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FIRST RECORDS OF THE GENUS *MICROPTERNA* STEIN, 1873 (INSECTA: TRICHOPTERA) IN KOSOVO WITH DISTRIBUTIONAL AND ECOLOGICAL NOTES

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Until recently the caddisfly fauna of Kosovo was poorly known, with only several records. During a two-year period of investigation (2009–2010) adult caddisflies were collected with ultraviolet light, aerial net and hand picking. The genus *Micropterna* Stein, 1873 is reported for the first time in Kosovo with four species: *Micropterna caesareica* Schmid, 1959, *Micropterna fissa* McLachlan, 1875, *Micropterna nycterobia* McLachlan, 1875 and *Micropterna sequax* McLachlan, 1875.

In this paper we present the distribution characteristics of the genus *Micropterna* in Kosovo with ecological notes on habitat characteristics and flight period. All four species of the genus *Micropterna* have limited distribution in Kosovo, being present only in seven out of forty-three investigated stations. The documentation of the genus *Micropterna* in Kosovo presents a contribution to a better understanding of distributional patterns of this genus in the Balkan Peninsula and South-Eastern Europe.

Keywords: Caddisflies, Balkan Peninsula, *Micropterna* Stein, 1873

Ibrahimi, H., Gashi, A., Grapci-Kotori, L. & Kučinić, M.: Prvi nalazi roda *Micropterna* Stein, 1873 (Insecta: Trichoptera) na Kosovu s podacima o rasprostranjenosti i ekološkim značajkama. Nat. Croat., Vol. 22, No. 1., 147–155, 2013, Zagreb.

Fauna tulara Kosova je donedavno bila slabo istraživana, sa samo nekoliko podataka. Tijekom dvogodišnjeg perioda istraživanja (2009-2010) odrasli oblici tulara prikupljani su UV lampom, entomološkom mrežom i manualno. Rod *Micropterna* Stein, 1873 po prvi je puta zabilježen na Kosovu s četiri vrste: *Micropterna caesareica* Schmid, 1959, *Micropterna fissa* McLachlan, 1875, *Micropterna nycterobia* McLachlan, 1875 i *Micropterna sequax* McLachlan, 1875.

U ovome radu predstavljamo značajke rasprostranjenosti roda *Micropterna* na Kosovu s ekološkim podacima o staništu i vremenu emergencije. Sve četiri vrste roda *Micropterna* na Kosovu imaju usku rasprostranjenost i prisutne su samo na sedam od ukupno četrdeset i tri istraživane postaje. Nalaz roda *Micropterna* na Kosovu predstavlja doprinos boljem razumijevanju distribucijskih obrazaca ovog roda na Balkanskom poluotoku i jugoistočnoj Europi.

Ključne riječi: tulari, Balkanski poluotok, *Micropterna* Stein, 1873

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INTRODUCTION

Caddisflies are a group of holometabolous insects which spend their life in and close to freshwater habitats. Although most of the species are not known as good flyers, some fly long distances during their adult life.

In the last several years extensive investigations of caddisfly fauna in the Balkan Peninsula have taken place regarding geographic distribution patterns (e.g. Kučinić, 2002; Živić *et al*., 2006; Ćuk & Vučković, 2009, 2010; Stanič-Koštroman, 2009; Previšić & Popijač, 2010; Oláh, 2010), description of new taxa (e.g. Kučinić & Malicky, 2002; Malicky *et al*. 2007; Oláh, 2010), description of larval stages of known species (e.g. Kučinić *et al*., 2008, 2010, 2011; Graf *et al*., 2008; Waringer *et al*., 2009), and ecological preferences, as well as phylogenetic and phylogeographic studies for several species (e.g. Pauls *et al*., 2006, 2008; Previšić *et al*., 2009).

