

New Records for the Caddisfly (Insecta: Trichoptera) Fauna of Montenegro

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ABSTRACT

Adult caddisflies were collected sporadically in the Ulqin Municipality and Çakorr Mountains in Montenegro during 2015 and 2016. Six species found during this investigation are first records for the caddisfly fauna of Montenegro: *Hydroptila sparsa* Curtis, 1834, *Hydropsyche modesta* Navàs, 1925, *Hydropsyche siltalai* Doehler, 1963, *Neureclipsis bimaculata* (Linnaeus, 1758), *Setodes punctatus* (Fabricius, 1793) and *Ernodes skipetarum* Malicky, 1986.

This study shows that this area is still poorly investigated and thus, more records are expected.

Key words: Aquatic insects, Balkans, rare species, biodiversity.

INTRODUCTION

Montenegro is an important biodiversity hot-spot in Europe, characterized by a rich and diverse alpine, forest, freshwater and marine ecosystems. A large number of rare and important plant and animal species is influenced by its geographic position in the Balkan Peninsula, heterogeneity of habitats, favorable and unique geologic and climate conditions. However, as it is the case with other Balkan countries, there are several groups of organisms which are still under-investigated. This is true for aquatic insects in general and caddisflies as well. First information on caddisflies of Montenegro date back to thirties and fifties of last century, carried out by the famous entomologist Radovanović (1935, 1953). During the seventies and eighties of the last century several other investigations on Balkan caddisflies contain fragmentary data about Montenegro as well, including several new species described from the area (Malicky, 1982, Marinković-Gospodnetić, 1975, 1980, 1981). There is only one detailed investigation related to the caddisflies of Montenegro, more precisely from Durmitor Mountains, where 95 species were found (Krusnik, 1987). Several other scarce data about caddisflies of Montenegro were published during the last years with several new species described, such as *Agapetus kampos* Oláh, 2013 and *Drusus gombos* Oláh, 2013 (Oláh, 2010; Oláh & Kovács, 2013).

The goal of this paper is to contribute to the list of caddisflies of Montenegro.

MATERIAL AND METHODS

Adult caddisfly specimens were collected by entomological net, handpicking and ultraviolet light trap. The ultraviolet light trap follows Malicky (2004). The sampling was carried out during 2015 and 2016 in three sampling stations in Montenegro (Figure 1). Collected samples were preserved in 80 % ethanol. The specimens were identified by the first author using the determination keys from Malicky (2004) and Kumanski (1985, 1988). The collection is deposited at the Laboratory of Zoology of the Faculty of Mathematics and Natural Sciences, University of Prishtina, Republic of Kosovo.

The first sampling station (S1) (42.033105° N, 19.247907° E, 431 m asl) is located around the spring area of a tributary of the Buna River at Kaliman village on the northern side of the Ulqin town. Most of the water coming out from this spring goes through the pipes for Water Supply Company and only a small amount flows downwards. The second sampling station (S2) (41.979916° N, 19.376023° E, 29 m asl) is located at the Buna River in Shtodër village along the border with Albania. The third sampling station (S3) (42.687398° N, 20.066640° E, 1170 m asl) is located at a nameless stream in the Çakorr Mountains, few meters far away from the former border pass with the Republic of Kosovo.

Note: Female specimens of the genera *Hydropsyche* Pictet, 1834 and *Tinodes* Leach, 1815 are identified only up to the generic level due to the difficulties in identifying these genera up to the species level.



Fig. 1. The map of the three sampling stations in Montenegro: 1. S1 - Spring area of a stream in Kaliman village, 2. S2 - Buna River in Shtodër village, 3. S3 - Stream in Çakorr Mountains.

RESULTS AND DISCUSSION

During this investigation thirteen taxa in total were found belonging to the following families: Rhyacophilidae, Hydroptilidae, Hydropsychidae, Polycentropodidae, Psychomyiidae, Ecnomidae, Leptoceridae and Beraeidae. Six species are first records for the caddisfly fauna of Montenegro: *Hydroptila sparsa*, *Hydropsyche modesta*, *Hydropsyche siltalai*, *Neureclipsis bimaculata*, *Setodes punctatus* and *Ernodes skipetarum*.

Hydroptila sparsa is amongst the few hydroptilid species found in Montenegro. During this investigation it was collected only once with ultraviolet light trap at Station S2, which is located at the Buna River. It is the fourth species of the genus *Hydroptila* Dalman, 1819 and the fifth species of the family Hydroptilidae found in Montenegro. As in most of other Balkan countries, lower reaches of rivers in Montenegro are still not adequately investigated and further samplings in these segments of the rivers will reveal more species of this family of caddisflies.

