



## Contribution to the knowledge of the caddisfly fauna (Insecta: Trichoptera) of the Ibër River in Kosovo, with the first record of *Hydroptila martini* Marshall, 1977

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**ABSTRACT.** This study presents the results of a faunistic survey of Trichoptera conducted at four sampling stations in the Ibër River, Kosovo. A total of 22 species from 9 families were recorded, comprising 133 male and 94 female specimens. The most species-rich site was L1, with 11 species, including the first confirmed record of *Hydroptila martini* Marshall, 1977 in Kosovo. This rare micro-caddisfly, represented by a single male specimen, highlights the importance of the study area for documenting overlooked taxa. Notable findings include the abundance of *Rhyacophila nubila* Zetterstedt, 1840 at L1, as well as *Psychomyia pusilla* Fabricius, 1781 and *Silo pallipes* Fabricius, 1781 at L2, reflecting diverse ecological conditions within the study area. Balkan endemics such as *Rhyacophila macedonica* Karaouzas, Valladolid & Ibrahim, 2022 and *Ecclisopteryx keroveci* Previšić, Graf & Vitecek, 2014 were recorded in low numbers, probably emphasizing the dependence of these two species on water quality. This study emphasizes the importance of increased conservation actions to protect and conserve the vulnerable freshwater ecosystems of Kosovo which support many endemic and rare Trichoptera species.

**Keywords:** Biodiversity, distribution, ecological preferences, freshwater, micro-caddisflies

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## INTRODUCTION

Caddisflies are a diverse group of aquatic insects that play crucial ecological roles in freshwater ecosystems. They function as bioindicators of water quality and contribute to nutrient cycling (e.g., Hajam et al., 2024). Their presence and distribution are influenced by various environmental factors, including hydrology, substrate composition, and water chemistry (Holzenthal, 2009; Thorp & Rogers, 2011). The Balkan Peninsula and Southeastern Europe are recognized as a significant hotspot of caddisfly diversity within the Western Palearctic region (Ibrahim, 2024). Previous research on Trichoptera in Southeastern Europe has highlighted the region's high species diversity and endemism

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with a continuous increase in studies in less investigated areas (e.g., Bozdoğan et al., 2025; Cerjanec et al., 2020; Malicky, 2005; Oláh, 2010, 2011; Oláh & Kovács, 2012, 2013, 2014; Oláh et al., 2013a, 2023b, 2019, 2022; Rimcheska et al., 2015; Kučinić et al., 2013, 2015, 2019; Ibrahimi et al., 2017, 2019a, 2022; Karaouzas et al., 2018; Hinić et al., 2020; Musliu et al., 2020; Slavevska-Stamenković et al., 2020; Ibrahimi & Bilalli, 2021). In recent years, systematic research on the Trichoptera fauna of Kosovo has advanced too (e.g., Gashi et al., 2015; Bilalli et al., 2019, 2024a, 2024b; Ibrahimi et al., 2012b, 2014a, 2014b, 2015b, 2016a, 2021a, 2021b, 2023, 2025; Salihu et al., 2023; Musliu et al., 2024); however, certain regions, including the Ibër River basin, remain insufficiently studied.

The Ibër River, an important watercourse in Kosovo, originates in Montenegro and flows through diverse geographic regions before merging with the Sitnica River. Despite its ecological significance, studies on the Trichoptera fauna of the Ibër River remain scarce, limiting our understanding of species composition and distribution patterns in this region. To date, only a few records of caddisflies have been reported from the Ibër River and its tributaries (e.g., Ibrahimi & Sejdiu, 2018; Ibrahimi et al., 2012a, 2015a, 2016b, 2024a, 2024b). Nevertheless, these limited records include endemic species such as *Drusus dardanicus* Ibrahimi, Previšić & Vitecek, 2015 and *Potamophylax kosovaensis* Ibrahimi & Bilalli, 2024, highlighting the region's importance for biodiversity.

This study aims to contribute to the knowledge of the Trichoptera fauna of the Ibër River by documenting species diversity and reporting new distributional records. Additionally, we discuss the ecological implications of these findings and their relevance to freshwater conservation efforts in Kosovo.

