

# Contribution to the knowledge of spiders (Araneae) of the upper course of the Neretva River in Bosnia and Herzegovina

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## KEY WORDS:

biodiversity, faunal survey, species inventory, spiders, Bosnia and Herzegovina

## KLJUČNE BESEDE:

biodiverzitet, naravovarstvo, favnistična raziskava, inventarizacija vrst, pajki, Bosna in Hercegovina

## KLJUČNE RIJEČI:

biodiverzitet, očuvanje prirode, istraživanje faune, inventarizacija vrsta, pauci, Bosna i Hercegovina

## ABSTRACT

The upper course of the Neretva River, located in the rugged landscapes of Bosnia and Herzegovina (BiH), hosts a unique and largely unexplored ecosystem with significant biodiversity. This study aims to document the spider (Araneae) species inhabiting this region, including the Neretva's wider catchment area, Nevesinjsko polje, and the Vranjača cave. Using various sampling methods, we identified 84 spider species from 72 genera and 22 families, with 50 (60%) species reported in BiH for the first time. Notable findings include the abundant *Piratula knorri* (Scopoli, 1763) (Lycosidae), and cave-dwelling species such as a region endemic *Parastalita stygia* (Joseph, 1882) (Dysderidae) and *Lepthyphantes leprosus* (Ohlert, 1865) (Linyphiidae). Our results emphasise the importance of this understudied region for spider biodiversity and underscore the need for ongoing research to enhance faunistic knowledge and inform conservation efforts in BiH.

## IZVLEČEK

Prispevek k poznavanju pajkov (Araneae) zgornjega toka reke Neretve v Bosni in Hercegovini

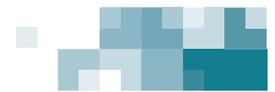
Zgornji tok reke Neretve, ki leži v razgibani pokrajini Bosne in Hercegovine (BiH), je edinstven in v veliki meri neraziskan ekosistem z visoko biotsko raznovrstnostjo. Namen prispevka je dokumentirati vrste pajkov (Araneae), ki naseljujejo to območje, vključno s širšim porečjem Neretve in Nevesinjskim poljem ter jamo Vranjača. Z različnimi metodami vzorčenja smo ujeli 84 vrst pajkov iz 72 rodov in 22 družin, pri čemer je bilo 50 (60 %) vrst prvič zabeleženih v BiH. Med zanimivejšimi najdbami gre omeniti vrsto *Piratula knorri* (Scopoli, 1763) (Lycosidae), ki je bila najštevilčnejša vrsta v obrežnem delu Neretve, in redke vrste, ki živijo v jamah, kot sta *Parastalita stygia* (Joseph, 1882) (Dysderidae) in *Lepthyphantes leprosus* (Ohlert, 1865) (Linyphiidae). Naši rezultati potrjujejo biotsko raznovrstnost pajkov v regiji in potrebo po nadaljnjih favnističnih raziskavah v BiH.

## APSTRAKT

Doprinos poznavanju pauka (Araneae) gornjeg toka rijeke Neretve u Bosni i Hercegovini

Gornji tok rijeke Neretve, smešten u neravnim pejzažima Bosne i Hercegovine (BiH), domaćin je jedinstvenih i uglavnom neistraženih ekosistema sa bogatim biodiverzitetom. Cilj ove studije je da dokumentuju vrste pauka (Araneae) koje naseljavaju ovaj region, uključujući šire područje sliva Neretve, Nevesinjsko polje i pećinu Vranjaču. Koristeći različite metode uzorkovanja, identifikovali smo 84 vrste pauka iz 72 roda i 22 porodice, od kojih je 50 (60 %) vrsta prvi put prijavljeno u BiH. Značajni nalazi uključuju brojnu populaciju vrste *Piratula knorri* (Scopoli, 1763) (Lycosidae), kao i vrste koje žive u pećinama, kao što su endemske vrste: *Parastalita stygia* (Joseph, 1882) (Dysderidae) i *Lepthyphantes leprosus* (Ohlert, 1865) (Linyphiidae). Naši rezultati naglašavaju značaj ovog nedovoljno proučavanog regiona za biodiverzitet pauka i podvlače potrebu za kontinuiranim istraživanjima kako bi se unapredilo znanje o fauni i naglasili naponi za očuvanje prirode u BiH.





## INTRODUCTION

The upper course of the Neretva River in Bosnia and Herzegovina (BiH) harbors one of Europe's most ecologically diverse yet understudied ecosystems. The region's varied topography and microclimates support rich biological diversity, but its spider fauna remains poorly documented (EEA 2010).

