



## ***Telmaeshna paradoxica* gen. et sp. nov., a new fossil dragonfly (Insecta: Odonata: Anisoptera) from the Yixian Formation, Liaoning, China**

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### **Abstract**

*Telmaeshna paradoxica* gen. et sp. nov., is described from the Upper Jurassic to Lower Cretaceous Yixian Formation, near Chaomidian Village, Beipiao City, Liaoning Province, China. It is included in the Anisoptera: Aeshnoptera: Aeshnomorpha: Panaeshnida, on the basis of the following characters: strongly elongated pterostigma; well-defined anal loop and Rspl; undulated RP2, RP3/4 and MA; divided hypertriangle and discoidal triangle; and prolonged gaff. It cannot be assigned to any described extant or extinct family of Panaeshnida, but we refrain from erecting a new family to accommodate it until more features (forewing, body characters) are known. Consequently, this new genus is provisionally retained as family uncertain. Its phylogenetic relationships within Anisoptera are discussed.

**Key words:** Insecta, Odonata, Anisoptera, Aeshnoptera, fossil, Upper Jurassic, Lower Cretaceous, China

### **Introduction**

At present, about nine families, 28 genera and 55 species of Mesozoic Aeshnoptera have been described (Bechly *et al.* 2001; Huang *et al.* 2003; Zhang *et al.* 2006). Liupanshaniidae, Progobiaeshnidae, Rudiaeschnidae, *Parapetala* (family position uncertain) and *Sopholibellula* were originally discovered in China.

The Yixian Formation consists of grey tuff, siltstone and mudstone which have yielded insects, conchost-racans, plants, primitive birds and feathered theropods. The age of the biota has been discussed by Wang *et al.* (2005) who summarized different theories about the age of the Yixian Formation based on abundant fossil data as compared the Yixian biota with the Solnhofen biota of Germany, the Purbeck biota in England, Late Jurassic Teri-type and Ryoseki-type floras in Japan, the Middle Jurassic Yorkshire flora, and the Great Estuarine conchostracan fauna in the UK. Wang *et al.* (2005) believe the Yixian Stage to be Late Tithonian to Berri-Asian, thus we regard the lower part of Yixian Formation as transition from Upper Jurassic to Lower Cretaceous.

Nineteen species of Odonata have been described from this formation up to now: *Sinaeschnidia heishankowense* Hong; *Archaeogomphus labius* Lin; *Pseudosamarura largina* Lin; *Dissurus liaoyuanensis* Hong; *Sinogomphus taoshanensis* Hong; *Hebeiaeschnidia fengningensis* Hong; *Chrysogomphus beipiaoensis* Ren; *Sinaeschnidia cancellosa* Ren; *Liogomphus yixianensis* Ren & Guo; *Mesocordulia boreala* Ren & Guo; *Rudiaeschna limnobia* Ren & Guo; *Dracontaeschnidium orientale* Zhang & Zhang; *Sinojagoria imperfecta* Bechly, Nel & Martínez-Delclòs; *Stylaeschnidium rarum* Zhang & Zhang; *Bellabrunetia catherinae* Fleck & Nel; *Abrohemeroscopus mengi* Ren, Liu & Chen; *Parapetala liaoningensis* Huang, Nel & Lin; *Sopholibellula eleganti* Zhang, Ren & Zhou; *Sopholibellula amoena* Zhang, Ren & Zhou. (Lin 1976; Hong 1982, 1984; Ren