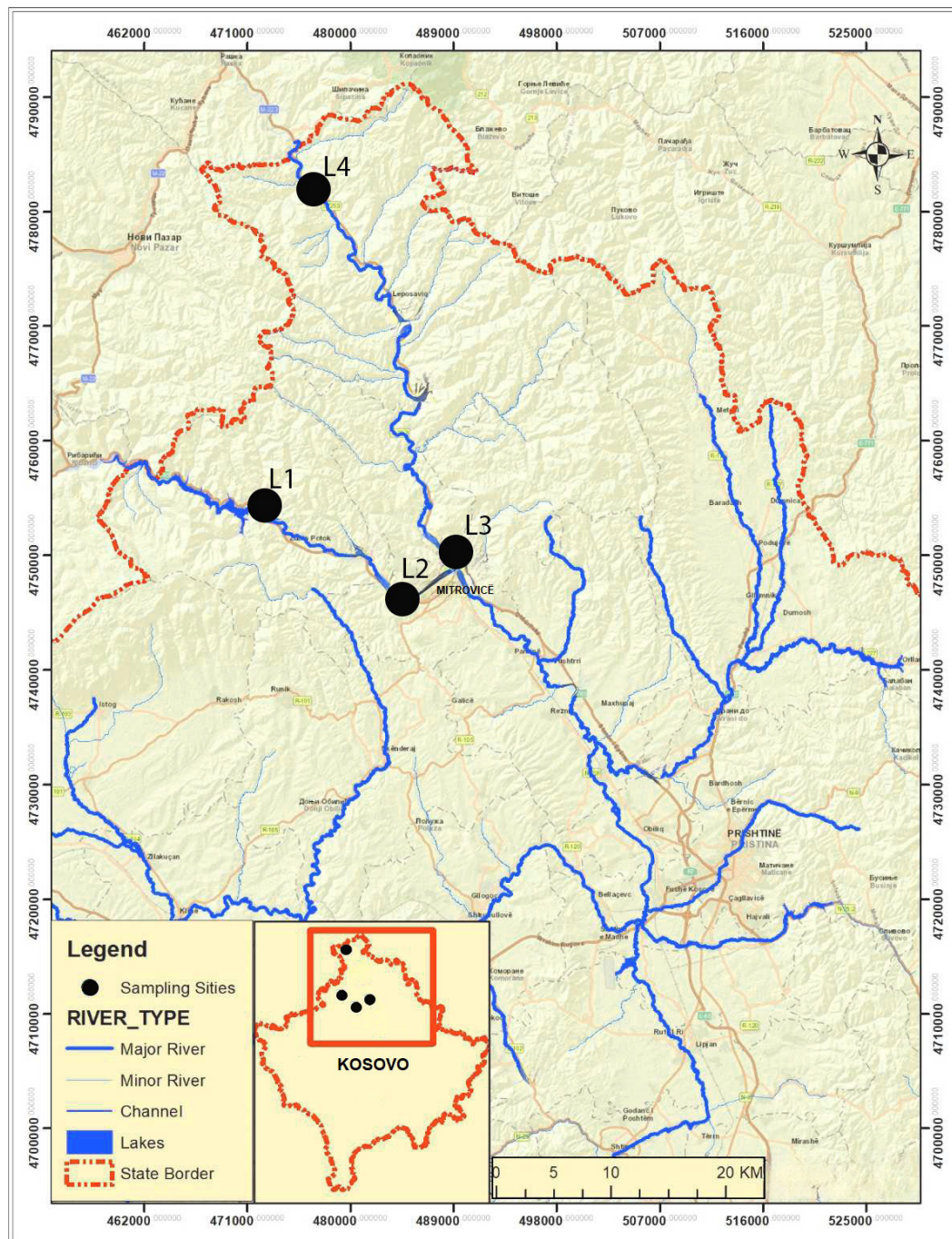
## MATERIAL AND METHODS

Adult caddisfly specimens were collected from four sampling stations along the Ibër River in Kosovo: L1 (Ujman), L2 (Koshtovë), L3 (Mitrovicë), and L4 (Rëvatskë) (Table 1, Fig. 1 and Fig. 2A–D). The first sampling site is located immediately after the Ujman Lake and is relatively out of the anthropogenic impact. The second sampling site is located in the Koshtovë village near a heavily impacted area by the discharge of untreated waters from nearby villages and restaurants. The third site is also located near the town of Mitrovica where the river is heavily impacted by the discharge of sewage and untreated waters from the surrounding inhabited areas. The fourth sampling station is located near the Rëvatskë village, a few kilometers before the state border with Serbia and after the river has received several tributaries, impacting considerably the increase of water quality. Sampling was conducted during the peak adult emergence period in 2023, specifically on July 25th, to maximize species diversity. At each site, ultraviolet (UV) light traps were used to sample caddisflies. Each trap consisted of a 15-watt UV light source placed over a white pan, powered by portable batteries, and operated for approximately 8 hours after dusk. Specimens attracted to the light were collected manually and preserved in 80% ethanol for subsequent identification. Specimens were collected by H. Ibrahimi, A. Bilalli, M. Musliu and D. Geci.

In the laboratory, specimens were identified at the species level using a standard taxonomic key by Malicky (2004). Morphological characteristics, particularly male and female genitalia, were examined under a stereomicroscope to confirm species identifications. Voucher specimens are deposited in the entomological collection of the Department of Biology at the University of Prishtina.

