



Description of the mature larva of *Ampulicomorpha schajovskoyi* De Santis & Vidal Sarmiento (Hymenoptera: Embolemidae)

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Abstract

The mature larva of *Ampulicomorpha schajovskoyi* De Santis & Vidal Sarmiento, 1977, is described and figured for the first time. Larval characters of Dryinidae and Embolemidae are discussed in regard to possible synapomorphies of each family and of both families together (Dryinidae + Embolemidae) as monophyletic groups. Some larval characters are compared with the corresponding conditions in other Chrysidoidea families.

Key words: Fulgoromorpha, Achilidae, Cixiidae, Dryinidae, morphology

Introduction

Embolemidae are a small family of Hymenoptera Chrysidoidea distributed in all zoogeographical regions. Considered the sister-group of the better known Dryinidae (Brothers 1999, 2011; Carpenter, 1999), this family includes at present two groups of species. The first group, composed of fossil and extant taxa characterized by two prominent and contiguous frontal antennal processes, includes the genera *Ampulicomorpha* Ashmead, 1893, and *Embolemus* Westwood, 1833 (Olmí *et al.* 2011). Up to now 23 species of *Ampulicomorpha* (Xu *et al.* 2012b) and 33 of *Embolemus* (Xu *et al.* 2012a) are known. The second group, composed of very old fossil taxa characterized by the absence of the two above frontal processes and by a larger distance between the antennal toruli, includes the genera *Baissobius* Rasnitsyn, 1975, with four species, and *Embolemopsis* Olmí, Rasnitsyn & Guglielmino, 2010, with one species (Olmí *et al.* 2010). Fossil Embolemidae are known both from amber and rock and the oldest ones are attributed to the Early Cretaceous (130–140 Mya) (Olmí *et al.* 2010, 2011).

The biology of Embolemidae is still poorly known and only few biological data are available. They are parasitoids of Fulgoromorpha (Hemiptera) nymphs living in concealed sites. The hosts of the genera *Embolemus* and *Ampulicomorpha* are, respectively, nymphs of Cixiidae feeding on roots in the soil (Varrone & Olmí 2012) and Achilidae feeding on fungus in rotten logs (Bridwell 1958; Wharton 1989). Knowledge of the relationships between embolemids and their hosts, their postembryonic development and their feeding habits is insufficient. Information on their larval morphology and anatomy is also very limited. The only available information on hosts concerns *Ampulicomorpha confusa* Ashmead, 1893 (parasitoid of *Epiptera floridae* (Walker, 1851) (= *Cixidia* (*Epiptera*) *fusca* (Walker, 1851)) (Hemiptera: Fulgoromorpha: Achilidae) in the USA (Bridwell 1958), whose final-instar larva has been summarily described by Wharton (1989), and *Embolemus ruddii* Westwood, 1833, reared from unidentified Cixiidae in Italy (Varrone & Olmí 2012).

Bridwell (1958) and Wharton (1989) both emphasized that Embolemidae, as for Dryinidae, form on the host's body a thylacium composed of larval exuviae enclosing the larva.

On November 21, 2007, Massimo Olmí discovered two nymphs of *Olmiana argentina* Guglielmino, Bückle & Emeljanov, 2010 (Hemiptera Achilidae) parasitized by *Ampulicomorpha schajovskoyi* De Santis & Vidal Sarmiento, 1977 at Pucará, in Lanín National Park, on the coast of Lacar Lake (Neuquén Province, Argentina). They were found inside a decaying *Nothofagus* trunk attacked by unidentified fungi fed on by the achilids, in a