

New Species of Variegated Mud-Loving Beetles (Coleoptera: Heteroceridae) from Mesozoic Deposits of China

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Abstract—A new species of variegated mud-loving beetles, *Heterocerites magnus*, sp. nov., is described from the Late Tithonian–Berriasian of China (Huangbanjigou, Yixian Formation). This is a second known representative of the family in the Mesozoic.

Keywords: Coleoptera, Heteroceridae, beetles, China, Jurassic, Cretaceous, Yixian, new species.

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INTRODUCTION

The family Heteroceridae is represented in the recent fauna by approximately 300 species, belonging to 15 genera. Larvae and adults live in the coastal waters of various water bodies, even on sea coasts, preferring soft substrates, in which they dig tunnels. They feed on detritus and algae, especially diatoms (Vanin et al., 2005).

Until recently, only a single species of this family was known from the Mesozoic, *Heterocerites kobdoensis* Ponomarenko, 1986 from the Myangad locality (West Mongolia, Lower Cretaceous, Gurvan-Eren Formation). To describe this species, the formal genus *Heterocerites* Ponomarenko, 1986 was created, in which it was suggested to describe Mesozoic Heteroceridae of unclear generic position (Ponomarenko, 1986; Ponomarenko and Kirejtshuk, 2010).

A study of the collection of the Capital Pedagogical University (Beijing, China) revealed a new species of the family Heteroceridae among fossil beetles from the locality Huanbanjigou of the Yixian Formation (environs of Chaomidian village, Shangyuan, Beipiao city, Liaoning Province), attributed to the Late Tithonian–Berriasian (Wang et al., 2004, 2005). The following combination of characters indicates that it belongs to this family: the serrate antennae; large mandibles with external denticle; pronotum elongate anteriorly, with a convex longitudinal process dividing the mesocoxae; mesocoxae broadly separated; metacoxa with short metacoxal plate; abdominal ventrite 1 with stridulatory lines; pubescent elytra with variegated pattern; front legs fossorial.

The poorly preserved antennae and mandibles, the absence of tarsi, genitalia and some other struc-

tures do not allow comparing the new species with recent genera; therefore, it is described in the formal genus *Heterocerites*.

The characteristic body shape and fossorial front legs of *Heterocerites magnus* give evidence that this species lived in the water-saturated earth near the water edge, like recent members of the family. The presence of Heteroceridae in this locality shows that the coasts of Huanbanjigou water bodies (or at least some of them) were gently sloping, forming a zone of soft coastal earth available for colonization by heterocerids.

SYSTEMATIC PALEONTOLOGY

Family Heteroceridae MacLeay, 1855

Formal genus *Heterocerites* Ponomarenko, 1986

Heterocerites magnus Prokin et Ren, sp. nov.

Etymology. From the Latin *magnus* (big).

Holotype. CNU COL LB, no. 2010023, counter impression of adult beetle without tarsi; Huanbanjigou locality; Upper Tithonian–Berriasian, Yixian Formation.

Description (Figs. 1, 2). A relatively small, flattened beetle. The head is large, broadened behind the base of the protruding mandibles, which bear an oval protrusion on the external margin. The antennae are serrate, include at least 10 segments, forming an elongate club. The labrum is large, transverse. The submentum is elongate, with notched anterior margin. The pronotum is transverse, 1.7–2.1 times as wide as long, with rounded angles. The prosternum on anterior margin has a portion dilated posteriorly, flattened a flattened process, which divides the broad transverse

