

## A second antlion from the Mesozoic of northeastern China (Neuroptera: Myrmeleontidae)

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### ABSTRACT

A new fossil antlion, *Choromyrmeleon aspoecorum* n.sp., is described and illustrated from the Yixian Formation (conservatively considered as Early Cretaceous or latest Jurassic) of Liaoning Province, China. This constitutes the second species of the genus *Choromyrmeleon* as well as the second fossil record of Myrmeleontidae from China.

**KEY WORDS:** China. Mesozoic. Myrmeleontidae. Paleontology. Planipennia. Taxonomy.

### INTRODUCTION

The Myrmeleontidae, commonly known as “antlions”, are the most diverse lineage of Neuroptera, with about 2000 described species worldwide. Antlions are typically large and conspicuous insects, predominantly found in arid and semiarid regions. Rice (1969) was the first to report on a fossil myrmeleontid from the Cretaceous. *Palaeoleon ferrogeneticus* Rice was discovered in Late Cretaceous deposits of Labrador, Canada (Rice 1969, Carpenter 1992). Although *Palaeoleon* has at times been segregated into a related but separate family, the Palaeoleontidae (e.g. Dobruskina et al. 1997, Martins-Neto 2000), the genus and its allies are most conservatively considered a primitive subfamily of Myrmeleontidae. In addition to *Palaeoleon* several other Cretaceous species have been described in the last 15 years, mostly from the Early Cretaceous deposits of the Crato Formation, northeastern Brazil (e.g. Martins-Neto 1990, 1992, 2000). From the latter deposit 10 genera and 23 species have presently been described, albeit quite poorly and the entire fauna is in need of serious revision as several are likely synonyms.

Ren & Guo (1996) described the first fossil antlion from the Mesozoic of China. *Choromyrmeleon othneius* was described from the Yixian Formation near Beipiao City (Liaoning Province). The specimen was, however, rather incomplete, with little more than the venation preserved. During excavations in 2000 one of us (DR) recovered a second antlion fossil with not only four complete wings, but also preserving quite well the body and antennae (Figs. 1–3). The discovery of an articulated antlion from these deposits is therefore noteworthy and the fossil is formally

described herein. This constitutes the second record of the Myrmeleontidae from the Mesozoic of China.

As alluded to above, the new fossil described herein was collected near Beipiao City, located in the western part of Liaoning Province, China. This locality is rich in insect fossils, including a large number of Neuroptera (e.g. Ren et al. 1995, Ren & Guo 1996, Ren & Yin 2002). A survey of the insect fauna of the Yixian Formation was provided by Ren et al. (1995, 1997). The age of the Yixian fossil beds is of some legitimate controversy, with the debate centering around either an Early Cretaceous (e.g. Barrett

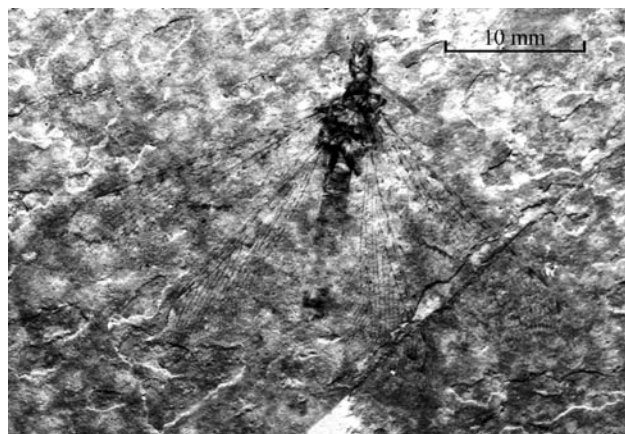


Fig. 1. Photograph of holotype of *Choromyrmeleon aspoecorum* n.sp. (LB20003); photographed dry.

2000, Swisher et al. 2002, Grimaldi & Engel 2005) or Late Jurassic age (e.g. Ren et al. 1995, 1997). The authors differ as to their position regarding this debate (DR agreeing with the older date, MSE agreeing with an Early Cretaceous age).

