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First Record of *Hydroptila ivisa* Malicky, 1972 (Trichoptera: Hydroptilidae) from Slovakia, with Additional Data on Caddisflies from Two Western Carpathian Streams

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ABSTRACT

We report the first record of *Hydroptila ivisa* Malicky, 1972 in Slovakia. The faunistic survey of caddisflies was conducted on the eastern slopes of the Veľká Fatra Mountains in the village of Blatnica (Turiec River Basin, central Slovakia) in 2024. One male and two females of *Hydroptila ivisa* were attracted by UV light traps at the Blatnický potok stream. In 2025, the presence of the species was confirmed at the same locality with the capture of two additional females. Furthermore, one male and one female were recorded upstream in the Gaderský potok stream, the main tributary of the Blatnický potok stream, located within the Veľká Fatra National Park. This is only the third known location of the species in the Carpathians; consistent with its already known habitat preferences, it was found in the rhithral. We also present a list of caddisfly species recorded during the survey, which expands the known species diversity of the region.

Keywords: faunistics, distribution, submontane stream, Ramsar site, Carpathians.

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INTRODUCTION

Research on caddisflies (Trichoptera) in Slovakia has been ongoing since the turn of 20th century; many studies, including recent significant records from Slovakia, were compiled by Navara et al. (2024). The current investigation was conducted in the Turiec region, known for its two mountain ranges, the Malá Fatra and Veľká Fatra, both protected as national parks. Nestled between them lies the Turiec Basin, through which the Turiec River flows. The river is notable for its ecosystem and adjacent marshes (Topercer & Kadlečík, 1997), which led to its listing under the Ramsar Convention on Wetlands of International Importance (Ramsar, 1971). From a biodiversity perspective, the region is considered unique on both national and European scales, owing to its complex geohistorical development (Krno, Tirjaková, Šporka, & Bulánková, 1997). The Turiec River basin has previously been examined in detail, yielding records of 62 caddisfly taxa (Krno et al., 1996). Subsequently, Rúfusová, Krno, and Šporka (2014) reported 54 caddisfly species from the Turiec River, alongside other aquatic invertebrates. Regarding the family Hydroptilidae, in both studies, only *Hydroptila vectis* Curtis, 1834, and *Ithytrichia lamellaris* Eaton, 1873 were recorded. In selected streams and river segments in the Turiec basin, benthic invertebrates are monitored as part of a state-run ecological assessment programme (e.g. Lešťáková, Mišíková Elexová, Očadlík, Ščerbáková, & Vráblová, 2021). Thomková et al. (2023) compared macroinvertebrate communities in the upper reaches of streams across different geological bedrock types within the region. They reported 23 caddisfly species, most of which were typical for epirhithral zones. During routine monitoring in 2024, caddisfly assemblages were surveyed in a specific urban environment. Unexpectedly, this effort led to the first record of *Hydroptila ivisa* in Slovakia. In 2025, the study was expanded to include sites upstream and downstream of the village of Blatnica, aiming to obtain additional records of *H. ivisa*, which proved successful.

MATERIAL AND METHODS

Adult caddisflies were collected at four sites (S1–S4) in and around the village of Blatnica (Western Carpathians, Slovakia) (Fig. 1, Table 1). Initial sampling was conducted directly in the village, downstream of the confluence of the Blatnický potok and Gaderský potok streams (site S2), during July and August 2024, and again in August 2025. This site is approximately 1 km downstream from the boundary of Veľká Fatra National Park, near the village centre. Due to flood control measures, the stream banks are reinforced with high concrete revetments (Fig. 2b). The site is characterised by a strong current, a substrate composed mainly of macro- and megalithal, and moss-covered stones. In 2025, an upstream site was added on the Gaderský potok stream (site S1) (Fig. 2a), located about 3 river kilometres upstream from its confluence with the Blatnický potok stream. This site lies within the forested area of Veľká Fatra National Park and represents a near-pristine habitat with natural, unaltered banks. The substrate was dominated by macrolithal, with patches of microlithal and gravel along the margins. The site was shaded mainly by deciduous trees, with occasional conifers, and mosses were largely absent. Two additional sites (S3 and S4) were established downstream of Blatnica village on the Blatnický potok stream (Figs. 3a, b). These sites are located in an agricultural landscape, but the stream retains natural banks without artificial reinforcement. The

riparian vegetation is relatively well developed and includes trees and shrubs (Fig. 3a). This stream section is part of a designated Ramsar site integrated into the Turiec wetlands (RSIS, 2025). It is also part of the NATURA 2000 network and protected as a Special Area of Conservation under the European Union's Habitats Directive (92/43/EEC).