**Table 1.** Sampling sites in the Ibër River, Kosovo.

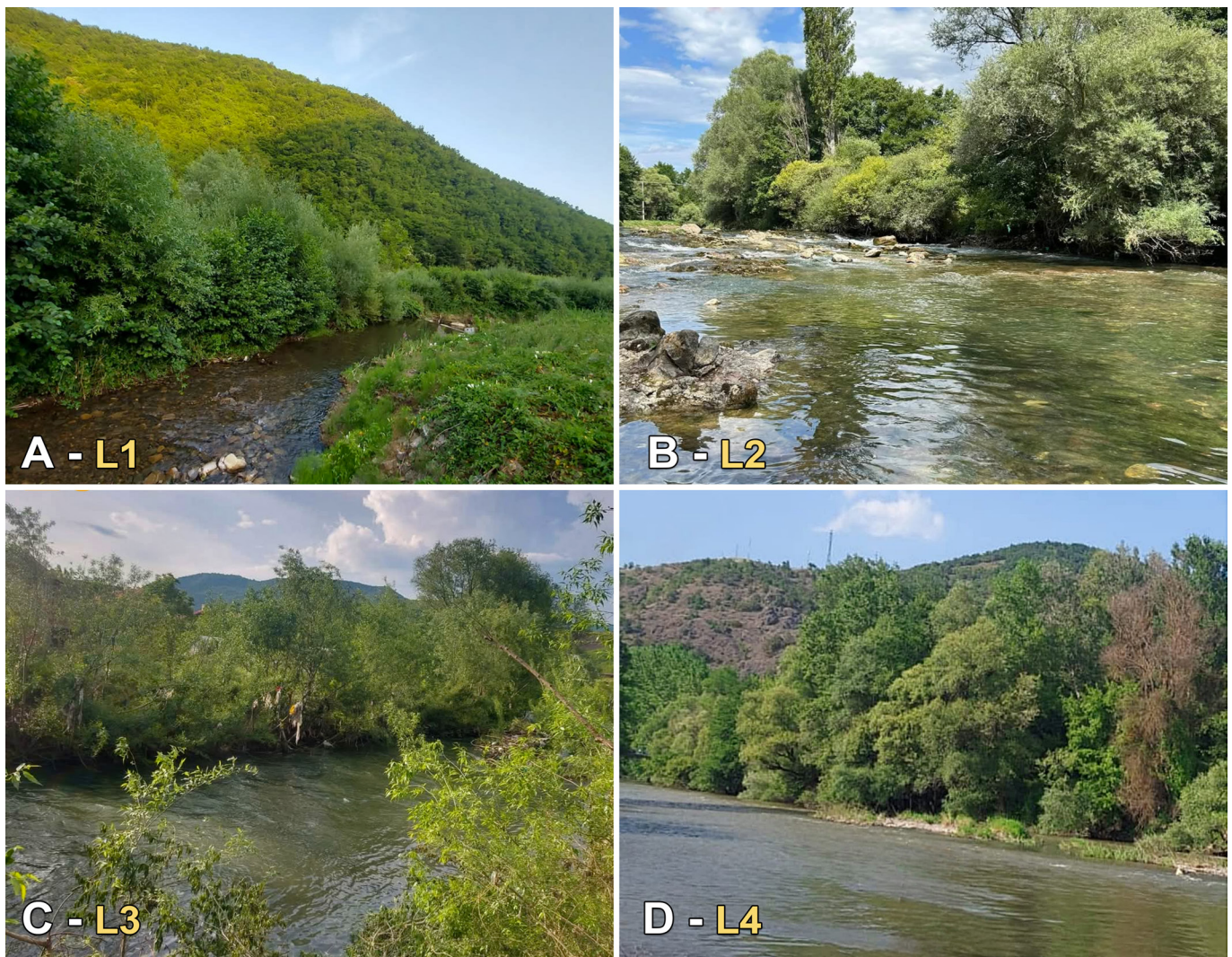
| Code | Site name             | Longitude & Latitude            | Altitude (a.s.l.) |
|------|-----------------------|---------------------------------|-------------------|
| L1   | Ujman (below the dam) | 42°56'41.5140"N, 20°39'39.060"E | 590 m             |
| L2   | Koshtovë              | 42°52'00.8148"N, 20°48'42.778"E | 521 m             |
| L3   | Mitrovicë             | 42°54'10.7424"N, 20°52'2.5032"E | 502 m             |
| L4   | Rëvatskë              | 43°11'30.8472"N, 20°42'39.020"E | 427 m             |



**Figure 1.** Map of sampling sites in the Ibër River, Kosovo.

## RESULTS

A total of 22 Trichoptera species from 9 families were recorded from the 4 sampling stations (L1, L2, L3, and L4) (Table 2). In total, 227 specimens were collected, comprising 133 males and 94 females. Family Rhyacophilidae was represented by 3 species: *Rhyacophila nubila*, *Rhyacophila macedonica*, and *Rhyacophila tristis*. Among these, *Rhyacophila nubila* was most abundant at L1, with 12 males recorded. *Rhyacophila macedonica* was distributed across L2, L3, and L4, while *Rhyacophila tristis* was found exclusively at L4. Hydroptilidae included *Hydroptila forcipata* and *Hydroptila martini*. *Hydroptila forcipata* was the most abundant species at L3, with 12 males and 9 females, whereas *Hydroptila martini* was represented by a single male specimen at L1.



**Figure 2.** Four sampling stations of caddisflies in the Ibër River, Kosovo: **A.** L1 Ujman, **B.** L2 Koshtovë, **C.** L3 Mitrovicë and **D.** L4 Rëvatskë.

