



## Discovery of the worker caste and descriptions of two new species of *Anomalomyrma* (Hymenoptera: Formicidae: Leptanillinae) with unique abdominal morphology

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### Abstract

The hitherto unknown worker caste of *Anomalomyrma* Taylor, 1990 is described for the first time. Two new species, *Anomalomyrma boltoni* n. sp. from Cameron Highlands, Peninsular Malaysia and *Anomalomyrma helenae* n. sp. from El Nido region of Palawan, Philippines, are described. In workers of both new species abdominal segments II and III (petiole and postpetiole) are rigidly fused together across both tergites and sternites. This is the first report of such fused abdominal morphology in worker Formicidae. Both new species lack a vertical lamella on the mandible, originally considered to be diagnostic for the genus and the main character separating *Anomalomyrma* from *Protanilla* Taylor, 1990. Modified generic diagnoses are proposed for both *Anomalomyrma* and *Protanilla*. Wing venation is described for the first time from an anomalomyrmine alate gyne, and prospects for the future of the nomenclature of the group's genera are discussed. A modified key to the genera of Leptanillinae is given along with a short note on the correct authorship of some leptanilline names.

**Key words:** ants, taxonomy, systematics, new species, wing venation, Philippines, Malaysia, *Protanilla*

### Introduction

The ant subfamily Leptanillinae represents one of the early branches of ant phylogeny, and until the recent discovery of Martialinae (Rabeling *et al.* 2008), the leptanillines were considered to be sister to all other ants under certain molecular phylogenetic analyses (Moreau *et al.* 2006, Brady *et al.* 2006). Brady *et al.* (2006), however, questioned the statistical rigor of this result and suggested alternative rooting of their tree that would result in Amblyoponinae and Leptanillinae emerging within a clade together with Agroecomyrmecinae. A close relationship of amblyoponines and leptanillines is also supported by some shared morphological and behavioral features (Brown *et al.* 1971, Gotwald & Léviex 1972, Masuko 1986, 1990, Bolton 1990, Ward 1994, Brady *et al.* 2006, Yamane *et al.* 2008).

The Leptanillinae are small to tiny subterranean ants that are infrequently collected, and very little is known of their habits. Masuko (1990) studied the biology of *Leptanilla japonica* and showed that adult queens are incapable of taking food on their own, instead relying on larval haemolymph secreted through specialized abdominal structures. Recent collections of *Leptanilla* in Europe show that there is a high cryptic diversity of these ants in the Mediterranean region (López *et al.* 1994, Scupola & Ballarin 2009). López *et al.* (1994) reported collecting large numbers of *Leptanilla* thanks to a rarely employed method and searching in a habitat seldom explored by ant collectors, i.e., “lavage de terre” method and sandy banks of periodic streams.

The subfamily is presently divided into two tribes, Anomalomyrmini Taylor, 1990 and Leptanillini Emery, 1910. A full list of subfamily, tribe, and generic references can be obtained from Bolton (2003) and the most recent