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A review of the current state of knowledge of fossil Mantispidae (Insecta: Neuroptera)

JAMES E. JEPSON
Museum für Naturkunde, Leibniz Institute for Evolution and Biodiversity Science, Invalidenstraße 43, 10115 Berlin, Germany.
E-mail: james.jepson@mfn-berlin.de

Abstract

There are 32 individual specimens of Mantispidae (Insecta: Neuroptera) currently recorded from the fossil record, the oldest of which dates back to the Lower Jurassic. These include 19 described species (in 16 genera), 1 specimen described to genus level and 9 unnamed specimens The specimens have been assigned to the extant subfamilies Drepanicinae (4), Mantispinae (10), Symphrasinae (1), and the extinct subfamily Mesomantispinae (16), with one *incertae sedis* within Mantispidae. There are currently no known fossil representatives of the subfamily Calomantispinae. Mesithoninae has been removed from Mantispidae and placed back within Berothidae. The species *Mesithone carnaria* and *M. monstruosa*, however, are true mantispids and have been removed from *Mesithone* and placed within a new genus *Karataumantispa* **gen. nov.** in the subfamily Mesomantispinae. The current state of knowledge of the fossil record of Mantispidae is reviewed and a key to the genera of Mesomantispinae is provided.

Key words: *Karataumantispa* **gen. nov.**, lacewings, mantispids, mantisflies, Mesomantispinae, Mesithoninae

Introduction

Mantispidae, also known as mantidflies or mantisflies, are a specialized family of insect in the order Neuroptera. They are easily recognized by their raptorial forelegs, large eyes, and elongation of the pronotum behind the forelegs (Lambkin 1986; New 1989; Grimaldi & Engel 2005). There are approximately 410 valid species-group taxa of extant mantispids known; these are divided into four subfamilies Symphrasinae (Nearctic and Neotropical distribution), Drepanicinae (Neotropical, Australian, and Oriental), Calomantispinae (Nearctic, Neotropical and Australian) and Mantispinae (Cosmopolitan) (Ohl, 2004; Shi *et al.*, 2015a). Mantispids have a specialized life history; they possess larvae that are parasites of Aranae and aculeate Hymenoptera, which develop in spider egg sacs or in the nests of wasps (Lambkin, 1986; Redborg, 1998). Some species of mantispid even mimic their hymenopteran hosts, which give them some protection against predation. The subfamily whose life history and biology is most well-known (and is also the most diverse with regards to species numbers) is Mantisipinae. Little is known about the biology and life history of the other three extant subfamilies (Redborg, 1998).

Fossil mantispids are relatively rare in the fossil record, however since the catalogue of Ohl (2004), which listed seven fossil species and three questionable fossil species, 29 specimens have been placed within the family (19 species described, one specimen described to generic level and nine unnamed specimens). The oldest record of Mantispidae is from the Lower Jurassic of Germany (Ansorge & Schlüter, 1990). Four more species of mantispid are found in the Jurassic, one from the Middle—Upper Jurassic of China (Jepson *et al.*, 2013) and three from the Upper Jurassic of Kazakhstan (Panfilov, 1980; Khramov, 2013). In the Lower and Upper Cretaceous 16 specimens are recorded: four species, two genera and five unnamed specimen from the Lower Cretaceous of China (Makarkin *et al.*, 2012; Jepson *et al.*, 2013), in the Upper Cretaceous one species from Kazakhstan (Makarkin, 1990), and two species from Burmese amber (Poinar & Buckley, 2011; Shi *et al.*, 2015a). Five fossil mantispids are known from the Palaeogene. In the Eocene, one species from England (Cockerell, 1921; Jarzembowski, 1980), four unnamed larvae from Baltic amber (Ohl, 2011; Wunderlich, 2012), and one species from Germany are known (Wedmann & Makarkin, 2007). Two species from France have been described from the Oligocene (Nel, 1989). The Neogene has

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