The family Polycentropodidae included 3 species: *Cyrnus trimaculatus*, *Plectrocnemia conspersa*, and an unidentifiable female of the genus *Polycentropus*. *Cyrnus trimaculatus* was recorded with 2 males and 6 females at L1, while *Plectrocnemia conspersa* was more abundant at L4, in addition to its presence at L1. The Psychomyiidae family was represented by three species, of which *Psychomyia pusilla*, was the most abundant species recorded at L2. The Philopotamidae family was represented by *Philopotamus montanus*, which was observed only at L1. Hydropsychidae included 2 species: *Cheumatopsyche lepida* and *Hydropsyche instabilis*. *Cheumatopsyche lepida* was recorded exclusively at L4, while *Hydropsyche instabilis* was found only at L1, with a single male specimen. The Goeridae family was represented by 3 species: *Silo graellsii*, *Silo pallipes*, and *Silo piceus*. *Silo graellsii* was found only at L1, represented by a single male. *Silo pallipes* was abundant at L2, with 12 males and 11 females, while *Silo piceus* was recorded at L4, with 7 males and 2 females. Limnephilidae was represented by 4 species: *Ecclisopteryx keroveci*, *Limnephilus lunatus*, *Micropterna nycterobia*, and *Potamophylax luctuosus*. *Ecclisopteryx keroveci* was recorded at L2 and L4, with small populations of both males and females. *Limnephilus lunatus* and *Micropterna nycterobia* were both found only at L1. *Potamophylax luctuosus* was recorded at L2, with 3 specimens. Finally, Sericostomatidae was represented by *Sericostoma flavicorne* s.l., which was observed at L1, L3, and L4, with varying numbers of males and females recorded. Sampling station L2 had the highest number of specimens (94 in total), while L3 had the lowest (33 in total).

**Table 2.** The composition of the caddisfly fauna in four sampling stations in the Ibër River.

| #  | Species/Sampling stations                                      | L1 |   | L2 |    | L3 |   | L4 |   |
|----|----------------------------------------------------------------|----|---|----|----|----|---|----|---|
|    |                                                                | ♂  | ♀ | ♂  | ♀  | ♂  | ♀ | ♂  | ♀ |
|    | <b>Goeridae</b>                                                |    |   |    |    |    |   |    |   |
| 1  | <i>Silo graellsii</i> Ed. Pictet, 1865                         | 1  |   |    |    |    |   |    |   |
| 2  | <i>Silo pallipes</i> (Fabricius, 1781)                         |    |   | 12 | 11 |    |   |    |   |
| 3  | <i>Silo piceus</i> (Brauer, 1857)                              |    |   |    |    |    |   | 7  | 2 |
|    | <b>Hydropsychidae</b>                                          |    |   |    |    |    |   |    |   |
| 4  | <i>Cheumatopsyche lepida</i> (Pictet, 1834)                    |    |   |    |    |    |   | 8  | 4 |
| 5  | <i>Hydropsyche instabilis</i> (Curtis, 1834)                   | 1  |   |    |    |    |   |    |   |
|    | <b>Hydroptilidae</b>                                           |    |   |    |    |    |   |    |   |
| 6  | <i>Hydroptila forcipata</i> (Eaton, 1873)                      |    |   |    |    | 12 | 9 |    |   |
| 7  | <i>Hydroptila martini</i> Marshall, 1977                       | 1  |   |    |    |    |   |    |   |
|    | <b>Limnephilidae</b>                                           |    |   |    |    |    |   |    |   |
| 8  | <i>Ecclisopteryx keroveci</i> Previšić, Graf & Vitecek 2014    |    |   | 1  | 3  |    |   | 2  | 2 |
| 9  | <i>Limnephilus lunatus</i> Curtis, 1834                        | 2  |   |    |    |    |   |    |   |
| 10 | <i>Micropterna nycterobia</i> McLachlan, 1875                  | 2  |   |    |    |    |   |    |   |
| 11 | <i>Potamophylax luctuosus</i> (Piller & Mitterpacher, 1783)    |    |   | 3  |    |    |   |    |   |
|    | <b>Philopotamidae</b>                                          |    |   |    |    |    |   |    |   |
| 12 | <i>Philopotamus montanus</i> (Donovan 1813)                    | 12 | 4 |    |    |    |   |    |   |
|    | <b>Polycentropodidae</b>                                       |    |   |    |    |    |   |    |   |
| 13 | <i>Cyrnus trimaculatus</i> (Curtis, 1834)                      | 2  | 6 |    |    |    |   |    |   |
| 14 | <i>Plectrocnemia conspersa</i> (Curtis, 1834)                  | 2  | 3 | 4  | 7  |    |   |    |   |
| 15 | <i>Polycentropus</i> sp.                                       |    | 1 |    |    |    |   |    |   |
|    | <b>Psychomyiidae</b>                                           |    |   |    |    |    |   |    |   |
| 16 | <i>Psychomyia pusilla</i> (Fabricius, 1781)                    |    |   | 23 | 19 |    |   |    |   |
| 17 | <i>Lype reducta</i> (Hagen, 1868)                              | 1  |   |    |    |    |   |    |   |
| 18 | <i>Tinodes pallidulus</i> McLachlan, 1878                      | 3  | 1 |    |    |    |   |    |   |
|    | <b>Rhyacophilidae</b>                                          |    |   |    |    |    |   |    |   |
| 19 | <i>Rhyacophila nubila</i> Zetterstedt, 1840                    | 12 |   |    | 4  | 3  | 2 |    |   |
| 20 | <i>Rhyacophila macedonica</i> Karaouzas, Valladolid & Ibrahimi |    |   | 1  | 3  | 5  | 2 | 5  | 2 |
| 21 | <i>Rhyacophila tristis</i> Pictet, 1834                        |    |   |    |    |    |   | 3  | 1 |
|    | <b>Sericostomatidae</b>                                        |    |   |    |    |    |   |    |   |
| 22 | <i>Sericostoma flavicorne</i> Schneider, 1845 s.l.             | 1  | 3 | 1  | 2  |    |   | 3  | 3 |

Below is the list of the recorded species. All specimens were collected on July 25, 2023, and sampling station data are provided in [Table 1](#).

