

A contribution to the bryophyte flora of Fruška Gora (Vojvodina, Serbia)

Tijana Cvetic¹ & Marko Sabovljević^{1,2}

¹Institute of Botany and Botanical Garden, Faculty of Biology, University of Belgrade, 43, Takovska St., 11000 Belgrade, Serbia, e-mail: tcvetic@bfbot.bg.ac.yu

²AG Bryologie, Nees Institut für Biodiversität der Pflanzen, Rheinische Friedrich Wilhelms Universität Bonn, Meckenheimer Allee 170, D-53115 Bonn, Germany, e-mail: marko@bfbot.bg.ac.yu; marko@uni-bonn.de (author for correspondence)

Received: July 20, 2004 ▷ Accepted: August 18, 2004

Abstract: The bryophyte flora of Fruška Gora Mt, situated in the province of Vojvodina (Northern Serbia), consists to date of 132 bryophyte taxa (118 moss and 14 liverwort species), which account for about 21 % of the bryophyte flora of Serbia and Montenegro. Two mosses are new to Serbia (*Entosthodon obtusus* and *Rhynchostegiella curviseta*) and one new for the state of Serbia and Montenegro (*Fissidens rivularis*). Most of the species present in the investigated area have mesic characteristics and a temperate distribution type (49 %). Oceanic-suboceanic and subboreal species account for 16 % and 13 % of the flora respectively.

Key words: bryophyte, flora, Fruška Gora, Serbia, Vojvodina

Introduction

The region of Serbia and Montenegro is still very poorly known bryologically, even though there have been a number of investigations into the bryoflora during the past decade (Sabovljević & Stevanović 1998, 1999; Sabovljević 1999, 2000; Dragičević & al. 2001; Papp & Sabovljević 2001; Veljić & al. 2001).

In particular, the region of Fruška Gora Mt has been very poorly studied bryologically, and only a few contributions have been published during the past century (Pavletić 1955; Popović 1966).

The National Park of Fruška Gora Mt is located in North Serbia (Fig. 1). Once an island in the ancient Pannonian Sea, Fruška Gora is now a mountain in the southern part of the Pannonian Plain. Located between 45°0' – 45°15' N and 16°37' – 18°01' E, it is bordered by loess plateaux in the South and West, and by the Danube on the North and East (Fig. 2). Fruška Gora is often considered as the northern- and east-

ernmost branch of the Dinaric Mts, falling away to the Great Pannonian Plain.



Fig. 1. The geographic position of Fruška Gora (black area) in Serbia and Montenegro is indicated by a black arrow.

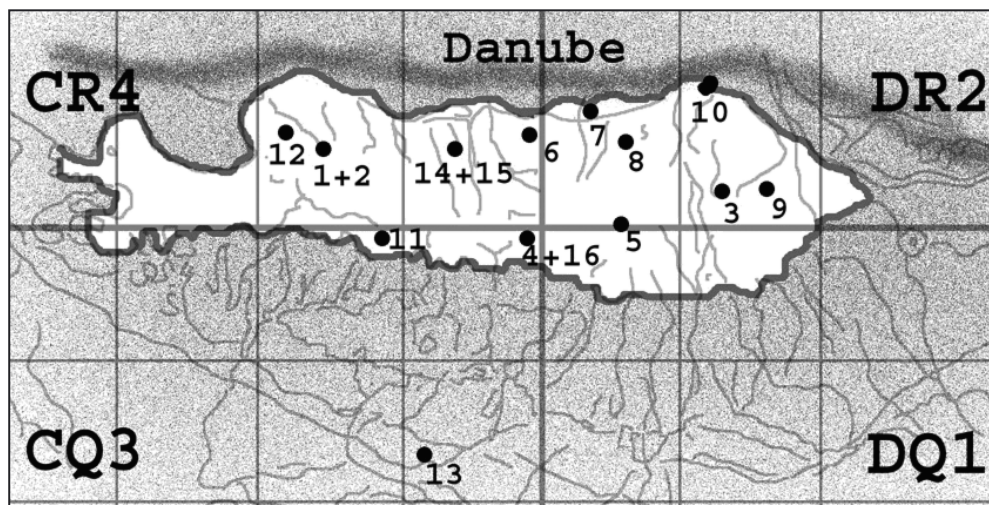


Fig. 2. Investigated area – UTM map (34T) 10×10 km. The unshaded area represents the main range of Fruška Gora. The National park comprises a narrower area.

