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A new fossil mordellid (Coleoptera: Tenebrionoidea: Mordellidae) from the Yixian Formation of Western Liaoning Province, China

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Abstract

A new genus and species, *Mirimordella gracilicruralis* **gen.** et **sp. nov.**, in the subfamily Praemordellinae of Mordellidae, is described and illustrated based on a nearly complete fossil specimen. It is from the Yixian Formation of western Liaoning Province, NE China. The diagnosis of the subfamily Praemordellinae is emended based on this new species. Characters such as simple and linear maxillary palpi, simple claws, simple penultimate segments of fore and middle tarsi, small hind coxal plates, slender hind femora, only apical ridges on hind tibiae and tarsi, and no elongated last tergum suggest that Praemordellinae might be the precursor of modern mordellids. The resemblance between the new species and the Late Jurassic *Praemordella martynovi* indicates close relationships between them and with the tribe Stenaliini in the subfamily Mordellinae. The position of epicoxa and slender hind femur suggest that the new species may be more primitive than *Praemordella martynovi* and may indicate the age of the Yixian Formation no later than Late Jurassic.

Key words: fossil, Mordellidae, new taxon, Late Jurassic, Yixian Formation, Liaoning

Introduction

Mordellids have a distinctive wedge-shaped body. The fossil representatives of this family, especially Mesozoic ones, are infrequent. The earliest occurrence of mordellids was assigned to the Late Jurassic, for which a new genus and species was described as *Praemordella martynovi* Scegoleva-Barovskaja (1929) (Fig. 1) from the Karatau Range in Kazakhstan. To date, Early Cretaceous mordellids have been reported from two sites: Lushangfen Formation of western Beijing, China (Huang & Yang 1999) and Koonwarra Bed of Victoria, Australia (Jeel & Duncan 1986), where a new genus and species, *Cretanaspis lushangfenensis* Huang & Yang, 1999 and one poorly preserved specimen without description were reported respectively. Huang and Yang (1999) considered *Cretanaspis* as an intermediate genus between modern Mordellinae and Anaspidinae and placed it within the family Mordellidae. In addition, Wang (1993) described a mordellid-like sample from the Yixian Formation of western Liaoning Province, and established an extinct family Liaoximordellidae for it, with *Liaoximordella hongi* as the type species. The Late Cretaceous has been claimed to be a very important time in the evolutionary history of the family based on the discovery of undoubted mordellid specimens. All of these mordellids are awaiting further identification, including five specimens from Burmese amber (Grimaldi *et al.* 2002) and five from New Jersey amber (Grimaldi *et al*. 2000).

Recently we recovered the current well preserved mordellid-like fossil from the Yixian Formation. This discovery is of great interest, as this specimen is an important supplement to the record of fossil mordellids and may aid study of the origin of modern mordellids. However, the age of the Yixian Formation is still being debated and three opinions have been offered: Late Jurassic (Ren *et al.* 1997, Zheng *et al*. 2003), the transition

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