

NEW RECORDS OF *SIMULIUM DEGRANGEI* (DIPTERA: SIMULIIDAE) IN SLOVAKIA

MATÚŠ KÚDELA

Department of Zoology, Faculty of Natural Sciences, Comenius University,
Mlynská dolina, SK-842 15 Bratislava, Slovakia [kudela@fns.uniba.sk]

Abstract

During blackfly research in various areas of Slovakia the species *Simulium* (*Simulium*) *degrangei* Doriier et Grenier, 1960 has been found at five previously unknown sites situated in three geomorphological units of the Western Carpathians: Veľká Fatra Mountains, Podunajská rovina Plain and Hronská pahorkatina Hills. The localities in Veľká Fatra and Hronská pahorkatina represent the first records of the species in these geomorphological units. In the Danube river four new sites have been found. The presence of *S. degrangei* on several known localities from the Malé Karpaty Mountains, Západné Tatry Mountains and neighboring Liptovská kotlina Basin has been confirmed.

Key words

Simuliidae, *Simulium degrangei*, Slovakia, faunistics.

INTRODUCTION

The blackfly *Simulium* (*Simulium*) *degrangei* Doriier et Grenier, 1960 belongs to the *bukovskii* species group that contains only three closely related species (ADLER & CROSSKEY 2011). NOVÁK (1956) reported this species from Slovakia as *S. schönbaueri* (cf. JEDLIČKA 1996) four years before it has been described from the western Alps (Savoy, France). Recently it is known from the south and central Europe and from Transcaucasia (ADLER & CROSSKEY 2011).

S. degrangei is one of the species with a relatively low frequency in Slovakia and it was found in only 2.8 % of all sites where blackflies were found (JEDLIČKA et al. 2001). Compared to other blackflies, the frequency of *S. degrangei* in the zoogeographical units (corresponding to the geomorphological

units and with the Danube river as a separate unit) is also rare and it was found in only 8.1 % of the units investigated (calculated according to data of STLOUKALOVÁ & JEDLIČKA 2005*).

The presented records originate from a more extensive research into blackfly biodiversity in central Europe. Among the processed samples of blackflies from several sites, I found also *S. degrangei* on sites where it was not known previously. Thereafter I have checked also some of the known localities to verify the actual presence of *S. degrangei* and to obtain fresh material for population genetic structure analysis.

* Due to the type error, JEDLIČKA et al. (2001) give the frequency of *S. degrangei* in the zoogeographical units erroneously as 0,8000 (tab. 1).

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MATERIAL AND METHODS

Praeimaginal stages of blackflies were collected individually at various types of running water habitats, with special attention to detect as many species as possible on each site. The collected material is preserved in 96% ethanol and a part of the larvae also in acetic ethanol. The material was identified using a stereomicroscope and the standard identification keys for blackflies in central Europe (KNOZ 1965, JEDLIČKA et al. 2004).

RESULTS

In the years 2007–2011 *S. degrangei* was found at nine sites and in five geomorphological units in Slovakia. The occurrence in the Veľká Fatra Mountains and Hronská pahorkatina Hills is reported for the first time. All four records from the Danube river are also from sections, where it was not previously known. The presence of *S. degrangei* on localities from Malé Karpaty Mountains, Západné Tatry Mountains and the neighboring Liptovská kotlina Basin has been confirmed.

Recently *S. degrangei* was found at following localities in Slovakia:

1. Belá river – Liptovský Hrádok (49.041° N, 19.716° E), 640 m a.s.l., Liptovská kotlina Basin, 16.6.2009: 1 pupa, 1 pupal exuvia, 1 empty cocoon (col. Brúderová).
2. Belá river – Dovalovo (49.049° N, 19.752° E), 680 m a.s.l., Liptovská kotlina Basin, 18.6.2007: 2 larvae, 64 pupae, 4 pupal exuviae, 1 empty cocoon.
3. Belá river – Pribylina (49.049° N, 19.752° E), Liptovská kotlina Basin, 740 m a.s.l., 14.6.2010: 30 larvae, 30 pupae.
4. Ľubochňanka stream – Ľubochňa, (49.029° N, 19.151° E), 600 m a.s.l., Veľká Fatra Mountains, 11.6.2008: 20 pupae.
5. Gidra stream – Píla (48.394° N, 17.326° E), 270 m a.s.l., Malé Karpaty Mountains, 27.5.2008: 35 pupae, 23 pupal exuviae.
6. Danube river, tributary – Bratislava, rkm 1872 (48.146° N 17.063° E), 135 m a.s.l., Podunajská rovina Plain, 17.4.2009: 3 larvae.
7. Danube river – Trávnik, rkm 1796 (47.749° N, 17.765° E), 109 m a.s.l., Podunajská rovina Plain, 10.4.2011: 5 larvae.
8. Danube river – Moča, rkm 1744 (47.758° N, 18.424° E), 102 m a.s.l., Hronská pahorkatina Hills, 3.5.2009: 2 pupae, 10.5.2009: 1 larva, 1 pupa.
9. Danube river – Mužla, rkm 1734 (47.768° N, 18.539° E), 102 m a.s.l., Hronská pahorkatina Hills, 3.5.2009: 2 pupal exuviae, 10.5.2009: 2 pupae, 3 pupal exuviae.

DISCUSSION

S. degrangei was found in the Slovak section of the Danube river in the territory of the former Danube inland delta (ILLÉŠOVÁ 1995, ILLÉŠOVÁ & STLOUKALOVÁ 1995), before (1992) and short after (1994) the dam in Gabčíkovo was put in operation. Later this species was not confirmed here, and was considered as being locally extinct. All four new localities where I found it in the Danube are outside of this river section – one (Bratislava) is upstream of the dam where the river still has submountain character with fast flow, the second is downstream of the dam, on the place where the river character changes towards slow lowland river (Trávnik), and finally, the last sites (Moča, Mužla) are already situated in the typical lowland section.

The new records indicate that the distribution of *S. degrangei* in Slovakia is probably wider than was previously known, what may be a consequence of the relatively short period during which this univoltine species can be detected. Despite of the new localities, the distribution pattern of *S. degrangei* can be still characterized as very curious – it is atypically scattered, ranging from 102 up to almost 1000 m a.s.l., and including streams and rivers of different width, ranging between 2 and 600 m (Danube). Also few other species seem to inhabit similar range of altitudes or stream sizes in Slovakia – e.g. *Prosimulium rufipes* (Meigen, 1830), *Simulium argyreatum* Meigen, 1838 or *Simulium variegatum* Meigen, 1818. However, the occurrence of these species is significantly more frequent among localities (JEDLIČKA et al. 2001) and they do not show the heavily fragmented pattern of *S. degrangei* distribution. In addition, *P. rufipes* is considered to be a complex of similar species (ADLER & CROSSKEY 2011) and such complexes of hidden species usually appear to have a wide distribution among various habitat types (ADLER & MCCREADIE 1997). On the other hand, until now there is no other indication that *S. degrangei* could be a sibling species complex.

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