

First Record of the Genus *Helicopsyche* von Siebold, 1856 (Trichoptera: Helicopsychidae) from the Republic of Macedonia

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Abstract: Larvae of the genus *Helicopsyche* von Siebold, 1856 (Trichoptera, Helicopsychidae) are reported for the first time from the Republic of Macedonia, extending the known distribution of this taxon on the Balkan Peninsula. Additionally, data on the zoogeography and ecology of the taxon are given.

Keywords: First record; *Helicopsyche*; Republic of Macedonia

Introduction

The larvae of the genus *Helicopsyche* von Siebold, 1856 (Trichoptera: Helicopsychidae) are remarkable snail-case building caddisflies (HOLZENTHAL *et al.* 2007) with dextral-coiled cases (JOHANSON, PHAM 2012). These helical, sand grain cases are so similar to snails that early studies (e.g. LEA 1834) described these insects as molluscs (VAUGHN 1985). Specimens from this genus have been recorded from all continents, except for Antarctica (JOHANSON 1998). Concerning their distribution in Europe, JOHANSON (1995) and GRAF *et al.* (2008) reported five species: *Helicopsyche bacescui* Orghidan & Botosaneanu, 1953, *H. lusitanica* McLachlan, 1884, *H. megalochari* Malicky, 1974, *H. revelieri* McLachlan, 1884 and *H. sperata* McLachlan, 1876. Among them *H. bacescui* and *H. megalochari* are known from the Balkan Peninsula, of which the former has a wider distribution while the latter is endemic to the Greek mainland (GRAF *et al.* 2008). Although known from neighbouring countries (Bulgaria, Greece, Kosovo and Serbia), the genus *Helicopsyche* has never been found from Albania and Macedonia (ŽIVIĆ *et al.* 2009, IBRAHIMOVIC *et al.* 2012b).

This paper reports the first record of genus *Helicopsyche* from the Republic of Macedonia. Data on the zoogeography and ecology of the taxon are also given.

Material and methods

The material was collected from the middle stretch of the Orevochka Reka River (41°23'48.32"N, 21°38'02.75"E, elevation 860 m a.s.l.) using a Surber sampler and a hand net in the period between March 2011 and March 2012 (Fig.1).

The collected specimens were preserved in 80% ethanol. Larvae were identified with stereomicroscope using the identification guides by WARINGER, GRAF (1997, 2013). They were deposited in the Macedonian National Collection of Invertebrates (MNCI), Faculty of Natural Science and Mathematics, Skopje, Republic of Macedonia.

Abbreviations of collector: BR = Biljana Rimcheska.

Results and Discussion

Helicopsyche sp.

Material studied. Hellenic Western Balkan (Ecoregion 6); Macedonia, Orevochka Reka, 860 m a.s.l., one larva (assessed population abundance 4.59 ind./m²; 0.08% of the total density of the benthic assemblage), 24 March 2011; 11 larvae (assessed population abundance 41.31 ind./m²; 2.02% of the total density of the benthic assemblage), 18 March 2012; leg. BR (MNCI).

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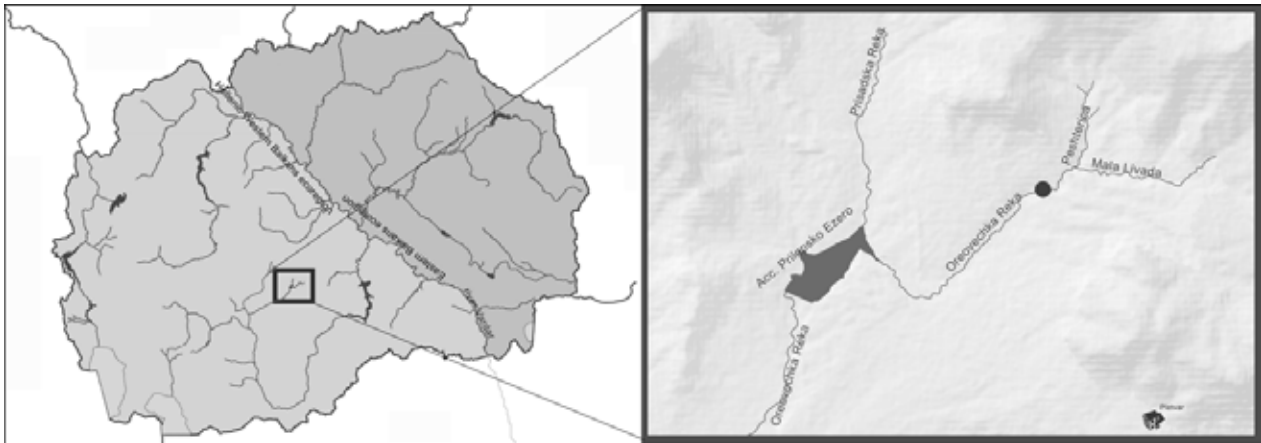