Spiders (Araneae), serving as both predators and prey, play an important role in maintaining ecological balance in the ecosystem (Cardoso et al. 2011; Foelix 2011). Despite their crucial role in food web dynamics and ecosystem integrity (Wise 1995), there is a significant lack of data on the diversity and distribution of spider species in this area. An initial overview of the spider fauna of the former Yugoslavia, including Bosnia and Herzegovina, was provided by Nikolić & Polenec (1981), offering an early foundation for regional studies. Komnenov (2009) further advanced this work in BiH with the first contemporary checklist for the country. Later publications reported new or even endemic species in the region (Wunderlich 2011; Logunov 2015; Bauer et al. 2020; Stanković & Ćurčić 2020) and expanded knowledge on subterranean species (Naumova et al. 2016). New species were added to the checklist as a result of revisions by group specialists (Bosmans 2009; Huber et al. 2021; Huber 2022; Castelluci et al. 2024).

Addressing this knowledge gap, our study maps the distribution of spider species along various points in the upper course of the Neretva River. Specimens were collected during the Neretva Science Week 2023, a field-based research expedition focused on biodiversity documentation in underexplored regions of Bosnia and Herzegovina. We documented numerous species – some recorded in this region for the first time – including in the wider Neretva catchment area, Nevesinjsko Polje, and the Vranjača Cave. These findings add to the limited knowledge of Bosnia and Herzegovina's araneofauna and offer the basis for further explorations of spider biodiversity patterns in the Balkan Peninsula. We aimed to highlight the importance of continued biodiversity research in underexplored regions like the upper Neretva River. A deeper understanding of these ecosystems is vital for their conservation and the sustainable management of natural resources in BiH and beyond (Russi 2013; MFTER 2016).

## MATERIAL AND METHODS

Specimens were collected during the Neretva Science Week 2023 (2–7 June 2023), an interdisciplinary biodiversity survey organized in the Upper Neretva region. Sampling was conducted by a team of araneologists and volunteers across 17 localities using various field techniques, including selective collection with forceps or an aspirator (Fig. 1), round sweep nets, leaf litter sifters, and pitfall traps. The specimens were preserved in 70% ethanol. The collected material was identified using several determination keys (Roberts 1995; Oger 2023; Nentwig et al. 2024). Extraction, identification, preparation, and observation were carried out on site using light stereomicroscopes in an improvised lab in Ulog village and at the Department of Biology, Biotechnical Faculty, University of Ljubljana.



**Figure 1.** Collecting spiders using an aspirator in one of the gravel bars along the upper part of the Neretva River (photo: Neža Pajek Arambašič).

**Slika 1.** Selektivno vzorčenje pajkov z aspiratorjem na enem od prodišč zgornjega toka reke Neretve (foto: Neža Pajek Arambašič).

**Slika 1.** Selektivno uzorkovanje pauka aspiratorom na jednom od šljunkovitih sprudova gornjeg toka rijeke Neretve (foto: Neža Pajek Arambašič).

## RESULTS

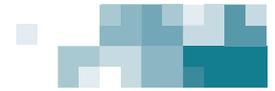
During the Neretva Science Week 2023, we collected 84 spider species from 72 genera and 22 families (Tab. 2). For each species, we provide data on the collecting site, geographic latitude and longitude (WGS84), altitude in metres above sea level (a.s.l), date of collection, sampling method, and material provider (Legit). As the authors of this article, we conducted all species identifications (Tab. 1).

To support future research on the spider fauna of Bosnia and Herzegovina, we provide photographic documentation of the pedipalps and epigynes of selected specimens listed in Tab. 1. This material includes newly recorded species found at multiple localities – likely widespread but previously overlooked – such as *Mangora acalypha*, *Drassyllus villicus*, *Microneta viaria*, *Pardosa alacris*, *Pardosa prativaga*, *Piratula knorri*, *Phrurolithus festivus*, *Metellina mengei*, and *Euryopis flavomaculata* (Figs. 2a–r). It also features rarely recorded species associated with cave habitats, *Lepthyphantes leprosus* (Figs. 2s–2t) (Nentwig et al. 2024), and the Dinaric endemic cave species *Parastalita stygia* (Fig. 2u).

## DISCUSSION

The spider fauna of BiH is poorly known as the national spider checklist comprises only 182 species (Nentwig et al. 2024; WSC 2024). Based on the diverse climate, terrain, and habitat types, one would expect this number to be up to 10 times higher. As seen in Fig. 3, checklists of neighboring countries Croatia, Serbia, and Montenegro comprise 771, 773, and 287 species, respectively, and are, like the Bosnian, far from complete. Altogether we identified 84 species from 72 genera and 22 families.