### *Taxonomic hierarchy*

**Class Insecta** Linnaeus, 1758

**Order Trichoptera**, Kirby, 1813

**Family Goeridae** Ulmer, 1903

**Genus *Silo*** Curtis, 1833

***Silo graellsii*** E. Pictet, 1865

**Material examined.** 1♂, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** The species is widespread in Europe (Neu et al., 2018), as well as in some localities in Kosovo (Ibrahimi et al., 2014b, 2019c).

***Silo pallipes* (Fabricius, 1781)**

**Material examined.** 12♂♂, 11♀♀, KOSOVO, L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E).

**Remarks.** A widespread species in Europe (Neu et al., 2018), while in Kosovo, it has a limited distribution, occurring only in a few localities (Ibrahimi et al., 2012a, 2019b).

***Silo piceus* (Brauer, 1857)**

**Material examined.** 7♂♂, 2♀♀, KOSOVO, L4 Rëvatskë (43°11'30.8472"N, 20°42'39.0204"E).

**Remarks.** The species is widespread in Europe (Neu et al., 2018) and reported in a few localities in Kosovo (Ibrahimi et al., 2012b, 2014a; Ibrahimi & Sejdiu, 2018).

**Family Hydropsychidae Curtis, 1835****Genus *Cheumatopsyche* Wallengren, 1891*****Cheumatopsyche lepida* (Pictet, 1834)**

**Material examined.** 8♂♂, 4♀♀, KOSOVO, L4 Rëvatskë (43°11'30.8472"N, 20°42'39.0204"E).

**Remarks.** A widely distributed species in Europe (Neu et al., 2018; Slavevska-Stamenković et al., 2021) and reported in a few localities in Kosovo (Ibrahimi et al., 2012b; 2014a; 2024b).

**Genus *Hydropsyche* Pictet, 1834*****Hydropsyche instabilis* (Curtis, 1834)**

**Material examined.** 1♂, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** A common European species found in lotic environments (Neu et al., 2018), reported in a few localities in Kosovo as well (Ibrahimi et al., 2012a, 2014b, 2019c, 2015b, 2019d).

**Family Hydroptilidae Stephens, 1836****Genus *Hydroptila* Dalman, 1819*****Hydroptila forcipata* (Eaton, 1873)**

**Material examined.** 12♂♂, 9♀♀, KOSOVO, L3 Mitrovicë (42°54'10.7424"N, 20°52'2.5032"E).

**Remarks.** Relatively widespread in Europe (Neu et al., 2018) whereas, in Kosovo, it is only reported from the Ibër River (Ibrahimi et al., 2012a).

***Hydroptila martini* Marshal, 1977**

**Material examined.** 1♂, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

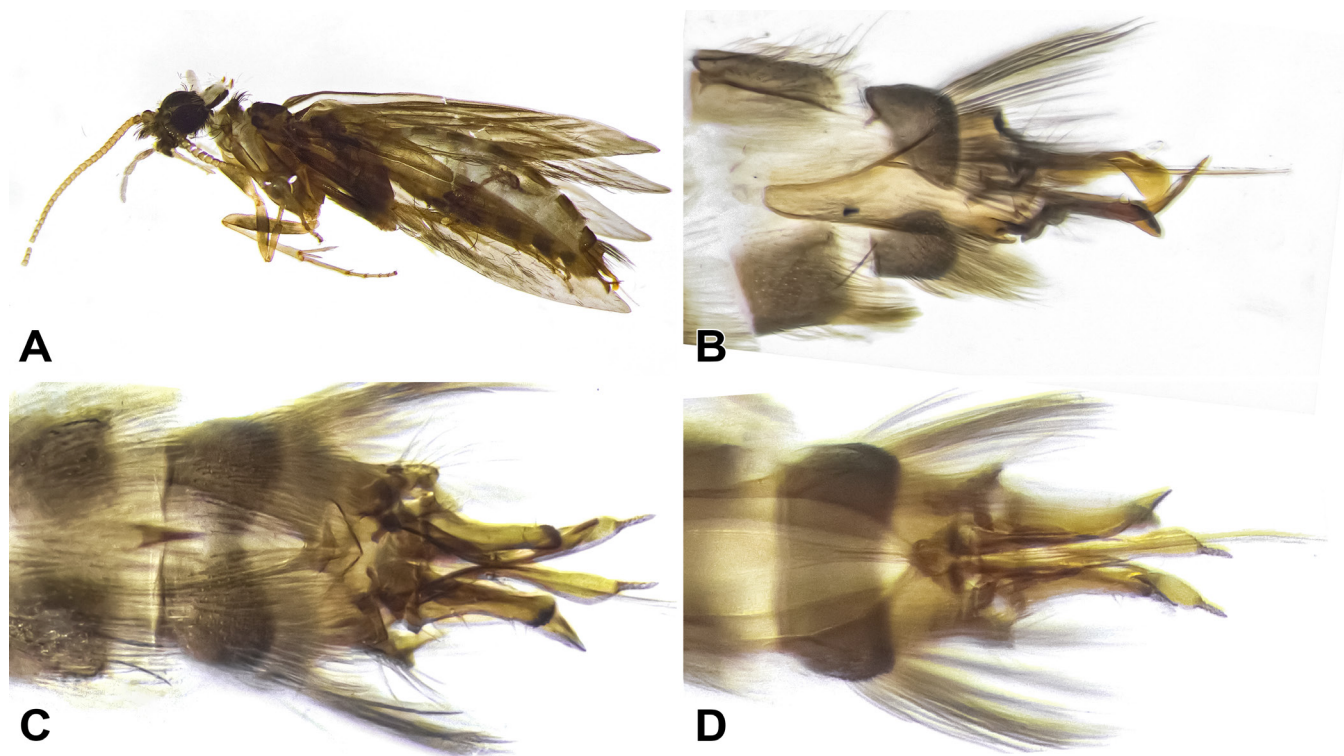
**Remarks.** Distributed in Austria, Czech Republic, Denmark, England, Germany, Hungary, Ireland, Italy, Slovenia, Romania, Spain, Sweden (Thomson, 2023). Recorded for the first time in Kosovo.

