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CONTRIBUTION TO THE BRYOFLORA OF BANJ BRDO (BANJA LUKA, REPUBLIC OF SRPSKA, B&H)

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Abstract

Banj brdo is situated within the City of Banja Luka (Republic of Srpska, Bosnia and Herzegovina). The present paper provides the first insight into the bryoflora of Banj brdo. Field investigations were conducted from March 2019 to February 2020, as well as in April 2022. A total of 30 species of bryophytes were collected. Marchantiophyta was represented by 8 species, while Bryophyta comprises 22 species. The genera *Metzgeria* and *Alleniella* were represented by two species each, while the other genera were represented by one species each. The families with the largest number of species and genera were Neckeraceae, Metzgeriaceae, Mniaceae, Polytrichaceae and Pottiaceae. Rajnerovo vrelo was the only recorded habitat of the liverworts *Apopellia endiviifolia*, *Conocephalum conicum* and *Marchantia polymorpha* on Banj brdo, and the need to preserve that habitat from negative anthropogenic influences is indicated. The most common recorded mosses on Banj brdo were *Brachytheciastrum velutinum* and *Hypnum cupressiforme*. It is necessary to continue bryological research on Banj brdo, in order to get a more complete insight into bryophyte diversity in that area.

Key words: bryophytes, mosses, liverworts, biodiversity, Balkans

INTRODUCTION

Bryological research in Bosnia and Herzegovina dates back to the middle of the 19th century (Pavletić, 1955; Grgić, 1985). These investigations were often sporadic, even with long interruptions (Grgić, 1985). Data on the presence and/or distribution of many species are still missing, especially those from taxonomically unresolved groups or species of freshwater and ephemeral habitats (Škondrić, 2023). Bryological research in the last decade has contributed to the new and noteworthy records for the bryoflora of Bosnia and Herzegovina (Ellis *et al*., 2016, 2021; Pantović *et al*., 2016, 2022, 2023; Škondrić *et al*., 2020). According to the latest literature data, the bryoflora of Bosnia and Herzegovina comprises 673 taxa (134 liverworts and 539 mosses) (Pantović *et al*., 2023).

Banj brdo is located in the northwestern part of the Republic of Srpska (Bosnia and Herzegovina), within the City of Banja Luka. Phytogeographically, the investigated locality is situated at the contact of the Illyrian province and the Pannonian sector of the Central European province of the Euro-Siberian-North American region (Horvatić, 1967). Forest

vegetation belonging to Carpinetalia betuli P. Fukarek 1968 (oak-hornbeam and mesic oak forests on deep nutrient-rich soils) has developed in the area of Banj brdo.

The climate of Banj brdo shows a moderately continental character. Winters are moderately cold and summers are warm. Average annual air temperatures range from 12 to 19°C (Dragić *et al*., 2020, 2021). The average annual air temperature in 2019 was 13.4 °C, while in 2020 it was 12.8 °C. The warmest month in 2019 was August with an average monthly air temperature of 24°C, while the coldest month was January with an average monthly air temperature of 1.3°C (Dragić *et al*., 2020). In 2020, the month with the highest average monthly air temperature was also August (23.5°C), and the lowest average monthly air temperature (1.3°C) was measured in January (Dragić *et al*., 2021). The total annual amount of precipitation in 2019 was 976.1 mm, while in 2020 it was 1002.7 mm. During 2019, May had the highest monthly amount of precipitation (224.7 mm), while in 2020 the most rain fell in October (172.7 mm) (Dragić *et al*., 2021).

The bryophytes of the Banj brdo have not been investigated previously. The aim of this paper is to present the first data for the bryoflora of Banj brdo.

MATERIAL AND METHODS

Field research of bryoflora in the area of Banj brdo (Banja Luka, Republic of Srpska, Bosnia and Herzegovina) was conducted from March 2019 to February 2020. Field investigation was carried out once a month and efforts were made to collect bryophytes from different microhabitats. Additional field research was conducted in April 2022. Standard keys and iconographies were used for determination: Smith (2004), Frahm and Frey (2004), Frey *et al*. (2006), Casas *et al*. (2006, 2009), Lüth (2019), Atherton *et al*. (2010) and Düll and Düll-Wunder (2023). Nomenclature and systematics of bryophytes were aligned according to Hodgetts *et al*. (2020). The syntaxonomical system for vegetation proposed by Mucina *et al*. (2016) was applied. Herbarium material is deposited in the Herbarium of the Department of Botany, Faculty of Natural Sciences and Mathematics, University of Banja Luka.

