



Article

urn:lsid:zoobank.org:pub:6DBC758C-F7CB-4AE2-BBF3-625C8A13D493

A new genus of *Scolebythidae* (Hymenoptera: Chrysidioidea) from the Early Cretaceous of China

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Abstract

A new genus *Mirabythus* Cai, Shih et Ren, **gen. nov.** (type species, *M. lechrius* Cai, Shih et Ren, **sp. nov.**) and *M. liae* Cai, Shih et Ren, **sp. nov.** from the family *Scolebythidae* are described from the Early Cretaceous Yixian Formation of Huangbanjigou Village, Liaoning Province, northeastern China. These findings extend the existence of *Scolebythidae* to the Early Cretaceous of China, while providing evidence to support Engel and Grimaldi's hypothesis that the family was widely distributed throughout the Cretaceous. Our two new species with clear venation also provide a comprehensive understanding of the venational changes from the Early Cretaceous to now. A key to the fossil and extant genera of *Scolebythidae* is provided.

Key Words: Hymenoptera, Chrysidioidea, *Scolebythidae*, Early Cretaceous, fossil, Yixian Formation, China

Introduction

Scolebythidae is a very small family of the basal aculeate superfamily *Chrysidioidea*. Currently, only nine genera with 13 species have been described, comprising six extant species and seven fossil species preserved in amber (Table 1). The *scolebythids* have a primitive biological trait, like most apocritans, that they are gregarious ectoparasitoids of wood-boring beetles in the families of *Cerambycidae* and *Anobiidae* (Brothers 1981; Melo 2000). The *Scolebythidae* can be readily and easily identified by its unique apomorphy of large, exposed, diamond-shaped prosternum (Carpenter 1986, Prentice *et al.* 1996).

The family was proposed by Evans (1963) based on two extant wasps, *Clystopsenella longiventris* Kieffer, 1911 from Brazil and *Scolebythus madecassus* Evans, 1963 from Madagascar. The third genus was added by Nagy (1975) for a species from South Africa and Australia, *Ycaploca evansi* Nagy, 1975, as well as the first description of a male *scolebythid*. With the discovery of *Pristapenesia stricta* (Azevedo, 1999) in South America and *Ycaploca fijianus* Beaver, 2002 in Fiji, both well below the equator, all the extant species are from Southern Hemisphere—e.g. South Africa, Australia, Fiji, southern South America (Nagy 1975; Day 1977; Evans *et al.* 1979; Azevedo 1999; Beaver 2002), supporting the notion that the family has a distribution entirely Austral. Later on, numerous *scolebythids*, all of *C. longiventris*, were recorded in north of the equator, challenging the notion that *chrysidoid* wasps are a Southern Hemisphere family (Gauld 1995; Fernandez *et al.* 2002; Cambra & Azevedo 2003; Engel 2005). The sixth extant species, *Pristapenesia asiatica* Azevedo, Xu et Beaver, 2011 was discovered in China and Thailand, which is also against the notion of only Austral distribution. Furthermore, the fossil records of the family obviously indicate a Northern Hemisphere distribution, such as the occurrence of *scolebythids* in the Mid-Eocene Baltic amber (Brues 1933; Brothers & Janzen 1999).

The first fossil *scolebythid* *Pristapenesia primaeva* Brues, 1933 in the Mid-Eocene Baltic amber was wrongly identified as a species of *Bethylidae*. Prentice *et al.* (1996) described two fossil *scolebythid* genera and species *Libanobythus milkii* Prentice et Poinar, 1996 and *Dominibythus inopinatus* Prentice et Poinar, 1996 (currently in *Pristapenesia* Brues, 1933) respectively, from the Early Cretaceous Lebanese amber (Barremian)