The average altitude of Fruška Gora is 300–400 m (Obradović 1966), and the highest peak is Crveni Čot (539 m). The massif extends in an east-west direction. On the southern and western slopes there is a gradual transition from the narrow central range to the loess plateaux, while the northern and eastern slopes are somewhat inclined as they descend to the Danube.

The composition of rocks and soil on Fruška Gora Mt is complex owing to its long and complicated geological history. Rocks of various age and type can be found – from palaeozoic metamorphic rocks to young post-tertiary sand and loess, and from limestones to siliceous rocks and serpentines.

Climate varies with altitude (Fig. 3). Fruška Gora belongs to the mild-continental central European climatic region, but because of its specific microclimate and vegetation is designated as subcontinental. Even though it is a low mountain, the higher

areas (above 200 m) have a colder and more humid submontane climate. The prevalent soil types are initial soil rendzynes, black soils, brown soils and cambisols (Stevanović 1984). The lower regions are covered mostly by alluvial soils, while the higher areas are covered mainly by cambisol and brown clay soil.

The hydrological network is dense and relatively evenly distributed throughout the region, rich in springs and streams. Large amounts of precipitation supply these streams. There is also some standing water. The eastern and western slopes are relatively arid, while the northern slopes have many rivulets. Nevertheless, most of these streams are seasonal, and Fruška Gora on the whole is relatively arid during the summer.

Fruška Gora was originally a woody region, and ca 30% of the forest has been protected within the National Park region. Only areas above 300 m altitude are still covered by native woods, mainly *Aculeato-*

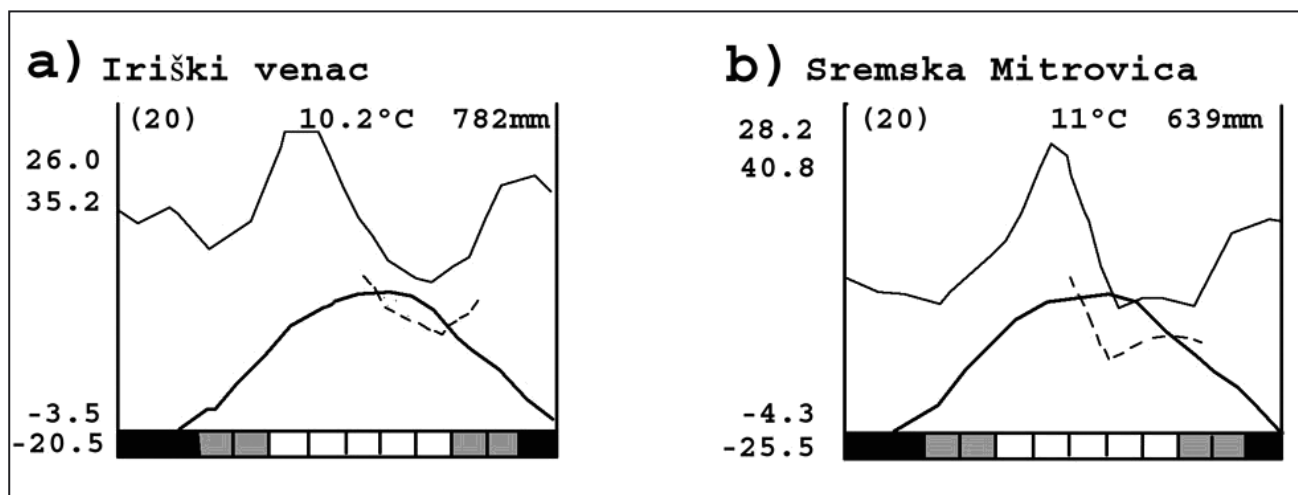


Fig. 3. Climatic diagrams of Fruška Gora: a) main range (near locality 5); b) at locality 13.

