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**Phylogenetics and classification of the world genera of
Diparinae (Hymenoptera: Pteromalidae)**

CHRISTOPHER A. DESJARDINS



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Phylogenetics and classification of the world genera of Diparinae (Hymenoptera: Pteromalidae)

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Abstract

A morphological phylogenetic analysis of the world genera of Diparinae (Hymenoptera: Pteromalidae) is provided, and the generic classification is revised. A hypothesized phylogeny is given based on 73 characters, primarily from adult females. The diparines are supported as monophyletic in all analyses based on 4–6 synapomorphies depending on their sister-group, including the presence of a cercal brush which is synapomorphic in all analyses. The cercal brush, in combination with the absence of a smooth, convex dorsellum, is diagnostic for Diparinae. *Liepara* Bouček (Pteromalidae: subfamily *inquirenda*) and *Bohpa* Darling (Pteromalidae: Ceinae) both appear as sister-group to Diparinae in different analyses. In the proposed classification scheme, Diparinae consists of 116 species in 14 genera. Nine genera are removed from Diparinae, two of which are placed in synonymy: *Calolelaps* Timberlake, *Dinarmolaelaps* Masi, *Mesolelaps* Ashmead, *Neolelaps* Ashmead, and *Stictolelaps* Timberlake are placed in Pteromalinae (Pteromalidae), while *Seyrigina* Risbec is placed in Eulophinae (Eulophidae); *Diparisca* Hedqvist is synonymized under *Spalangiopecta* Masi (Pteromalidae: Ceinae); *Bekiliella* Risbec is synonymized under *Notanisuus* Walker (Pteromalidae: Cleonyminae); and *Liepara* Bouček and the tribe Lieparini Bouček are placed in Pteromalidae without a subfamily association. Fifteen new generic synonyms are proposed: *Afrolelaps* Hedqvist, *Alloterra* Kieffer and Marshall, *Diparomorpha* Hedqvist, *Emersonia* Girault, *Grahamisia* Delucchi, *Parurios* Girault, *Pondia* Hedqvist, *Pseudipara* Girault, *Trimicrops* Kieffer, and *Uriolelaps* Girault under *Dipara* Walker; *Spalangirolelaps* Girault under *Lelaps* Walker; *Australolaelaps* Girault under *Neapterolelaps* Girault; *Dolichodipara* Hedqvist under *Myrmicolelaps* Hedqvist; and *Dipareta* Bouček and *Malinka* Bouček under *Pseudoceraphron* Dodd. Three genera are described as new: *Cerodipara*, *Dozodipara*, and *Chimaerolelaps*. Fourteen new species are described: *Cerodipara sabensis*, *Chimaerolelaps villosa*, *Conophorisca littoriticus*, *C. grisselli*, *Dozodipara insularis*, *Lelaps noortii*, *Myrmicolelaps iridius*, *M. aurantius*, *Neapterolelaps viridescens*, *N. mitteri*, *Nosodipara ferrana*, *Pseudoceraphron regieri*, *P. burwelli*, and *P. fijensis*. A key to the genera of Diparinae is provided. The species of each genus are cataloged, and species-level keys are provided for most genera in which new species are described. New biological information shows that diparine host range is not restricted to Curculionidae as previously thought; one species of *Myrmicolelaps* was reared from mantid oothecae and a second from a tsetse fly puparium (Glossinidae: *Glossina*).

Key words: morphology, phylogeny, taxonomy, Chalcidoidea, Pteromalidae, Diparinae, Ceinae, *Dipara*, *Lelaps*

Introduction

Chalcidoidea, one of the largest superfamilies of parasitic Hymenoptera, includes about 22,000 described species (Noyes 2003). The majority of chalcidoids, commonly called chalcids, are parasitoids and have major importance in the biological control of insect pests. Despite the ecological and economic importance of Chalcidoidea, phylogenetic relationships both within and between chalcidoid families are still largely obscure. A central difficulty is the status of the problematic family Pteromalidae, one of the three largest (3506 species (Noyes 2003)) and often considered the “garbage can” of the superfamily. Pteromalidae is defined only by the absence of features defining other chalcidoid families and may be paraphyletic with respect to a number of these; the limits and placement of this family are simply unknown. Thirty-one subfamilies are currently recognized within Pteromalidae (Noyes 2003), although inclusion and exclusion of many subfamilies is still highly uncertain. Few comprehensive phylogenetic studies have been conducted at the subfamily or tribal level (see Heydon 1997, Gibson 2003 for examples), making the coding of characters and choice of exemplars difficult in higher-level analyses.

One of the most enigmatic of pteromalid subfamilies is Diparinae. Because diparines typically live in leaf