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Subfamily Limoniinae Speiser, 1909 (Diptera, Limoniidae) from Baltic amber (Eocene): the genus *Helius* Lepeletier & Serville, 1828

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Abstract

A revision of the genus *Helius* Lepeletier & Serville, 1828 (Diptera: Limoniidae) from Baltic amber (Eocene) is presented. Redescriptions of 5 species, *Helius formosus* Krzemiński, 1993, *Helius linus* Podenas, 2002, *Helius minutus* (Loew, 1850), *Helius mutus* Podenas, 2002, *Helius pulcher* (Loew, 1850) of this genus from Baltic amber are given and documented by photographs and drawings. Four new species of the genus *Helius* from Baltic amber are described: *Helius gedanicus* sp. nov., *Helius hoffeinsorum* sp. nov., *Helius similis* sp. nov., *Helius fossilis* sp. nov. A key to species of *Helius* from Baltic amber is provided. Patterns morphological evolution and the aspects evolutionary history of *Helius* are discussed.

Key words: Diptera, Limoniidae, *Helius*, Baltic amber, Eocene, morphology, taxonomy, new species, evolutionary aspects

Introduction

The genus *Helius* Lepeletier & Serville, 1828 (Limoniidae) is distributed worldwide and comprises ca. 200 extant species mainly from Oriental, Australian and Oceanian, and also Neotropic region. In the Palearctic region 17 species are known, 3 of which occur in Europe (Oosterbroek 2014). Fourteen species are known from the fossil record. The oldest representatives of the genus have been described from the Early Cretaceous Lebanese amber (Kania *et al.* 2013), from the Upper Cretaceous (Early Cenomanian) from Tanai village, Myanmar, Burma (Ribeiro 2002) and from Turonian imprints from Orapa Diamond Mine, Botswana (Rayner & Waters 1990). Three species are known from the Oligocene, one of them from North Montana, USA (Krzemiński 1991), and two other from the Late Oligocene of Rott-am-Siebengebirge, Germany: *Helius weigandi* (Statz, 1934) and *Helius tenerus* Statz, 1944. Additionally three species of the genus *Helius* are known from the Middle Miocene of Caucasus: *Helius stavropolensis* Krzemiński, 2002, *Helius miocenicus* Krzemiński, 2002, *Helius verticillis* Krzemiński, 2002. Five species from Eocene Baltic amber were recognised before current study. First two (Loew 1850), were originally described in the genus *Rhamphidia*, these are *Helius pulcher* (Loew, 1850) and *Helius minutus* (Loew, 1850). Meunier (1906) and Alexander (1931) discussed taxa described by Loew (1850) and presented redescriptions of *Helius pulcher*, and the latter author proposed to synonymize *Antocha succinea* Meunier, 1906 under *Helius pulcher*. Krzemiński (1985) discussed the Baltic amber fossils of the genus *Helius* and described *Helius abditus* Krzemiński, 1985. Later, Krzemiński (1993) in his revision of all representatives of *Helius* from Baltic amber synonymized *Antocha succinea* and *Helius abditus* under *Helius minutus* (Loew, 1850). This revision added one more species—*Helius formosus* Krzemiński, 1993. Podenas (2002) described two additional species: *Helius linus* Podenas, 2002 and *Helius mutus* Podenas, 2002. All the extinct species from Baltic amber are placed in the nominative subgenus *Helius* Lepeletier & Seville, 1828.

Labandeira (2005). Most Nematocera are characterized by primitive suctorial and lapping mouthparts and a short rostrum, which generally restricts them to open flowers with exposed nectaries and to flowers with short tubular corollas. This general observation is true also for Limoniidae, which behaviour, ecological requirements, and ecomorphological disparity are still poorly known. Ancient origins of these insects, probably use of pollen and nectar as food would have placed them as early pollinators of angiosperm plants, rapidly diversifying since the middle of the Cretaceous period. It seems that much more research and attention should be given to the fossil Limoniidae entombed in amber, as well as to recent forms, to resolve numerous raising questions.

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