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New fossil Praeaulacinae wasps (Insect: Hymenoptera: Evanioidea: Praeaulacidae) from the Middle Jurassic of China

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Abstract

A new genus with a new species, *Archaulacus probus* **gen. et sp. nov.**, and two new species, *Praeaulacus subrhombeus* **sp. nov.**, *P. tenellus* **sp. nov.**, belonging to the subfamily Praeaulacinae (Praeaulacidae) are described and illustrated. The specimens were collected from the Middle Jurassic of Jiulongshan Formation at Daohugou in Inner Mongolia, China. *Archaulacus* **gen. nov**. differs from other genera of Praeaulacinae in having the first abscissa of Rs of the fore wing subvertical to R and 2m-cu slightly basad of 2r-m. This is the first time that these characters are reported for the Praeaulacinae. Based on new information provided by the new species, an updated key to the known species of *Praeaulacus* is provided.

Key words: Fossil insects, new genus, new species, Middle Jurassic, China

Introduction

The Evanioidea first appeared during the Jurassic radiation. The Evanioidea comprises three extant families, Aulacidae Shuckard, 1841, Evaniidae Latreille, 1802 and Gasteruptiidae Kirby, 1837 (e.g. Aguiar et al. 2013)Two extinct families, Praeaulacidae Rasnitsyn, 1972 and Andreneliidae Rasnitsyn & Martínez-Delclòs 2000, have been placed in Evanioidea (Rasnitsyn 1972, 2002; Rasnitsyn & Martínez-Delclòs 2000). The taxonomic status of Andreneliidae has been more contentious: Grimaldi & Engel consider that Andreneliidae have been synonymized with Evaniidae, and Baissinae, a stem subfamily of Gasteruptiidae, was given family rank (Grimaldi & Engel 2005; Engel 2006). However, Zhang & Rasnitsyn (2007) prefer to recognize Andreneliidae as a family until more information accumulates and retain Baissinae as a subfamily within Gasteruptiidae.

Praeaulacinae was assigned as a subfamily of Praeaulacidae by Rasnitsyn (1972). Up to date, eight fossil genera of Praeaulacinae from the Middle Jurassic to the Lower Cretaceous have been recorded: *Praeaulacus* Rasnitsyn, 1972 from three Formations: Upper Jurassic of Karatau-Mikhailovka in Kazakhstan, Middle Jurassic of Jiulongshan Formation in China and Lower Cretaceous of Shar-Teg in Mongolia; *Aulacogastrinus* Rasnitsyn, 1983 from two Formations: Upper Jurassic of Karabastau Formation in Kazakhstan and Middle Jurassic of Jiulongshan Formation in China; *Gulgonga* Oberprieler , Rasnitsyn & Brothers, 2012 from the Upper Jurassic of Talbragar Fish Bed in Australia; while all other genera, *Eosaulacus* Zhang & Rasnitsyn, 2008; *Praeaulacinus* Rasnitsyn,1972; *Praeaulacon* Zhang & Rasnitsyn, 2008; *Sinaulacogastrinus* Zhang & Rasnitsyn, 2008; *Sinevania* Zhang & Rasnitsyn, 2010, are from the Middle Jurassic of Jiulongshan Formation in China. All of these genera of Praeaulacinae indicate that Jiulongshan Formation of Daohugou fossil-bearing beds contain abundant fossil wasps of Praeaulacinae and the broadest generic diversity occurred during the Middle Jurassic.

A new genus with a new species, *Archaulacus probus* **gen. et sp. nov.**, and two new species, *Praeaulacus subrhombeus* **sp. nov.** and *P. tenellus* **sp. nov.**, are described in this paper, which expands our knowledge of the Praeaulacinae in the Middle Jurassic of northeastern China. All specimens were collected from the Middle Jurassic beds of Daohugou, Jiulongshan Formation, Ningcheng Country, Inner Mongolia, China. The age of the Daohugou fossil-bearing beds is considered to be the Late Middle Jurassic (Bathonian-Callovian boundary), about 165 million years (My) (Chen *et al.* 2004; Ren *et al.* 2010; Zhao *et al.* 2010; Wang *et al.* 2012a; Yang *et al.* 2012).

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