Quercus-Carpinetum and *Tilio-Fagetum submontanum* (<http://www.fruskagora-natl-park.co.yu/s/index.htm>, Obradović 1966). The slopes are covered by pastures, vineyards, orchards and cultivated land.

Fruška Gora is a region with a high biodiversity (Obradović 1966; Stevanović 1984). With many different microclimates (from a lowland, semiarid continental type in the foothill, to a relatively cold and humid, submontane climate in the central range) Fruška Gora is host to many endangered species, and is known for its rich orchid flora.

Methods

Field work was performed during 2003. The localities are listed in Appendix 1 and mapped in Fig. 2. Wide neighbouring areas were included in the investigation, and a transect method was also used to cover as wide an area and as many habitats as possible.

Identification of specimens was based on Petrov (1975), Smith (1991, 1993), Casas & al. (2001) and Cortini Pedrotti (2001). Nomenclature for liverworts follows Grolle & Long (2000), and for mosses Corley (1981), Corley & Crundwell (1991) and Casas & al. (2001). An analysis of distributional types was performed according to Düll (1983, 1984, 1985). For ecological values, Düll (1991) was used.

The material collected is deposited in the authors' private herbaria.

Results and Discussion

In our investigation, 117 bryophyte species (105 mosses and 14 liverworts) have been recorded. Including published records that have not been detected in our recent investigations, the number of bryophyte taxa in Fruška Gora has been increased to 132 (116 species and 2 varieties of mosses and 14 species of liverworts). Of the 35 previously recorded species (Pavletić 1955; Popović 1966), 23 were re-found in our investigation, while 12 were either overlooked or have disappeared from this area (or were misidentified in previous research). Therefore, 95 bryophyte species are newly recorded for Fruška Gora, 84 mosses and 11 liverworts (Appendix 2). No new liverwort species were recorded in this investigation, but two moss species are new for Serbia (*Entosthodon obtusus* and *Rhynchostegiella cur-*

viseta) and one for Serbia and Montenegro (*Fissidens rivularis*).

Despite the good hydrological network, and because of its temporary nature, liverworts are represented by only 10.5% of the bryoflora of Fruška Gora. This is not surprising, because liverworts constitute to date only 19% of bryophyte flora of Serbia and Montenegro (Sabovljević & Stevanović 1998, 1999; Sabovljević 2000). Among the mosses the most abundant are the *Hypnales* (46%) (Fig. 4). Most of the species found prefer low (40%) to intermediate (37.5%) temperatures, and intermediate (70%) moisture (Fig. 6). The most abundant (51.5%) are taxa that prefer moderately light conditions. Regarding life forms (Fig. 7), the most abundant are chamaephytes (44%), followed by epiphytic chamaephytes (29%).

The greatest diversity of species was found in the region of Dumbovo (loc. 14+15) (Appendix 1). These localities actually consist of a wide segment of woodland with a small stream (Dumbovački Potok) and its waterfall (ca 8 m height). 30% (i.e. 36) of the Fruška Gora bryophyte species have been found at this site. This is obviously a basic habitat (79% of the bryophytes are basophytic). Most of the species were found at the waterfall (19 mosses and 6 liverworts) where water falls over calcareous rock. A small number of acido-