Type material of the species described herein is deposited in the Department of Biology, Capital Normal University, Beijing. Nomenclature of wing venation follows that of New (1985). Figures were prepared with the aid of a camera lucida attached to a LEICA MZ12.5 dissecting microscope.

## SYSTEMATIC PALEONTOLOGY

Family: Myrmeleontidae Latreille, 1802

GENUS: *Choromyrmeleon* Ren & Guo, 1996

*Choromyrmeleon aspoeckorum* n.sp.

(Figures 1–4)

**Etymology.** The specific epithet honors Drs. Horst and Ulrike Aspöck, foremost authorities on the Neuropterida.

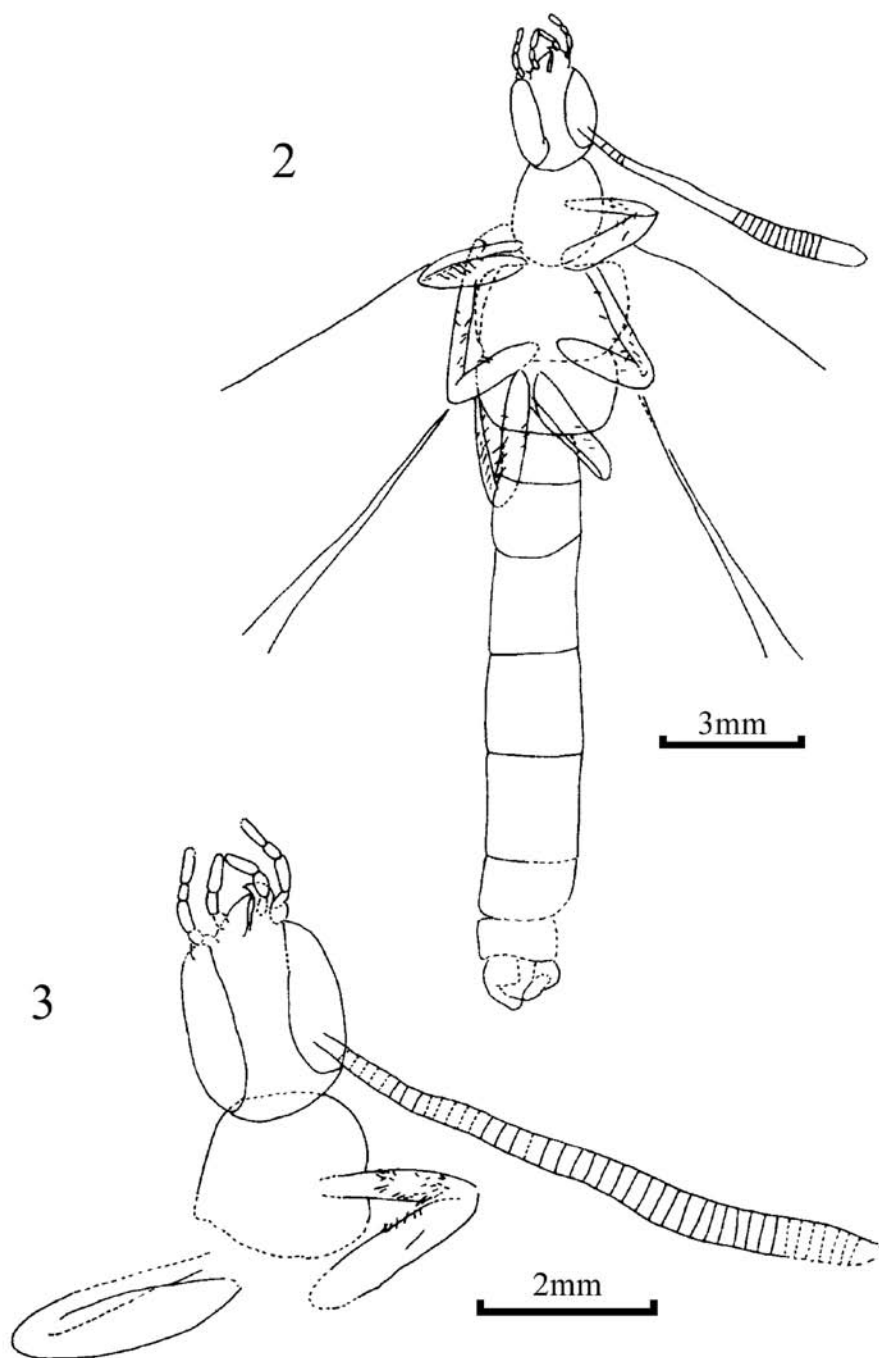


Fig. 2–3. Line illustration of holotype of *Choromyrmeleon aspoeckorum* n.sp. (LB20003). 2. Illustration of full body as preserved (wings omitted). 3. Detail of head and prothoracic segment.

**Locality and Horizon.** Huanbanjiegou, Chaomidian Village, Shangyuan Township, Beipiao City, Liaoning Province, China; second member of Yixian Formation (Ren et al. 1997).

**Holotype.** A well-preserved, complete body with all wings present, registration No. LB20003 (Fig. 1); deposited in the Department of Biology, Capital Normal University, Beijing.

**Diagnosis.** The new species can be most readily separated from *C. othneius* by the apical forking of Rs (Rs

beyond termination of R1 does not fork until marginal twigging in the new species, Rs continues to fork beyond termination of R1 in *C. othneius*), the more strong arching of the radial system (apically R1 and Rs continue along wing apex separated by distance slightly less than C-Sc separation in *C. othneius*; apically R1 and Rs more strongly arch posteriorly leaving a wide space between them and the wing apex, many times broader than C-Sc separation in the new species), and the location of the oblique vein (distinctly before CuA fork in the new species, confluent with CuA fork in *C. othneius*). Moreover, the head of this species is quite un-