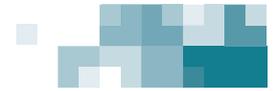
**Table 1.** Localities where spiders were collected. Sampling methods' abbreviations are: A – aspirator, F – forceps, LLS – leaf litter sifter, MT – moth trap, P – photo voucher, RSN – round sweep net.

**Tabela 1.** Lokacije vzorčenja pajkov. Kratice metod vzorčenja so: A – aspirator, F – pinceta, LLS – sejanje listne stelje, MT – past za nočne metulje, P – fotovaučer, RSN – okrogla lovilna vreča.

**Tabela 1.** Lokacije uzorkovanja pauka. Skraćenice metoda uzorkovanja su: A – aspirator, F – pinceta, LLS – sito za lišće, MT – klopka za moljce, P – foto vaučer, RSN – okrugla mreža za hvatanje.

Locality ID	Description of the Locality	Lat. Long.	Altitude m a.s.l.	Date	Sampling methods	Legit
NSW01	meadow; Ulog; Ulog; Kalinovik; Upper Neretva	43.416792°N 18.311152°E	651 m	2. 6. 2023 7. 6. 2023	F, A	N. Pajek Arambašič, Ž. Kuralt, A. Požrl
NSW02	river bank and riparian vegetation; Ulog; Ulog; Kalinovik; Upper Neretva	43.415693°N 18.314688°E	656 m	2. 6. 2023	F, A	N. Pajek Arambašič, Ž. Kuralt
NSW03	riparian forest; Neretva; Cerova; Kalinovik; Upper Neretva	43.37662°N 18.357438°E	692 m	3. 6. 2023	F, A	N. Pajek Arambašič, Ž. Kuralt
NSW04	forest; Jablanići; Ulog; Kalinovik; Upper Neretva	43.403599°N 18.333226°E	672 m	3. 6. 2023	LLS	N. Pajek Arambašič, Ž. Kuralt
NSW06	wet meadow; Kladopoljsko jezero; Obalj; Kalinovik; Upper Neretva	43.4169175°N 18.4265456°E	1388 m	2. 6. 2023	P	N. Pajek Arambašič, Ž. Kuralt
NSW07	wet meadow; Ulog; Ulog; Kalinovik; Upper Neretva	43.417381°N 18.310999°E	644 m	4. 6. 2023	RSN	N. Pajek Arambašič, Ž. Kuralt
NSW08	gravel bar; Nedavić; Nedavić; Kalinovik; Upper Neretva	43.460237°N 18.321882°E	607 m	4. 6. 2023	F, A	M. Zgmajster, E. Premate, A. Požrl, L. Trebše, T. Kepic
NSW09	meadow; Biograd; Nevesinje; Nevesinje; Nevesinjsko polje	43.1856583°N 18.1206417°E	835 m	5. 6. 2023	F, A, RSN	N. Pajek Arambašič, Ž. Kuralt
NSW10	cave; Vranjača; Biograd; Nevesinje; Nevesinjsko polje	43.1862556°N 18.1152972°E	820 m	5. 6. 2023	F, A	N. Pajek Arambašič, Ž. Kuralt
NSW11	river bank and riparian vegetation; Strujevina; Nevesinje; Nevesinje; Nevesinjsko polje	43.20111°N 18.13361°E	857 m	5. 6. 2023	F, A	N. Pajek Arambašič, Ž. Kuralt
NSW12	bog; Sopilja; Nevesinje; Nevesinje; Nevesinjsko polje	43.3013083°N 18.1175361°E	841 m	5. 6. 2023	F, A, RSN	N. Pajek Arambašič, Ž. Kuralt
NSW13	forest; Obrnja; Ulog; Kalinovik; Upper Neretva	43.3906139°N 18.2767056°E	1210 m	5. 6. 2023	F, A, LLS	N. Pajek Arambašič, Ž. Kuralt
NSW14	meadow; Budisavlje; Grabovica; Nevesinje; Nevesinjsko polje	43.219947°N 18.228212°E	855 m	5. 6. 2023	MT	N. Pajek Arambašič, Ž. Kuralt
NSW15	cave; Čašica ; Tmuše; Kalinovik; Upper Neretva	43.441546°N 18.326585°E	1072 m	5. 6. 2023	F, A	N. Pajek Arambašič, Ž. Kuralt
NSW16	gravel bar; Trešnjevica; Ulog; Kalinovik; Upper Neretva	43.44222°N 18.3067°E	634 m	6. 6. 2023	F, A	N. Pajek Arambašič, Ž. Kuralt
NSW17	meadow; Jezero; Ulog; Kalinovik; Upper Neretva	43.41734°N 18.28943°E	820 m	6. 6. 2023	F, A	A. Požrl