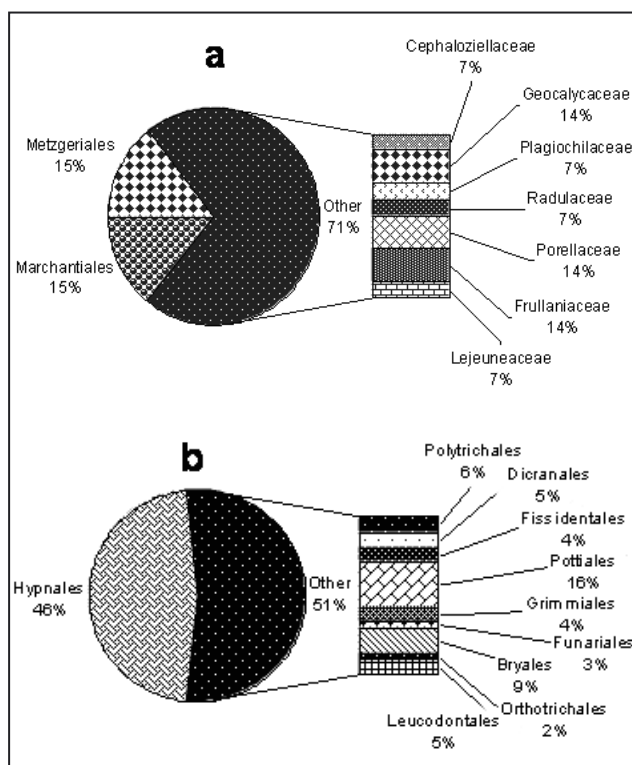


Fig. 4. Distribution of liverworts. (a) and mosses (b) in orders and families in Fruška Gora Mt

phytes are found in the surrounding woods, on acidic soil (Fig. 5). An interesting site is Vrdnik and its surroundings (loc. 5), which is located in the higher part of central range (Fig. 2), and obviously has somewhat more acidic substrata, so that acidophytic bryophytes constitute 66 % of bryophytes present.

The taxa found on Fruška Gora Mt belong to many different chorological types (Fig. 8). The most outstanding feature is the dominance of species with a temperate distribution (49%). This is predictable considering the climate, vegetation, and geographical position of the investigated area. Taxa with oceanic-suboceanic distribution are the second category numerically (16%), implying the presence of submediterranean influence deep within the mild continental climate zone. The subboreal (13%) distribution type is the third most common, and together with the boreal type (8%) constitutes 21 % of the flora. This can be explained by the higher parts of National Park being colder and more humid, thus conventionally with a submontane climate. Subcontinental and sub-alpine chorological elements are represented at 3% each. When compared with Avala Mt (150 km air distance to south) (Sabovljević & Cvetić 2003), the investigated area has a similar diversity of bryophytes, dominated by temperate chorological elements, but it seems that Fruška Gora is also very similar to the west Serbian hill regions where boreal bryophyte elements are relatively highly represented (Papp & Sabovljević 2001).

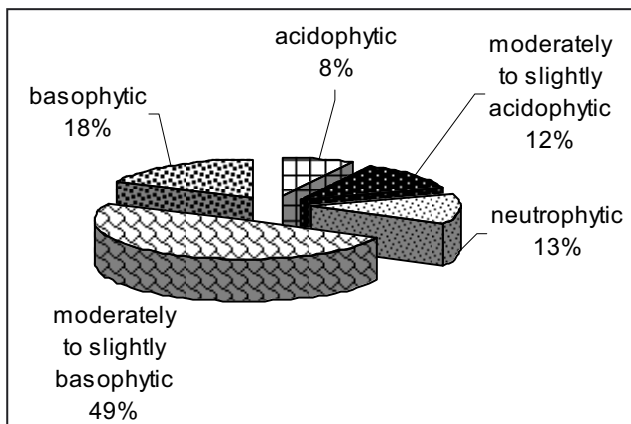


Fig. 5. Percentage of taxa with different substrate pH preferences. The values in Düll (1991) were combined into 5 categories as follows: acidophytic = values 1 and 2; moderately to slightly acidophytic = 3 and 4; neutrophytic = 5; moderately to slightly basophytic = 6 and 7; basophytic = 8 and 9.

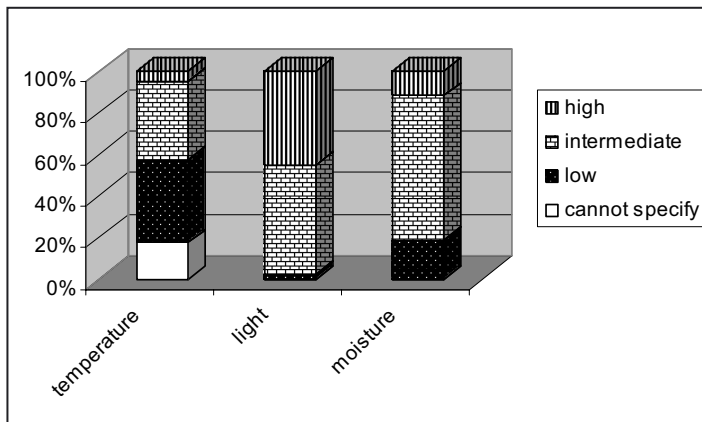


Fig. 6. Percentage of taxa with different temperature, light and moisture preferences.

