



## Chimeromyiidae, a new family of Eremoneuran Diptera from the Cretaceous

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### Abstract

A new family of eremoneuran Brachycera, the Chimeromyiidae, is proposed for two genera and eight species of a distinctive, monophyletic group of flies in 125–100 myo amber. The new family is related to the Empidoidea and basal Cyclorrhapha. Four new species of *Chimeromyia* are described: *C. pilitibia* Grimaldi and Cumming (in Lebanese amber), *C. mediobscura* Grimaldi and Cumming, *C. alava* Arillo and Grimaldi (in Spanish amber), and *C. burmitica* Grimaldi and Cumming (in Burmese amber). A new genus, *Chimeromyina* Arillo and Grimaldi is also described, for a primitive new species *C. concilia* (in Spanish amber). New details of these flies are described, particularly of male and female terminalia, and the relationships between this and other eremoneuran families are discussed.

**Key words:** Eremoneura, amber, Cretaceous, Empidoidea, Cyclorrhapha

### Introduction

The Eremoneura is a monophyletic group of flies comprised of the dance and long-legged flies (Empidoidea) and the Cyclorrhapha, the latter representing the largest lineage within the Brachycera. Evolutionary history of the Eremoneura begins in the Mesozoic, with compression fossils from the Jurassic and with amber fossils occurring from the Early Cretaceous through the Tertiary (Grimaldi & Engel 2005). Grimaldi & Cumming (1999) monographed diverse Brachycera in various Cretaceous ambers, most of which were Eremoneura. Among them was an enigmatic group of three species in Early Cretaceous Lebanese amber (ca. 125 myo), belonging to the genus *Chimeromyia*, named on the basis of the chimeric features of these flies being both empidoid and Cyclorrhaphan. Herein we describe new species in the genus from Cretaceous amber of Spain (ca. 110 myo) and Myanmar (Burma) (ca. 100 myo), which greatly extend the geographical and stratigraphical distribution of the group. Moreover, we describe a primitive new genus related to *Chimeromyia*, which illuminates some aspects of character evolution in these highly specialized flies.

While the exact relationships of *Chimeromyia* and the new genus remain ambiguous even with the new discoveries we report here, there is no question as to their eremoneuran identity. These flies possess an arista, a term used for the last three articles of the flagellum (antennomeres 8–10, with 10 being the longest) observed in virtually all Cyclorrhapha (Stuckenberg 1999). A three-articled arista has been viewed as a synapomorphy of Cyclorrhapha, exclusive of Opetiidae (see discussion in Sinclair & Cumming 2006, p. 24), however, similar apical, whip-like flagellomeres occur in some Empidoidea and a few other groups of Brachycera. These apical flagellomeres are sometimes referred to as an arista, but because different antennomeres are involved (either 9–10, or 8–10 with 9 being the longest) they are probably not homologous (Stuckenberg 1999). *Chimeromyia* also possesses a single maxillary palpomere, wing vein C ending at the