Table 1. List of sampling sites.

Site	Altitude (m asl.)	GPS coordinates	Stream
S1	530	48°56'45.08"N, 18°56'52.46"E	Gaderský potok
S2	499	48°56'07.50"N, 18°55'35.00"E	Blatnický potok
S3	485	48°56'47.32"N, 18°55'35.76"E	Blatnický potok
S4	465	48°57'55.21"N, 18°55'04.80"E	Blatnický potok

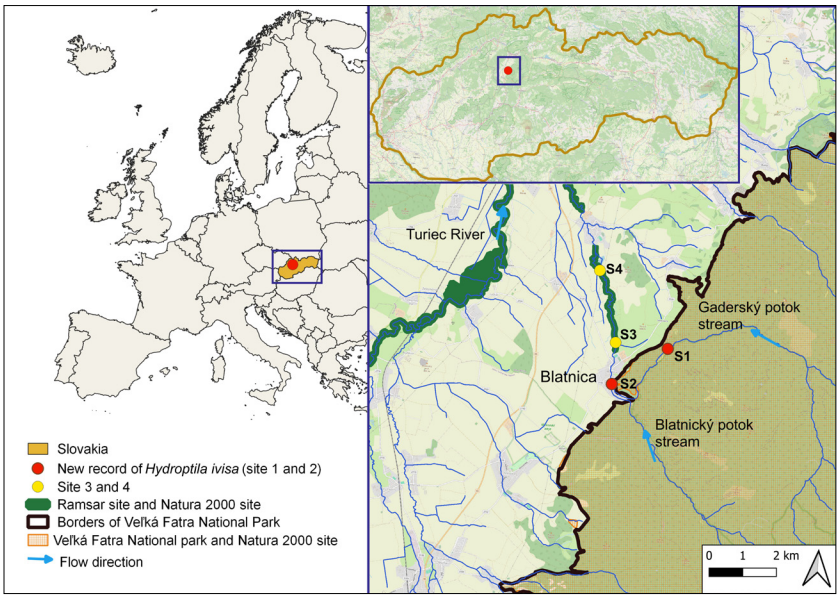

Figure 1. Map of the investigated area with the sampling sites. Source/Base maps: ZBGIS (GKÚ) and ŠOP SR. Map created in QGIS 3.28.13.

Figure 2. Sampling sites, where *Hydroptila ivisa* was recorded. a) S1– the Gaderský potok stream in the Veľká Fatra National Park forest, b) S2– the Blatnický potok stream below confluence with the Gaderský potok stream, the village Blatnica (Martin district, Slovakia).

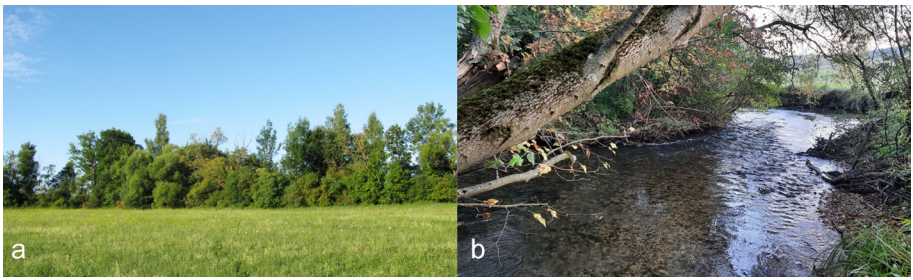

Figure 3. The lower stretch of the Blatnický potok stream. a) Vegetation cover along the stream where S4 was located, b) The sampling site S4.

Adult caddisflies were collected using UV light traps. All specimens were preserved in 75% ethanol and identified according to the identification atlas by Malicky (2004). Male and female genitalia of *Hydroptila ivisa* were cleared in 10% KOH, rinsed in distilled water, and photographed using a Canon EOS R7 camera mounted on an Olympus BX41 microscope. Image stacking was performed using Helicon Focus version 8.3.5.

RESULTS

In total, more than 10,000 adult caddisflies were collected, representing 51 species from 15 families (Table 2). The most significant finding was the discovery of the microcaddisfly *Hydroptila ivisa* in both the Blatnický potok stream and its main tributary, the Gaderský potok stream. At the village site (S2), one male and two females were recorded in 2024, followed by two additional females in 2025. The supplementary site, located upstream in the forested section of Veľká Fatra National Park (S1), was sampled in 2025, where one male and one female were collected.

