

# The oldest African bat from the early Eocene of El Kohol (Algeria)

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**Abstract** The Afro-Arabian Paleogene fossil record of Chiroptera is very poor. In North Africa and Arabia, this record is limited, thus far, to a few localities mainly in Tunisia (Chambi, late early Eocene), Egypt (Fayum, late Eocene to early Oligocene), and Sultanate of Oman (Taqah, early Oligocene). It consists primarily of isolated teeth or mandible fragments. Interestingly, these African fossil bats document two modern groups (Vespertilionoidea and Rhinolophoidea) from the early Eocene, while the bat fossil record of the same epoch of North America, Eurasia, and Australia principally includes members of the “Eochiroptera.” This paraphyletic group contains all primitive microbats excluding modern families. In Algeria, the region of Brezina, southeast of the

Atlas Mountains, is famous for the early Eocene El Kohol Formation, which has yielded one of the earliest mammalian faunas of the African landmass. Recent fieldwork in the same area has led to the discovery of a new vertebrate locality, including isolated teeth of Chiroptera. These fossils represent the oldest occurrence of Chiroptera in Africa, thus extending back the record of the group to the middle early Eocene (Ypresian) on that continent. The material consists of an upper molar and two fragments of lower molars. The dental character association matches that of “Eochiroptera.” As such, although very fragmentary, the material testifies to the first occurrence of “Eochiroptera” in Algeria, and by extension in Africa. This discovery demonstrates that this basal group of Chiroptera had a worldwide distribution during the early Paleogene.

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## Introduction

Chiroptera is today one of the most diversified orders of placental mammals (representing 20% of mammalian species). Bats have a worldwide distribution and occupy many ecological niches (Hill and Smith 1984; Harrison and Hooker 2010; Maitre et al. 2008; Marandat 1991). This worldwide distribution was established by the early Eocene. They are found in every continent during the early Eocene except Antarctica (Gunnell and Simmons 2005; Simmons 2005). The well-preserved specimens of the Green River Formation (early Eocene, Wyoming), Messel (middle Eocene, Germany), and Mahenge (middle Eocene, Tanzania) all demonstrate the early acquisition of flight (Gunnell et al. 2003; Simmons et al. 2008) and possibly also laryngeal echolocation (Veselka et al. 2010). These two capabilities are