



A new fossil genus of Mesochrysopidae (Neuroptera) from the Early Cretaceous Yixian Formation of China

DONG REN¹, VLADIMIR N. MAKARKIN^{1,2,3} & QIANG YANG¹

¹College of Life Science, Capital Normal University, Beijing, 100048, China. E-mail: rendong@mail.cnu.edu.cn

²Institute of Biology and Soil Sciences, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, 690022, Russia.
E-mail: vnmakarkin@mail.ru

³Corresponding author. E-mail: vnmakarkin@mail.ru

Abstract

Longicelochrysa yixiana **gen. et sp. nov.** (Neuroptera: Mesochrysopidae) is described from the Mesozoic Yixian Formation (China). Allopteridae and Tachynymphidae of Nel *et al.* (2005) are considered subfamilies of Mesochrysopidae, along with Mesochrysopinae. *Longicelochrysa* gen. nov. displays a mixture of character states of Mesochrysopinae and Allopterinae and can not be assigned to any subfamily, indirectly supporting a family status of Mesochrysopidae *sensu lato*.

Key words: Neuroptera, Mesochrysopidae, Yixian Formation, Mesozoic, China

Introduction

The Mesozoic family Mesochrysopidae Handlirsch, 1906 *sensu lato* was hitherto represented by 13 genera and 22 species from the Early Jurassic to the Early Cretaceous of Eurasia and South America (Makarkin & Menon 2005; Nel *et al.* 2005; Menon & Makarkin 2008; Martins-Neto & Rodrigues 2009). The taxonomy of this group remained obscure and unresolved for a long time. Some authors believed that this is a fossil subfamily (variously composed) of Chrysopidae (e.g., Adams 1967, Schlüter 1984, Séméria & Nel 1990; Martins-Neto 2003), while others treated it as a separate family, and again its generic composition varied between authors (e.g., Panfilov 1980, Carpenter 1992, Ponomarenko, 2003). Moreover, the taxon was obviously paraphyletic and included some genera distantly related to it as well as true Chrysopidae. Makarkin & Menon (2005) and Nel *et al.* (2005) revised simultaneously the taxon and found almost identical generic composition but as different taxonomic ranks: the clade Allopteridae + Mesochrysopidae + Tachynymphidae + *Mesotermes* Haase, 1890 of Nel *et al.* (2005) was treated by Makarkin & Menon (2005) as the family Mesochrysopidae (*s.l.*).

In the present paper we describe another new genus from the Early Cretaceous Yixian Formation of China. This genus is unlike other genera known from this formation; its systematic position is unclear and can not be assigned to any subfamilies. We consider here the families Mesochrysopidae *s. str.*, Allopteridae and Tachynymphidae of Nel *et al.* (2005) to be subfamilies of Mesochrysopidae.

Material and methods

The specimen examined was collected near Chaomidian Village [120°50'E, 41°37'N] in Liaoning Province, NE China from the deposits of the Yixian Formation. Early Cretaceous age of this formation is considered to be well supported by radiometric dating (using different radioactive decay series) from 133.46 ± 18 for the lowest beds (Chen *et al.* 2004), 126.1 ± 1.7 to 124.6 ± 0.1 Ma for the second Member containing fossil insects