New species and revisions of Pediciidae (Diptera) from the Middle Jurassic of northeastern China and Russia

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Abstract

Two new species of Praearchitipula Kalugina, 1985, P. apprima sp. nov. and P. mirabilis sp. nov., are described and illustrated from the late Middle Jurassic Jiulongshan Formation of Daohugou in eastern Inner Mongolia, China. In addition, we propose to transfer Architipula abnormis Hao & Ren, 2009 (which is from the same locality of Daohugou) from Architipula of Limoniidae to Praearchitipula of Pediciidae: Praearchitipula abnormis (Hao & Ren, 2009) comb. nov. In addition, we propose to transfer Praearchitipula spasskia Kalugina, 1985 to the genus Mesotipula (Limoniidae, Architipulinae). We also suggest treating Praearchitipula lata Kalugina, 1985 as a junior synonym of Praearchitipula notabilis Kalugina, 1985. An emended generic diagnosis of Praearchitipula is provided.

Key words: Daohugou, Jiulongshan Formation, new species, Praearchitipula, Tipuloidea

Introduction

Pediciidae are a relatively species-poor family of the Tipuloidea comprising about 490 extant species. The family is widespread in the world except for the Afrotropical and Antarctic Regions (Oosterbroek 2015). The phylogenetic relationships among Pediciidae genera and subgenera have not yet been investigated. Recent phylogenetic studies based on morphological and molecular evidence (Ribeiro 2008; Petersen et al. 2010) placed the family Pediciidae as the sister group of the other families of Tipuloidea.

The Pediciidae currently are divided into two subfamilies: Pediciinae and Ulinae (Oosterbroek 2015). Up to date, 11 fossil species belonging to 3 genera have been reported, ranging from the Middle Jurassic to the Upper Oligocene (Alexander 1931; Kalugina & Kovalev 1985; Krzemiński 2000; Krzemiński and Evenhuis 2000; Podenas 2001). Only one extant genus, Tricyphona Zetterstedt, 1837, is represented in the fossil record with 6 species known from Baltic amber (Alexander 1931; Podenas 2001). The extinct genus Fragisternella Krzemiński, 2000, contains a single species from the Upper Oligocene of Asia (Krzemiński 2000). Kalugina (in Kalugina and Kovalev 1985) described five species in Praearchitipula from Kubekovo locality, Itatskaya Formation, Middle Jurassic of Siberia (Russia), and Novospasskoye locality, Ichetuy Formation, Lower or Middle Jurassic of Transbaikalia (Russia) (Kalugina & Kovalev 1985), and classified it in the subfamily Architipulinae (Limoniidae). She described five species in Praearchitipula: P. lata, P. notabilis, P. parvula, P. spasskia and P. trinervis. Krzemiński and Evenhuis (2000) transferred P. notabilis to the family Pediciidae for discovering presectoral position of sc-r in one specimen. Lukashevich (2009) transferred Praearchitipula parvula Kalugina, 1985 to Mesotipula Handlirsch, 1939 within the Limoniidae, based on the terminal position of sc-r.

In this paper, we describe two new species, Praearchitipula apprima sp. nov. and Praearchitipula mirabilis sp. nov., and assign them to Pediciidae based on the characters present in three well-preserved fossil specimens with almost complete bodies and wings. In our opinion, P. spasskia Kalugina, 1985 also belongs to the genus Mesotipula. We suggest treating Praearchitipula lata Kalugina, 1985 as a junior synonym of Praearchitipula...