



Phylogenetic revision and the origin of *Polyphrix* Townes (Hymenoptera, Ichneumonidae, Cryptinae), with description of a new species

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Abstract

Polyphrix stellata **sp. nov.**, from the Brazilian Amazon Forest, is described and illustrated. The validity of the genus is cladistically tested using implied weighting, in a matrix with 26 species and 75 morphological characters. Concavity constants (*K*) from 1 to 6 were tested. All analyses recovered all known *Polyphrix* species as a monophyletic group. The preferred results, with *K*2–6, suggest (*Prosthopor* *nigrifemur* Gupta + *Lagarosoma assitum* Gupta) + *Messatoporus* sp. as the sister group of the genus; with *K*1, this group also included two species of Gabuniina. The results with *K*1–5 suggest an Amazonian origin of the genus, with species from northern Brazil appearing basally in the clade, while both Atlantic Forest species appear as sister groups. A redescription of *Polyphrix* is presented, combining the original definition with recently published additions and original information. An updated key to species is presented, and new morphometric data is provided for *P. varians* and *P. cristata*. *Prosthopor mexicanus* **comb. nov.** is proposed as a new combination for *Polyphrix mexicanus* Kasparyan & Ruíz, representing the first record of *Prosthopor* from North America. Seven new distribution records are provided for *Polyphrix*, expanding its known range to 29°51' of latitude, from Guyana to Paraná (southern Brazil).

Key words: Lymeonina, Cryptini, implied weighting, Phygadeuontinae, Caxiuanã

Introduction

Townes (1970) erected *Polyphrix* to include a single species from the Brazilian Amazon Basin, *P. varians*. Nogueira & Aguiar (2005) expanded and consolidated the original description of the genus, described two additional species, *P. atlantica* and *P. cristata*, and presented a key to the species and new distribution records for *P. varians*. Kasparyan & Ruíz (2008) described a new species from Mexico, *P. mexicanus*, with many differences from the generic definition. The genus is characterized by many unusual features, such as the propodeum with a series of stout, straight, transverse wrinkles behind the anterior transverse carina, absence of posterior transverse carina and apophyses; notaulus faint; mesoscutum smooth and shiny; and transverse furrow at the base of the propodeum very wide, smooth and polished. The phylogenetic relationships of the genus remained essentially unknown until now. It was placed by Townes in the Lymeonina, but the subtribal arrangement of cryptine genera is known to be highly artificial (Laurenne *et al.*, 2006); besides, the general morphology of *Polyphrix* is not particularly similar to any other known group of Cryptinae.

The species of the genus seem to be rare. Townes (1970) examined only three specimens, and Nogueira & Aguiar (*op. cit.*) reported only six more. The two Atlantic Forest species are known only from one locality each, and *P. varians* only from three localities, in the states of Pará and Goiás, northern and central Brazil.

This work represents the first cladistic assessment of *Polyphrix* and its species, and aims also to describe a new species, update and improve the key to the species, and redescribe the genus combining information from Townes (1970), Nogueira & Aguiar (*op. cit.*), and original data.