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Taxonomic revision of the ant genus *Leptomyrmex* Mayr (Hymenoptera: Formicidae)

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Abstract

The ants of the genus *Leptomyrmex* (Hymenoptera: Formicidae), commonly called 'spider ants', are distinctive members of the ant subfamily Dolichoderinae and prominent residents of intact wet forest and sclerophyll habitats in eastern Australia, New Caledonia and New Guinea. This revision redresses pervasive taxonomic problems in this genus by using a combination of morphology and molecular data to define species boundaries and clarify nomenclature. Twenty-seven *Leptomyrmex* species are recognized and are informally split into two groups: the macro-*Leptomyrmex* (21 species), and its sister group, the micro-*Leptomyrmex* (six species). Nine subspecies are elevated to species status: *L. cnemidatus* Wheeler 1915, *L. geniculatus* Emery 1914, *L. melanoticus* Wheeler 1934, *L. nigriceps* Emery 1914, *L. rothneyi* Forel 1902, *L. ruficeps* Emery 1895, *L. rufipes* Emery 1895, *L. rufithorax* Forel 1915 and *L. tibialis* Emery 1895. Nineteen new synonymies are proposed (senior synonyms listed first): *L. cnemidatus* Wheeler 1915 = *L. erythrocephalus venustus* Wheeler 1934 = *L. erythrocephalus brunneiceps* Wheeler 1934; *L. darlingtoni* Wheeler 1934 = *L. darlingtoni fascigaster* Wheeler 1934 = *L. darlingtoni jucundus* Wheeler 1934; *L. erythrocephalus* (Fabricius 1775) = *L. froggatti* Forel 1910 =

L. erythrocephalus mandibularis Wheeler 1915 = *L. erythrocephalus unctus* Wheeler 1934 = *L. erythrocephalus clarki* Wheeler 1934; *L. fragilis* (F. Smith 1859) = *L. fragilis femoratus* Santschi 1932 = *L. fragilis maculatus* Stitz 1938 = *L. wheeleri* Donisthorpe 1948; *L. melanoticus* Wheeler 1934 = *L. contractus* Donisthorpe 1947; *L. niger* Emery 1900 = *L. lugubris* Wheeler 1934; *L. rufipes* Emery 1895 = *L. quadricolor* Wheeler 1934; *L. rufithorax* Forel 1915 = *L. erythrocephalus basirufus* Wheeler 1934; *L. tibialis* Emery 1895 = *L. nigriventris hackeri* Wheeler 1934; *L. varians* Emery 1895 = *L. erythrocephalus decipiens* Wheeler 1915 = *L. varians angusticeps* Santschi 1929; *L. wiburdi* Wheeler 1915 = *L. wiburdi pictus* Wheeler 1915. Tools for identification of the macro-*Leptomyrmex* species include a revised species-level key based on the worker caste, keys to males in Australia and New Guinea, full descriptions of workers, images of known workers, males and queens, and illustration of male genitalia. Phylogenetic relationships among the macro- and micro- *Leptomyrmex* species are discussed, as is the status of a putative fossil relative.

Key words: Australia, New Caledonia, New Guinea, illustrated keys, Dolichoderinae, synonymy, molecular systematics

Introduction

The genus *Leptomyrmex* (Hymenoptera: Formicidae) is a distinctive member of the ant subfamily Dolichoderinae. Commonly known as 'spider ants' for their, long legs and spider-like movements, these orange and black ants are prominent residents of intact wet forest and sclerophyll habitats throughout their range. The global distribution of this genus is restricted to eastern Australia, New Caledonia and New Guinea, as well as the nearby Indonesian islands of Aru and Seram.

This revision identifies 27 *Leptomyrmex* species as a result of nomenclatural revisions that include changes in species status and synonymies. The species are informally split into two groups: the macro-*Leptomyrmex* (21 species), and its sister group, the micro-*Leptomyrmex* (six species). Workers of *Leptomyrmex* can be easily recognized by elongate antennal scapes which surpass the posterior margin of the head by more than one half their length, a medially notched hypostoma, mandibles with 7–15 teeth and 5–12 denticles, and a laterally located anterior tentorial pit.

Macro-*Leptomyrmex* are large, diurnal and many are conspicuously colored in black, orange or bicolorous black and orange. Micro-*Leptomyrmex* species have been recently described from Australia's eastern forests (Smith and Shattuck 2009), and were placed in *Leptomyrmex* based on mandibular dentition, anterior clypeal margin configuration, elongate scapes and head, cleft medial hypostomal margin, anterior tentorial pit location, keeled fourth gastral sternite and reduced hind tibial spurs. In some cases, scapes are shorter than in the macro species, and in one species (*L. ramorniensis*) the hypostoma is only weakly notched. All six species are readily distinguished from their larger congeners by their small size (head width < 0.80mm), brown coloration, relatively short dorsal face of the propodeum, angular (not rounded) petiole and gaster lacking lateral compression (Smith and Shattuck 2009).

Collections and descriptive work on the macro-*Leptomyrmex* date back to the late 1700s, but revisionary work on the entire genus was not undertaken until the early 20th century, when W.M. Wheeler (1919, 1934) addressed the taxonomy of the genus. The accumulation of over 40 nominal specific and subspecific names within this genus led to questions about species identity. Complex color variation in several species and local occurrences of mimicry within and among species have contributed to the lack of clarity in species boundaries.

This revision of the genus *Leptomyrmex* attempts to redress this problem by clarifying nomenclature and defining species boundaries within the macro-*Leptomyrmex*. Here we offer a revised species-level key to species based on the worker caste, keys to males in Australia and New Guinea, full descriptions of workers, images of known workers, males and queens, and illustrations of male genitalia. The micro-*Leptomyrmex* species are not redescribed here. However, phylogenetic relationships among all macro- and micro- *Leptomyrmex* species, based on molecular data, are discussed. In stabilizing the taxonomy of this group, we hope to render macro-*Leptomyrmex* available and identifiable for future research and conservation purposes. As the macro-