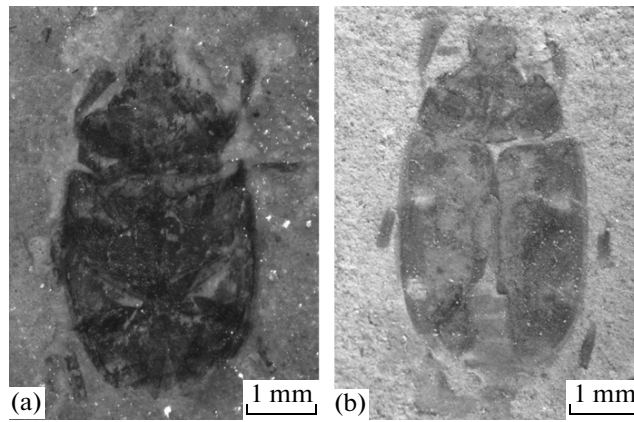


Fig. 1. *Heterocerites magnus*, sp. nov.: (a) holotype CNU COL LB, no. 2010023; paratype CNU COL LB, no. 2010065. Scale bar 1 mm.

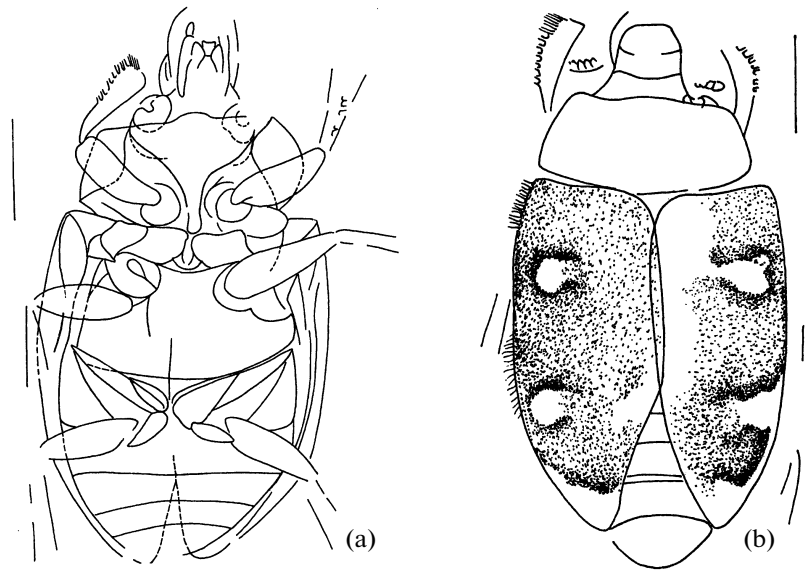


Fig. 2. *Heterocerites magnus*, sp. nov.: (a) holotype CNU COL LB, no. 2010023; (b) paratype CNU COL LB, no. 2010065. Scale bar 1 mm.

front tarsi. The profemur protrudes beyond the body outline, are approximately equal in length to protibia. The protibia is flattened, with a series of large spines and long erect hairs. The mesocoxae are rounded, broadly separated. The mesofemur protrudes beyond the body margin, slightly longer than the profemur. The metaventrite is considerably longer than the mesoventrite; at the level of the metacoxae 1.5 times as wide as long, and 3.3 times larger than at the level of the mesoxae. Metacoxae are transverse, slanting, almost contiguous, with short metacoxal plates, rounded protruding medially. The metatrochanter is large, pointed. The metafemur is more weakly broadened, compared to profemur and mesofemur. The abdomen has five visible ventrites; the suture between ventrite 1 and ventrite 2 medially not distinct; ventrite 1 has lateral femoral (submetacoxal) stridulatory lines,

underdeveloped medially. The elytra are dark, covered with dense semierect hairs, with three groups of lightened spots: apically and at 1/4 and 5/8 length from the base. The spots are displaced towards the elytral margin, and sometimes flow into the lightened marginal bead. The epipleura are wide broad near the humeral angle, with epipleral carina.

Measurements, mm. Length, 5–5.4; width, 2.6–2.7 (at the level of metacoxae; without elytra, 2.3); Elytron length, 3.2–3.3.

Comparison. The new species differs from *H. kobdoensis* in the larger size, broader body, more elongate metaventrite, and more pronounced elytral coloration consisting of three groups of spots.

Material. Holotype and paratypes CNU COL LB, no. 2010065, direct impression of adult beetle

without tarsi, and CNU COL LB no. 2010069, counter impression of an adult beetle without tarsi.

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