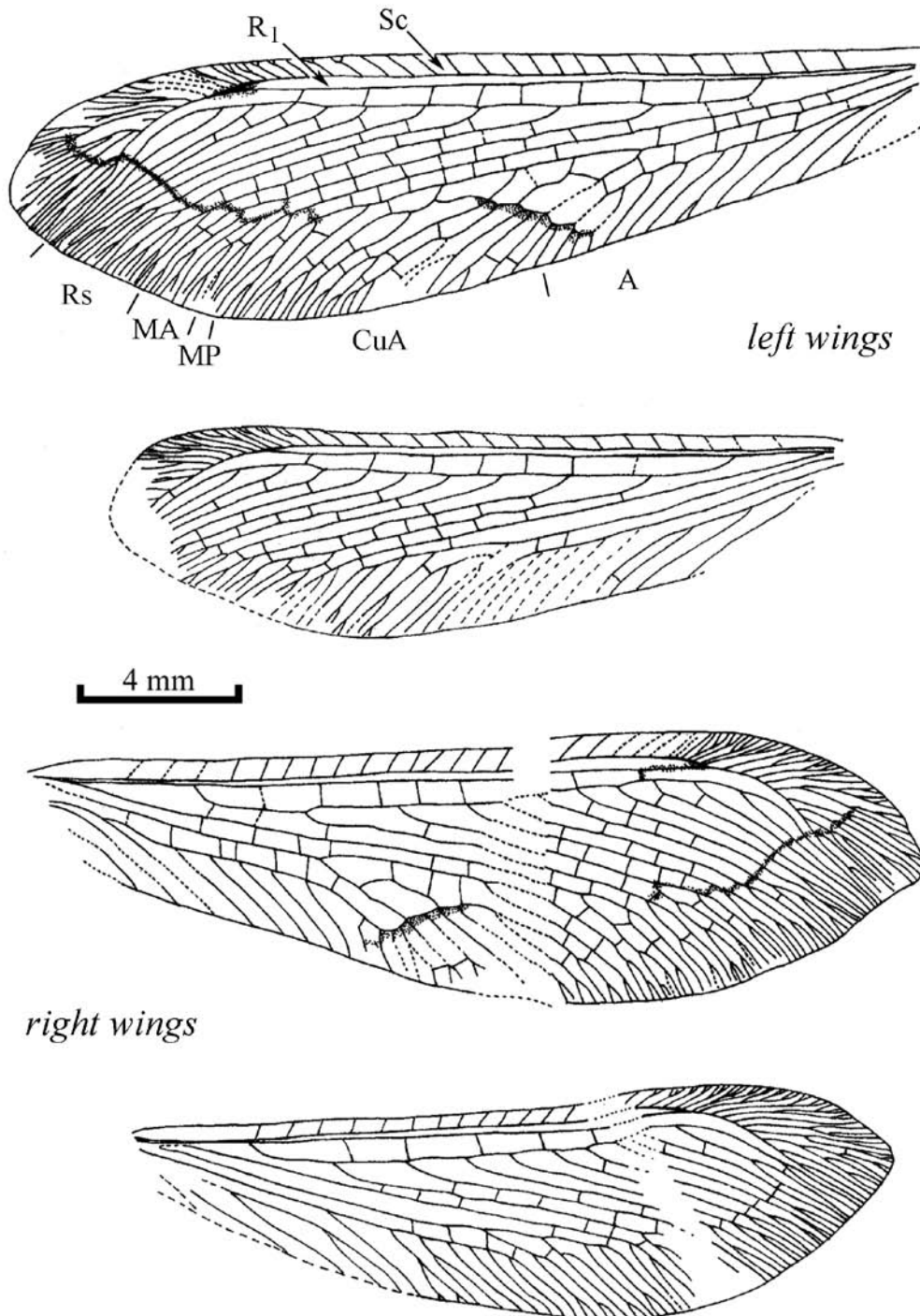


Fig. 4. Detail of wing venation of holotype of *Choromyrmeleon aspoecorum* n.sp. (LB20003) as preserved (forewings above, hind wings below).

sual in that it is narrow and prolonged rather than the more typical transverse form of modern myrmeleontids.

**Description.** Forewing length (preserved part) 25 mm, width 7 mm; hind wing length (preserved part) 20 mm, width 5.6 mm; antennal length at least 6.8 mm. Head width, including compound eyes, as wide as anterior pronotal width; compound eyes large and prominent; antenna moderately short, less than half as long as forewing, with at least 42 well-defined flagellar articles, articles expanded apically to form a weakly-defined club (the apical expansion of the flagellar width is characteristic of Myrmeleontidae) (Figs. 2–3); mandibles strongly developed; maxillary palp pentamerous (*i.e.* 5-segmented), with P5 (= fifth, or distalmost, palpomere) elongate and cylindrical; labial palp trimerous (*i.e.* 3-segmented), with labial P3 similar in shape to maxillary P5. Pronotum about as broad as long; anterolateral angles rounded; details of pterothorax obscured. Wings moderately broad; apex of forewing somewhat falcate; trichosors distinctly absent; membrane of wing without microtrichia; details of venation depicted in figure 4; forewing and hind wing without Banksian lines; presectoral crossveins absent in both forewing and hind wing; costal cells simple, not biareolate; Rs arising distinctly before CuA fork in forewing or MP2 fork in hindwing; Rs in forewing does not fork beyond termination of R1 until marginal twigging; R1 and Rs more strongly arch posteriorly in forewing apical fifth, leaving wide space between them and wing apex, distance many times broader than C-Sc separation; CuA in forewing forking slightly beyond origin of MA from Rs; oblique vein between MP and CuA in forewing located distinctly before fork of CuA; 2A in forewing simple and straight, not linked to 1A or 3A by crossvein or meeting at a point. Legs ill preserved, tarsi missing. Abdomen with eight visible segments; terminalia obscured.

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