

Some new faunistic records of Chironomidae (Diptera) from the Republic of Kosovo

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Abstract

In this article, we share our results regarding adult male Chironomidae collected from the Lepenc River Watershed located above the settlements of Dimcë and Dërmjak, part of the Karadak Mountain range in western Kosovo. We document 16 species and one taxon at the generic level from these habitats, with 12 species identified as new faunistic records for Kosovo.

Introduction

Despite Europe being a well-studied part of the Palearctic, a few regions in this continent remain that require further investigation into the diversity of their Chironomidae fauna, in particular countries in the Balkans and the Caucasus regions. In the Balkan Peninsula, the Chironomidae diversity of the landlocked nation of Kosovo has only recently received attention. Płóciennik (2008) expedition in Albania updated the number of known Chironomidae from this country and provided additional faunistic records from the neighbouring Balkan countries. Berljolli et al. (2019) presented a list of the Chironomidae collected from two springs in western Kosovo as supplementary materials. Berljolli et al. (2020) conducted a comprehensive study of 37 springs in the Bjeshkët e Nemuna Mountains, recording 43 Chironomidae taxa with clear zonation of species distribution based on their habitats. The Bjeshkët e Nemuna Mountains encompass three countries in the Balkans: Albania, Kosovo, and Montenegro. Berljolli and Płóciennik's (2023) study of benthic invertebrates of springs in the Bjeshket e Nemuna National Park, Kosovo, established that, with 43 out of 51 taxa identified, Chironomidae are the major invertebrate component of these habitats. Płóciennik et al. (2023) presented a detailed overview of Chironomidae taxa in small freshwater systems of the Balkans, their ecology, and the environmental factors influencing their diversity. These studies overall produced 23 named species for Kosovo.

As part of the investigation into the diversity of aquatic insects from the western Balkans, Musliu et al. (2024) collected adults of Chironomidae, representing interesting findings on faunistic knowledge of Kosovo's Chironomidae. In this study, we present these findings on adult male Chironomidae collected from Lepenc River Watershed above the villages of Dimcë and Dërmjak, part of the Karadak Mountain in western Kosovo.

Material and Methods

Collection, preparation, mounting, and imagery

The adult Chironomidae specimens were sampled at night with ultraviolet pan traps. The 50 cm-diameter pan traps were filled approximately 30% with a solution of 30% water mixed with a few drops of detergent and positioned near the water source. To attract specimens, ultraviolet light sources with an eight-watt output were installed above the white pans and operated from dusk to the next morning (Fig. 1). Collected samples were immediately preserved in 80% ethanol. The adult specimens were



Figure 1. The ultraviolet light trap used for the collection of Chironomid specimens.

mounted on slides using a Canada balsam mounting medium following the procedures outlined in Epler (2001). The imagery was produced using an OMAX A3550U Camera mounted on an AMScope compound microscope. Images were stacked and compressed using Helicon Focus 8.0 and further edited in GIMP 2.10.38 software. The voucher specimens of Chironomidae are deposited at the entomology collection of the Department of Biology, Faculty of Mathematics and Natural Sciences, University of Prishtina, Kosovo.

Sampling area

The sampling was carried out at two sampling sites: Dimcë (Figs 2a-b) (42.170295°N, 21.315259°E) and Dërmjak (Figs 2b-c) (42.173038°N, 21.316659°E) in Hani i Elezit Municipality, Kosovo. Both sites are located within Kosovo's Lepenc River Watershed and the Black Sea Basin. At the Dimcë sampling site, the stream bed was primarily composed of large rocks, accompanied by stones, pebbles, gravel, and a small amount of fine sediment. The streambanks were densely vegetated, with over 80% of their surface covered



Figure 2. Sampling habitats at Lepenc River Watershed, Kosovo (a-d). a-b. Dimcë, c-d. Dërmjak.

with vegetation. The riparian zone on both sides of the stream was well-preserved and largely undisturbed, contributing to the ecological stability of the area. At the Dërmjak sampling site, the streambed was primarily composed of large rocks, along with stones, pebbles, gravel, and a small amount of fine sediment. The stream banks were densely vegetated, with more than 80% of their surface covered by vegetation, and the riparian zone on both sides remained intact and undisturbed. A notable feature of this site was a small waterfall-like segment that created a deeper pool of water immediately below it, adding to its hydrological diversity.

Results

A total of 16 species, and one taxon at the generic level, were identified from 66 adult males collected from the Lepenc River Watershed, with 12 species representing new faunistic records for Kosovo (Table 1). The gallery of the newly recorded species from Kosovo is provided in Fig. 3.

Discussion

With the exception of *Limnophyes spinigus* Sæther, 1990, all other species identified in this study have a widespread Palearctic distribution. *L. spinigus*, previously widely reported from Northern and Western Europe, now has two records from the Balkans, one from Montenegro in BOLD system (Sample ID: BIOUG56208-C11) and the other from Kosovo, suggesting a more widespread distribution of this species on the continent.

