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Fossil flower bugs (Heteroptera: Cimicomorpha: Cimicoidea) from the Late Jurassic of Northeast China, including a new family, Vetanthocoridae

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Abstract

An extinct new family of flower bugs, Vetanthocoridae **fam. nov.**, with 2 new tribes, Vetanthocorini and Crassicerini, 8 new genera, and 9 new species (*Byssoidecerus levigatus* **gen.** & **sp. nov.**, *Collivetanthocoris rapax* **gen.** & **sp. nov.**, *Vetanthocoris decorus* **gen.** & **sp. nov.**, *Vetanthocoris longispicus* **gen.** & **sp. nov.**, *Curvicaudus ciliatus* **gen.** & **sp. nov.**, *Mecopodus xanthos* **gen.** & **sp. nov.**, *Pustulithoracalis gloriosus* **gen.** & **sp. nov.**, *Curticerus venustus* **gen.** & **sp. nov.**, and *Crassicerus furtivus* **gen.** & **sp. nov.**) are described from the Late Jurassic Yixian Formation in western Liaoning Province, China. These fossil records suggest there was an important diversity of flower bugs in the earlier Late Jurassic of northern China. A key to four flower-bug families and a key to the known fossil flower bugs are provided.

Key words: Heteroptera, Cimicoidea, Vetanthocoridae, flower bugs, new family, new tribe, new genus, new species, late Jurassic, Yixian Formation, China

Introduction

The recent Anthocoridae (sensu lato) is small family with about 80 genera and 500 species, and widespread in all zoogeographical regions (Bu & Zheng 2001). This group was once considered to comprise three subfamilies: Anthocorinae, Lyctocorinae, and Lasiochilinae (Carayon 1972). In 1991, these three subfamilies were raised to family rank, as Anthocoridae (sensu stricto), Lyctocoridae, and Lasiochilidae, based on a cladistic analysis (Schuh & Štys 1991); this action has been subsequently accepted (e.g., Schuh & Slater 1995, Zheng 1999, Bu & Zheng 2001). This classification, and the phylogeny which underlies it, depends heavily on such microscopic features as peritreme, fossula spongiosa, abdominal spiracle, dorsal laterotergites, and genitalia. However, these features are difficult to study on fossil flower bugs, and so some paleoentomologists still prefer to use Carayon's classification system (Popov & Herczek 2001).

Recently we discovered 67 fossil specimens, including 7 parts and counterparts, of flower bugs collected from Yixian Formation. Among them were many complete specimens, including well-preserved antennae, rostrum, ocelli, wings, legs, abdomens, and ovipositors. These new fossils are an important supplement to flower bug records and provide new evidence for studying flower bugs' origin and evolution. Careful examination of these specimens has revealed 2 new tribes, Vetanthocorini and Crassicerini, 8 new