Material examined: Blatnický potok, 499 m (S2) 20.07.2024, 1 ♂ 2 ♀♀; 20.08.2025, 2 ♀♀; Gaderský potok, 530 m (S1): 22.07.2025, 1 ♀; 26.7.2025, 1 ♂.

Altogether, seven individuals of *H. ivisa* were recorded (2♂♂, 5♀♀). The male and female genitalia (Fig. 4) matched the drawings provided by Malicky (2004).

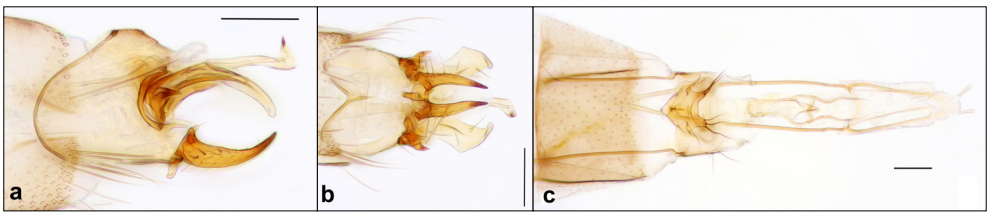

Figure 4. Genitalia of *Hydroptila ivisa*. Male genitalia a) lateral view, b) ventral view; c) female genitalia, ventral view. Scale bar length 0.1 mm.

Caddisfly assemblages at the study sites were dominated by *Agapetus ochripes* (5,600 individuals) and *Psychomyia pusilla* (2,000 individuals). Other relatively numerous species included *Hydropsyche instabilis*, *Ecclisopteryx dalecarlica*, *Lepidostoma basale*, and *Odontocerum albicorne*. The family Hydroptilidae was represented by six species*: Hydroptila forcipata*, *H. ivisa*, *H. vectis*, *Ithytrichia*

lamellaris, and *Oxyethira flavicornis*. Among them, *I. lamellaris* was the most abundant (42 individuals), followed by *H. forcipata* (17 ind.).

Table 2. The list of caddisflies collected during the study in 2024 and 2025.

