

A new genus and species of Chresmodidae (Insecta: Gryllones) from Upper Jurassic-Lower Cretaceous of Yixian Formation, Inner Mongolia, China

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Abstract

A new genus with a new species of Chresmodidae (Insecta: Gryllones), *Sinochresmoda magnicornia* gen. et sp. nov., including specimens of male, female and nymph, is described and illustrated. These fossils were collected from the Upper Jurassic-Lower Cretaceous of Yixian Formation of Liutiaogou Village, Inner Mongolia (Nei Mongol Autonomous Region), China. Both male and female possess wings, and have sexual dimorphism in antenna. Antennae of male are highly specialized and horn-shaped, incurvated as horn with the scape strongly expanded, and the first segment of the flagella incurvated as a pair of brackets, while antennae of female are normally filiform. Wings of the new species are short, not exceeding the length of the abdomen. Fringe hairs along the wing margins, a unique feature for Chresmodidae, are dense, wavy and bundled together. Nymphs and adults probably lived in the same environment. In addition, one specimen demonstrates the extraordinary structure of tarsus with a high number of “tarsomeres”, which has been reported in other species of this family.

Key words: fossil insect, Chresmodidae, sexual dimorphism, new taxa, Yixian Formation, Late Jurassic-Early Cretaceous, China

Introduction

Chresmodidae, an extinct insect family, is quite rare. It currently contains 1 genus with 4 species: *Chresmoda obscura* Germar, 1839; *Chresmoda orientalis* Esaki, 1949; *Chresmoda aquatica* Martínez-Delclòs, 1989; and *Chresmoda libanica* Nel, Azar, Martínez-Delclòs & Makhoul 2004. Besides, *Sauropthiroides mongolicus* is also suspected to belong to this family (Rasnitsyn, 2002; Nel *et al.*, 2004). The family has been found in Eurasian region and Brazil, ranging from the Upper Jurassic to the Upper Cretaceous (Grimaldi & Engel, 2005; Nel *et al.*, 2005). The first species, *C. obscura*, was erected by Germar (1839). Debates on its taxonomic status have never ceased ever since its finding, ranging from Hemiptera, Mantodea, Phasmatodea and Polyneoptera (Zherikhin, 1978; Carpenter, 1992; Martínez-Delclòs, 1989; Rasnitsyn and Quicke, 2002; Grimaldi & Engel, 2005). It is known that nymphs and males are apterous, but females have four wings with possible flight capability (Nel *et al.*, 2005). Chresmodids are supposed to be aquatic insects, probably carnivorous (Baudoin, 1980; Nel *et al.*, 2004; Nel *et al.*, 2005). In this family, tarsi possess an extraordinary structure, so called ultra-articulated tarsi, which are probably associated with their capability of skating on water-surface (Nel *et al.*, 2004; Nel *et al.*, 2005).

This family is still an enigma to date. Recently, we collected several well-preserved chresmodids from Yixian Formation of Liutiaogou Village, Inner Mongolia (Nei Mongol Autonomous Region), China. Based on their different and unique morphological characters, we erect a new genus and species, *Sinochresmoda magni-*