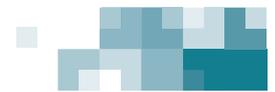
**Table 2.** Species list of the examined spiders. New records for the fauna of Bosnia and Herzegovina are marked with an asterisk. For abbreviations of localities, see [Tab. 1](#). Numbers next to gender symbols refer to the number of collected individuals.

**Tabela 2.** Seznam zabeleženih vrst pajkov. Prve najdbe za Bosno in Hercegovino so označene z zvezdico. Natančen opis lokalitet je v [Tab. 1](#). V oklepajih je navedeno število in spol ujetih in določenih pajkov.

**Tabela 2.** Lista vrsta istraživanih pauka. Novi nalazi za Bosnu i Hercegovinu označeni su zvjezdicom. Detaljan opis lokaliteta dat je u [Tab. 1](#). Brojevi pored simbola pola odnose se na broj sakupljenih jedinki.

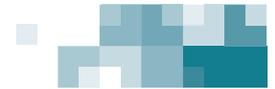
No.	Family / Species	Localities
<b>AGELENIDAE</b>		
1	* <i>Eratigena agrestis</i> (Walckenaer, 1802)	NSW09 (1 ♀)
2	* <i>Histopona torpida</i> (C. L. Koch, 1837)	NSW02 (1 ♀, 1 ♂)
<b>AMAUROBIIDAE</b>		
3	* <i>Amaurobius jugorum</i> L. Koch, 1868	NSW04 (1 ♀)
<b>ANYPHAENIDAE</b>		
4	<i>Anyphaena accentuata</i> (Walckenaer, 1802)	NSW02 (2 ♀, 2 ♂), NSW03 (1 ♂), NSW16 (1 ♀)
<b>ARANEIDAE</b>		
5	<i>Aculepeira ceropegia</i> (Walckenaer, 1802)	NSW12 (1 ♂)
6	* <i>Araneus triguttatus</i> (Fabricius, 1775)	NSW01 (1 ♂)
7	* <i>Cyclosa conica</i> (Pallas, 1772)	NSW09 (1 ♀)
8	* <i>Mangora acalypha</i> (Walckenaer, 1802)	NSW07 (1 ♀, 3 ♂), NSW09 (2 ♀, 1 ♂), NSW12 (1 ♀)
9	<i>Nuctenea umbratica</i> (Clerck, 1757)	NSW01 (1 juv)
10	<i>Zilla diodia</i> (Walckenaer, 1802)	NSW09 (1 ♀)
<b>CLUBIONIDAE</b>		
11	* <i>Clubiona similis</i> L. Koch, 1867	NSW02 (2 ♀)
<b>DICTYNIDAE</b>		
12	* <i>Brigittea civica</i> (Lucas, 1848)	NSW12 (2 ♀)
13	* <i>Brigittea latens</i> (Fabricius, 1775)	NSW07 (1 ♀)
14	<i>Dictyna uncinata</i> Thorell, 1856	NSW07 (1 ♀)
<b>DYSDERIDAE</b>		
15	* <i>Harpactea lepida</i> (C. L. Koch, 1838)	NSW13 (1 ♂)
16	<i>Parastalita stygia</i> (Joseph, 1882)	NSW10 (1 ♂)
<b>GNAPHOSIDAE</b>		
17	* <i>Callilepis nocturna</i> (Linnaeus, 1758)	NSW09 (1 ♀)
18	* <i>Callilepis schuszeri</i> (Herman, 1879)	NSW02 (1 ♀)
19	<i>Drassodes lapidosus</i> (Walckenaer, 1802)	NSW01 (1 ♂), NSW02 (2 ♀, 2 ♂), NSW09 (2 ♂)
20	* <i>Drassyllus villicus</i> (Thorell, 1875)	NSW02 (1 ♀, 1 ♂), NSW03 (1 ♀, 1 ♂), NSW04 (2 ♀)
21	* <i>Haplodrassus signifer</i> (C. L. Koch, 1839)	NSW02 (1 ♀)
<b>LINYPHIIDAE</b>		
22	* <i>Agyneta rurestris</i> (C. L. Koch, 1836)	NSW11 (1 ♀)
23	* <i>Crosbyarachne silvestris</i> (Georgescu, 1973)	NSW13 (1 ♀)
24	<i>Diplocephalus cristatus</i> (Blackwall, 1833)	NSW10 (1 ♀)
25	<i>Frontinellina frutetorum</i> (C. L. Koch, 1835)	NSW01 (1 ♀)
26	<i>Lepthyphantes leprosus</i> (Ohlert, 1865)	NSW10 (1 ♀, 1 ♂), NSW13 (3 ♀)
27	* <i>Microneta viaria</i> (Blackwall, 1841)	NSW03 (1 ♀), NSW13 (3 ♀)