The Republic of Kosovo is a small country (10, 910 km^2) with a very specific and diverse landscape within ecoregion 5 and 6 (according to Illies, 1978). It is one of the least explored parts of the European continent with respect to caddisfly fauna. Previously, studies in Kosovo were limited to larval stages in relation to water quality assessment (Ibrahimi & Gashi, 2008). However, these studies did not constitute reliable taxonomic information due to the difficulties in identifying species in the larval stage. Despite several years of extensive investigation of Trichoptera larva bioindicators (e.g. Grapci-Kotori, 2002; Shukriu, 1979; Gashi, 1993, 2006; Rugova, 2002; Zhushi-Etemi, 2005), the genus *Micropterna* was not reported from Kosovo.

This paper is the third in a series of results dealing with the occurrence and ecology of caddisflies collected during 2007–2011 in Kosovo (Ibrahimi *et al*., 2012a, b).

MATERIAL AND METHODS

Adult specimens of genus *Micropterna* were collected with UV lamp and an aerial net at seven localities (S2, S5, S9 S13, S15, S20 and SJ) belonging to the Adriatic, the Aegean and the Black Sea water basins (Fig. 1. and Tab. 1).

The first investigation site (S2) is located in a small streamlet in Mazhiç village, Mitrovica Municipality. The dominant substrates in this station are boulders and pebbles. The second site (S5) is a second order stream in Siqevë village, 5 km from Prishtina town. The dominant substrates at this locality are pebbles partly covered with mosses. The third site (S9) is located in the spring area of the only stream inside the Blinajë Hunting Park nearby the town of Lipjan. The fourth site (S13) is located in the upper reach of Lepenc River. The dominant substrates in this station are boulders, pebbles and pebbles covered with moss. The fifth site (S15) is located in a segment of Lumbardhi i Prizrenit River in Sredskë village, Prizren Municipality. The dominant substrates in this station are pebbles and cobbles. The sixth site (S20) is located in the spring area of Vrella River in Vrella village nearby the town of Istog/Burim. The dominant substrates in this locality are pebbles and boulders. The seventh site (SJ) is located at the spring area of the Gurra e Demjanit stream, Gjakova Municipality. The dominant substrates in this locality are pebbles, pebbles covered with moss and cobbles. The sampling was carried out between March 2009 and November 2010. *Mycropterna nycterobia* was additionally collected manually inside the first author's house on 2nd of June 2011 and *Micropterna caesareica* was collected inside Brezovica Forest on 24th of November 2010.

