



## Mosquitoes (Diptera: Culicidae) in Eocene amber from the Rovno region, Ukraine

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### Abstract

*Culex ekaterinae* sp. nov. is described based on an adult male embedded in amber from the Rovno region, northwestern Ukraine. The new species is compared with its presumed closest known relative, i.e. *Culex erikae* Szadziewski et Szadziewska, 1985 described from adults in Baltic amber. The two species exhibit distinct differences in the size of the main body parts, including the antenna, maxillary palpus and proboscis, as well as in the venation of the wing, the structure of the unguis and male genitalia—characters crucial in the diagnosis of adult mosquitoes. A redescription of *Culiseta gedanica* Szadziewski et Gilka, 2011, to date known from a single adult male, is presented based on a male in amber from Voronki, Rovno region. A tabulation of fossil Culicidae with their geological ages is provided.

**Key words:** *Culex*, *Culiseta*, fossils, new species, systematics

### Introduction

Rovno amber has been dated to the Priabonian Age (33.9–37.8 Mya) of the Eocene Epoch (Sokoloff *et al.* 2018; Radchenko & Perkovsky 2021; Radchenko *et al.* 2021). Most Rovno amber containing nematoceran Diptera, and most other inclusions studied thus far, was mined in Klesov (Sarny district, Rovno region) (Perkovsky *et al.* 2010; Mitov *et al.* 2021). The new findings, including mosquitoes, come from the former Zarechnoye and Vladimirets districts of the northwestern part of the Rovno region (Perkovsky & Nel 2021 and references therein).

The nematoceran Diptera constitute more than half (58%) of all Rovno amber insect inclusions, but only 144 species have been recorded so far (Azar *et al.* 2013; Perkovsky & Fedotova 2016 and references therein; Fedotova & Perkovsky 2017; Sontag & Szadziewski 2011; Zakrzewska & Gilka 2014; Perkovsky & Sukhomlin 2015; Baranov *et al.* 2016; Pielowska *et al.* 2018; Kopeć *et al.* 2019; Wojtoń *et al.* 2019; Skartveit 2021; Wagner 2021), and 110 (76%) of these species are not known from coeval Baltic amber. Fossil representatives of four families of the infraorder Culicomorpha have been described from Rovno amber, including Ceratopogonidae (Sontag & Szadziewski 2011; Perkovsky & Rasnitsyn 2013; Perkovsky 2013, 2017), Chironomidae (Zelentsov *et al.* 2012; Gilka *et al.* 2013; Baranov & Perkovsky 2014; Baranov *et al.* 2014; Zakrzewska & Gilka 2014; Andersen *et al.* 2015; Zakrzewska *et al.* 2016; Dietrich & Perkovsky 2020), Corethrellidae (Baranov *et al.* 2016) and Simuliidae (Perkovsky *et al.* 2013; Perkovsky & Sukhomlin 2015, 2016); however, information on mosquitoes (Culicidae) from this amber has not been published to date.

Twenty-seven extinct fossil species of Culicidae have been described. Three species are representatives of three extinct genera that existed in the Late Cretaceous Epoch or at the turn of the Early and Late Cretaceous (today called the “mid-Cretaceous”) of the Mesozoic Era. Twenty-four species of the extant genera *Aedes*, *Anopheles*, *Coquillettia*, *Culex*, *Culiseta* and *Toxorhynchites*, and three extinct genera are known from the more recent Cenozoic Era.