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## Family Panorpodidae (Insecta, Mecoptera) from Baltic amber (upper Eocene): new species, redescription and palaeogeographic remarks of relict scorpionflies

AGNIESZKA SOSZYŃSKA-MAJ<sup>1,3</sup> & WIESŁAW KRZEMIŃSKI<sup>2</sup>

<sup>1</sup>University of Łódź, Department of Invertebrate Zoology and Hydrobiology, Łódź, Poland <sup>2</sup>Institute of Systematic and Evolution of Animals, Polish Academy of Sciences, Kraków, Poland. E-mail: krzeminski@muzem.pan.krakow.pl

<sup>3</sup>Corresponding author. E-mail: agasosz@biol.uni.lodz.pl

### Abstract

The history of the species-poor family Panorpodidae is very interesting due to its uneven present distribution. The only fossils of the genus *Panorpodes* are two species known from Baltic amber, described in 1856 and 1954. A third species, *Panorpodes weitschati* **sp. nov.**, is herein described. New diagnoses and descriptions as well as new drawings of all fossil species of *Panorpodes* are provided, including the first illustration of the wing of *P. hageni*. Fossil *Panorpodes* display three diametrically opposed patterns of wings markings, from the highly transparent wings of *P. brevicauda*, through transparent wings with dark bands and spots of *P. weitschati* **sp. nov.**, to the dark wings with only narrow transparent bands of *P. hageni*. The fossil specimens are characterized by a great variability in wing venation, even in a single specimen, similar to that of living species.

**Key words:** distribution, fossil, *Panorpodes*, redescription, short-faced scorpionflies

### Introduction

The order Mecoptera is a small and relict group of holometabolous insects including more than 600 extant species divided into nine families (Cai *et al.* 2008; Bicha 2010). These insects are characterized by an uneven distribution. They are present on almost all continents, with greatest diversity in Northern Hemisphere. Scorpionflies are known from the early Permian, and from the late Permian to the Jurassic they were one of the most significant elements of the insect fauna (Novokshonov 2002). The huge diversity in morphology and behavior among the small number of extant species indicates that extant Mecoptera are only the remnants of a once very diverse group (Penny 1975). In the Baltic amber from upper Eocene—Bartonain/Priabonian (37.7 ± 3 Ma) (Perkoysky *et al.* 2007), representatives of three families of Mecoptera were found (Weitschat & Wichard 2002): Bittacidae (five species), Panorpidae (three species) and Panorpodidae (two species) (Pictet-Baraban & Hagen 1856; Carpenter 1954, 1955, 1976; Krzemiński 2007, Krzemiński & Soszyńska-Maj 2011).

Two families, Panorpidae and Bittacidae, contain most of the modern scorpionfly species, while Panorpodidae, the short-faced scorpionflies, is one of the smallest families of Mecoptera, with only two extant genera, *Brachypanorpa* Carpenter, 1931 and *Panorpodes* MacLachlan, 1875 (Byers 2005). The shorter, wider rostrum than occurs in Panorpidae and the smooth tarsal claws support the hypothesis that Panorpodidae are herbivores, although little is known of the diet and feeding behavior of *Panorpodes* (Penny 2006, Palmer 2010). Recent distribution of the family is relict and disjunctive. Five species belonging to *Brachypanorpa* are known only from North America. Seven species of genus *Panorpodes* occur in Japan, Korea and China (Tan & Hua 2008, Zhong *et al.* 2011) and one has been found in North America (Byers 2005) (Fig. 1).

The panorpodid fossil *Austropanorpodes gennaken* Petrulevičius, 2009 was described from the lower Eocene of Patagonia. However, assignment of this fossil to Panorpodidae is not perfectly clear. If its family classification is correct, the specimen from Argentina is the first and only fossil short-faced scorpionfly discovered in the Southern