



Two new fossil species of *Itaphlebia* (Mecoptera: Nannochoristidae) from Jiulongshan Formation, Inner Mongolia, China

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Abstract

Two new species, *Itaphlebia exquisita* **sp. nov.** and *Itaphlebia laeta* **sp. nov.**, were collected from the Jiulongshan Formation (Middle Jurassic) of Daohugou, Inner Mongolia, China. A key to the species of the genus *Itaphlebia* is provided and diagnosis of the genus is revised. *Itaphlebia exquisita* **sp. nov.** differs from other species in having an extra medial vein branch. *Itaphlebia laeta* **sp. nov.** shows a transitional character to the extant genera by having a simple Sc. These new findings expand the distribution of *Itaphlebia* from middle-southern Russia to northeastern China.

Key words: new species, *Itaphlebia*, Nannochoristidae, Mecoptera, Middle Jurassic, Jiulongshan Formation

Introduction

Nannochoristidae, a family of Mecoptera, consists of two extant genera: *Nannochorista* Tillyard, 1917 and *Microchorista* Byers, 1974. The genus *Nannochorista* was reported in Australia and the South America: three species in Tasmania, one subspecies in New South Wales (Tillyard 1917, Riek 1954), and three species in Chile and Argentina (Byers 1989). Only one species of the genus *Microchorista* was discovered in New Zealand (Tillyard 1917, Byers 1974).

The classification of fossil nannochoristid genera is in a state of change and revision. The earliest fossil record of Nannochoristidae is in the Upper Permian of Australia, consisting of three genera: *Nannochoristella* Riek, 1953, *Neochoristella* Riek, 1953 and *Robinjohnia* Martynova, 1948 (Riek 1953, Carpenter 1992). However, the familial assignment of these genera is still being disputed. Grimaldi and Engel considered the assignment of *Nannochoristella* to Nannochoristidae to be incorrect (Grimaldi & Engel 2005). Novokshonov (1994) transferred *Nannochoristella* and *Neochoristella* into the subfamily Pseudonannochoristinae, and later moved *Robinjohnia* to Robinjohniidae (Novokshonov 1997b). Three genera, *Dahurochorista* Sukatsheva, 1985 (Early-Middle Jurassic), *Dahurolarva* Sukatsheva, 1985 (Early-Middle Jurassic) and *Namdyrus* Sukatsheva, 1993 (Upper Jurassic-Lower Cretaceous) were erected for Russian specimens (Sukatsheva 1985, 1993). *Tarantogus* Sukatsheva, 1985 (Middle Jurassic, Russia) and *Undisca* Sukatsheva, 1990 (Lower Cretaceous, Russia) were originally regarded as Mesopsychidae (Sukatsheva 1985, 1990). *Itaphlebia* Sukatsheva, 1985 and *Chrysopanorpa* Ren, 1995 (Middle Jurassic, China) were originally regarded as genera of Mesopanorpoidea (Sukatsheva 1985, Ren *et al.* 1995). These four genera were transferred later into Nannochoristidae and *Chrysopanorpa* Ren, 1995 (Middle Jurassic, China) was regarded as junior synonym of *Itaphlebia* Sukatsheva, 1985 (Novokshonov 1997a, 1997b). *Jichoristella* Ren, 1995 (originally described in Nannochoristidae) was considered by Novokshonov (1997a) to be closer to Bittacidae. *Protochoristella* Sun, Ren & Shih, 2007 (Middle Jurassic) was erected in China (Sun *et al.* 2007). *Nannochorista* (*Eunannochorista*) *sibirica* Novokshonov, 1997 (Middle Jurassic) is the earliest fossil record of *Nannochorista* (Novokshonov 1997a).