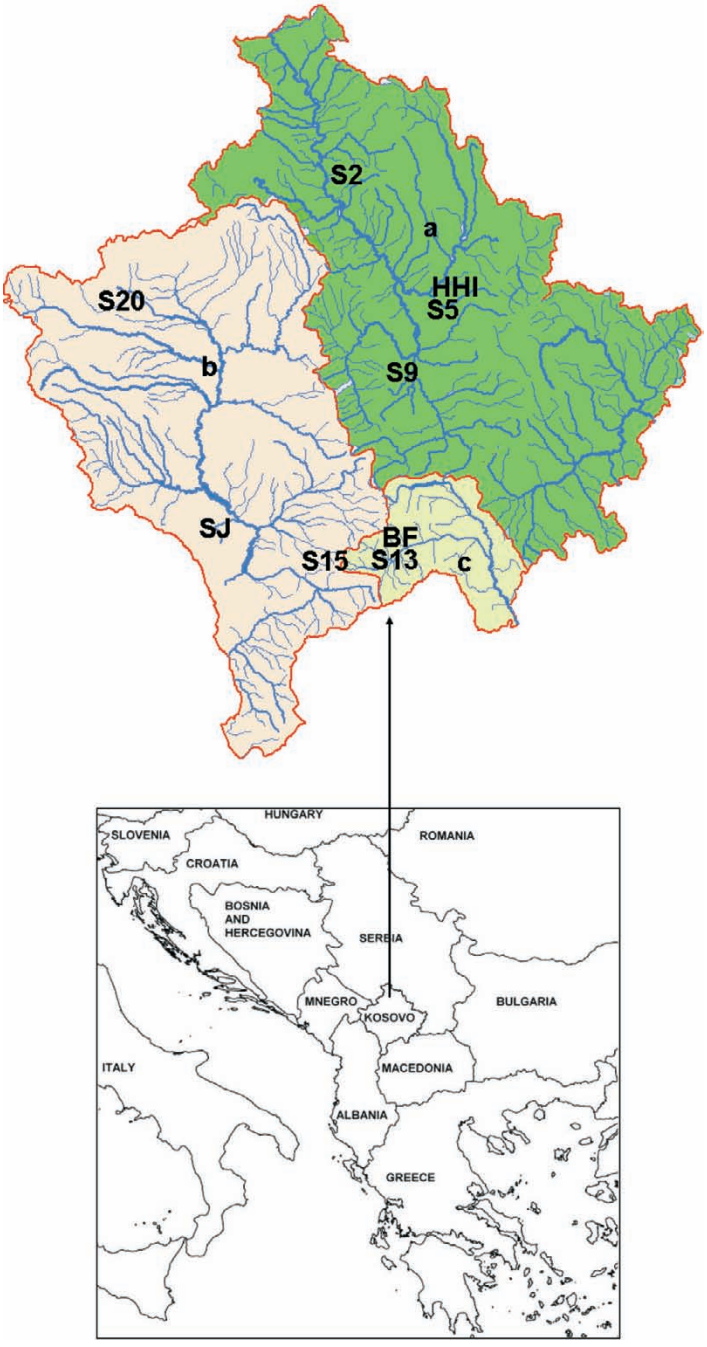

Fig. 1. Map of Kosovo with indicated river basins in Kosovo: a) Black Sea Basin, b) Adriatic Sea Basin and c) Aegean Sea Basin, and investigated sites: S2 – Mazhiq, S5 – Siqevë, S9 – Blinajë, S13 – Lepenc, S15 – Sredskë, S20 – Vrellë, SJ – Demjan, HHI – First Author's House, BF – Brezovicë Forest

Tab. 1. Locality data for the seven investigated sampling stations plus two accidental sites where *Micropterna* specimens were found.

Code	Sampling Stations	River/Stream	Latitude °N	Longitude °E	Altitude m
S2	Mazhiq	Mazhiq Stream	42.9401	20.9331	853
S5	Siqevë	Siqevë Stream	42.7369	21.2343	798
S9	Blinajë	The first lake streamlet	42.5185	20.9788	721
S13	Lepenc	Lepenc River	42.1813	20.9781	1465
S15	Sredskë	Lumbardhi i Prizrenit River	42.1708	20.8623	820
S20	Vrellë	Vrellë Stream	42.7739	20.4011	543
SJ	Demjan	Gurra e Demjanit Spring	42.288	20.5155	376
HHI	First author's house		42.7248	21.137	616
BF	Brezovicë – forest		42.1859	21.006	1482

All samples were fixed in 96 % ethyl alcohol. In the laboratory they were analyzed under a stereomicroscope and stored in 96 % ethyl alcohol. Species were identified using the key of Malicky (2004). Specimens reported here are kept in the Halil Ibrahimi caddisfly collection at the department of biology, Faculty of Mathematical and Natural Sciences, University of Prishtina, Kosovo.