Fig. 1. Map of the Orevechka Reka River, R. Macedonia. The dot (on the right side) shows the locality where larvae of *Helicopsyche* sp. were sampled

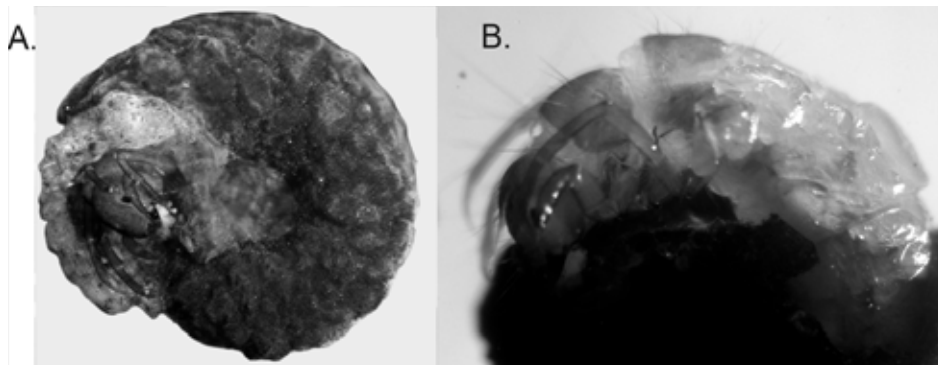


Fig. 2. Larva of *Helicopsyche* sp. from the Orevechka Reka River. **A.** View on the larva within its helical, sand grain case. **B.** Lateral view of the larva after destroying part of its case



Fig. 3. Photograph of the sampling locality of *Helicopsyche* sp. within the middle stretch of the Orevechka Reka

During a study on macroinvertebrate fauna of the Orevechka Reka River, 12 larval specimens of *Helicopsyche* sp. (Trichoptera: Helicopsychidae) were

collected. This was the first finding of this caddisfly family and genus in Macedonia. Based on the fact that only *Helicopsyche bacescui* had a wider distribution in the neighbouring regions, we supposed that the larva (Fig. 2) belonged to this species. However, in order to confirm the taxonomic status, further collections of adults from this locality are needed.

Larvae of *Helicopsyche* sp. were collected during the spring period (March 2011 and March 2012) from an altitude of 860 m. The adjacent catchment of the river was densely forested, and shading of aquatic habitats was intense (Fig. 3). In this stretch of the Orevechka Reka River stony substrates dominated, with considerable amounts of sand between the stones, which was in accordance with the reported ecological preferences of *Helicopsyche* for mesolithal (GRAF *et al.* 2008).

The present study revealed that the populations of *Helicopsyche* sp. were small (Fig. 4): *Helicopsyche* sp. (4.59 ind./m²; 0.08%) was subrecent in March 2011, and recent in March 2012 (41.31 ind./m²; 2.02%). Larvae of Chironomidae and Plecoptera were the dominant taxa within the benthic assemblages in the studied stretch, followed by the pea clams of the

