

# The first araripeneurine antlion in Burmese amber (Neuroptera: Myrmeleontidae)



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## ABSTRACT

*Burmanera minuta* gen. et sp. nov., the first araripeneurine antlion in amber, is characterized, described and compared with the modern and Mesozoic Myrmeleontidae. The precise position of the fossil within this group is debatable. Interestingly, despite a rather rich fossil record, all Mesozoic Myrmeleontidae belong to subfamilies that are not recorded in the Cenozoic, although this might merely reflect the artificiality of the classification as the extinct groups may be paraphyletic with respect to their younger counterparts (e.g., Araripeneurinae may very well be nothing more than a stem group of no classificatory value).

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## 1. Introduction

The antlions, family Myrmeleontidae (Neuroptera: Myrmeleontiformia), are relatively scarce in the fossil record when compared to other Neuroptera. While there are few species, some known only as larvae, from the Cenozoic (Statz, 1936; Engel and Grimaldi, 2007), it is during the Mesozoic that there is a more enriched record, albeit still comparatively meager. The estimate origin for (Ascalaphidae + Myrmeleontidae) is during the late Jurassic at around 153 Ma and around 134 Ma for the stem Myrmeleontidae (Winterton et al., 2010). The Lower Cretaceous Crato Formation in Brazil has revealed a nominally diverse fauna (Martins-Neto et al., 2007), and other antlions are known from the Lower Cretaceous of Israel, Mongolia, China (Ponomarenko, 1992;

Ren and Guo, 1996; Dobruskina et al., 1997; Ren and Engel, 2008), and the Upper Cretaceous of Labrador, Canada (Rice, 1969). All of the Mesozoic antlions are represented by compression fossils, with a state of preservation that is always good, although Whalley (1980) reported a putative, fragmentary myrmeleontid from Lebanese amber. Stange (2004) provided an annotated list of the modern and fossil antlions, and advocated subfamilial status for the two Mesozoic groups Palaeoleontinae Martins-Neto, 1992 and Araripeneurinae Martins-Neto and Vulcano, 1989 (sometimes considered as separate families in Myrmeleontoidea), although monophyly has never been demonstrated for either one. Both are distinguished solely on the basis of putative plesiomorphies and should be re-evaluated in a cladistic framework (something beyond the scope of the present contribution). Hitherto no Myrmeleontinae have been recorded from the Mesozoic, nor have Myrmeleontidae been formally described from Cretaceous amber.

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Here we provide the first formal description of an antlion in Burmese amber and based on a nearly complete adult (Fig. 1). This amber deposit has already produced a rather diverse neuropteran fauna, with described species of Berothidae, Rachiberothidae (sometimes considered a subfamily of the former), Mantispidae, Coniopterygidae, Psychopsidae, Berothidae, Nymphidae, Osmyliidae, Dilaridae (Grimaldi et al., 2002; Engel and Grimaldi, 2008; Makarkin, 2015a,b; Huang et al., 2015), and undescribed material of Kalligrammatidae and Chrysopoidea is also known (pers. obs.).

Indeed, Neuropterida as a whole are well represented in Burmese amber, with diverse snakeflies (Engel, 2002; pers. obs.) and various Sialidae (Engel and Grimaldi, 2008; pers. obs.).

## 2. Material and methods

The present specimen is preserved in a piece of relatively clear, yellow amber, and was ground and polished prior to examination and photography.

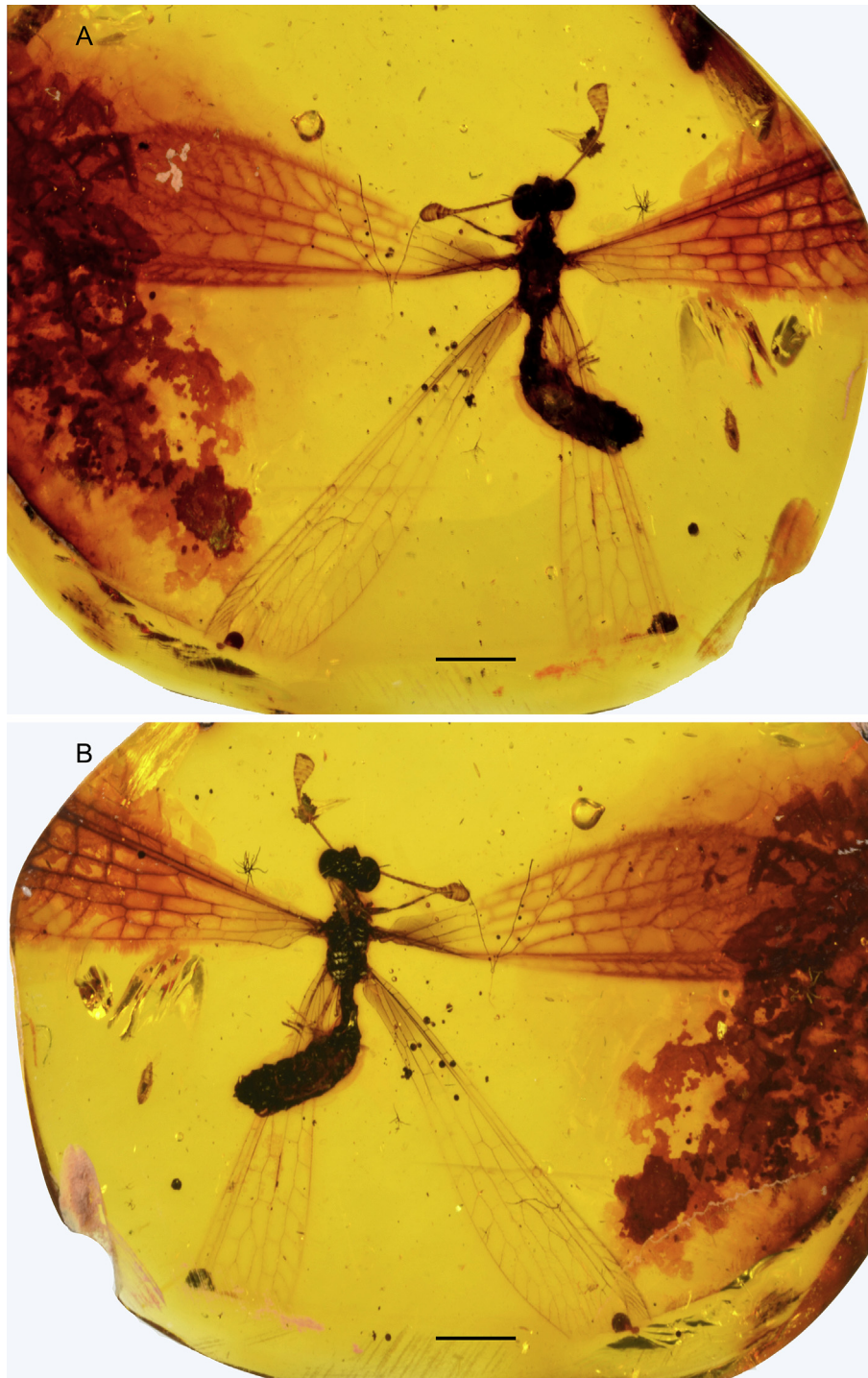


Fig. 1. *Burmanera minuta* gen. et sp. nov., holotype NIGP163428, photographs of general habitus. A, dorsal view; B, ventral view (scale bars = 1 mm).

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