Species/site	S1	S2	S3	S4
1. *Brachycentrus montanus* Klapálek, 1892	1 ♂			
2. *Ecnomus tenellus* (Rambur, 1842)*				1 ♂ 1 ♀
3. *Agapetus delicatulus* McLachlan, 1884		1 ♀		
4. *Agapetus ochripes* Curtis, 1834	390 ♂ 2,500 ♀	73 ♂ 357 ♀	650 ♂ 850 ♀	300 ♂ 500 ♀
5. *Glossosoma boltoni* Curtis, 1834	2 ♀	1 ♀	1 ♀	1 ♀
6. *Goera pilosa* (Fabricius, 1775)		1 ♀		
7. *Silo pallipes* (Fabricius, 1781)	2 ♂ 1 ♀	1 ♂	1 ♂ 8 ♀	16 ♂ 21 ♀
8. *Hydropsyche instabilis* (Curtis, 1834)	80 ♂	3 ♂	36 ♂	170 ♂
9. *Hydropsyche modesta* Navás, 1925*		1 ♂		
10. *Hydropsyche pellucidula* (Curtis, 1834)		1 ♂	3 ♂	
11. *Hydropsyche siltalai* Döhler, 1963	1 ♂			
Hydropsyche spp.	310 ♀		450 ♀	400 ♀
12. *Cheumatopsyche lepida* (Pictet, 1834)		2 ♂ 3 ♀	86 ♀	33 ♀
13. *Agraylea sexmaculata* Curtis, 1834*	1 ♂	5 ♂ 1 ♀		
14. *Hydroptila forcipata* (Eaton, 1873)	1 ♂ 5 ♀	1 ♂ 1 ♀	7 ♀	2 ♀
15. *Hydroptila ivisa* Malicky, 1972*	1 ♂ 1 ♀	1 ♂ 4 ♀		
16. *Hydroptila vectis* Curtis, 1834*		6 ♀		
17. *Ithytrichia lamellaris* Eaton, 1873		1 ♂ 2 ♀	2 ♀	5 ♂ 32 ♀
18. *Oxyethira flavicornis* (Pictet, 1834)*		1 ♂ 1 ♀		
19. *Athripsodes albifrons* (Linnaeus, 1758)*		1 ♂ 3 ♀		1 ♂
20. *Athripsodes cinereus* (Curtis, 1834)*		1 ♀		1 ♀
21. *Ceraclea albimacula* (Rambur, 1842)*		1 ♀		1 ♂
22. *Mystacides azurea* (Linnaeus, 1761)*			1 ♀	
23. *Mystacides longicornis* (Linnaeus, 1758)*				1 ♂
24. *Oecetis testacea* (Curtis, 1834)*		1 ♂		
25. *Lepidostoma basale* (Kolenati, 1848)	7 ♂ 14 ♀	6 ♂ 19 ♀	18 ♂ 110 ♀	2 ♂ 6 ♀
26. *Ecclisopteryx dalecarlica* Kolenati, 1848	10 ♀	3 ♂ 3 ♀	20 ♂ 150 ♀	2 ♂ 11 ♀
27. *Chaetopteryx fusca* Brauer, 1857	2 ♂			
28. *Allogamus auricollis* (Pictet, 1834)				4 ♂
29. *Halesus digitatus* (Schrank, 1781)	6 ♀			
30. *Halesus radiatus* (Curtis, 1834)	2 ♂		1 ♂	1 ♂
31. *Micropterna testacea* (Gmelin, 1789)*	1 ♀			
32. *Potamophylax depilis* Szczęsny, 1994		1 ♀		
33. *Potamophylax latipennis* (Curtis, 1834)	1 ♂	1 ♂		
34. *Stenophylax permistus* McLachlan, 1895*	2 ♂			
35. *Odontocerum albicorne* (Scopoli, 1763)	73 ♂ 26 ♀	3 ♂ 2 ♀	10 ♂ 14 ♀	30 ♂ 21 ♀
36. *Philopotamus ludificatus* McLachlan, 1878				1 ♀
37. *Philopotamus montanus* (Donovan, 1813)	3 ♀			
38. *Philopotamus variegatus* (Scopoli, 1763)	1 ♂ 1 ♀			
39. *Cyrnus trimaculatus* (Curtis, 1834)*			1 ♀	1 ♀
40. *Plectrocnemia conspersa* (Curtis, 1834)	3 ♂	1 ♀		
41. *Polycentropus flavomaculatus* (Pictet, 1834)			1 ♀	
42. *Polycentropus irroratus* (Curtis, 1835)*				3 ♂
43. *Lype reducta* (Hagen, 1868)	1 ♂ 1 ♀		1 ♀	
44. *Psychomyia pusilla* (Fabricius, 1781)	40 ♂ 205 ♀	16 ♂ 149 ♀	500 ♂ 1,000 ♀	18 ♂ 78 ♀
45. *Tinodes unicolor* (Pictet, 1834)*	1 ♀		1 ♀	1 ♀
46. *Rhyacophila fasciata* Hagen, 1859	1 ♀			1 ♀
47. *Rhyacophila nubila* (Zetterstedt, 1840)	1 ♀	1 ♂	1 ♂ 9 ♀	5 ♂ 11 ♀
48. *Rhyacophila obliterata* McLachlan, 1862	12 ♂		3 ♂ 1 ♀	15 ♂ 3 ♀
49. *Rhyacophila vulgaris* Pictet, 1834	2 ♂ 1 ♀	6 ♂ 1 ♀	2 ♂ 3 ♀	
50. *Sericostoma personatum* (Spence, 1826)	2 ♂	1 ♂ 2 ♀		1 ♂
51. *Sericostoma schneiderii* (Kolenati, 1848)	22 ♂ 70 ♀		2 ♂ 46 ♀	2 ♂

* - species recorded within the region for the first time; ♂ - male, ♀ - female

DISCUSSION

Previous investigations by Krno et al. (1996) and Rúfusová et al. (2014) documented a substantial portion of the regional caddisfly fauna based on larval material. However, for species such as *Hydroptila ivisa*, as with many other members of the family Hydroptilidae (commonly referred to as microcaddisflies), larval stages are not reliably identifiable to the species level and require adult specimens for accurate identification (Waringer & Graf, 2011). The use of UV light traps to collect adult specimens in this study enabled us to expand the known species richness of the region by 17 additional species.