Although previous freshwater studies conducted in the Balkans, including Kosovo, have produced and provided significant information about the Chironomidae fauna and their ecology, actual faunistic studies

Table 1. List and record of the Chironomidae (Diptera) species collected from Lepenc River Watershed, Kosovo, 2024. NFR = New Faunistic Record, No. = Number.

Subfamily	Species	No. adult male	Location	NFR
Tanypodinae	<i>Procladius (Psilotanypus) choreus</i> (Meigen, 1804)	1	Dërmjak	Kosovo
	<i>Psectrotanypus varius</i> (Fabricius, 1787)	1	Dërmjak	Kosovo
Orthoclaadiinae	<i>Brillia longifurca</i> Kieffer, 1921	2	Dimcë	Kosovo
	<i>Cardiocladius fuscus</i> Kieffer, 1924	9	Dërmjak	Kosovo
	<i>Cricotopus (s.s.) bicinctus</i> (Meigen, 1818)	17	Dimcë	
		8	Dërmjak	
	<i>Cricotopus (Paratrichocladius) nigrinus</i> (Goetghebuer, 1938)	1	Dërmjak	Kosovo
	<i>Eukiefferiella claripennis</i> (Lundbeck, 1898)	1	Dërmjak	
	<i>Eukiefferiella devonica</i> (Edwards, 1929)	2	Dërmjak	Kosovo
		3	Dimcë	
	<i>Limnophyes spinigus</i> Sæther, 1990	2	Dërmjak	Kosovo
	<i>Orthocladus (s.s.) oblidens</i> (Walker, 1856)	1	Dërmjak	Kosovo
<i>Rheocricotopus (Psilocricotopus) chalybeatus</i> (Edwards, 1929)	6	Dërmjak	Kosovo	
<i>Tvetenia calvescens</i> (Edwards, 1929)	4	Dimcë	Kosovo	
Chironominae	<i>Chironomus (s.s.) riparius</i> (Meigen, 1804)	3	Dërmjak	
	<i>Microchironomus tener</i> (Kieffer, 1918).	1	Dimcë	Kosovo
	<i>Polypedilum (Uresipedilum) convictum</i> (Walker, 1856)	1	Dërmjak	
	<i>Polypedilum (Tripodura) pullum</i> (Zetterstedt, 1838)	1	Dërmjak	Kosovo
	<i>Polypedilum (Tripodura) sp.</i>	2	Dërmjak	

