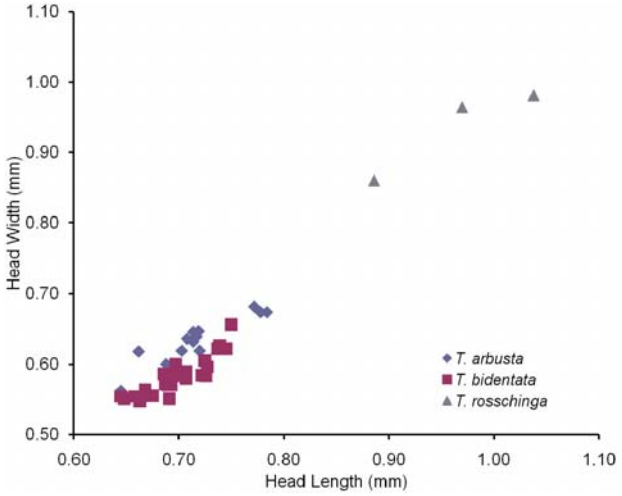


Fig. 6: Plot of head width versus head length for *Turneria arbusta* (Papua New Guinea: 13 workers), *T. bidentata* and *T. rosschinga* sp.n. (see main text for information on material from the latter two species).

much more common than previously thought, the infrequent encounters being caused by lack of careful collecting, especially in arboreal habitats. Morphologically, the new material fits well with the concept of this species developed by SHATTUCK (1990), although additional variation in colour and the shape of the propodeum has come to light. Body colour is now known to vary from brown to yellow-brown with a black gaster, but there is no indication that this is other than intraspecific. The convexity of the area between the propodeal spiracles (when viewed dorsally), a character used to separate this species from the

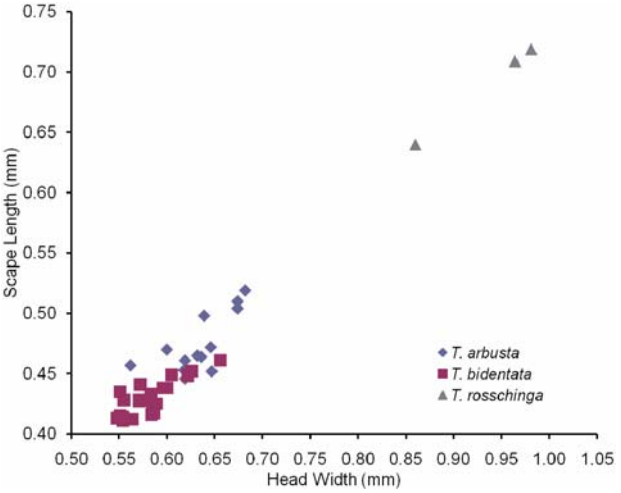


Fig. 7: Plot of scape length versus head width for *Turneria arbusta* (Papua New Guinea: 13 workers), *T. bidentata* and *T. rosschinga* sp.n. (see main text for information on material from the latter two species).

Papua New Guinea-based *T. arbusta* SHATTUCK, 1990, also varies more than originally thought, being less concave in some specimens, especially those from the Northern Territory. However, this region is still concave and the separation from *T. arbusta* is supported by this character as well as differences in head shape (more elongate in *T. bidentata* and broader in *T. arbusta*, Fig. 6) and scape length (averaging shorter in *T. bidentata*, longer in *T. arbusta*, Fig. 7). Together, these characters suggest that these species are distinct and both are best regarded as valid species.

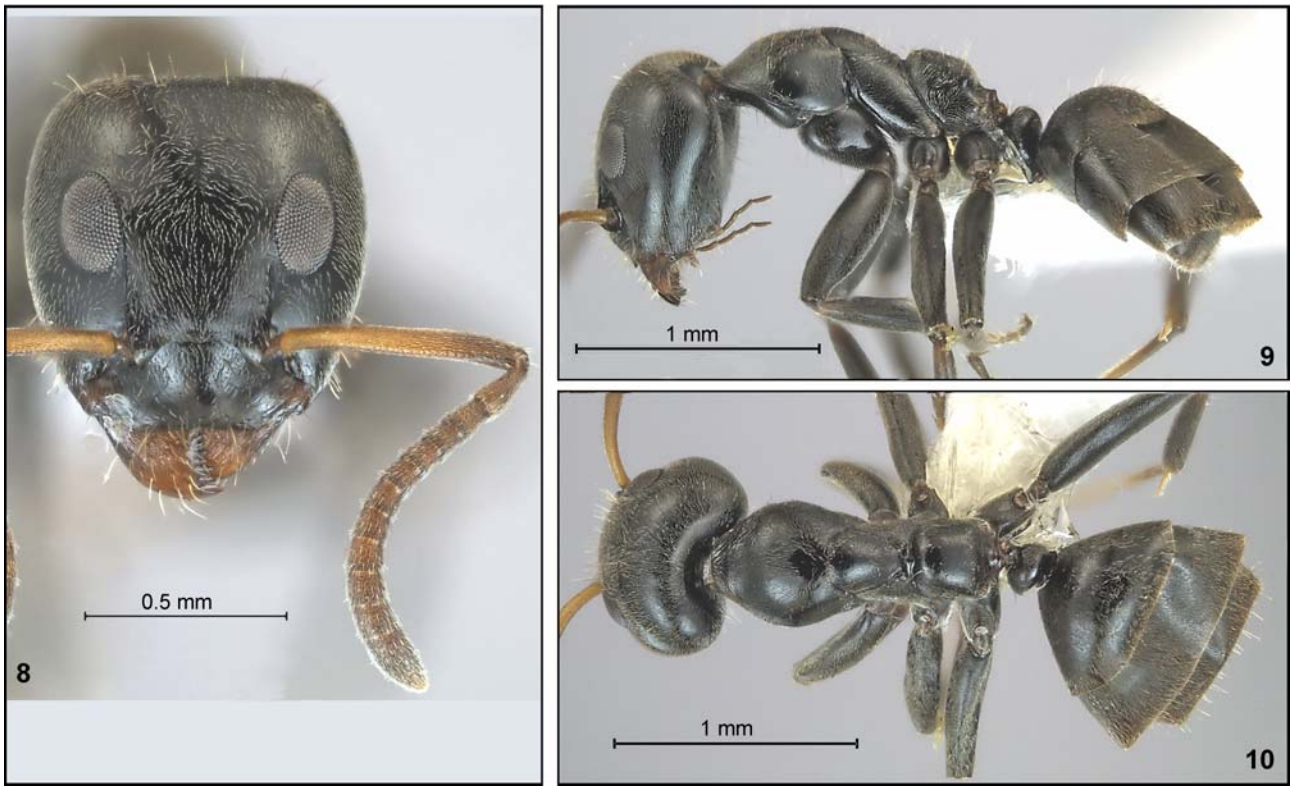
***Turneria rosschinga* sp.n.** (Figs. 5 - 10)

