

NEW RECORDS FOR THE STONEFLY FAUNA (INSECTA: PLECOPTERA) OF KOSOVO

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Bilalli, A., Musliu, M., Ibrahim, H. & Sivec, I.: New records for the stonefly fauna (Insecta: Plecoptera) of Kosovo. Nat. Croat., Vol. 29, No. 1, 29-36, Zagreb, 2020.

We sporadically collected stoneflies on Berisha Mountain in Kosovo during 2017 and 2018. During this investigation we found 12 species belonging to the following families: Leuctridae, Nemouridae and Perlidae. Five species were recorded for the first time from Kosovo: *Nemoura anas*, *N. asceta*, *N. peristeri*, *N. vinconi* and *Protonemura beaumonti*.

This work contributes to the knowledge of the stonefly fauna of Kosovo and highlights it as one of the least explored countries in Europe.

Key words: Plecoptera, new records, Kosovo, *Nemoura anas*, *N. asceta*, *N. peristeri*, *N. vinconi*, *Protonemura beaumonti*

Bilalli, A., Musliu, M., Ibrahim, H. & Sivec, I.: Novi nalazi obalčara (Insecta: Plecoptera) Kosova. Nat. Croat., Vol. 29, No. 1, 29-36, Zagreb, 2020.

Tijekom 2017. i 2018. na planini Berisha na Kosovu povremeno su prikupljeni obalčari. Pronađeno je 12 vrsta koje pripadaju sljedećim porodicama: Leuctridae, Nemouridae i Perlidae. Pet vrsta zabilježeno je po prvi puta za Kosovo: *Nemoura anas*, *N. asceta*, *N. peristeri*, *N. vinconi* i *Protonemura beaumonti*.

Ovaj rad doprinosi je poznavanju faune obalčara Kosova, kao jedne od najmanje istraženih zemalja Europe.

Ključne riječi: Plecoptera, novi nalazi, Kosovo, *Nemoura anas*, *N. asceta*, *N. peristeri*, *N. vinconi*, *Protonemura beaumonti*

INTRODUCTION

Plecoptera is a small monophyletic order of hemimetabolous insects, commonly called stoneflies, with 4096 described species, belonging to 412 genera and 30 families (DE WALT *et al.*, 2019). Species diversity of Plecoptera is highest in temperate regions and at high altitudes, as the nymphs are most commonly found in cold, fast flowing and rocky streams.

The stonefly fauna of the Balkan Peninsula is still poorly known. Despite several investigations conducted during the past decades (e.g. AUBERT, 1963, 1964; IKONOMOV 1969, 1970, 1971, 1972, 1973, 1974a, b, 1975, 1976a, b, 1977, 1978, 1979, 1980a, b, 1981,

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1982, 1983a, b, c, d, 1986; MURÁNYI 2008, 2011; MURÁNYI *et al.*, 2014, 2016; PONGRÁCZ, 1923; RAUŠER 1963, 1965; SIVEC 1980a, b), there are still areas from which there are no data at all, or from which they are rather fragmentary. The Republic of Kosovo is one of the least investigated areas in the Balkans regarding stonefly fauna. There are only few taxonomic investigations in this regard (DAUTI, 1977, 1980, 1986, 1987; SIVEC, 1980b). Several other investigations include data about the larval stage of stoneflies (DAUTI *et al.*, 2007, ZHUSHI – ETEMI, 2005; IBRAHIMI *et al.*, 2007; GASHI, 1993, 2006; IBRAHIMI, 2007; SHUKRIU, 1979); however since the primary goal of these studies was water quality assessment, these investigations lack taxonomic and faunistic importance, because most of the results are presented only up to the level of genus or family.

The goal of this study was to contribute to the faunistics and distribution of stonefly fauna in Kosovo, more precisely from Berisha Mountain.

