



***Mathesius liaoningensis* gen. et sp. nov. of Jehol Biota, a presumptive relative of the clerid or thaneroclerid branches of Cleroidea (Coleoptera)**

JIRÍ KOLIBÁČ¹ & DI-YING HUANG²

¹Moravian Museum, Department of Entomology, Hviezdoslavova 29a, CZ-627 00 Brno, Czech Republic. E-mail: jkolibac@mzm.cz

²State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, No. 39 East Beijing Road, Nanjing 210008, China. E-mail: huangdiying@sina.com

Abstract

Mathesius liaoningensis, a new genus and species of Cleroidea, probably relative of clerid or thaneroclerid branches of the superfamily, is described from the Lower Cretaceous; it belongs among the oldest and the best preserved cleroid fossils that have been known so far. The unique specimen was found in Yixian Formation (ca. 125 Ma) near Huangbanjigou Village, Beipiao City, Liaoning Province, NE China and belongs to the famous Chinese Jehol Biota. A classification of *Mathesius liaoningensis* **gen. et sp. nov.** within Cleroidea is based on cucujiform aedeagus with distinct medial apodeme (strut) and probably paired struts of the phallobase, pentamerous meso- and metatarsi, narrowly separated pro- and mesocoxae, metacoxae extending laterally to meet elytra. A possible relationship with the clerid or thaneroclerid branches is based on predacious mandibles, absence of large spines in tibiae, lobes at least in meso- and metatarsomeres 2–3 (probably 1–4), probably six visible abdominal ventrites, and shape of body. With the exception of the aforementioned features, the well-preserved fossil shows interesting morphological characters which are figured in detail and discussed in the context of morphology of some recent cucujiform families.

Key words: Coleoptera, Cucujiformia, Cleroidea, Lower Cretaceous, Jehol Biota, China, new genus, new species

Introduction

The famous Early Cretaceous Jehol Biota was widely distributed in North China and the adjacent countries. Huangbanjigou Village at Beipiao City, west Liaoning Province, where the beetle was collected, is one of the most famous locality that yielded very abundant and well-preserved fossil insects. The horizon is situated in the Yixian Formation that is now considered to be deposited in the Barremian to early Aptian, some 125–121 Ma (Swisher *et al.* 1999). Climatic condition of Yixian can be deduced from flora found in the formation. It was dominated by conifers closely related to modern species that are found mainly in subtropical and temperate upland forests. Plants recorded in the formation indicate a warm and humid climate. However, observation of the growth rings of petrified wood indicates that the wet, humid conditions were interrupted by dry periods, in which the environment became dryer and more arid (Wang *et al.* 2006). The flora can be characterized by extensive forests, dominated by ginkgoes, conifers, cycads, and seed fern trees. Ground cover plants included lycopods, horsetails, ferns, and several species of primitive flowering plants (Zhou 2006). Volcanic activity, along with periodic wildfires, and noxious gases released from the lake bottoms caused the ecosystem to be continually destroyed and regrown. This, along with the wide diversity of habitats in the surrounding region, may have contributed to the fast diversification of life forms present in the ecosystem (Zhou 2006). Diverse and abundant animal fossils was yielded in the Yixian Formation that includes many feathered dinosaurs and beaked birds (Chang 2003), as well as tree-dwelling and climbing mammals and lizards (Zhou 2006). Insect communities found here are also diverse, with at least 17 orders known until now (Chang 2003).

A morphology, distribution, biology and taxonomy of the cucujiform families relevant for our communication have been recently reviewed by Leschen *et al.* (2010). We also accepted the system used in the book. The described