Both species of the family Hydropsychidae found during this investigation are recorded for the first time from Montenegro. *Hydropsyche modesta* was previously reported from all countries in the Balkan Peninsula except Montenegro (Malicky, 2018). It has been sampled with ultraviolet light trap and entomological net, at station S2 in the Buna River and at station S3 in the Çakorr Mountains. The most interesting finding during this investigation is the species *Hydropsyche siltalai*, which was found at station S1 and is apparently the first finding for ecoregion 5 (Graf, Murphy, Dahl, Zamora-Muñoz, & López-Rodríguez, 2008). This species is distributed mainly in

Western Europe up to Slovenia and in Central Europe, mostly in Hungary and Romania. The occurrence of *H. siltalai* in Montenegro close to the border with Albania shows that the area of this species is larger than previously thought.

Setodes punctatus and *Neureclipsis bimaculata* are not found very frequently in the Balkan Peninsula. *Mystacides azureus* and *Ecnomus tenellus* are widespread species in Europe and Balkans, present almost in all countries surrounding Montenegro (Malicky, 2018).

Ernodes skipetarum was found in the Çakorr Mountains at a stream close to the former border pass with the Republic of Kosovo. Previously this species has been known from few localities in Kosovo and Albania (Chvojka, 1997; Ibrahim et al, 2016a), all of them located in the Bjeshkët e Nemuna Mountains.

Recent studies in the Balkan Peninsula (e.g. Ibrahim, Kučinić, Gashi & Grapci Kotori, 2014a, Ibrahim et al, 2014b, 2015a, 2015b, 2016b; Kučinić et al, 2013; Oláh, Ibrahim, & Kovács, 2013; Previšič et al, 2014; Vitecek et al, 2015), which is known as an important hotspot of caddisfly biodiversity in Europe, show that there are still poorly investigated areas. This investigation with several first findings is a result of few days collecting effort in Montenegro and shows that this country is also under-investigated. The current documented number of known caddisfly species in Montenegro is only 137 species.

Systematic list of caddisflies collected at three stations (S1, S2, S3) in Montenegro during 2015 and 2016. Species new to the fauna of Montenegro are indicated by an asterisk.*

EN - Entomological net; UV - Ultraviolet light trap

Family Rhyacophilidae

Rhyacophila fasciata Hagen, 1859

S2 Buna River in Shtodër village: 25.10.2015. 2♂♂ (EN). S3 Stream in the Çakorr Mountains: 13.10.2016. 5♂♂, 3♀♀ (EN). S3 Stream in the Çakorr Mountains: 22.11.2016. 2♂♂, 2♀♀ (EN).

Rhyacophila balcanica Radovanovic, 1953

S3 Stream in the Çakorr Mountains: 13.10.2016. 1♂ (EN).

Family Hydroptilidae

Hydroptila sparsa Curtis, 1834 *

S2 Buna River in Shtodër village: 25.08.2015. 5♂♂, 3♀♀ (UV).

Family Hydropsychidae

Hydropsyche spp. females.

S1 Tributary of Buna River in Kaliman village: 24.08.2015. 2♀♀ (UV). S2 Buna River in Shtodër village: 24.08.2015. 2♀♀ (UV). S2 Buna River in Shtodër village: 24.08.2015. 2♀♀ (EN). S3 Stream in the Çakorr Mountains: 13.10.2016. 3♀♀ (EN).

Hydropsyche modesta Navàs, 1925 *

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S2 Buna River in Shtodër village: 24.08.2015. 2♂♂ (UV). S3 Stream in the Çakorr Mountains: 13.10.2016. 1♂ (EN).

Hydropsyche siltalai Doehler, 1963 *

S1 Tributary of Buna River in Kaliman village: 24.08.2015. 4♂♂ (UV). S2 Buna River in Shtodër village: 20.07.2015. 1♂ (EN).

Family Polycentropodidae

Neureclipsis bimaculata (Linnaeus, 1758) *

S2 Buna River in Shtodër village: 25.08.2015. 2♂♂ (EN). S2 Buna River in Shtodër village: 13.07.2016. 4♂♂ (EN). S2 Buna River in Shtodër village: 14.07.2016. 2♂♂ (UV).

Family Psychomyiidae

Psychomyiia pusilla (Fabricius, 1781)

S3 Stream in the Çakorr Mountains: 22.11.2016. 2♂♂.

Tinodes spp. females.

S1 Tributary of Buna River in Kaliman village: 24.08.2015. 1♀ (UV).

Family Ecnomidae

Ecnomus tenellus (Rambur, 1842)

S2 Buna River in Shtodër village: 25.08.2015. 2♂♂ (UV). S2 Buna River in Shtodër village: 14.07.2016. 3♂♂ (UV).

Family Leptoceridae

Mystacides azureus (Linnaeus, 1761)

S2 Buna River in Shtodër village: 25.08.2015. 3♂♂, 1♀ (UV).

Setodes punctatus (Fabricius, 1793) *

S2 Buna River in Shtodër village: 25.08.2015. 2♂♂ (EN).

Family Beraeidae

Ernodes skipetarum Malicky, 1986*

S3 Stream in the Çakorr Mountains: 23.06.2016. 2♂♂ (EN).

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