MATERIAL AND METHODS

Sampling was carried out at two sampling stations on Berisha Mountain (Figs. 1 and 2). This mountainous area is located in the Drenas Municipality, between the villages Llapushnik, Kishnarekë and Nekoc at altitudes up to 1000 meters a.s.l. The first sampling station (S1) is located at the upstream area of a small streamlet just above Kish-

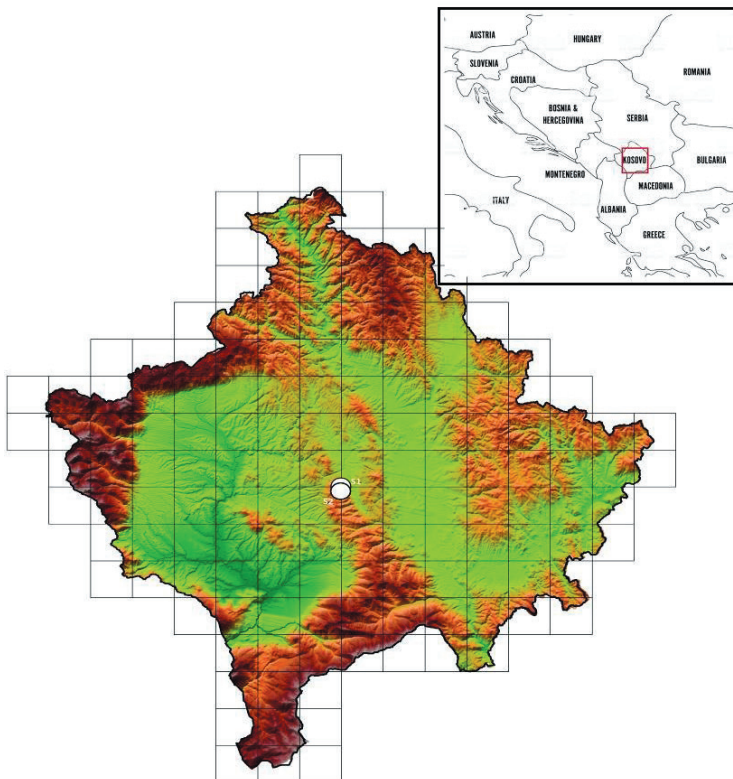


Fig. Map of the sampling stations in the Berisha Mountain, Kosovo.



Fig. 2. Sampling sites in the Berisha Mountain, Kosovo (S1 Kishnarekë and S2 Nekoc).

nareskë (N° 42.544168; E° 20.876845; 707 meters a.s.l.). The second sampling station, S2, is located at the upstream area of the Lugu i Gashit streamlet, above Nekoc (N° 42.523249; E° 20.868111; 837 meters a.s.l.). Adult stonefly specimens were collected using entomological nets and hand picking. The sampling was carried during May 2017 and January 2018. Collected samples were preserved in 80% ethanol.

The collection is deposited at the Laboratory of Zoology of the Faculty of Natural and Mathematics Sciences, University of Prishtina, Republic of Kosovo.

RESULTS AND DISCUSSION

During this investigation we found 12 species belonging to 5 genera and 3 families of Plecoptera. The distribution of species within families is as follows: Nemouridae (9), Leuctridae (2) and Perlidae (1).

The highest number of specimens comes from these species: *Leuctra prima* Kempny, 1899 (77 specimens), *Nemoura anas* Murányi, 2007 (11 specimens) and *Protonemura praecox* (Morton, 1894) (11 specimens), while all other species were collected with fewer than ten specimens. Three species were found each with one specimen only during this investigation: *Nemoura peristeri* Aubert, 1963, *N. vinconi* Murányi, 2007 and *Protonemura intricata* (Ris, 1902).

Systematic list of stoneflies collected on Berisha Mountain during 2017 and 2018. Species new to the fauna of Kosovo are indicated by an asterisk *.

Family Leuctridae Klapálek, 1905

Leuctra hippopus Kempny, 1899

S1 Berisha Mt.: 3.5.2017. 7 ♀♀; S2 Berisha Mt.: 10.5.2017. 2 ♀♀.

Leuctra prima Kempny, 1899

S2 Berisha Mt.: 28.1.2018. 35 ♂♂, 42 ♀♀.