The occurrence of *H. ivisa* is particularly noteworthy. This species has previously been recorded in Austria (Malicky, 1999), Bulgaria (Kumanski, 1985), the Czech Republic (Komzák & Kroča, 2011), France (Coppa, 2010), Germany (Weinzierl & Dorn, 1995), Italy (Lodovici & Valle, 2020), Kosovo (Bilalli, Ibrahimi, Musliu, Geci, & Grapci-Kotori, 2024), Slovenia (Urbanič, 2004), Switzerland (Lubini-Ferlin & Vicentini, 2005), and Ukraine (Szczęsny & Godunko, 2008) (see also Thomson, 2023). Its distribution is primarily centred in the Alps; it is relatively common in Lower and Upper Austria (Malicky, 1999) and is classified as Least Concern (LC) in Austria (Malicky, 2009). In Switzerland it is considered Vulnerable (VU) (Lubini, Knispel, Sartori, Vincentini, & Wagner, 2012). Only a few records are known from the Carpathians, where it was first reported by Szczęsny & Chvojka (2008), and there are only sporadic occurrences in the Pyrenees, Apennines, and the Balkans (Neu, Malicky, Graf, & Schmidt-Kloiber, 2018). The most recent record before this study was from Kosovo (Bilalli et al., 2024).

Although our finding is not the first within the Carpathian ecoregion, it represents the first record of *H. ivisa* in Slovakia; and it is only third known location in the Carpathians, occurring a decade after the last record from the Czech Republic (Komzák & Kroča, 2011). Its rarity has been further emphasised also from Kosovo by Bilalli et al. (2024), who described the species as difficult to detect despite repeated sampling efforts, likely reflecting small and localised populations.

We collected *H. ivisa* in rhithral zones, its preferred natural habitat (Graf, Murphy, Dahl, Zamora-Muñoz, & López-Rodríguez, 2008), consistent with findings from Italy (Corallini, Bicchierai, Cianficconi, & Tucciarelli, 2013) and Kosovo (Bilalli et al., 2024). Within the rhithral (from epirhithral to hyporhithral), it inhabits lithal microhabitats, particularly those with algal cover (Graf et al., 2008), and is associated with fast-flowing, turbulent waters (Kumanski, 1985). These ecological preferences, together with its submontane to colline altitudinal range (Graf et al., 2008), are consistent with our observations. We recorded the species in both a regulated reach with hydromorphological alterations and a near-natural forested site approximately 3 km upstream.

For comparison, the *H. ivisa* record from Kosovo originated from a disturbed site (Bilalli et al., 2024), while in the Czech Republic, it was recorded in a regulated reach downstream of a reservoir in the village of Morávka (Komzák & Kroča, 2011). These findings suggest a degree of ecological plasticity, although the species still appears to prefer relatively clean, oxygen-rich streams with suitable microhabitats. Regarding the other caddisfly species recorded in this study, most are common and widespread in submontane streams across

Slovakia. However, from a faunistic perspective, the record of *Agapetus delicatulus* is notable, as its distribution in Slovakia remains little known (Navara, Chvojka, & Lukáš, 2025), despite previous occurrence in the studied region (Krno et al., 1996). The record of *Oecetis testacea*, although a widely distributed species, is also significant, as adult specimens were only recently documented for the first time in Slovakia (Navara et al., 2024). The species is known from both lentic and lotic habitats (Graf et al., 2008).

Several other species, such as *Ecnomus tenellus*, *Hydropsyche modesta*, *Agraylea sexmaculata*, *Hydroptila vectis*, *Oxyethira flavicornis*, *Athripsodes albifrons*, *Athripsodes cinereus*, *Ceraclea albimacula*, *Mystacides azurea*, *Mystacides longicornis*, *Micropterna testacea*, *Stenophylax permistus*, *Cyrnus trimaculatus*, *Polycentropus irroratus*, and *Tinodes unicolor* are documented for the first time in the Turiec region. Some of them, such as *A. sexmaculata, O. flavicornis, A. cinereus,* and *M. longicornis*, are probably not native to the investigated stream stretches and were likely attracted to the UV light from nearby aquatic habitats. Nevertheless, they are included here for faunistic purposes.

In conclusion, the occurrence of *Hydroptila ivisa* was repeatedly recorded within a typical submontane caddisfly assemblage. Compared to 2024, the extended sampling effort in 2025 led to the record of an additional locality for the species. Although not the first record within the Carpathian ecoregion, this is the first documentation of *H. ivisa* in Slovakia, thereby extending the known range of the species. However, further studies are needed to better understand its ecology, habitat requirements, and distribution within Slovakia.

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