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Further records of Amphipoda from Baltic Eocene amber with first evidence of prae-copulatory behaviour in a fossil amphipod and remarks on the taxonomic position of *Palaeogammarus* Zaddach, 1864

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Abstract

Two pieces of Baltic amber with amphipod inclusions were studied. One of them contained approximately twenty individuals identified as belonging to the extinct genus *Palaeogammarus* and described as *P. debroyeri* **sp. nov.** Interestingly, among the individuals there are two pairs preserved in an evident prae-copula position. This is the first finding of such mating behaviour in fossil amphipods. Based on this behavioural trait and on the observed morphological features, we conclude that the genus *Palaeogammarus* should be placed in Gammaridae and not in Crangonyctidae. The second amber piece contains two individuals identified as belonging to the still extant genus *Synurella* and described as *S. aliciae* **sp. nov.**

Key words: Crustacea, Amphipoda, Gammaridae, Crangonyctidae, *Palaeogammarus*, *Synurella*, fossil, amber, new species

Introduction

Organisms living in aquatic habitats are not supposed to be found frequently in fossil tree resin, such as amber, as it is a highly hydrophobic medium. However, the fossil record provides numerous amber-preserved limnetic arthropods including water beetles, water striders, and crustaceans (Schmidt and Dilcher 2007). Among the latter, findings of amphipod inclusions in the pieces of Baltic Eocene amber are the most common (Zaddach 1864, Lucks 1928, Just 1974, Jażdżewski and Kulicka 2000 a, b, 2002, Coleman and Myers 2001, Coleman and Ruffo 2002, Weitschat et al. 2003, Coleman 2004, 2006, Jażdżewski and Kupryanowicz 2010). So far, some 10 fossil amphipod taxa were described, all of them being attributed either to the family Niphargidae Bousfield, 1977 (*Niphargus* Schiödte, 1849) or Crangonyctidae Bousfield, 1973 (*Palaeogammarus* Zaddach, 1864, *Synurella* Wrzesniowski, 1877 and one unidentified crangonyctid). Interestingly, now both the above mentioned families are represented in Europe mostly by subterranean or groundwater taxa. On the other hand, members of the family Gammaridae Latreille, 1802 clearly predominate in the extant epigean fauna (Meijering et al. 1995, Väinöla et al. 2008).

In the present paper we provide a description of two new amphipod species of the genera *Palaeogammarus* and *Synurella* found in Baltic Eocene amber. A short discussion upon the systematic position of *Palaeogammarus* and first evidence of prae-copulatory behaviour among fossil amphipods, are provided.

Material and methods

The two studied amber pieces (Figs 1–3) with amphipod inclusions came from the private collection of Mr Jürgen Velten (Idstein, Germany) and were purchased by the Museum of Earth, Warsaw, Poland). Their catalogue numbers are no. 22611 (amber piece 1) and no. 22612 (amber piece 2). Most probably both pieces were found on the Sambia Peninsula (south-eastern shore of the Baltic Sea) and originate from the Eocene period (ca. 45–50 Mya).

Observations of morphological details and respective drawings were done under a stereoscopic microscope

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