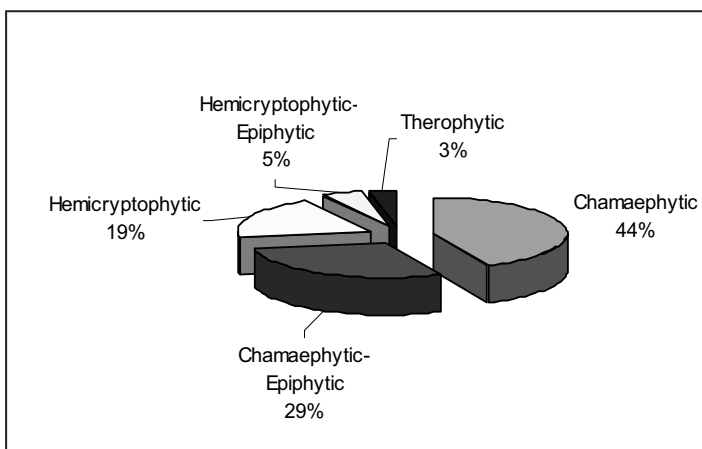


Fig. 7. Life forms of the Fruška Gora bryophytes.

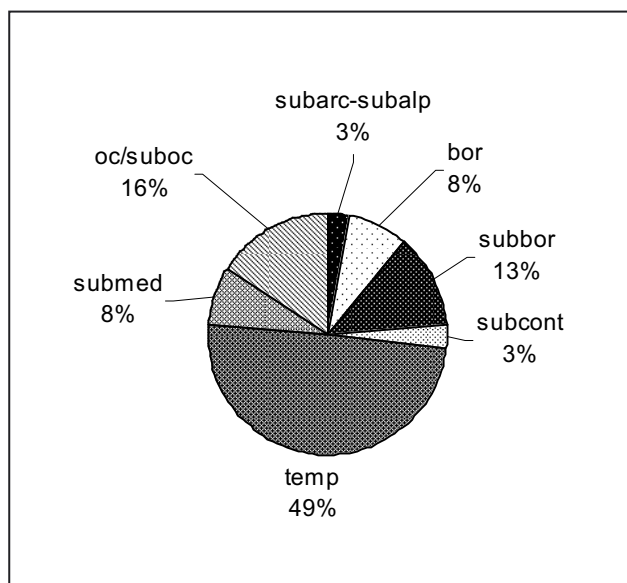


Fig. 8. Percentage of the main distribution types among the Fruška Gora bryophytes.

Conclusions

The bryophyte flora of Fruška Gora consists of 132 taxa (116 species, 2 varieties of mosses and 14 species of liverworts). Two species (*Entosthodon obtusus* and *Rhynchostegiella curviseta*) are new for Serbia and one (*Fissidens rivularis*) for the state of Serbia and Monenegro.

Considering that Fruška Gora is a national park with many types of substrata and different microcli-

mates, we expect to find greater diversity of bryoflora, and further investigations are likely to produce new bryophyte records. Fruška Gora is dominated by temperate chorological elements, but there is also a considerable submediterranean and boreal influences.

Acknowledgement. The senior author wishes to express his gratitude to the Bequest Fund of the British Bryological Society for supporting this research.

Appendix 1

List of localities with UTM coordinates, percentage of species present and ecological preferences of species in each locality.

Locality	UTM (34T) 10 × 10	% species of FG bryoflora	% mosses in each locality	% liverworts in each locality	acido phytic	neutro phytic	slightly basophytic	baso phytic
1+2	CR4 30	20	83.3	16.7	4.17	8.33	37.5	50
3	DR2 10	25.8	87.1	12.9	27.59	10.34	34.48	27.59
4+16	CQ3 44	18.33	95.5	4.5	20	10	40	30
5	DQ1 04	17.5	85.7	14.3	66.67	16.67	5.56	11.1
6	CR4 40	13.33	100	0	16.67	16.67	50	16.67
7	DR2 00	11.67	100	0	8.33	16.67	25	50
8	DR2 00	6.67	100	0	37.5	0	50	12.5
9	DR2 10	4.17	80	20	0	0	60	40
10	DR2 11	5.83	100	0	0	0	75	25
11	CQ3 34	7.5	88.9	11.1	12.5	0	25	62.5
12	CR4 30	9.17	90.9	9.1	10	10	60	20
13	CQ3 43	8.33	100	0	0	0	33.3	66.7
14+15	CR4 40	30	77.8	22.2	11.76	8.82	23.53	55.89