**Diagnosis.** Specimen from L1 Ujman possesses all characteristics typical for the species (Fig. 3): bulbous anterior segment IX in lateral view; expressed median lobe of segment X in dorsal view and typical intermediate appendages, subapically inflated.

**Family Limnephilidae Kolenati, 1848****Genus *Ecclisopteryx* Kolenati, 1848*****Ecclisopteryx keroveci* Previšić, Graf & Vitecek, 2014**

**Material examined.** 1♂, 3♀♀, KOSOVO, L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E); 2♂♂, 2♀♀, KOSOVO, L4 Revatskë (43°11'30.8472"N, 20°42'39.0204"E).

**Remarks.** A species with a limited distribution in the Balkans (Previšić et al., 2014), it is also considered rare in Kosovo (Ibrahimi et al., 2015a).



**Figure 3.** *Hydroptila martini* Marshall, 1977. **A.** Habitus, lateral view; **B–D.** Male genitalia. **B.** Lateral view; **C.** Ventral view; **D.** Dorsal view.

#### Genus *Limnephilus* Leach, 1815

##### *Limnephilus lunatus* Curtis, 1834

**Material examined.** 2♂♂, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** A widely distributed species in Europe (Neu et al., 2018), reported in a few localities in Kosovo (Ibrahimi & Vehapi, 2017; Ibrahimi et al., 2014a, 2019d; Bilalli et al., 2018).

#### Genus *Micropterna* Stein, 1873

##### *Micropterna nycterobia* McLachlan, 1875

**Material examined.** 2♂♂, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** *M. nycterobia* is widely distributed across Europe (Neu et al., 2018), whereas, in Kosovo, it was first recorded for the first time in 2013 and consequently in a few other sites (Ibrahimi et al., 2013, 2014a, 2018).

#### Genus *Potamophylax* Wallengren, 1891

##### *Potamophylax luctuosus* (Piller & Mitterpacher, 1783)

**Material examined.** 3♂♂, KOSOVO, L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E).

**Remarks.** This species is widespread in Europe (Neu et al., 2018) and reported in a few localities in Kosovo (Ibrahimi et al., 2012a, 2014b, 2019c).

#### Family Philopotamidae Stephens, 1829

##### Genus *Philopotamus* Stephens, 1829

##### *Philopotamus montanus* (Donovan, 1813)

**Material examined.** 12♂♂, 4♀♀, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** This species is widespread in Europe and Kosovo (Neu et al., 2018).

**Family Polycentropodidae Ulmer, 1903****Genus *Cyrnus* Stephens, 1836*****Cyrnus trimaculatus* (Curtis, 1834)**

**Material examined.** 2♂♂, 6♀♀, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** The species is relatively rare in Kosovo (e.g., Ibrahim et al., 2012a, 2014a; Salihu et al., 2023) and widespread in Europe (Neu et al., 2018).

**Genus *Plectrocnemia* Stephens, 1836*****Plectrocnemia conspersa* (Curtis, 1834)**

**Material examined.** 2♂♂, 3♀♀, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E), 4♂♂, 7♀♀, KOSOVO L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E).

**Remarks.** The species is relatively rare in Kosovo (e.g., Ibrahim et al., 2019c; Musliu et al., 2020) and widespread in Europe (Neu et al., 2018).

**Genus *Polycentropus* Curtis, 1835*****Polycentropus* sp.**

**Material examined.** 1♀, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** A single sampled female specimen of this species was impossible to be identified at the species level. Most probably it belongs to the *Polycentropus slovenica* Malicky, 1998. More specimens especially males are needed for safe identification.

**Family Psychomyiidae Walker, 1852****Genus *Psychomyia* Latreille, 1829*****Psychomyia pusilla* (Fabricius, 1781)**

**Material examined.** 23♂♂, 19♀♀, KOSOVO, L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E).

**Remarks.** This species is widespread in Europe and Kosovo (Neu et al., 2018).

**Genus *Lype* McLachlan, 1878*****Lype reducta* (Hagen, 1868)**

**Material examined.** 1♂, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** The species has a broad distribution across Europe and is commonly found in freshwater habitats (Neu et al., 2018).

**Genus *Tinodes* Curtis, 1834*****Tinodes pallidulus* McLachlan, 1878**

**Material examined.** 3♂♂, 1♀, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E).

**Remarks.** The species is found in various European freshwater ecosystems (Neu et al., 2018) and has been recorded in previous studies in Kosovo (Ibrahim et al., 2019c).

