



## Morphological and genetic variability of *Baetis (Rhodobaetis) braaschi* Zimmermann, 1980 (Ephemeroptera: Baetidae)

PAVEL SROKA<sup>1,4</sup>, ALEXANDER V. MARTYNOV<sup>2</sup> & ROMAN J. GODUNKO<sup>1,3</sup>

<sup>1</sup>Biology Centre of the Academy of Sciences of the Czech Republic, Institute of Entomology, Branišovská 31, CZ–37005 České Budějovice, Czech Republic. E-mail: pavel.sroka@centrum.cz

<sup>2</sup>I.I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Bohdan Khmel'nyts'kii 15, 01601 Kiev, Ukraine. E-mail: martynov\_av@ukr.net

<sup>3</sup>State Museum of Natural History, National Academy of Sciences of Ukraine, Teatralna 18, 79008 Lviv, Ukraine. E-mail: godunko@museum.lviv.net; godunko@seznam.cz

<sup>4</sup>Corresponding author

### Abstract

Specimens of *Baetis (Rhodobaetis) braaschi* Zimmermann, 1980 from the three distant geographic regions (Crimean Peninsula, Eastern Ukraine and Caucasus) are investigated and compared using a methodological approach combining morphological and molecular (partial mtDNA *COI* sequences) data. Intraspecific variability in several morphological characters is recognized and described, whereas *COI* sequences are found to be very uniform. The amount and distribution of the changes of *COI* sequences do not follow the pattern of morphological variability and/or geographic origin of the specimens. This indicates that analysis of the changes in the *COI* sequence can contradict the pattern of morphological characters commonly used for the discrimination of the individual *Rhodobaetis* species. As a basis for the future taxonomic changes concerning subgenus *Rhodobaetis*, it is advised (where possible) to critically evaluate both molecular and morphological data.

**Key words:** morphology, taxonomy, mayflies, barcoding

### Introduction

Within the genus *Baetis* Leach, 1815, *B. braaschi* belongs to the subgenus *Rhodobaetis* Jacob, 2003 which conceptually follows the original *Baetis rhodani* species-group as defined by Müller-Liebenau (1969). The subgenus currently encompasses 26 species (Soldán & Godunko 2008), and forms a diversified and widely distributed lineage within *Baetis*.

*Baetis braaschi* was described by Zimmermann (1980) on the basis of relatively limited material, namely three larvae from the mountains of the Crimean Peninsula. In more than two decades since the original description, only a few studies concerning *B. braaschi* have been published. Novikova (1987) in her revisionary paper provided some additional diagnostic characters and drawings of this species. The occurrence of *B. braaschi* on the Crimean Peninsula was briefly noted by Jacob (2003); the species was considered endemic to the Crimea.

Godunko *et al.* (2004a) published a detailed redescription of the species based on the Crimean material, establishing also *Baetis stipposus* Kluge, 1982 as the junior synonym of *B. braaschi* Zimmermann, 1980. The species *B. stipposus* was previously, and primarily, known through its Central Asian forms, originally being described as found in Uzbekistan, Kazakhstan, Turkmenistan and Tajikistan (Kluge 1982), though later identified in the Caucasus Mountains (Novikova 1987), and Crimea (see Godunko *et al.* 2004a for details and references therein). The synonymy of *B. stipposus* with *B. braaschi* therefore considerably enlarged the distributional area of *B. braaschi*. Being originally considered an endemic faunistic element of the Crimean Peninsula, it is now known to be distributed in a wide geographical area extending from Central Asia to the Caucasus and Crimea.