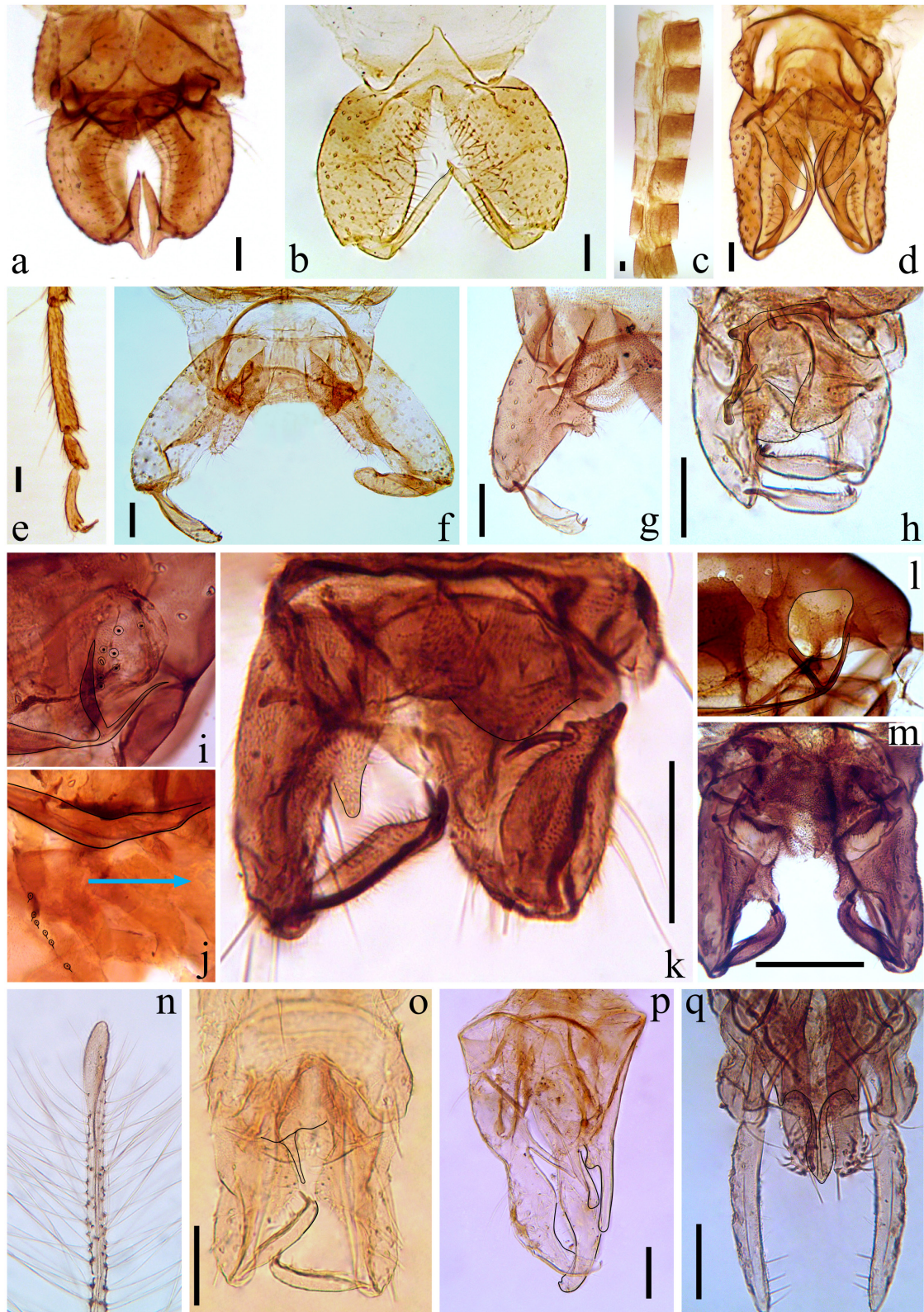


Figure 3. Gallery of the newly recorded species collected from Lepenc River Watershed, Kosovo. a. *Procladius (Psilotanytus) choreus* (Meigen, 1804), b. *Psectrotanytus varius* (Fabricius, 1787), c-d. *Brillia longifurca* Kieffer, 1921, e-f. *Cardiocladius fuscus* Kieffer, 1923, g. *Cricotopus (Paratichocladus) nigrinus* (Goetghebuer, 1938), h. *Eukiefferiella devonica* (Edwards, 1929), i-k. *Limnophyes spinigus* Sæther, 1990, l-m. *Rheocricotopus (Psilocricotopus) chalybeatus* (Edwards, 1929), n-o. *Tvetenia calvescens* (Edwards, 1929), p. *Microchironomus tener* (Kieffer, 1918), q. *Polypedilum (Tripodura) pullum* (Zetterstedt, 1838). a, b, d, f-h, k, m, o-q. Hypopygium, c. Abdominal segments II–VII, e. Hind leg tarsal segments 3–5, i. Thoracic humeral setae, j. Thoracic preepisternal setae; arrow indicates the direction of thorax, l. Thoracic humeral pit, n. Apex of last antennal flagellomere. *Orthocladus (s.s.) oblidens* (Walker, 1856) was omitted due to the poor condition of the specimen. All scale bars are 50 μ m.

are still necessary to assess the real richness and diversity of the species. Furthermore, to increase the taxonomic resolution of Chironomidae fauna, conducting these faunistic studies by including adults rather than just immatures would be necessary (Bitušik and Trnková, 2019). The 12 new faunistic records obtained in this study for Kosovo, from a single freshwater system, demonstrate the future potential of discovering more Chironomidae fauna in the country and the Balkans.

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References

- Berlajolli, V. and Płóciennik, M. 2023. A preliminary list of crenobiontic species in the Bjeshket e Nemuna National Park (Republic of Kosovo). - *Oltenia-Studii și comunicări Științele naturii* 39 (2): 100–1003.
- Berlajolli, V., Płóciennik, M., Pešić, V. and Berlajolli, X. 2020. Chironomidae of the Cursed Mountains (Bjeshkët e Nemuna National Park). BIODIVEST Conference, Craiova, Romania.
- Berlajolli, V., Płóciennik, M., Antczak-Orlewska, O. and Pešić, V. 2019. The optimal time for sampling macroinvertebrates and its implications for diversity indexing in rheocrenes – case study from the Prokletije Mountains. - *Knowledge and Management of Aquatic Ecosystem* 420(6): 1–9. DOI: <https://doi.org/10.1051/kmae/2018043>
- Bitušik, P. and Trnková, K. 2019. A preliminary checklist of Chironomidae (Diptera) from Albania with first records for the Balkan Peninsula. - *Zootaxa* 4563: 361–371 DOI: <https://doi.org/10.11646/zootaxa.4563.2.10>
- Epler, J.H. 2001. Identification manual for the larval Chironomidae (Diptera) of North and South Carolina. A guide to the taxonomy of the midges of southeastern United States, including Florida. North Carolina Department of Environment and Natural Resources, Raleigh, NC and St. Johns River Water Management District, Palatka, FL. Special Publication SJ2011-SP13 526.
- Musliu, M., Bilalli, A., Geci, D. and Ibrahim, H. 2024. First record of *Hydroptila kalonichtis* Malicky, 1972 (Trichoptera, Hydroptilidae) from the western Balkans. - *Natura Croatica* 33: 279–286. DOI: <https://doi.org/10.20302/NC.2024.33.22>
- Płóciennik, M. (2008) New records of Chironomidae (Diptera) from Albania. - *Lauterbornia* 63: 101–108.
- Płóciennik, M., Berlajolli, V., Dmitrović, D., Gligorović, B., Pešić, V. and Gadawski, P. 2023. The Chironomidae (Diptera) diversity in the Balkan Peninsula spring systems and other small water bodies. - *International Journal of Limnology* 59 (6): 1–11. DOI: <https://doi.org/10.1051/limn/2023005>

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