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Stenelmis puberula Reitter (Coleoptera: Elmidae)—description of larva and its association with adults, using DNA sequences

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Abstract

The mature larva of *Stenelmis puberula* Reitter is described for the first time, based on material collected in north-eastern Slovakia (Central Europe). The conspecificity with associated adults was tested using sequences of one nuclear (5' end of 18S rRNA) and three mitochondrial gene fragments (two fragments covering almost the whole cytochrome oxidase c subunit I; and a fragment of cytochrome b) with a total of ca. 2600 bp.

Key words: Coleoptera, Elmidae, *Stenelmis*, larval morphology, description, molecular taxonomy, DNA, Slovakia

Introduction

Elmidae (riffle beetles) is the largest family of Dryopoidea, widely distributed throughout the world. The genus *Stenelmis* Dufour represents likely the largest genus of the family, comprising more than 170 species from the Palearctic, Afrotropical, Oriental and Nearctic regions (Kodada & Jäch 2005). Although elmids are very common in the running waters of Central Europe, *Stenelmis* species are among the most scarcely collected elmids. Only three species are recorded from the Central Europe so far: *S. canaliculata* Gyllenhall, *S. consobrina* Dufour (e.g. Steffan 1961; Jäch 1992) and *S. puberula* (e.g. Zaitzev 1910, 1951). Records of *S. canaliculata* from Slovakia (Burakowsky *et al*. 1983; Nagy 1999) are doubtful.

Stenelmis puberula Reitter, 1887 was described on the basis of a single specimen from Caucasus (Reitter 1887) and until recently it was recorded from Caucasus, Afganistan, Iran and Turkmenistan (Zaitzev 1910, 1951; Olmi 1981). *S. apfelbecki* Kuwert from Bosnia (Kuwert 1890) was, according to Grouvelle (1897), defined as a junior synonym of *S. puberula*. The first records of this species from the Central Europe come from Slovakia (Kodada *et al.* 2004). Its occurrence is restricted to the north-eastern corner of the country, close to the Polish and Ukrainian borders (Kodada *et al.* 2004; Zaťovičová *et al.* 2004).

A match of the larva described herein with adult beetles was made using several DNA fragments because the most reliable method, i.e. rearing larvae under laboratory conditions, is difficult due to the habitat requirements and duration of larval development (Brown 1987). Using DNA sequences with the appropriate level of variation for this purpose is still not very common. In elmids all existing larval descriptions and matches of larvae with adults, including the most recent ones, are based on morphological characters and habitat preferences (e.g. Springer & Acosta 2003). The only case of using molecular data to assign larvae to specific adults within Elmidae is the description of a larva of the Malaysian *Hedyselmis opis* Hinton (Čiampor Jr. & Ribera 2006).

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