



Two Middle Jurassic hanging-flies (Insecta: Mecoptera: Bittacidae) from Northeast China

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Abstract

Two new genera with two new species, *Formosibittacus macularis* **gen. et sp. nov.** and *Jurahylobittacus astictus* **gen. et sp. nov.** are described on the basis of well preserved specimens collected from the Jiulongshan Formation (Middle Jurassic) of Daohugou, Inner Mongolia, China. *Formosibittacus* can be distinguished from all known genera by a combination of the following features: three cross-veins between R_1 and R_{2+3} ; one pterostigmal cross-vein; and two cross-veins between M_4 and CuA. *Jurahylobittacus* differs from all known genera by a combination the following of characters: one cross-vein between R_1 and R_{2+3} ; one pterostigmal cross-vein; and two cross-veins between M_4 and CuA.

Key words: Mecoptera, Bittacidae, New genus, Middle Jurassic, China

Introduction

Bittacidae is a large family of Mecoptera, which is one of the less diverse insect Orders. At present, there are about 270 extant species (Krzemiński 2007). Extant Bittacidae are distributed all over the world and live in both temperate and warm tropical climates. Usually their wings are slender, their tarsus have only one claw, and the fifth tarsomere can be folded against the fourth. They are called hanging-flies because they commonly hang their bodies by their fore legs or fore and middle legs from branches within low vegetation. They are predaceous, using their hind legs to catch prey insects. In addition to living genera, there are about 23 fossil genera (Krzemiski 2007, Novokshonov 1997, Petrulevičius *et al.* 2007). Fossil records show the broadest generic diversity occurred in the Jurassic (Novokshonov 2002). Four fossil genera of hanging-flies have been recorded in China including *Liaobittacus* Ren 1994 from Haifanggou Formation, *Megabittacus* Ren 1997 from Yixian Formation, *Sibirobittacus* Sukatsheva 1990 from Yixian Formation and *Megolbittacus* Petrulevičius *et al.* 2007 from Jiulongshan Formation.

The fossil specimens described in this paper were collected from the Jiulongshan Formation at Daohugou Village of Ningcheng County in southeastern Inner Mongolia. The age of the Daohugou fossil-bearing beds is considered to be the Middle Jurassic (Shen *et al.* 2003, Chen *et al.* 2004, Liu *et al.* 2004, Ren *et al.* 1995, Ren *et al.* 2002, Ren & Krzemiński. 2002, Ji *et al.* 2006, Gao & Ren 2006, Huang *et al.* 2006).

Material and methods

The fossil specimens were examined by a LEICA MZ12.5 dissecting microscope and illustrated with the aid of a camera lucida attached to the microscope; drawings were scanned into computer by EPSON5100 and