Bryophytes were collected from the entrance ramp on Banj brdo (44.750391° N, 17.175230° E, 211 m a.s.l.), and along the path through the forest to the plateau Trešnjik (44.735735° N, 17.173865° E, 441 m a.s.l.), and from the plateau, the collection continued along the asphalt roadsides back to the entrance ramp (Figure 1).

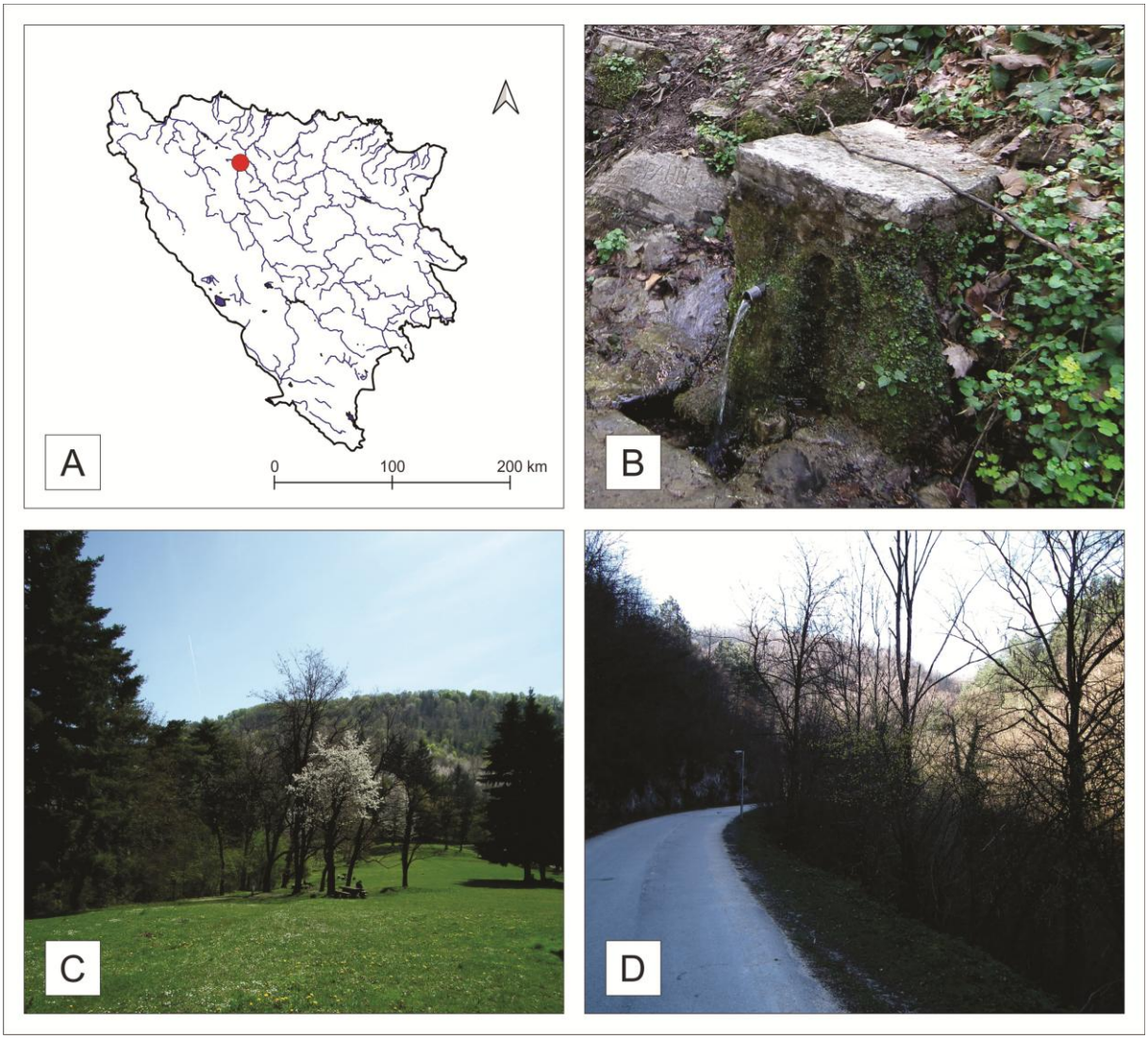

Figure 1. Banj brdo (Banja Luka): A – Geographical position; B – Rajnerovo vrelo; C – Trešnjik; D – Asphalt roadsides (Photos by S. Škondrić)

RESULTS AND DISCUSSION

The present study provides the first insight into the bryoflora of Banj brdo. During the field research, a total of 30 species of bryophytes were collected from March 2019 to February 2020, as well as in April 2022.