1. Rim; 2. Vicinity of Rim; 3. Monument to Branko Radičević with surroundings; 4. Rest house Brankovac; 5. Vrdnik and environs; 6. Beočin meadows; 7. Rakovac; 8. Quarry near Rakovac; 9. Stražilovo; 10. Petrovaradin; 11. Ležimir; 12. Roman bathhouse ruins; 13. Sremska Mitrovica; 14. Dumbovac rivulet; 15. Dumbovac waterfall; 16. Brankovac.

Appendix 2

Floristic catalogue

LIVERWORTS:

N	species	localities
1	<i>Cephaloziella stellulifera</i> Schiffn.	11
2	<i>Conocephalum conicum</i> (L.) Underw.	14
3	<i>Frullania dilatata</i> (L.) Dumort.	3, 5
4	<i>Frullania tamarisci</i> (L.) Dumort.	Pa55, 3
5	<i>Lejeunea cavifolia</i> (Ehrh.) Lindb.	14
6	<i>Lophocolea bidentata</i> (L.) Dumort.	5
7	<i>Lophocolea heterophylla</i> (Schrad.) Dumort.	3, 5, 14
8	<i>Marchantia polymorpha</i> L.	Po66, 15
9	<i>Metzgeria conjugata</i> Lindb.	15
10	<i>Metzgeria furcata</i> (L.) Dumort.	1, 14
11	<i>Plagiochila porelloides</i> (Torrey ex Nees) Lindb.	14, 15
12	<i>Porella cordaeana</i> (Hüb.) Moore	2, 9, 16
13	<i>Porella platyphylla</i> (L.) Pfeiff.	Pa55, Po66, 1, 3
14	<i>Radula complanata</i> (L.) Dumort.	2, 12, 14

MOSSES:

N	species	localities
1	<i>Amblystegium confervoides</i> (Brid.) Schimp.	13
2	<i>Amblystegium juratzkanum</i> Schimp.	1
3	<i>Amblystegium riparium</i> (Hedw.) Schimp.	2, 14, 17
4	<i>Amblystegium saxatile</i> Schimp.	3
5	<i>Amblystegium serpens</i> (Hedw.) Schimp.	1, 3, 7, 8, 12, 14
6	<i>Amblystegium subtile</i> Schimp.	7, 14
7	<i>Amblystegium varium</i> (Hedw.) Lindb.	1
8	<i>Anomodon attenuatus</i> (Hedw.) Huebener	Pa55, 1, 7, 14
9	<i>Anomodon viticulosus</i> (L.) Hook. & J. Tayl.	Po66
10	<i>Atrichum angustatum</i> (Brid.) Bruch	Pa55, Po66, 5
11	<i>Atrichum tenellum</i> (Röhl.) Bruch & Schimp.	5
12	<i>Atrichum undulatum</i> (Hedw.) P. Beauv.	Po66, 3, 5, 8,
13	<i>Barbula convoluta</i> Hedw.	4, 7
14	<i>Barbula unguiculata</i> Hedw.	7, 12
15	<i>Brachythecium glareosum</i> (Spruce) Schimp.	11
16	<i>Brachythecium mildeanum</i> (Schimp.) Milde	13, 14
17	<i>Brachythecium rivulare</i> Bruch	Pa55
18	<i>Brachythecium rutabulum</i> (Hedw.) Bruch	Pa55, 5, 6, 12
19	<i>Brachythecium salebrosum</i> (Web. et Mohr.)	1, 5
20	<i>Brachythecium velutinum</i> (L.) Bruch	Pa55
21	<i>Bryoerythrophyllum recurvirostrum</i> (Hedw.) P. C. Chen.	2, 3, 4, 7
22	<i>Bryum argenteum</i> Hedw.	4, 10, 12, 13
23	<i>Bryum caespiticium</i> Hedw.	2, 6, 10, 11, 12