Family Nemouridae Billberg, 1820*Amphinemura sulcicollis* (Stephens, 1836)

S2 Berisha Mt.: 10.5.2017. 6 ♀♀

Nemoura anas Murányi, 2007 *

S1 Berisha Mt.: 3.5.2017. 4 ♂♂, 1 ♀; S2 Berisha Mt.: 10.5.2017. 1 ♂, 5 ♀♀.

Nemoura asceta Murányi, 2007 *

S1 Berisha Mt.: 3.5.2017. 2 ♂♂.

Nemoura cinerea (Retzius, 1783)

S1 Berisha Mt.: 3.5.2017. 5 ♂♂, 3 ♀♀.

Nemoura peristeri Aubert, 1963 *

S1 Berisha Mt.: 3.5.2017. 1 ♂.

Nemoura vinconi Murányi, 2007 *

S1 Berisha Mt.: 3.5.2017. 1 ♂.

Protonemura beaumonti (Aubert, 1956) *

S2 Berisha Mt.: 10.5.2017. 1 ♂, 1 ♀.

Protonemura intricata (Ris, 1902)

S2 Berisha Mt.: 10.5.2017. 1 ♂

Protonemura praecox (Morton, 1894)

S2 Berisha Mt.: 28.1.2018. 5 ♂♂, 6 ♀♀.

Family Perlidae Latreille, 1802*Perla illiesi* Braasch & Joost, 1973

S2 Berisha Mt.: 10.5.2017. 1 ♂, 1 ♀.

Five species found during this investigation were recorded for the first time for Kosovo: *Nemoura anas*, *N. asceta*, *N. peristeri*, *N. vinconi* and *Protonemura beaumonti*. *Nemoura asceta* and *N. vinconi* were described from Albania (MURÁNYI, 2007) while *Nemoura anas* was described from material collected from Albania, Montenegro and Macedonia (MURÁNYI, 2007). *N. asceta* was also recently found in Turkey (DARILMAZ et al., 2016). *Nemoura peristeri* was until now known only from a few localities in Macedonia. The finding of these four species of the genus *Nemoura* Latreille, 1796 in Kosovo greatly enlarges their known distribution. The fifth species of this genus found during this investigation, *Nemoura cinerea*, is widespread in Europe and central Asia (BAUMAN, 1975).

Protonemura beaumonti is currently known only from Greece, Serbia and Bulgaria (KARAOUZAS et al., 2016). Our finding in Kosovo enlarges its distribution area in the Balkan Peninsula and represents the southeasternmost point of its distribution. *Protonemura ntricate* is widespread in Europe (ILLIES, 1978, FOCHETTI & TIerno DE FIGUEROA, 2004). *Leuctra hippopus* is a detritivore stonefly that is widely distributed in streams of the western Palaearctic (GRAF et al., 2009). *Leuctra prima* is distributed in the center and southeast of Europe. In the Iberian Peninsula it has only been found in the Pyrenees (SÁNCHEZ-ORTEGA et al., 2003; TIerno DE FIGUEROA et al., 2003). *Protonemura praecox* is

widely distributed throughout Europe (center, south and British Isles). In the Iberian Peninsula it is only present in the northern fringe (LUZÓN ORTEGA *et al.*, 2013). *Perla illiesi* is widespread in Bosnia, Bulgaria, Croatia, Italy, Kosovo, Macedonia, Montenegro and Slovenia (SIVEC & STARK, 2002).

The results of this investigation, based on only few sampling efforts, show that Kosovo contains species that are rare in the region. The country is still under-investigated in terms of stonefly fauna.

Received July 25, 2019

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SUMMARY

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In this paper we present new records for the stonefly fauna of Kosovo. Stonefly specimens were collected on Berisha Mountain during 2017 and 2018. During this investigation we found 12 species belonging to the following families: Leuctridae, Nemouridae and Perlidae. Five species are recorded for the first time from Kosovo: *Nemoura anas*, *N. asceta*, *N. peristeri*, *N. vinconi* and *Protonemura beaumonti*.

This investigation contributes to the faunistics and distribution of stonefly fauna in Kosovo, more precisely from Berisha Mountain.