MARCHANTIOPHYTA

CONOCEPHALACEAE

Conocephalum conicum (L.) Dumort.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, Rajnerovo vrelo, on rocks, 16.10.2019, leg. P. Lazić, det. S. Škondrić.

FRULLANIACEAE

Frullania dilatata (L.) Dumort.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, accompanied by *Metzgeria furcata* (L.) Corda and *Radula complanata* (L.) Dumort., 08.03.2019, leg. P. Lazić, det. S. Škondrić.

LOPHOCOLEACEAE

Chiloscyphus polyanthos (L.) Corda

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on soil, accompanied by *Metzgeria furcata* and *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen, 02.06.2019, leg. P. Lazić, det. S. Škondrić.

MARCHANTIACEAE

Marchantia polymorpha L.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, Rajnerovo vrelo, on rocks, 29.04.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Brachytheciastrum velutinum*, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on soil, accompanied by *Apopellia endiviifolia* (Dicks.) Nebel & D. Quandt, 20.09.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, 16.10.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on soil, 16.10.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Brachytheciastrum velutinum*, 01.11.2019, leg. P. Lazić, det. S. Škondrić.

METZGERIACEAE

Metzgeria conjugata Lindb.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, accompanied by *Isothecium alopecuroides* (Lam. ex Dubois) Isov. and *Brachytheciastrum velutinum*, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Fissidens taxifolius* Hedw., 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 29.04.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Brachytheciastrum velutinum*, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Brachytheciastrum velutinum*, 01.12.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Brachytheciastrum velutinum*, 21.02.2020, leg. P. Lazić, det. S. Škondrić.

Metzgeria furcata (L.) Corda

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, accompanied by *Radula complanata* and *Frullania dilatata* (L.) Dumort., 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Isothecium alopecuroides* (Lam. ex Dubois) Isov., 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 29.04.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Radula complanata* (L.) Dumort., 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen, 20.09.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Radula complanata* (L.) Dumort., 18.10.2019, leg. P. Lazić, det. S. Škondrić.

RADULACEAE

Radula complanata (L.) Dumort.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, accompanied by *Metzgeria furcata* and *Frullania dilatata*, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Metzgeria furcata*, 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, with sporophytes, 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, with sporophytes, accompanied by *Metzgeria furcata*, 18.10.2019, leg. P. Lazić, det. S. Škondrić.

PELLIACEAE

Apopellia endiviifolia (Dicks.) Nebel & D. Quandt

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, Rajnerovo vrelo, on rocks, 29.04.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Brachytheciastrum velutinum*, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Marchantia polymorpha*, 20.09.2019, leg. P. Lazić, det. S. Škondrić.

BRYOPHYTA

ANOMODONTACEAE

Anomodon viticulosus (Hedw.) Hook. & Taylor

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on rocks, 18.10.2019, leg. P. Lazić, det. S. Škondrić.

BRACHYTHECIACEAE

Brachytheciastrum velutinum (Hedw.) Ignatov & Huttunen

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, accompanied by *Metzgeria conjugata* and *Isothecium alopecuroides*, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on decaying wood, accompanied by *Oxyrrhynchium hians*

(Hedw.) Loeske, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Metzgeria furcata* and *Chiloscyphus polyanthos*, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on rocks, accompanied by *Apopellia endiviifolia*, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Marchantia polymorpha*, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Metzgeria conjugata*, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Metzgeria conjugata*, 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on rocks, 20.09.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Metzgeria furcata*, 20.09.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Marchantia polymorpha*, 01.11.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 01.11.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Metzgeria conjugata*, 01.12.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 28.01.2020, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Fissidens taxifolius*, 21.02.2020, leg. P. Lazić, det. S. Škondrić.

Brachythecium rutabulum (Hedw.) Schimp.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on rocks, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on rocks, 02.06.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 01.12.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, 28.01.2020, leg. P. Lazić, det. S. Škondrić.