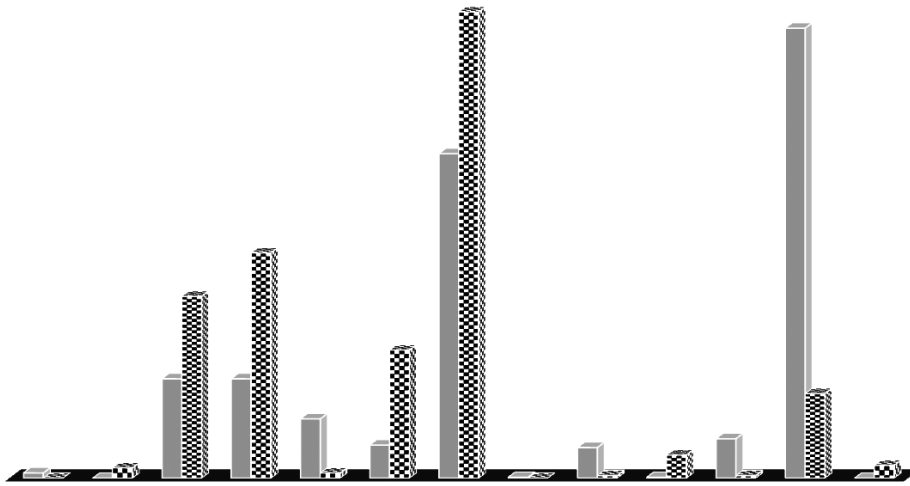


Fig. 4. Total macroinvertebrate density (%) of the sampling site at the Orevoechka Reka River during March 2011 and March 2012

genus *Pisidium* and the amphipod *Gammarus roesei* (Gammaridae). Within Trichoptera, *Helicopsyche* sp. was a dominant species in March 2012 (Fig. 4).

Helicopsyche bacescui, the putative species to which our larval samples belong, is known from Hungary (NÓGRÁDI, UHERKOVICH 2001, UHERKOVICH 2005), Romania (CIUBUC 1993, UJVÁROSI *et al.* 2008), Serbia (ŽIVIĆ *et al.*, 2009), KOSOVO (IBRAHIMI *et al.* 2012b), Bulgaria (KUMANSKI 1988, BORISOVA *et al.* 2013), Greece (JOHANSON 1995) and the European part of Turkey (SİPAHİLER, MALICKY 1987). According to GRAF *et al.* (2008) this species is present in European Ecoregions 6, 7, 10 and 12. Additionally, *H. bacescui* was found by SİPAHİLER (2007) from the north-western area of the Asian part of Turkey, which belongs to Ecoregion Y (Asia Minor).

Although the known distribution of *H. bacescui* covers a large geographical area, the species has a disjunctive distribution and inhabits small areas in mountainous regions. The literature data show that populations are decreasing in Hungary and Serbia. Thus, in Hungary the small area of *H. bacescui* is rather vulnerable due to the deterioration of its habitat owing to human impact (UHERKOVICH 2005). According to IUCN criteria *H. bacescui* has been categorised as Endangered (EN) species in Serbia (PETROVIĆ 2014), since this species covers a very small area (only 102 km²). This is the reason why this caddisfly is on the list of macroinvertebrates whose conservation status needs to be assessed in the rivers

and streams in Serbia (RADULOVIĆ *et al.* 2012).

A rather small distribution area of *H. bacescui* was documented from Kosovo. During the previous years, from more than 100 examined localities all over the country, only few specimens of *H. bacescui* were found from one locality (IBRAHIMI *et al.* 2007, 2012a,b, 2013, 2014, IBRAHIMI, GASHI 2008, OLÁH *et al.* 2013a).

Similarly, despite intensive research of adults of Trichoptera (OLÁH 2010, 2011, OLÁH *et al.* 2013a,b, OLÁH, KOVÁCS 2013) as well as larvae of aquatic insects during the last decades (SMILJKOV, SLAVEVSKA-STAMENKOVIĆ 2004, 2006, KİTANOVA *et al.* 2008, SMILJKOV *et al.* 2008, SLAVEVSKA-STAMENKOVIĆ *et al.* 2010, 2011, 2012, RIMCHESKA *et al.* 2014), the genus *Helicopsyche* has not been recorded earlier from Macedonia. The narrow distribution range, together with the low population densities suggest that *Helicopsyche* is one of the most threatened taxon in the Republic of Macedonia.

Even though the taxonomic status of the larvae is not clear, the data about its presence in Macedonia contributes to our knowledge of the distribution of the genus *Helicopsyche* and fills the gap in the central part of the Balkan Peninsula.

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