RESULTS AND DISCUSSION

During the period March 2009 – November 2010, forty-three different stations in streams and rivers all over Kosovo, mostly upper and middle reaches, were investigated for caddisfly fauna. The genus *Micropterna* was found at seven localities, or only 13 % of all investigated localities. On the Balkan Peninsula eight species of the genus *Micropterna* are present: *Micropterna caesareica, Micropterna fissa, Micropterna lateralis* (Stephens, 1837), *Micropterna malaspina* Schmid, 1957, *Micropterna nycterobia, Micropterna sequax, Micropterna testacea* (Gmelin, 1789) and *Micropterna taurica* Martynov 1917 (Malicky, 2004; Stanić-Koštroman, 2010; Malicky, 2005; Živić *et al*., 2006; Kumanski, 1985, 1988, 1997; Oláh, 2010). Four of these species were recorded in Kosovo during this investigation: *Micropterna caesareica, M. fissa, M. nycterobia* and *M. sequax* (Tabs. 2 and 3). *Micropterna caesareica* and *Micropterna nycterobia* were found synoptically, at all other locations only one single *Micropterna* species was found.

Micropterna caesareica is a Southeastern European species found also in Asia Minor. In Bulgaria (Kumanski, 1988) and Greece (Malicky, 2005) it is reported from several stations while in Turkey so far it is reported from one locality only (Sipahiler, 2003). It was reported from Hungary as well in a limited number of individuals during 1964 (Nogradi, 1994), but apparently this species is not a permanent member of the Hungarian caddisfly fauna and it may have reached there by flying from elsewhere (Nogradi, 1994). In Kosovo it is found in stations S5 and S20, the first belonging to the Black Sea basin and the second one to Adriatic Sea basin. Additionally during the field trip in Brezovica Mountain which belongs to the Sharr Massif, a single female specimen of *M. caesareica* was found inside the forest (station BF) about 1 km from the closest stream.

Tab. 2. Date of specimen collection and sampling method used: LT (light trap), AN (aerial net) and HP (handpicking).

Micropterna caesareica Schmid, 1959
S5 Siqevë: 16.09.2009. 1 ♂ (LT); S20 Vrellë: 09.11.2009. 1 ♀ (LT); 24.11.2010 BF Brezovicë 1 ♀ (AN)
Micropterna fissa McLachlan 1875
SJ Demjan: 13.11.2010. 1 ♀ (AN).
Micropterna nycterobia McLachlan, 1875
S5 Siqevë: 17.10.2009. 6 ♀♀, 6 ♂♂ (LT); 18.11.2009. 3 ♂♂ (LT); S9 Blinajë: 11.10.2010. 1 ♀ (LT); S15 Sredskë: 22.07.2009. 6 ♀♀, 12 ♂♂ (LT); HHI First author's house 1 ♂ (HP).
Micropterna sequax McLachlan, 1875
S2 Mazhiq: 18.06.2009. 3 ♂♂ (LT); S13 Lepenc: 17.08.2009. 3 ♀♀, 4 ♂♂ (LT); 18.10.2009. 3 ♂♂ (LT).

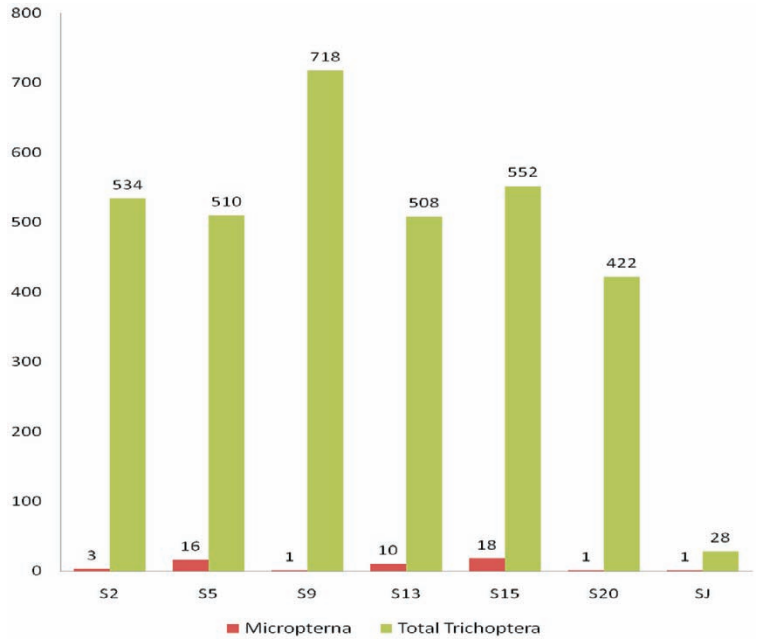

Fig. 2. Contribution of *Micropterna* species individuals of seven investigated stations (S2, S5, S9, S13, S15, S20 and SJ) in total number of individuals belonging to Trichoptera species.