Type. Holotype worker from Kioloa, ANU Field Station, New South Wales, 35° 32' S, 150° 23' E, 12 August 1990, S.O. Shattuck, abandoned pasture, foraging on *Eucalyptus* trunk with *Anonychomyrma* (ANIC, ANIC32-051853).

Other material examined. **Australia:** New South Wales: Lidsdale State Forest, Lithgow, leg. A. York, 1 worker (ANIC); Mt. Coryah, Narrabri, leg. P.M. Room, 1 worker (ANIC). Tasmania: 25 km NW Swansea, leg. N. Meeson, 1 worker (TERC).

Diagnosis. Belonging to the genus *Turneria* as defined above but differing from all other known species in having the propodeum low and rounded and lacking the rounded protuberances found in other species. Additionally, this is the most hirsute species in the genus, with abundant long erect hairs present on the dorsal surfaces of the head and mesosoma.

Description. Head very slightly longer than wide (CI 95 - 99) (Fig. 6), anterior clypeal margin weakly concave medially; eyes elongate but less so than in other *Turneria* species; erect hairs absent from scapes and sides of head, abundant elsewhere, entire head capsule with abundant appressed pubescence; mandibles with nine teeth. Promesonotum forming a uniform arch, pro-mesonotal suture only slightly impressed; metanotal groove well developed, separated from propodeum by a short, nearly vertical face; propodeum relatively low, posterior face much shorter than dorsal face; propodeal spiracles just below propodeal angle and raised on low protuberances; erect hairs present on dorsal mesosomal surface, appressed pubescence abun-



Figs. 8 - 10: *Turneria rosschinga* worker sp.n. (holotype): (8) front of head; (9) lateral view of body; (10) dorsal view of body (photographs by S. Shattuck, copyright CSIRO).

dant but less so on lateral surface of pronotum. Petiole included strongly anteriorly and with a rounded apex. Gaster with abundant pubescence and numerous erect hairs. Legs lacking erect hairs. Body reddish-black, antennae, mandibles and tarsi yellowish-red.

Measurements. Worker (n = 3, including holotype). CI 95 - 99, EI 29, EL 0.25 - 0.29, HL 0.89 - 1.04, HW 0.86 - 0.98, ML 1.17 - 1.44, MTL 0.67 - 0.77, SI 73 - 74, SL 0.64 - 0.72.

Etymology. Named in dedication of Ross and Ching Crozier. The specific name is an arbitrary combination of letters and is to be treated as a noun in apposition.

Comments. This species differs significantly from others in the genus both biogeographically and morphologically. It is here placed in *Turneria* based on the configuration of the frontal carinae which are widely spaced and with their posterior extensions approaching the anteromedial margins of the eyes. This feature is shared with existing *Turneria* species but is never seen in other genera. Additionally, the mandibular teeth are uniform in size and spacing rather than being asymmetrical and irregular as found in the otherwise similar genus *Iridomyrmex* MAYR, 1862. These characters suggest that this is a slightly aberrant *Turneria* rather than a member of another dolichoderine genus.

Biogeographically, *Turneria rosschinga* sp.n. is the only species known to occur in cool temperate areas, the remaining species being found in more tropical areas, typically in rainforest habitats (Fig. 5). Morphologically, this species lacks the characteristic protuberances on the propodeum found in other members of the genus, instead the propodeum is low, rounded and relatively elongate and similar to that found in typical dolichoderines. In fact the shape of the propodeum is nearly identical to that seen in *Iridomyrmex mirabilis* HETERICK & SHATTUCK, 2011. However, it differs from that species in having the spiracle higher and protuberant while in *I. mirabilis* the spiracle is typical of *Iridomyrmex* in being lower on the propodeum and more or less flush with the surface. It seems likely that *T. rosschinga* represents a basal element within the genus, sharing a number of characters (abundant pilosity and low, rounded propodeum) with forms outside the genus which are not found in other species within the genus.

Biologically, little is known about this species. Three of the four collections were from pitfall traps, while the fourth was of a single worker foraging on a *Eucalyptus* trunk in an abandoned paddock. This individual was foraging together with *Anonychomyrma* workers and was initially confused with them as it is superficially very similar to typical *Anonychomyrma* workers. Whether there is a biological relationship between these species, or if they were simply foraging independently on the same tree, is unknown at this point.

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