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Description of a new genus and two new species of Leiodidae (Coleoptera) from Baltic amber using phase contrast synchrotron X-ray microtomography

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Abstract

A new genus and two new amber fossil species of Leiodidae are described: *Catops perkovskyi* sp. n. (Cholevinae Cholevini) and *Tafforeus cainosternus* gen. n., sp. n. (Leiodinae Pseudoliadini); using virtual dissection by propagation phase contrast synchrotron X-ray microtomography, which allows for visualization of the genital structures in a non-invasive way. The external and internal morphology of the new species is compared to that of the extant related species. Putative evolutionary relationship between *Tafforeus* and the genus *Cainosternum* Notman, 1921, and their placement in the tribe Pseudoliadini are discussed.

Key words: paleoentomology, Cholevini, Pseudoliadini

Introduction

Only a small number of fossil species of Leiodidae have been described. Among approximately 4000 valid species, currently five fossil species are attributed to this family, four from amber deposits and one from limestone deposits: *Catops nathani* Perkovsky, 2001a (Cholevinae, Cholevini) and *Nemadus microtomographicus* Perreau & Tafforeau, 2011 (Cholevinae, Andemadini), from Baltic amber; *Prionochoeta gratschevi* Perkovsky, 2009 (Cholevinae, Cholevini), from Rovno amber (Ukraine); *Aglyptinus poinari* Perkovsky, 2000 (Leiodinae, Scotocryptini), from Dominican amber; and *Mesagyrtoides fulvus* Perkovsky, 1999b, from the upper Jurassic limestone of Shar Teg (Mongolia). *Nyujwa zherichini* Perkovsky, 1990, from the lower Cretaceous limestone of Buriatia (Russia), originally placed in the tribe Agyrtodini of the subfamily Camiarinae, has been subsequently transferred to Nitidulidae (Kirejtschuk 2008).

If the taxonomic position of each amber fossil species of Leiodidae is rather clear (they are all placed in genera previously described for extant species), the original placement of the more ancient fossil from limestone deposits (*Mesagyrtoides* Perkovsky, 1990; placed in the tribe Pseudoliadini of the subfamily Leiodinae) is disputable since the description explicitly mentions open procoxal cavities, which are generally closed in Pseudoliadini (Newton 1998).

Two other genera, *Mesecanus* Newton, 1981, from the Jurassic deposits of Novospassk, and *Ponomarenkia* Perkovsky, 2001b, from the Jurassic deposits of Transbaikalia, both currently assigned to Agyrtidae (Leschen & Beutel 2004), the presumed sister group of Leiodidae, have been attributed previously either to Leiodidae (Perkovsky 1999a) or Agyrtidae (Newton 1981, 1997; Perkovsky 2001b). The difficulty of finding an appropriate placement for these genera, which have several character states intermediate between the two families, suggests that the separation between the latter could have occurred during the Jurassic period.

The small number of fossil taxa in the literature is not merely due to a lack of interest in fossils among specialists of Leiodidae (a single author described four among the five extinct species). Indeed, the biotopes of Leiodidae do not predispose them to being trapped in fossil deposits, especially not in amber. Many extant species of Leiodidae live in the ground (e.g., decayed organic material, mold, nests or burrows of ground mammals, superficial underground environment, caves, etc.) like Cholevinae; some are mycetophagous like Agathidiini,