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Systematics of the *Monomorium rothsteini* Forel species complex (Hymenoptera: Formicidae), a problematic ant group in Australia

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Abstract

A recent molecular, morphological and distributional analysis of *Monomorium rothsteini* demonstrated that it comprises many separately evolving lineages that could be recognised morphologically and/or genetically based on mitochondrial DNA sequences. Based on these results *M. rothsteini* is revised, resulting in four species being brought out of synonymy (*M. bogischi* Wheeler, *M. leda* Forel, *M. humilior* Forel and *M. subapterum* Wheeler) and 18 new species recognised: *M. broschorum* n. sp., *M. capeyork* n. sp., *M. eremoides* n. sp., *M. eremum* n. sp., *M. geminum* n. sp., *M. hertogi* n. sp., *M. hoffmanni* n. sp., *M. kidman* n. sp., *M. maryannae* n. sp., *M. merepah* n. sp., *M. mitchell* n. sp., *M. oodnadatta* n. sp., *M. pilbara* n. sp., *M. speculum* n. sp., *M. stagnum* n. sp., *M. tenebrosum* n. sp., *M. topend* n. sp., *M. torrens* n. sp. *Monomorium rothsteini* v. *doddi* Santschi is recognised as a valid synonymy of *M. rothsteini* s.str. Along with *M. rothsteini* Forel s. str., there are now 23 described species in the complex, however it likely comprises many more species given the number of additional *COI* lineages and morphotypes that remain unresolved due to incomplete data. Biological notes are provided as well as a key to workers, descriptions, images and distribution maps for each species.

Key words: integrative taxonomy, Myrmicinae, COI barcoding, morphology, seed-harvesting, Australia

Introduction

Ants are an ever-present component of most Australian environments. Their abundance and ubiquity in arid regions is paralleled by their species diversity. One of the more speciose genera, *Monomorium*, occurs across the entire continent in habitats as diverse as tropical rainforest mountain tops and the hottest, driest desert regions.

The phylogenetic status of *Monomorium* as a highly polyphyletic taxon was recently demonstrated in the context of a large-scale molecular study of Myrmicine evolution (Ward *et al.* 2014) which had broad implications for the generic level classification of the subfamily, and *Monomorium* in particular, and resulted in several revised generic names. The more than 60 Australian species remain in *Monomorium* s.l. and there is an urgent need for a revision at both the generic and species levels. This study represents a step in this direction, and focusses on one of the large and previously taxonomically intractable groups, the *M. rothsteini* species complex.

The *M. rothsteini* complex is a diverse radiation within this taxonomically challenging genus. The type species was first described from Charters Towers in North Queensland by Forel (1902) who subsequently described two additional subspecies, *M. rothsteini humilior* and *M. rothsteini leda* (Forel 1910, 1915), followed by *M. rothsteini doddi* Santschi (1919). In a study discussing phylogenetic origins of aptery and subaptery, Wheeler (1917) erected the taxa *M. subapterum* Wheeler and *M. subapterum* var. *bogischi*. These six taxa were synonymised under *M. rothsteini* as part of a broader taxonomic revision of Australian *Monomorium* (Heterick 2001).

The morphological variation that exists within what is formally recognised as *M. rothsteini* is considerable and

clearly forming an obtuse angle; dorsally with anterior transverse carinae completely absent in a majority of specimens when present very weakly so, transverse and longitudinal strigae absent. Petiole node narrow, less than 2 x eye width when viewed from above; shape in posterior view tapering to a narrow point, in lateral view anterior and posterior faces converging to a narrowly rounded point. Petiole node smooth and shining, some specimens with fine reticulate sculpture along posterior basal margin, postpetiole without sculpture. T1 completely smooth and without sculpture.

Head and mesosoma light to dark brown with a reddish-orange tinge, petiole and postpetiole somewhat darker, legs brown, metasoma dark brown.

Distribution. This species is known from Adelaide and the Flinders Rangers in South Australia.

Etymology. The specific name is a noun in apposition and refers to the river that runs through Adelaide, the type locality.

COI sequences. Genbank accession numbers for this species are KC572924 and KC573001.

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