



## The first psychodid (Diptera: Psychodidae: Phlebotominae) species from the Lower Eocene amber of Vastan, Gujarat, India

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### Abstract

The new genus and species, *Phlebotoiella eoindianensis*, from the Eocene Vastan amber deposits in western India is described and illustrated. This marks the first Psychodidae to be described from Vastan amber. The relationship of this new genus is discussed as well as its biogeographic implications.

**Key words:** Lower Eocene, systematics, India, Vastan amber, Phlebotominae, new genus

### Introduction

Psychodidae is a cosmopolitan and widely distributed family often associated with moist habitats, especially the immature stages. Adults of extant forms can also be found in many habitats. Psychodidae are well represented in the dipteran fossil record. According to Evenhuis (1994) 18 genera and about 52 fossil species were described before 1994. The oldest sand flies have been found in Lebanese amber from the Lower Cretaceous (Azar *et al.* 1999, 2003). The fossil evidence from the Lower Cretaceous and the numerous species in amber, suggests that the family was already diverse during the Tertiary (Evenhuis 1994). The family is now widespread on all continents except Antarctica, suggesting that it has a long history which began in the Mesozoic (Ansorge 1994). Lambrecht (1980) estimated that Psychodidae originated as long ago as the Permian/Triassic boundary.

The Vastan amber has been dated at about 52 Mya. The age implicates that the amber fauna must have existed before the Indian-Asian collision, which occurred at about 49–50 Ma (Bajpai and Gingerich 1998), founded on biostratigraphic and biogeographic data from vertebrates. The Palaeoenvironment has been interpreted by Sahni *et al.* (2006) as a freshwater to brackish water environment. The amber beds are interpreted as a marginal marine to very shallow marine habitat, probably with mangrove vegetation (Bandana & Phadtare 1997, Sahni *et al.* 2006).

The present paper represents the first description of an especially well preserved psychodid species (Phlebotominae) from Indian amber, which opens a window of opportunity for a comparison of the Indian fossil fauna with the extant fauna.

### Materials and methods

The amber used for the present study derives from the Vastan lignite mine deposited about 30 km northeast of