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Signal from the Cretaceous—a new species of *Alavesia* from Burmese amber (Diptera: Empidoidea: Atelestidae)

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
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Abstract

A new species of *Alavesia* (Empidoidea: Atelestidae), *Alavesia wimpala* sp. nov. is described from the mid-Cretaceous amber of Myanmar. Together with the recently described *Alavesia longistylata* H. Zhang & Wang in Zhang *et al.* 2020 and *A. longicornuta* Sinclair & Grimaldi, 2020 the herein described species *Alavesia wimpala* sp. nov. forms a distinct group of *Alavesia* Waters & Arillo, 1999 which we consider deserving a subgeneric level. Subgenus *Pemmonalavesia* subgen. nov. is introduced here comprising three species. Males of these species have a very prolonged third segment of stylus bearing a long-oval pennon. The palpus is prolonged and blade- or ribbon-shaped. A catalogue to all 19 species of the genus is given as well as a key to *Alavesia* (*Pemmonalavesia* subgen. nov.). The function of the prolonged antenna in display and courtship is discussed. Most probably the triangular shape of the wings with its broad base allows a hovering flight in these species to present the pennons at the end of stylus. These characters indicate a high derived courtship behaviour in these flies in the Cretaceous period. On the other hand a possible raptorial behaviour of the new species is suggested.

Keywords: *Pemmonalavesia*, antenna, pennon, Cretaceous, Myanmar

Introduction

The genus *Alavesia* was described by Waters & Arillo (1999) from Lower Cretaceous amber of Álava (Spain) in the Empidoidea family Hybotidae. The genus was erected based on the single species *A. subiasi* Waters & Arillo, 1999. A further inclusion, obviously belonging to *Alavesia*, was reported from Cretaceous amber of

Myanmar (Grimaldi *et al.*, 2002). A second species was described and named from contemporaneous Asturias amber (Spain) (Peñalver & Arillo, 2007). Amazingly, some years after the description of fossil taxa, two extant *Alavesia* species were described from the Brandberg massif in Namibia, South Africa (Sinclair & Kirk-Spriggs, 2010). The genus was then transferred to Atelestinae in Atelestidae based on the male and female genitalia and a three-segmented stylus. In recent years, further species of *Alavesia* have been described from Myanmar amber (Jouault *et al.*, 2020; Poinar & Vega, 2020; Sinclair & Grimaldi, 2020; H. Zhang *et al.*, 2020; S. Zhang *et al.*, 2020). Roughly in the same time span, one of us (CH) identified several *Alavesia* specimens in Burmese amber from private collections in Germany, and on internet platforms where Burmese fossil *Alavesia* specimens were offered for sale. Here we describe a third *Alavesia* species from Cretaceous amber from Myanmar with remarkably modified antennae.

Material and methods

The amber piece with the inclusion was donated by Rainer Ohlhoff (Germany). It probably originates from an amber mine in the Hukawng Valley, Kachin State, in northern Myanmar (Burma) and was purchased from a private local amber digger between 2010 and 2012. It is a single fly specimen embedded in a rectangular shaped clear amber piece with maximum dimensions 8.8 × 6.2 × 5.8 mm (Fig. 1A). The amber piece was trimmed very close to the fly to obtain an almost clear frontal view, with head and wing margin close to the surface. The inclusion

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