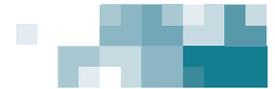
No.	Family / Species	Localities
28	* <i>Midia midas</i> (Simon, 1884)	NSW13 (1 ♀)
29	* <i>Oedothorax agrestis</i> (Blackwall, 1853)	NSW03 (4 ♀)
30	* <i>Oedothorax apicatus</i> (Blackwall, 1850)	NSW02 (1 ♀)
31	<i>Porrhomma convexum</i> (Westring, 1851)	NSW10 (2 ♀, 1 ♂)
32	* <i>Sauron rayi</i> (Simon, 1882)	NSW04 (1 ♀)
33	<i>Tenuiphantes flavipes</i> (Blackwall, 1854)	NSW02 (1 ♀), NSW03 (5 ♀), NSW13 (1 ♀)
34	* <i>Trichoncus affinis</i> Kulczyński, 1894	NSW02 (1 ♀)
35	* <i>Trichopterna cito</i> (O. Pickard-Cambridge, 1873)	NSW10 (1 ♀)
36	* <i>Walckenaeria monoceros</i> (Wider, 1834)	NSW13 (1 ♀)
<b>LYCOSIDAE</b>		
37	* <i>Alopecosa pulverulenta</i> (Clerck, 1757)	NSW09 (2 ♀)
38	* <i>Arctosa leopardus</i> (Sundevall, 1833)	NSW11 (1 ♀)
39	<i>Arctosa maculata</i> (Hahn, 1822)	NSW02 (1 ♂)
40	* <i>Pardosa agrestis</i> (Westring, 1861)	NSW07 (1 ♀)
41	* <i>Pardosa alacris</i> (C. L. Koch, 1833)	NSW03 (1 ♀), NSW09 (3 ♀, 2 ♂)
42	<i>Pardosa amentata</i> (Clerck, 1757)	NSW03 (2 ♀), NSW07 (1 ♀)
43	<i>Pardosa hortensis</i> (Thorell, 1872)	NSW02 (5 ♀), NSW04 (1 ♀), NSW07 (1 ♀, 2 ♂), NSW09 (5 ♀)
44	<i>Pardosa lugubris</i> (Walckenaer, 1802)	NSW02 (2 ♀), NSW03 (3 ♀, 2 ♂), NSW04 (4 ♀), NSW09 (3 ♀, 2 ♂)
45	<i>Pardosa morosa</i> (L. Koch, 1870)	NSW02 (3 ♀), NSW03 (2 ♀)
46	* <i>Pardosa prativaga</i> (L. Koch, 1870)	NSW11 (1 ♀), NSW12 (1 ♀)
47	* <i>Pardosa proxima</i> (C. L. Koch, 1847)	NSW11 (1 ♀)
48	* <i>Pardosa atomaria</i> (C. L. Koch, 1847)	NSW12 (2 ♂)
49	* <i>Pirata piraticus</i> (Clerck, 1757)	NSW12 (2 ♀)
50	* <i>Piratula knorri</i> (Scopoli, 1763)	NSW02 (1 ♀, 2 ♂), NSW03 (5 ♀, 7 ♂), NSW08 (1 ♀)
51	* <i>Trochosa ruricola</i> (De Geer, 1778)	NSW01 (1 ♀)
<b>NESTICIDAE</b>		
52	<i>Nesticus cellulanus</i> (Clerck, 1757)	NSW02 (1 ♀)
<b>OXYOPIIDAE</b>		
53	* <i>Oxyopes heterophthalmus</i> (Latreille, 1804)	NSW12 (1 ♂)
<b>PHILODROMIDAE</b>		
54	<i>Philodromus aureolus</i> (Clerck, 1757)	NSW01 (1 ♂)
55	* <i>Philodromus margaritus</i> (Clerck, 1757)	NSW11 (1 ♂)
<b>PHRUROLITHIDAE</b>		
56	* <i>Phrurolithus festivus</i> (C. L. Koch, 1835)	NSW02 (1 ♀), NSW04 (1 ♂)
57	* <i>Phrurolithus minimus</i> C. L. Koch, 1839	NSW02 (1 ♀, 2 ♂)
<b>PISAUROIDAE</b>		
58	<i>Pisaura mirabilis</i> (Clerck, 1757)	NSW07 (1 ♀, 1 ♂), NSW09 (1 ♂), NSW12 (1 ♀)
<b>SALTICIDAE</b>		
59	* <i>Attulus rupicola</i> (C. L. Koch, 1837)	NSW02 (4 ♀)
60	* <i>Carrhotus xanthogramma</i> (Latreille, 1819)	NSW03 (1 ♂)
61	* <i>Chalocoscirtus infimus</i> (Simon, 1868)	NSW09 (3 ♂)





