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The first fossil buprestids from the Middle Jurassic Jiulongshan Formation of China (Coleoptera: Buprestidae)

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Abstract

A new genus with three new species of fossil Buprestidae, *Sinoparathyrea bimaculata* **gen. et sp. nov.**, *S. gracilenta* **sp. nov.**, and *S. robusta* **sp. nov.**, from the Middle Jurassic Jiulongshan Formation of Inner Mongolia, China, are described. This is the earliest fossil record of buprestids in China and it is also the first record of buprestids from the Middle Jurassic Jiulongshan Formation of China.

Key words: Coleoptera, Buprestidae, fossil, Middle Jurassic, Jiulongshan Formation, China

Introduction

The Buprestidae is the eighth largest family of Coleoptera with many extant buprestids common and abundant in their respective habitats. The Buprestidae is comprised of nearly 14900 valid species (Bellamy 2008a; Bellamy 2009), which were placed in 12 subfamilies by Brues *et al*. (1954), seven subfamilies by Bílý (1974), 13 subfamilies by Cobos (1980) and Nelson (1982), five subfamilies by Lawrence & Newton (1982) and 14 subfamilies by Bellamy (1985). Nowadays, a consolidated system of six subfamilies is commonly accepted (Bellamy 2008b).

The Buprestidae had a rather early appearance in the paleontological record (Bílý & Kirejtshuk 2007). Up to now, more than 95 fossil species of buprestids have been described from all over the world (Zhang 1989; Hong 1990; Alexeev 1993; Zhang *et al*. 1994; Alexeev 1995; Alexeev 1996; Prokop & Bílý 1999; Alexeev 2000; Alexeev 2008; Alexeev 2009). Among these records, only six species in six genera are from the Jurassic, but none from the Jurassic of China. It is the earliest fossil record of buprestids in China. According to all the reported fossil records, buprestids flourished at the Cenozoic (Grimaldi & Engel 2005).

Three fossil specimens of Buprestidae were recently collected from the Middle Jurassic Daohugou beds, Jiulongshan Formation, Ningcheng County, Inner Mongolia in China. It is the first time that buprestids were discovered from this locality.

The geological section at the Daohugou Village is composed of grey tuffaceous sandstone and sandy mudstone. The paleoenvironment reconstructed for this locality is a volcanic region with mountain streams and lakes (Ren & Krzeminski 2002). Daohugou has provided an abundant and diverse insect fauna composed of complete specimens of Ephemeroptera (Huang *et al*. 2008), Odonata (Zhang *et al*. 2008), Plecoptera (Liu *et al*. 2007), Blattodea (Liang *et al*. 2009), Orthoptera (Li *et al*. 2007), Heteroptera (Yao *et al*. 2006), Homoptera (Wang *et al*. 2007), Neuroptera (Ren 2002), Raphidioptera (Engel & Ren 2008), Coleoptera (Tan *et al*. 2006), Hymenoptera (Shih *et al*. 2009) and Diptera (Ren and Krzemiski 2002). In addition, also found are spiders (Seldon *et al*. 2008), freshwater conchostracans (Zhang & Shen 1987), salamanders (Gao & Shubin 2003), feathered dinosaurs (Xu & Zhang 2005), pterosaurs (Ji & Yuan 2002), and mammals (Ji *et al*. 2006).

Surrounding gymnosperm forests were dominated by Ginkgopsida (*Ginkgoites, Ginkgo, Baiera, Czekanowskia, Phoenicopsis*), Coniferopsida (*Pityophyllum, Rhipidiocladus, Elatocladus, Schizolepis, Podozamites*), Lycoposidas (*Lycopodites, Selaginellites*), Sphenopsida (*Equisetum*), Filicopsida (*Todites, Coniopteris*), Cycadopsida (*Anomozamites*) (Mi *et al.* 1996). All these paleontological data were interpreted as indicating a humid and warm-temperate climate (Tan & Ren 2002).

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