



## Short communication

# New non-biting midges (Diptera: Chironomidae) from Lower Cretaceous Wealden amber of the Isle of Wight (UK)

Viktor Baranov<sup>a,\*</sup>, Wojciech Giłka<sup>b</sup>, Marta Zakrzewska<sup>b,\*\*</sup>, Edmund Jarzembowski<sup>c,d</sup>

<sup>a</sup> Ludwig-Maximilians-Universität Munich (LMU), Biocenter, Department of Biology II Großhaderner Str. 2, 82152, Planegg-Martinsried, Germany

<sup>b</sup> University of Gdańsk, Faculty of Biology, Department of Invertebrate Zoology and Parasitology, Laboratory of Systematic Zoology, Wita Stwosza 59, 80-308, Gdańsk, Poland

<sup>c</sup> State Key Laboratory of Palaeobiology and Stratigraphy, Nanjing Institute of Geology and Palaeontology and Center for Excellence in Life and Palaeoenvironment, Chinese Academy of Sciences, Nanjing, 210008, China

<sup>d</sup> Department of Earth Sciences, Natural History Museum, Cromwell Road, London, SW7 5BD, UK



## ARTICLE INFO

## Article history:

Received 10 September 2018

Received in revised form

2 November 2018

Accepted in revised form 18 November 2018

Available online 20 November 2018

## Keywords:

Chironomidae

Mesozoic

Amber

Systematics

Biogeography

## ABSTRACT

Non-biting midges (Chironomidae) from Lower Cretaceous Wealden amber of the Isle of Wight (lower Barremian, ca. 128 Ma) are reviewed. As a result, *Dungeyella gavini* Jarzembowski, Azar *et al.*, 2008, the only chironomid species known from this amber deposit, is for the first time recognised from the adult male, and the systematic position of *Dungeyella* within the subfamily Buchonomyiinae is established. *Libanodiamesa simpsoni* sp. nov. (Prodiamesinae), now found in Wealden amber, is the second species of the genus previously only recorded from Lower Cretaceous Lebanese amber. A detailed morphological analysis revealed characters (wing venation patterns, genital apparatus structure) defined as unique for the two genera, the diagnoses of which are amended. Biogeographical features of the Wealden amber Chironomidae are also discussed against the background of their fossil records from the Cretaceous.

© 2018 Elsevier Ltd. All rights reserved.

## 1. Introduction

Non-biting midges (Chironomidae) are among the most abundant and diverse aquatic insects, with over 7000 described extant species worldwide (Ferrington, 2007; Pape *et al.*, 2011). The geological history of non-biting midges stretches from the Late Triassic onwards, with the oldest known chironomid being *Aenne triassica* Krzemiński and Jarzembowski (1999). Since chironomid larvae in different genera are closely associated with specific types of habitat and environmental conditions, the family is often used in environmental monitoring and paleoenvironmental reconstruction. Seredusz and Wichard (2007) and Grund (2006) have pioneered the approach of paleohabitat reconstruction based on the generic composition of chironomid species complexes in amber. This approach works best when extant genera are present in the fauna, so it is practically limited to the Cenozoic; however, some paleoenvironmental

information can be inferred from extinct taxa as well (Azar *et al.*, 2008; Jarzembowski *et al.*, 2008; Baranov *et al.*, 2017). Thus studies of fossil chironomid faunas are not only providing us with new taxonomic and phylogenetic information, but also allow an insight into the palaeoenvironment in which the insects lived.

Adult chironomids were amongst the first inclusions found in Cretaceous amber in the UK (Jarzembowski, 1995). These were from Wealden amber ('chiltonchineite') in the Wessex Formation exposed by marine erosion on the southwest coast of the Isle of Wight (IoW) in southern England and are some 128 million years old (Jarzembowski, 1999). Unlike in the Wealden rock fauna, chironomids dominated the small amber assemblage considered to have been preserved in a climatically controlled debris deposit (Jarzembowski *et al.*, 2008). The first chironomid inclusion to be described from this bed, *Dungeyella gavini* Jarzembowski *et al.*, 2008, was a female clearly belonging to an extinct fauna unlike Cenozoic chironomids.

In this paper, using subsequently found inclusions in the Wealden amber of the IoW, we describe a new species of the subfamily Prodiamesinae as well as elucidate the taxonomic position of the genus *Dungeyella* Jarzembowski *et al.*, 2008, the only chironomid so far described from 'chiltonchineite'.

\* Corresponding author.

\*\* Corresponding author.

E-mail addresses: [baranow@biologie.uni-muenchen.de](mailto:baranow@biologie.uni-muenchen.de) (V. Baranov), [marta.zakrzewska@biol.ug.edu.pl](mailto:marta.zakrzewska@biol.ug.edu.pl) (M. Zakrzewska).