Homalothecium lutescens (Hedw.) H.Rob.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on rocks, 18.10.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, in rock crevices, 14.04.2022, leg. S. Škondrić, det. S. Škondrić.

Oxyrrhynchium hians (Hedw.) Loeske

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on decaying wood, accompanied by *Brachytheciastrum velutinum*, 08.03.2019, leg. P. Lazić, det. S. Škondrić.

FISSIDENTACEAE

Fissidens taxifolius Hedw.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on soil, accompanied by *Metzgeria conjugata* and *Tortella tortuosa* (Hedw.) Limpr., 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Weissia controversa* Hedw., 18.10.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Weissia controversa*, 01.12.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Brachytheciastrum velutinum*, 21.02.2020, leg. P. Lazić, det. S. Škondrić.

FUNARIACEAE

Funaria hygrometrica Hedw.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on soil, 08.03.2019, leg. P. Lazić, det. S. Škondrić.

GRIMMIACEAE

Schistidium confertum (Funck) Bruch & Schimp.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on rocks, 18.10.2019, leg. P. Lazić, det. S. Škondrić.

HYPNACEAE

Hypnum cupressiforme Hedw.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, 01.11.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 01.12.2019, leg. P. Lazić, det. S. Škondrić.

LEMBOPHYLLACEAE

Isothecium alopecuroides (Lam. ex Dubois) Isov.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, accompanied by *Metzgeria conjugata* and *Brachytheciastrum velutinum*, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, accompanied by *Metzgeria furcata*, 08.03.2019, leg. P. Lazić, det. S. Škondrić.

MNIACEAE

Mnium marginatum (Dicks.) P.Beauv.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Thamnobryum alopecurum* (Hedw.) Gangulee, 18.10.2019, leg. P. Lazić, det. S. Škondrić.

Plagiomnium rostratum (Schrad.) T.J.Kop.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on rocks, 02.06.2019, leg. P. Lazić, det. S. Škondrić.

MYURIACEAE

Ctenidium molluscum (Hedw.) Mitt.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, in rock crevices, 14.04.2022, leg. et det. S. Škondrić.

NECKERACEAE

Alleniella besseri (Lobarz.) S.Olsson, Enroth & D.Quandt

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, in rock crevices, 14.04.2022, leg. et det. S. Škondrić.

Alleniella complanata (Hedw.) S.Olsson, Enroth & D.Quandt

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on bark, 29.04.2019, leg. P. Lazić, det. S. Škondrić.

Exsertotheca crispa (Hedw.) S. Olsson, Enroth & D. Quandt

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on rocks, 28.01.2020, leg. P. Lazić, det. S. Škondrić; Banj brdo, on rocks, 21.02.2020, leg. P. Lazić, det. S. Škondrić.

Pseudanomodon attenuatus (Hedw.) Ignatov & Fedosov

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on rocks, 08.03.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 15.07.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on bark, 28.01.2020, leg. P. Lazić, det. S. Škondrić.

Thamnobryum alopecurum (Hedw.) Gangulee

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, Rajnerovo vrelo, on rocks, accompanied by *Mnium marginatum*, 18.10.2019, leg. P. Lazić, det. S. Škondrić.

POLYTRICHACEAE

Atrichum undulatum (Hedw.) P.Beauv.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on soil, 20.09.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, 18.10.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, 01.12.2019, leg. P. Lazić, det. S. Škondrić.

Pogonatum aloides (Hedw.) P.Beauv.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on soil, 18.10.2019, leg. P. Lazić, det. S. Škondrić.

POTTIACEAE

Tortella tortuosa (Hedw.) Limpr.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on soil, accompanied by *Metzgeria conjugata* and *Fissidens taxifolius*, 08.03.2019, leg. P. Lazić, det. S. Škondrić.

Weissia controversa Hedw.

Bosnia and Herzegovina, Republic of Srpska, Banja Luka, Banj brdo, on soil, accompanied by *Fissidens taxifolius*, 18.10.2019, leg. P. Lazić, det. S. Škondrić; Banj brdo, on soil, accompanied by *Fissidens taxifolius*, 01.12.2019, leg. P. Lazić, det. S. Škondrić.

