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A new genus and species of ibis fly in the Lowermost Eocene amber of Oise (France) (Diptera: Athericidae)

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Abstract

A new athericid genus and species, *Eoatrichops jeanbernardi*, **gen. n., sp. n.,** is described, based on four specimens from the Lowermost Eocene of Oise (France). Its external morphology is analyzed and compared with of all genera of Athericidae. *Eoatrichops* is very similar to the modern genus *Atrichops* Verrall, differences concern the wing venation and tibial spur formula.

Key words: Insecta, fossil, taxonomy, palaeodiversity, Paleogene

Introduction

The family Athericidae was erected by Stuckenberg (1973) for several genera that had previously been associated with the family Rhagionidae. The Athericidae is a relatively small family of tabanomorph flies comprising nine modern and five extinct genera. The fossil record is sparse even in the Cenozoic, with only four species reported: *Atherix saunieri* Théobald, 1937, *Atrichops hesperius* Cockerell, 1914 (Oligocene, Florissant, USA), plus the extinct genus *Succinatherix* Stuckenberg, 1974 with the two species *S. avita* Stuckenberg, 1974 and *S. setifera* Stuckenberg, 1974 from Eocene Baltic amber (Cockerell 1914; Théobald 1937; Stuckenberg 1974).

The family is also represented in the Mesozoic by four extinct genera and a few more species, all compression fossils except one, viz., *Athericites* Mostovski *et al*., 2003 (Early Cretaceous of England and Siberia, with five species: *A. finchi* Mostovski *et al*., 2003, *A. gordoni* Mostovski *et al*., 2003, *A. kensmithi* Mostovski *et al*., 2003, *A. sellwoodi* Mostovski *et al*., 2003, and *A. zazicola* Mostovski *et al*., 2003), *Palaepangonius eupterus* Ren, 1998 (Yixian formation, Early Cretaceous, Liaoning, China), *Sinocretomyia minuscula* Zhang, 2012 (Laiyang formation, Early Cretaceous, Shangdong, China), and *Galloatherix incompletus* Nel *et al*., 2014 (Early Cenomanian amber of France) (Ren 1998; Mostovski *et al*. 2003; Zhang 2012; Nel *et al*. 2014).

Here we present four new fossil specimens preserved in two French amber pieces, one alone and three fossilised together with three other insects. These fossils correspond to a new genus and species, very similar to the modern genus *Atrichops* Verrall, 1909.

Material and methods

The Oise amber deposit is located near Creil at the place known as "Le Quesnoy" (Oise, northern France). The lignite layers containing the amber belong to the Lower Eocene of the Paris basin (~53 Ma). This age corresponds to Paleocene–Eocene Thermal Maximum (PETM), one of the most important periods of global warming. Data from the evaluation of flora and fauna in Oise amber suggest a semideciduous forest under a hot climate with a wet and a dry season. Representatives of the Combretaceae or Caesalpiniaceae are considered as amber producing trees in this region. Up to date, 20,000 amber inclusions have been collected from this site, including hexapods, mites, spiders, and two pseudoscorpions. Plant remains (leaves, seeds, flowers, pollen), fungi and microorganisms are also very abundant (for review see Brasero *et al*. 2009).

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and the presence of a long-stalked anal cell are characters important to recognize the genus *Atrichops*. Nevertheless the last character seems to be rather variable within a given genus of Athericidae because a stalked anal cell is present in some *Atherix* Meigen, 1803 and absent in others (see Stuckenberg 1973; Webb 1981). *Eoatrichops* differs from the Latest Eocene-Earliest Oligocene *Atrichops hesperius* Cockerell, 1914, unique fossil currently attributed to this genus, in the absence of a short fusion A_1+CuA_2 (Cockerell 1914).

Among the modern athericid genera described after 1985, *Suraginella* Stuckenberg, 2000 shares with *Eoatrichops* the antennal bases less distant than the diameter of median ocellus, and shape of pedicel, but it differs from it in the cell m3 closed (Stuckenberg 2000). The genus *Asuragina* Yang & Nagatomi, 1992 strongly differs from *Eoatrichops* in the widely separated bases of the antennae (Yang & Nagatomi 1992). Among the fossil athericid genera, *Eoatrichops* differs from the Baltic amber *Succinatherix* Stuckenberg, 1974 in the tibial formula 0/2/2 instead of 1/2/2 and the absence of the propleural projection, even if they share the close antennal bases and reniform antennal segment 3 (Stuckenberg 1974). *Eoatrichops* differs from the Lower Cretaceous genus *Athericites* Mostovski *et al*., 2003 in the basal radial cell reaching the level of apex of Sc instead of being much shorter, and vein R_4 not sigmoidal (Mostovski *et al*. 2003). *Eoatrichops* differs from the Lower Cretaceous genus *Sinocretomyia* Zhang, 2012 in the vein R_{2+3} nearly straight instead of being strongly sigmoidal and the arista subapical instead of being apical on basal flagellomere (Zhang 2012). The Lower Cretaceous *Palaepangonius* Ren, 1998 differs from *Eoatrichops* in the different shaped discal cell, with proximal part distinctly narrower than distal part, and vein R_4 much more sigmoidal (Ren 1998). The mid Cretaceous *Galloatherix* is characterized by the veins M_1, M_2 and M_3 as long as discal cell, unlike *Eoatrichops* (Nel *et al*. 2014).

Note. *Atherix saunieri* Théobald, 1937 (Late Eocene of Gard department, France, type stored in the Musée of Nimes, could not located, and probably lost) has a vein R_{2+3} ending on anterior wing margin very far from apex of R_1, which is clearly not a character for Athericidae (see Théobald 1937: pl. 11, fig. 7). Its venation more strongly resembles that of a Rhagionidae. We consider that it does not belong to the Athericidae and it is a Diptera of uncertain family, **nov. stat**.

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