No.	Family / Species	Localities
62	* <i>Euophrys frontalis</i> (Walckenaer, 1802)	NSW09 (1 ♂)
63	<i>Evarcha arcuata</i> (Clerck, 1757)	NSW09 (1 ♀, 3 ♂), NSW12 (2 ♂)
64	<i>Evarcha falcata</i> (Clerck, 1757)	NSW09 (1 ♂)
66	* <i>Heliophanus dubius</i> C. L. Koch, 1835	NSW09 (1 ♀)
66	<i>Heliophanus flavipes</i> (Hahn, 1832)	NSW09 (2 ♂)
67	* <i>Heliophanus patagiatus</i> Thorell, 1875	NSW01 (1 ♂)
68	* <i>Neon reticulatus</i> (Blackwall, 1853)	NSW03 (1 ♀)
69	<i>Philaeus chrysops</i> (Poda, 1761)	NSW06 (1 ♂), NSW09 (1 ♀, 1 ♂)
<b>SPARASSIDAE</b>		
70	<i>Micrommata virescens</i> (Clerck, 1757)	NSW05 (1 ♀), NSW12 (1 ♂)
<b>TETRAGNATHIDAE</b>		
71	<i>Meta menardi</i> (Latreille, 1804)	NSW10 (1 ♀)
72	* <i>Metellina mengei</i> (Blackwall, 1869)	NSW03 (1 ♂), NSW07 (1 ♀)
73	<i>Metellina merianae</i> (Scopoli, 1763)	NSW02 (1 ♀, 1 ♂), NSW03 (2 ♀)
74	<i>Tetragnatha extensa</i> (Linnaeus, 1758)	NSW07 (1 ♂)
<b>THERIDIIDAE</b>		
75	* <i>Crustulina guttata</i> (Wider, 1834)	NSW04 (1 ♀)
76	* <i>Euryopsis flavomaculata</i> (C. L. Koch, 1836)	NSW02 (1 ♀, 2 ♂), NSW03 (1 ♂), NSW04 (2 ♀)
<b>THOMISIDAE</b>		
77	* <i>Diaea livens</i> Simon, 1876	NSW07 (1 ♂)
78	<i>Misumena vatia</i> (Clerck, 1757)	NSW17 (1 ♀)
79	<i>Ozyptila praticola</i> (C. L. Koch, 1837)	NSW03 (2 ♂)
80	* <i>Pistius truncatus</i> (Pallas, 1772)	NSW07 (1 ♂)
81	<i>Synema globosum</i> (Fabricius, 1775)	NSW07 (7 ♀)
82	<i>Thomisus onustus</i> Walckenaer, 1805	NSW09 (1 ♂)
83	<i>Tmarus piger</i> (Walckenaer, 1802)	NSW07 (1 ♀)
84	<i>Xysticus kochi</i> Thorell, 1872	NSW01 (1 ♀), NSW07 (4 ♀, 2 ♂), NSW09 (1 ♂), NSW12 (1 ♂)





**Figure 2.** Ventral views of epiginae and lateral views of right pedipalps of selected species. *Mangora acalypha* epigyne (a) and pedipalp (b), *Drassyllus villicus* epigyne (c) and pedipalp (d), *Microneta viaria* epigyne (e), *Pardosa alacris* epigyne (f) and pedipalp (g), *Pardosa prativaga* epigyne (h), *Piratula knorri* epigyne (i) and pedipalp (j), *Phrurolithus festus* epigyne (k) and pedipalp – ventral view (l), and pedipalp – lateral view (m), *Metellina menzei* epigyne (n) and pedipalp (o), *Euryops flavomaculata* epigyne (p) and pedipalp (r), *Lepthyphantes leprosus* epigyne (s) and pedipalp (t), and *Parastalita stygia* pedipalp (u). (Scale bars represent 100 µm).