Marchantiophyta was represented by 8 species, 7 genera and 7 families. Bryophyta included 22 species, 21 genera and 12 families. The genera *Metzgeria* and *Alleniella* were represented by two species each. In the material collected during field research, the families with the largest number of species and genera were Neckeraceae, Metzgeriaceae, Mniaceae, Polytrichaceae, and Pottiaceae.

The representatives of the division Marchantiophyta (liverworts) are mostly adapted to moist and shaded habitats. They grow on river banks and streams, lakes, ponds and swamps, and some species that live in water are also known. They are sensitive to drought, so they are rarely found in arid areas (Frahm, 2001). In the area of Banj brdo there is Rajnerovo vrelo, a captured spring, that is overgrown with the liverworts *Apopellia endiviifolia*, *Conocephalum conicum* and *Marchantia polymorpha*. These species of liverworts were recorded during our field research only in the above-mentioned specific habitat. Consequently, there is a need to preserve the Rajnerovo vrelo in its current state, because any human activity would inevitably lead to the destruction of the habitat of these species. Other liverwort species inhabited the tree bark: *Frullania dilatata*, *Metzgeria conjugata*, *M. furcata* and *Radula complanata*, while the species *Chiloscyphus polyanthos* was recorded on the forest floor.

The representatives of the division Bryophyta (mosses) were recorded on different substrates: soil, rocks, rock crevices, tree bark and decaying trees and branches. The most common species recorded on Banj brdo area was *Brachytheciastrum velutinum*, and it grew on tree bark, rocks, soil and decaying trees and branches. Pleurocarpic moss *Hypnum cupressiforme* is also a common species. Our findings are in accordance with literature data (Kutnar *et al*., 2023).

CONCLUSION

Banj brdo belongs to the City of Banja Luka and is located in the northwestern part of the Republic of Srpska (Bosnia and Herzegovina). The bryoflora of Banj brdo has not been investigated previously. The present study provides the first insight into the bryoflora of Banj brdo. During field research, from March 2019 to February 2020, as well as in April 2022, a total of 30 species of bryophytes were collected. Marchantiophyta was represented by 8 species, 7 genera and 7 families. Bryophyta comprises 22 species, 21 genera and 12 families. The genera *Metzgeria* and *Alleniella* were represented by two species each. The families with the largest number of species and genera were Neckeraceae, Metzgeriaceae, Mniaceae, Polytrichaceae and Pottiaceae. Rajnerovo vrelo was the only recorded habitat of liverworts *Apopellia endiviifolia*, *Conocephalum conicum* and *Marchantia polymorpha* on Banj brdo, and the need to preserve that habitat from negative anthropogenic influences is indicated. The most common recorded mosses on Banj brdo were *Brachytheciastrum velutinum* and *Hypnum cupressiforme*. It is necessary to continue bryological research on Banj brdo, in order to get a more complete insight into their diversity.

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PRILOG ZA BRIOFLORU BANJ BRDA (BANJA LUKA, REPUBLIKA SRPSKA, B&H)

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Sažetak

Banj brdo se nalazi u okviru grada Banja Luka (Republika Srpska, Bosna i Hercegovina). Ovaj rad pruža prvi uvid u briofloru Banj brda. Terenska istraživanja su sprovedena od marta 2019. do februara 2020. godine, kao i u aprilu 2022. godine. Ukupno je prikupljeno 30 vrsta briofita. Razdio Marchantiophyta je bio zastupljen sa osam vrsta, a razdio Bryophyta sa 22 vrste. Rodovi *Metzgeria* i *Alleniella* bili su zastupljeni sa po dvije vrste, dok su ostali rodovi bili zastupljeni sa po jednom vrstom. Familije sa najvećim brojem vrsta i rodova bile su Neckeraceae, Metzgeriaceae, Mniaceae, Polytrichaceae i Pottiaceae. Rajnerovo

vrelo je bilo jedino zabilježeno stanište jetrenjača *Apopellia endiviifolia*, *Conocephalum conicum* i *Marchantia polymorpha* na Banj brdu što ukazuje na potrebu očuvanja tog staništa od negativnih antropogenih uticaja. Najčešća zabilježena mahovina na Banj brdu bila je *Brachytheciastrum velutinum*, kao i *Hypnum cupressiforme*. Neophodno je nastaviti briološka istraživanja Banj brda, kako bi se dobio potpuniji uvid u raznovrsnost briofita na tom području.

Ključne riječi: briofite, mahovine, jetrenjače, biodiverzitet, Balkan

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