The stream network in the area where this specimen was found belongs to Aegean water basin. Earlier, *M. caesareica* was registered in Macedonian side of the Sharr Massif as well (Kumanski, 1997). The documentation of *M. caesareica* at three localities in Kosovo greatly widens the distributional area of this species in Southeastern Europe.

Tab. 3. List of four *Micropterna* species found in seven investigated (S2, S5, S9, S13, S15, S20 and SJ) stations plus two stations with random find (HHI and BF), with total number of collected individuals and total number of species per station. S2 – Mazhiq, S5 – Siqevë, S9 – Blinajë, S13 – Lepenc, S15 – Sredskë, SJ – Demjan, HHI – First Author's House and BF – Brezovicë Forest

Taxa/Stations	S2	S5	S9	S13	S15	S20	SJ	HHI	BF	Total ind.
Micropterna caesareica Schmid, 1959		1				1			2	4
Micropterna fissa McLachlan, 1875							1			1
Micropterna nycterobia McLachlan, 1875		15	1		18			1		34
Micropterna sequax McLachlan, 1875	3			10						13
Total species	1	2	1	1	1	1	1	1	1	∑ = 53

Micropterna fissa is a widespread species with a distribution area from Turkey up to France and Portugal (www.faunaeuropea.org). Until recently in the Balkan Peninsula it was known to have a disjunctive distribution, being present in Greece and Bulgaria and then only in Croatia (www.faunaeuropea.org). Recently it was found in Albania, at two localities only (Oláh, 2010). In Kosovo its only known locality is the spring area of the Gurra e Demjanit stream (SJ) in the Has region, which belongs to the Adriatic Sea basin.

Micropterna nycterobia and *Micropterna sequax* are widespread European species (www.faunaeuropea.org). In Kosovo the first is present at three stations and the second at two stations. Additionally, on 2nd of June 2011, a single male specimen of *Micropterna nycterobia* was found inside the first author's house, at least 4 km distant from the closest stream which is one of the stations where this species was found (S5, Siqevë). It is a well known fact that *Micropterna* species can fly very long distances in order to find suitable places for aestivation. During the one-year period of investigation *M. nycterobia* was found during October and November only at this site, while in two other stations it was found during July and October. Because it was found in June as well it is obvious that the species emerges much earlier and its absence during the summer period is a result of its adult diapause and migration.

What is certain is that the four *Micropterna* species found in Kosovo belong to a group of rare species with a low number of individuals as compared to the total number of other Trichoptera species. In percentage the *Micropterna* contribution to the total number of Trichoptera individuals cached during the investigation period varies from 0.13 % to 3.57% (Fig. 2).

Considering the population size of *Micropterna* species found in the investigated stations and trends related to habitat degradation in these sites we can conclude that all these species have the status of potentially endangered species. According to our data these species have few isolated populations with low abundance in all cases. Furthermore the suitable conditions in streams and rivers where *Micropterna* species were found are limited either as a result of anthropogenic impact or of natural conditions in the area. This is especially true for *Micropterna fissa*. According to present knowledge it is restricted to one station (SJ) in an area not exceeding 10 square meters. The population has a low number of individuals and the locality is under continuous threat from extensive water exploitation and habitat degradation. After only 10 meters, from the spring area, a large proportion of water is used by a nearby restaurant and the sewage from a restaurant and nearby houses is discharged directly into the stream. In Siqevë stream (S5), the unimpacted stream is only some 3 km long. The section below is heavily polluted by sewage discharges from nearby villages. No caddisfly assemblages were noted in this impacted area. After less than 1 km from station S20 the river is adversely affected either by use of its waters for irrigation or by the direct sewage discharge from nearby settlements. The other sites are also adversely affected by human activities, limiting further the optimal conditions of *Micropterna* species.