**Slika 2.** Ventralni pogledi na epigine in lateralni pogledi na desne pedipalpe izbranih vrst. *Mangora acalypha* epigina (a) in pedipalp (b), *Drassyllus villicus* epigina (c) in pedipalp (d), *Microneta viaria* epigina (e), *Pardosa alacris* epigina (f) in pedipalp (g), *Pardosa prativaga* epigina (h), *Piratula knorri* epigina (i) in pedipalp (j), *Phrurolithus festus* epigina (k) in pedipalp – ventralni pogled (l), ter pedipalp – lateralni pogled (m), *Metellina menzei* epigina (n) in pedipalp (o), *Euryops flavomaculata* epigina (p) in pedipalp (r), *Lepthyphantes leprosus* epigina (s) in pedipalp (t) ter *Parastalita stygia* pedipalp (u). (Merila predstavljajo 100 µm).

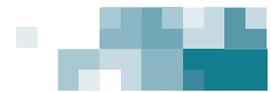
**Slika 2.** Ventralni prikazi epigina i bočni prikazi desnih pedipalpa odabranih vrsta. *Mangora acalypha* epigina (a) i pedipalp (b), *Drassyllus villicus* epigina (c) i pedipalp (d), *Microneta viaria* epigina (e), *Pardosa alacris* epigina (f) i pedipalp (g), *Pardosa prativaga* epigina (h), *Piratula knorri* epigina (i) i pedipalp (j), *Phrurolithus festus* epigina (k), pedipalp – ventralni prikaz (l) i pedipalp – bočni prikaz (m), *Metellina menzei* epigina (n) i pedipalp (o), *Euryops flavomaculata* epigina (p) i pedipalp (r), *Lepthyphantes leprosus* epigina (s) i pedipalp (t) i *Parastalita stygia* pedipalp (u). (Skala predstavlja 100 µm).

Of these, 56 were collected in the Upper Neretva, and 37 in the Nevesinjsko polje and Vranjača cave. 50 (60%) of the identified spider species are new additions to araneofauna of BiH, which confirms the knowledge gap in the country and supports further faunistic research in the region.

*Piratula knorri* (Scopoli, 1763) (Figs. 2i, j) was among the more frequently encountered species along the Neretva River. This wandering spider from the Lycosidae (wolf spider) family is

strongly associated with riparian habitats, where it exploits surface tension to run across water and may even dive to pursue prey. Its dependence on freshwater ecosystems makes it sensitive to habitat disturbance, which is reflected in its inclusion on the Red List of Slovenian spiders (Polenec 1992). Highlighting its presence in our survey underscores the ecological value and conservation relevance of intact riverine habitats in the region.

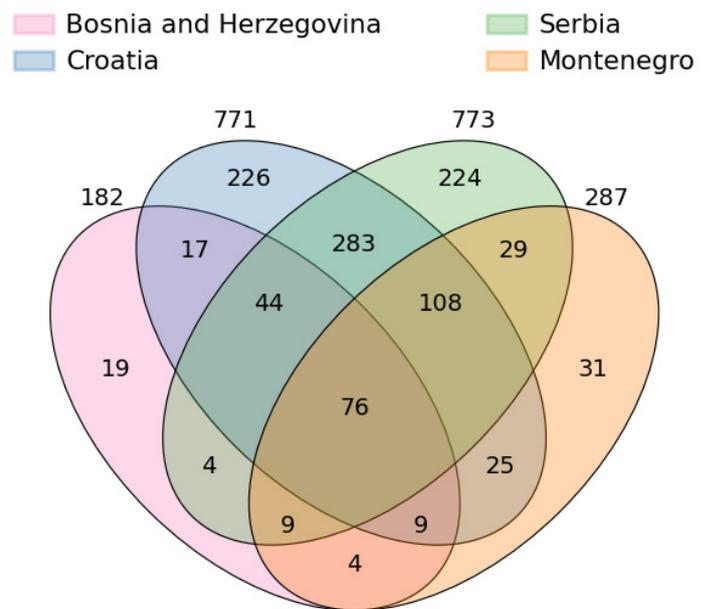




The visit to Vranjača cave proved to be very fruitful since, among others, we managed to collect *Leptyphantes leprosus* (Ohlert, 1865) (Figs. 2s,t), which is rarely found in natural habitats according to the Spiders of Europe portal (Nentwig et al. 2024). Moreover, we also collected *Parastalita stygia* (Joseph, 1882) (Fig. 2u), an eyeless Dysderid spider, endemic to the Dinaric region, in the cave.