**Family Rhyacophilidae Stephens, 1836****Genus *Rhyacophila* Pictet, 1834*****Rhyacophila nubila* Zetterstedt, 1840**

**Material examined.** 12♂♂, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E); 4♀♀, KOSOVO L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E); 3♂♂, 2♀♀, KOSOVO, L3 Mitrovicë (42°54'10.7424"N, 20°52'2.5032"E).

**Remarks.** The species is widespread in Western Palearctic (e.g. Ibrahim et al., 2024c; Neu et al., 2018) and Kosovo (Ibrahim et al., 2012a, 2014b, 2015b; Bilalli et al., 2018; Ibrahim & Sejdiu, 2018).

### *Rhyacophila macedonica* Karaouzas, Valladolid & Ibrahimi, 2022

**Material examined.** 4♀♀, KOSOVO L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E); 5♂♂, 2♀♀, KOSOVO, L3 Mitrovicë (42°54'10.7424"N, 20°52'2.5032"E).

**Remarks.** This species is a Balkan endemic known from Greece, Kosovo, North Macedonia and Serbia (e.g. Valladolid et al., 2022; Salihu et al., 2023; Musliu et al., 2024). Some of the previously reported specimens as *R. fasciata* from Kosovo are actually *R. macedonica*, although both species occur in Kosovo (Ibrahimi et al., 2019c; Valladolid et al., 2021, 2022).

### *Rhyacophila tristis* Pictet, 1834

**Material examined.** 3♂♂, 1♀, Kosovo L4 Revatskë (43°11'30.8472"N, 20°42'39.0204"E).

**Remarks.** This is a widespread European species (e.g. Neu et al., 2018, Ibrahimi et al., 2017), widely distributed also in Kosovo (e.g., Ibrahimi et al., 2012a, 2014a, 2014b; Ibrahimi & Vehapi, 2017; Musliu et al., 2020).

## Family Sericostomatidae Stephens, 1836

### Genus *Sericostoma* Latreille, 1825

#### *Sericostoma flavicorne* Schneider, 1845 *sensu lato*

**Material examined.** 1♂, 3♀♀, KOSOVO, L1 Ujman (42°56'41.514"N, 20°39'39.06"E); 1♂, 2♀♀, KOSOVO, L2 Koshtovë (42°52'0.8148"N, 20°48'42.7788"E); 3♂♂, 3♀♀, KOSOVO, L4 Revatskë (43°11'30.8472"N, 20°42'39.0204"E).

**Remarks.** *Sericostoma flavicorne* Schneider, 1845 *sensu stricto* is most likely restricted to Turkey, from where it was described, as proved by recent investigations (e.g., Sipahiler, 2021). *Sericostoma schneiderii* Kolenati, 1848 was originally described from Croatia. Malicky (2004) synonymized several *Sericostoma* species under *S. flavicorne*, including *S. schneiderii*. Recent detailed investigations have reaffirmed the status of these species and led to the description of several new ones (e.g., Sipahiler, 2021; Olah & Vinçon, 2023). In the Balkans, *Sericostoma* specimens have been reported as both *S. flavicorne* and *S. schneiderii*. However, these reports of *S. flavicorne* should be understood in a broader sense referring to Malicky (2004), as is the case in this study. It is likely that *S. schneiderii* is the only species present in the Western Balkans, but this hypothesis requires confirmation through detailed morphological examinations of different populations. In some male specimens collected in the Ibër River, it is obvious that lateral prolongation of segment X have a small projection on the dorsal branch, which is not as big as in *S. flavicorne*, but still visible. While this is atypical for *S. schneiderii*, it can also be a variation.

## DISCUSSION

The faunistic composition of Trichoptera recorded from the study area reflects a diverse assemblage of species from 9 families, with notable differences in species distribution and abundance between the sampling sites. Among the findings, the record of *Hydroptila martini* is particularly significant, as this species is rarely encountered in Europe and represents the first confirmed record for Kosovo. This discovery highlights the importance of the Ujman sampling station as a habitat for overlooked or underreported micro-caddisfly species. The presence of *Hydroptila martini*, represented by a single male specimen, urges the need for further investigations into the micro-habitats of Hydroptilidae in the region to better understand their ecological preferences and conservation requirements. A single report of this species from the Balkan Peninsula from Montenegro (Neu et al., 2018) could not be traced and is thus not included in the comprehensive distribution of Hydroptilidae by Thomson (2023) making our finding probably the first confirmed record of this species from the Balkan Peninsula.

