



Article

First extinct genus of a flea (Siphonaptera: Pulicidae) in Miocene amber from the Dominican Republic

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Abstract

A new, extinct genus of flea is described and figured in the tribe Spilopsyllini (Siphonaptera: Pulicidae) from a male preserved in Early Miocene Dominican amber. *Eospilopsyllus kobberti* Beaucournu & Perrichot, **n. gen.** and **n. sp.**, is characterized by the absence of ctenidia, very small eyes, lanceolate terminal segment of the maxillary palpus, enlarged second abdominal sternite, legs with six notches on dorsal margin of tibiae, five pairs of lateral plantar bristles on distitarsomeres, and ungues with a reduced space between the basal lobe and the tarsal claw. Most of the extant spilopsyllines parasitize lagomorphs and squirrels, but these taxa were seemingly absent from the Greater Antilles until very recently. Instead, the Tertiary record and biogeographical history of land mammals on these islands suggests that early spilopsyllines may have parasitized the endemic solenodon insectivores or echimyid rats.

Key words: Fossil flea, Pulicidae, Spilopsyllini, host-parasite association, Miocene, amber, Dominican Republic

Introduction

Siphonaptera is a rarely collected order of arthropods, which is easily explained by their exclusively ectoparasitic lifestyle. The likelihood of discovering fossil fleas is even lower since they are most abundant and diverse on burrowing mammalian species (Medvedev & Krasnov 2006), thus they are seldom preserved as compressions in sediments or as mummified inclusions in amber, the polymerized form of fossil tree resin. The fossil record of fleas is excessively meagre and was only confined to Cenozoic representatives of modern families and genera until the recent, spectacular finding of giant transitional flea-like forms from the Middle Jurassic and Early Cretaceous of China (Gao *et al.* 2012; Huang *et al.* 2012). These Mesozoic fossils exhibit several defining features of fleas while primitively retaining traits such as non-jumping hind legs, well-developed eyes, and a body compressed dorso-ventrally instead of laterally. Together with other rare compression fossils from Late Mesozoic Eurasian and Australian localities that are superficially similar (Riek 1970; Ponomarenko 1976; Jell & Duncan 1986; Rasnitsyn 1992), they should be considered as stem-group fleas, the group of taxa more closely related to the true fleas than to any other extant taxon by having some, but not all, of their synapomorphies. Yet these Mesozoic fossils provide an invaluable insight into the origins of fleas and suggest a rooting among the 'siphonate' Mecoptera (scorpionflies) (Huang *et al.* 2012).

Modern lineages of fleas have thus a very scant fossil record entirely restricted to the Cenozoic, and exclusively in amber (Table 1). Four species have been described from Late Eocene Baltic amber, which all belong in the extant Palearctic genus *Palaeopsylla* Wagner (family Ctenophthalmidae): *P. klebsiana* Dampf, *P. dissimilis* Peus, *P. (Peusianapsylla) baltica* Beaucournu & Wunderlich, and *P. groehni* Beaucournu. According to Beaucournu and Wunderlich (2001), at least *P. dissimilis* might be grouped with *P. baltica* to form a *Peusianapsylla*-group or sub-genus easily distinguished from *Palaeopsylla* s. str. by the presence of eyes and the