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# Revision of the oriental ant genus *Cladomyrma*, with an outline of the higher classification of the Formicinae (Hymenoptera: Formicidae)

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**Abstract.** The Oriental ant genus *Cladomyrma* is revised and possible phylogenetic relationships are discussed. *Cladomyrma hewitti* and *hobbyi* are newly synonymized with *andrei*. *Cladomyrma cryptata*, *maschwitzi*, *mossyna* and *petalae* are described as new species. A lectotype for *Cladomyrma hewitti* is designated. A synopsis of the classification of Formicinae, based on new morphological characters, is provided. New morphological characters at the generic level are described and the relationships of *Cladomyrma* within Formicinae are discussed.

## Introduction

This study was initiated by a discussion of the phylogenetic relationships of the old world genera *Aphomomyrmex*, *Cladomyrma* and *Petalomyrmex* and the new world genus *Myrmelachista*; all, except some in *Myrmelachista*, obligatory inhabitants of internodes of rainforest trees, especially legumes (McKey, 1991). Their life style, living in branches and hollow internodes of climbers and trees, which are actively opened by the queen, is a possible synapomorphy for these genera (U. Maschwitz and D. McKey, pers. comm.). All the queens of these ant genera show a similar flattened head and alitrunk, which has been interpreted as an adaptation to their life in plant cavities (Wheeler, 1910; Snelling, 1979; McKey, 1991), and therefore the question has been raised as to whether they form a monophyletic taxon (Maschwitz *et al.*, 1991; D. McKey, pers. comm.).

The old world genera of this assemblage of arboreal ant genera (i.e. *Aphomomyrmex*, *Cladomyrma* and *Petalomyrmex*) are all rarely collected and thus are poorly represented in our collections. Furthermore, the descriptions of the three *Cladomyrma* species are based on queens, which are mainly caught by light traps. This makes the association of recently collected workers with the described queens difficult. Samples collected during recent biological studies of *Cladomyrma* in Malaysia (Maschwitz *et al.*, 1991), could not be identified to species level, and it became apparent that there were several undescribed species.

This paper has three purposes: to discuss the phylogenetic placement of *Cladomyrma* within the Formicinae; to assess possible relationships of *Cladomyrma* with *Aphomomyrmex*, *Myrmelachista* and *Petalomyrmex*; and to provide a revision of *Cladomyrma* species needed by workers currently studying their biology.

The Formicinae includes forty-eight recent genera, with approximately 3000 described species mostly in tropical regions. Members of this subfamily are diagnosed by the acidopore at the apex of the terminal gastral sternite, by the reduction of the sting apparatus to two lateral spiracular plates, a median connection and an anal arc, and a replacement of the sting with an acid-spraying system, and by a highly modified proventriculus (Emery, 1925; Eisner, 1957). Beside the proventricular structure, no external morphological characters are known to diagnose the males of Formicinae. Nevertheless,

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