This paper presents a contribution to a better understanding of distributional patterns of the genus *Micropterna* in the Balkan Peninsula and South-Eastern Europe. Further trichopterological studies in Kosovo and Balkan Peninsula are needed for the sake of a better knowledge of the distribution and ecology of the genus *Micropterna* and Trichoptera in general.

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We would like to thank Professor Hans Malicky for determination of *Micropterna fissa*. We would also kindly express our gratitude to the authorities of Blinajë Hunting Park for allowing us to collect caddisflies in station S9 which is inside the park. This study is a part of the first author's PhD thesis »Faunistical, ecological and biogeographical characteristics of Kosovo caddisflies (Insecta: Trichoptera)«.

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SAŽETAK

Prvi nalazi roda *Micropterna* Stein, 1873 (Insecta: Trichoptera) na Kosovu s podacima o rasprostranjenosti i ekološkim značajkama

H. Ibrahimi, A. Gashi, L. Grapci-Kotori & M. Kučinić

Fauna tulara Kosova je donedavno bila slabo istraživana, sa samo nekoliko faunističkih podataka. Tijekom dvogodišnjeg sistematskog istraživanja u periodu od 2009. do 2010. godine adulti tulara prikupljani su UV lampom, entomološkom mrežom i manualno. Rod *Micropterna* Stein, 1873 je tijekom tih istraživanja po prvi put zabilježen na Kosovu s četiri utvrđene vrste: *Micropterna caesareica* Schmid, 1959, *Micropterna fissa* McLachlan, 1875, *Micropterna nycterobia* McLachlan, 1875 i *Micropterna sequax* McLachlan, 1875.

U ovome radu predstavljamo značajke rasprostranjenosti roda *Micropterna* na Kosovu s ekološkim podacima o staništu i vremenu emergencije. Sve četiri vrste roda *Micropterna* na Kosovu imaju usku rasprostranjenost i prisutne su samo na sedam od ukupno 43 istraživane postaje.

U svim slučajevima nalaza na području Kosova sve četiri vrste roda *Micropterna* zabilježene su s malim brojem jedinki u odnosu na ukupan broj jedinki drugih vrsta Trichoptera, te pripadaju skupini rijetkih vrsta. U postocima doprinos jedinki vrsta roda *Micropterna* u ukupnom broju jedinki tulara prikupljenih tijekom istraživanog razdoblja različit je i kreće se od 0,13% do 3,57% (Fig. 2). S obzirom na veličinu populacije vrsta roda *Micropterna* pronađenih na istraživanim postajama i degradaciju staništa na tim lokalitetima možemo zaključiti da sve te vrste imaju status potencijalno ugroženih vrsta.

Nalaz vrste *M. caesareica* na tri postaje na Kosovu naveliko proširuje poznati areal rasprostranjenosti ove vrste u jugoistočnoj Europi i to predstavlja njezin najsjeverniji nalaz. Vrsta *M. fissa* koja je dosada bila poznata na Balkanskom poluotoku samo u Grčkoj, Bugarskoj, Albaniji i Hrvatskoj sada je nađena i na Kosovu na postaji S3. *M. nycterobia i M. sequax* su široko rasprostranjene vrste u Europi i na Kosovu su nađene, prva na tri postaje, a druga na dvije.

Buduća istraživanja Trichoptera na području Kosova doprinijet će boljem poznavanju rasprostranjenja i ekologije vrsta iz roda *Micropterna*.