These results are noteworthy, especially considering the short sampling period and unfavourable weather with daily showers. Spiders also differ in their annual cycles, meaning we missed spider species that reach adulthood in either early spring or late summer/early autumn. Long-term sampling throughout the year would yield even higher alpha diversity and uncover even more rare (possibly endangered) species.

The majority of species documented in this study represent taxa that are commonly found across Central and Southeastern Europe and are therefore expected to occur in Bosnia and Herzegovina. Their presence aligns well with these species' known distribution patterns and habitat preferences, particularly in temperate forest and grassland ecosystems typical of the region. While the assemblage reflects a largely expected faunal composition, the findings provide valuable baseline data for future biodiversity assessments and monitoring efforts.



**Figure 3.** Venn diagram depicting comparison of spider species between Bosnia and Herzegovina and neighbouring countries according to Nentwig et al. (2024).

**Slika 3.** Vennov diagram števila vrst pajkov v Bosni in Hercegovini in v sosednjih državah po Nentwig et al. (2024).

**Slika 3.** Vennov dijagram broja vrsta pauka u Bosni i Hercegovini i susjednim zemljama prema Nentwigu et al. (2024).

## POVZETEK

V okviru projekta Neretva Science Week 2023 smo raziskovali pajke ozemlja zgornjega toka reke Neretve in širše okolice, vključno z Nevesinjskim poljem in jamo Vranjača v Bosni in Hercegovini. Vzorčili smo na sedemnajstih lokacijah (Tab. 1), in ulovili ter določili 84 vrst pajkov, ki pripadajo 72 rodovom in 22 družinam pri čemer je bilo kar 60 odstotkov prvič zabeleženih v Bosni in Hercegovini (Tab. 2). Tako visok delež novih vrst za državo kaže na pomanjkljivo poznavanje favne pajkov v BiH in izpostavlja pomen tovrstnih raziskav na tem razmeroma neraziskanem območju. Primerjava s favno pajkov sosednjih držav kaže precejšnjo diskrepanco, saj imata

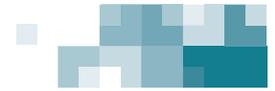
## SAŽETAK

U okviru projekta Sedmica nauke Neretva 2023, istraživali smo pauke iz gornjeg toka rijeke Neretve i šireg okolnog područja, uključujući Nevesinjsko polje i pećinu Vranjaču u Bosni i Hercegovini. Uzorkovali smo na 17 lokacija (Tab. 1), te uhvatili i identifikovali 84 vrste pauka koje pripadaju 72 roda i 22 porodice, od kojih je 60 % prvi put zabilježeno u Bosni i Hercegovini (Tab. 2). Tako visok udio vrsta koje su nove u zemlji ukazuje na nedostatak znanja o fauni pauka u BiH i naglašava važnost takvih istraživanja u ovom relativno neistraženom području. Poređenje sa faunom pauka susjednih zemalja pokazuje značajnu razliku, jer Hrvatska i

Hrvatska in Srbija po več kot 770 zabeleženih vrst, medtem ko je število doslej zabeleženih vrst v Bosni in Hercegovini le 182 (Sl. 3), kar je glede na raznolikost habitata in podnebnih razmer presenetljivo nizko. Z dolgoročnimi raziskavami bi bi zagotovo zaznali večje število vrst, predvsem tistih, ki odraslost dosežejo v zgodnji pomladi ali pozno poleti in jeseni. Tovrstne raziskave bi prispevale k bolj podrobnemu vpogledu v vrstno sestavo in pestrost območja ter podprle bodoče naravovarstvene pobude in trajnostno upravljanje naravnih virov v Bosni in Hercegovini.

Srbija imaju po više od 770 zabilježenih vrsta, dok je broj do sada zabilježenih vrsta u Bosni i Hercegovini samo 182 (Sl. 3), što je iznenađujuće malo obzirom na raznolikost staništa i klimatskih uslova. Dugoročna istraživanja bi sigurno otkrila veći broj vrsta, posebno onih koje dostižu odraslu dob u rano proljeće ili kasno ljeto i jesen. Takva istraživanja bi doprinijela detaljnijem uvidu u sastav vrsta i raznolikost područja te podržala buduće inicijative za očuvanje prirode i održivo upravljanje prirodnim resursima u Bosni i Hercegovini.





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