Family Rhyacophilidae was well represented by three species, demonstrating its typical presence in fast-flowing, cool-water habitats. *Rhyacophila nubila* was abundant at Ujman, while *Rhyacophila macedonica*, a recently described species with a known range in the Balkans, was recorded at three sites. This finding

aligns with earlier studies indicating the presence of *Rhyacophila macedonica* in a variety of lotic environments (Valladolid et al., 2021, 2022). The high abundance of *Psychomyia pusilla* at L2, with 42 specimens recorded, reflects the suitability of the site's conditions for this species. Such dominance of Psychomyiidae has been noted in studies across Europe, where *Psychomyia pusilla* is often linked to considerably disturbed habitats (Graf et al., 2008). Similarly, the abundance of *Silo pallipes* at L2 indicates that this species can tolerate considerable deterioration of water quality. The finding of *Ecclisopteryx keroveci* at L2 and L4 is also important. This species, described in 2014, is endemic to the Balkans and restricted to high-altitude streams (Previšić et al., 2014). Its presence highlights the importance of these sites and their role in supporting Balkan endemics. The population structure observed here, with males and females represented in low numbers, reflects the naturally limited distribution of this species and emphasizes the need for focused conservation measures to ensure the preservation of its habitats. Such a low population of this species in investigated sites indicates that the species is vulnerable to water quality deterioration. The record of *Cheumatopsyche lepida* at L4, with 8 males and 4 females, aligns with its known preference for medium to large rivers with moderate currents. Its presence at L4 may indicate favourable flow dynamics at this station, as this species is often indicative of well-oxygenated waters with good ecological status (Graf et al., 2008).

The discovery of 22 species across the four sites, with distinct patterns of species composition, emphasizes the ecological heterogeneity of the study area. L1, as the most species-rich site, contained a variety of taxa, from the broadly distributed *Rhyacophila nubila* and *Philopotamus montanus* to the less distributed *Hydroptila martini*. In contrast, L3 and L4 supported smaller but ecologically specialized assemblages, including rare species such as *Rhyacophila macedonica*, *Ecclisopteryx keroveci*, and *Potamophylax luctuosus*. The findings also emphasize the importance of small-scale studies in broader biogeographical contexts. The Trichoptera fauna of Kosovo has taken an increased attention during the past decade along with multiple studies conducted in neighbouring regions such as Albania and North Macedonia. Studies from these countries have documented similarly high levels of endemism and species richness, pointing to the Balkans as a biodiversity hotspot for freshwater invertebrates.

Finally, the results of this study contribute to the growing set of data highlighting the need for targeted conservation efforts in the Balkans. The unique assemblage of Trichoptera species recorded here emphasizes the vulnerability of freshwater ecosystems in the region to anthropogenic pressures. Conservation measures should prioritize the preservation of freshwater ecosystems with minimal disturbance, ensuring that critical habitats for endemic and rare species are maintained. These studies and measures are urgently needed in light of recent trends in water quality degradation across Kosovo (Bilalli et al., 2022, Grapci et al., 2010, 2019, 2020, 2025; Ibrahimimi et al., 2007, 2021c) including Ibër River (Bućinca et al., 2024; Zogaris et al., 2024).

## AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: H. Ibrahimimi: Fieldwork, identification of specimens, writing, and reviewing, A. Bilalli., D. Geci. & M. Musliu: Fieldwork sampling of specimens, photography, and writing. All authors approved the final version of the manuscript.

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## AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in the Department of Biology, Faculty of Mathematics and Natural Sciences, University of Prishtina "Hasan Prishtina", Prishtinë, Kosovo, and are available, upon request.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

## CONSENT FOR PUBLICATION

Not applicable.

## CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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## مطالعه فون حشرات راستهٔ بال‌مударان (Insecta: Trichoptera) رودخانه ایبر در کوزوو و اولین گزارش گونهٔ *Hydroptila martini* Marshall, 1977

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**چکیده:** این مقاله نتایج مطالعات فونستیک حشرات راستهٔ بال‌مударان که در چهار ایستگاه نمونه‌برداری در رود ایبر، کوزوو انجام شده است، را ارائه می‌دهد. در مجموع ۲۲ گونه از ۹ خانواده ثبت شده است که شامل ۱۳۳ نمونه نر و ۹۴ نمونه ماده می‌باشد. غنی‌ترین محل از نظر گونه‌ها، ایستگاه L1 شامل ۱۱ گونه بود که از میان آنها حضور گونهٔ *Hydroptila martini* Marshall, 1977 برای اولین بار در کوزوو ثبت شد. از این گونهٔ کمیاب تنها یک نمونه نر جمع‌آوری شد و حضور آن، اهمیت منطقه مطالعاتی را برای ثبت دیگر تاکسون‌های نادیده گرفته شده را نشان می‌دهد. یافته‌های قابل توجه دیگر شامل فراوانی *Rhyacophila nubila* Zetterstedt, 1840 در ایستگاه L1 و همچنین گونه‌های *Psychomyia pusilla* Fabricius, 1781 و *Silo pallipes* Fabricius, 1781 در ایستگاه L2 نشان‌دهندهٔ تنوع شرایط اکولوژیک در این مناطق می‌باشد. گونه‌های اندمیک‌های منطقهٔ بالکان مانند *Rhyacophila Ecclisopteryx keroveci* Previšić, Graf & *macedonica* Karaouzas, Valladolid & Ibrahimi, 2022 در Vitecek, 2014 در تعداد کم ثبت شدند که احتمالاً نشان‌دهندهٔ وابستگی این دو گونه به کیفیت آب می‌باشد. نتایج این تحقیق مطالعه بر اهمیت افزایش اقدامات حفاظتی برای نگهداری اکوسیستم‌های آب شیرین آسیب‌پذیر کوزوو که زیستگاه بسیاری از گونه‌های اندمیک و کمیاب بال‌مударان می‌باشد تأکید دارد.

**واژگان کلیدی:** تنوع زیستی، توزیع، ترجیح اکولوژیک، آب شیرین، ریز-بال‌مударان