24	<i>Bryum capillare</i> Hedw.	3, 7, 8, 11
25	<i>Bryum flaccidum</i> Brid.	8, 16
26	<i>Campyliadelphus chrysophyllum</i> (Brid.) R. S. Chopra	11
27	<i>Ceratodon purpureus</i> (Hedw.) Brid.	Pa55, 3, 4, 6, 13
28	<i>Cirriphyllum tommasinii</i> (Boulay) Grout	13
29	<i>Cratoneuron filicinum</i> (Hedw.) Spruce	14, 15
30	<i>Ctenidium molluscum</i> (Hedw.) Mitt.	Po66, 3, 15
31	<i>Dicranella cerviculata</i> (Hedw.) Schimp.	5, 8
32	<i>Dicranella heteromalla</i> (Hedw.) Schimp.	3, 5
33	<i>Dicranella subulata</i> (Hedw.) Schimp.	16
34	<i>Dicranella varia</i> (Hedw.) Schimp.	6, 8, 11
35	<i>Dicranum scoparium</i> (L.) Hedw.	Po66
36	<i>Didymodon acutus</i> (Brid.) K. Saito	12, 17
37	<i>Didymodon insulanus</i> (De Not.) Hill	10
38	<i>Didymodon luridus</i> Hornsch.	7
39	<i>Didymodon vinealis</i> Hedw.	13
40	<i>Drepanocladus aduncus</i> (Hedw.) Warnst.	13
41	<i>Entosthodon fascicularis</i> (Hedw.) C. Müll.	6
42	<i>Entosthodon obtusus</i> (Hedw.) Lindb.*	16
43	<i>Eurhynchium hians</i> (Hedw.) Sande Lac.	2, 16
44	<i>Eurhynchium praelongum</i> (Hedw.) Bruch	1, 3, 7
45	<i>Eurhynchium pulchellum</i> (Hedw.) Jenn.	6
46	<i>Eurhynchium pumilum</i> (Wils.) Schimp.	1
47	<i>Eurhynchium striatum</i> (Schr.) Schimp.	Po66
48	<i>Fissidens bryoides</i> Hedw.	3
49	<i>Fissidens dubius</i> P. Beauv.	1, 15
50	<i>Fissidens rivularis</i> (Spruce) Bruch	7
51	<i>Fissidens taxifolius</i> Hedw.	1, 2, 3, 6, 14, 16
52	<i>Fissidens viridulus</i> (Sw.) Wahlenb. var. <i>tenuifolius</i> (Boul.) A.J.E. Sm.	2, 16
53	<i>Funaria hygrometrica</i> Hedw.	Pa55, 2, 3
54	<i>Grimmia anodon</i> Bruch. & Schimp.	10, 13
55	<i>Grimmia pulvinata</i> (Hedw.) Sm.	11
56	<i>Grimmia trichophylla</i> Grev.	12
57	<i>Gymnostomum calcareum</i> Nees & Hornsch.	3
58	<i>Herzogiella seligeri</i> (Brid.) Iwats.	14, 17
59	<i>Homalia trichomanoides</i> (Hedw.) Schimp.	15
60	<i>Homalothecium sericeum</i> (Spruce) H. Rob.	2, 16
61	<i>Homalothecium lutescens</i> (Hedw.) Robins	8
62	<i>Hypnum callichroum</i> Brid.	8, 5
63	<i>Hypnum cupressiforme</i> Hedw.	Pa55, Po66, 3, 4, 5, 7, 12, 14
63 a	<i>Hypnum cupressiforme</i> Hedw. var. <i>lacunosum</i> Brid.	12
64	<i>Hypnum recurvatum</i> (Lindb. & Arnell) Kindb.	11
65	<i>Hypnum resupinatum</i> J. Tayl.	5, 16
66	<i>Isothecium myurum</i> Brid.	Pa55, Po66, 14, 17
67	<i>Leskea polycarpa</i> Hedw.	Pa55, 1, 3, 6
68	<i>Leucodon sciuroides</i> (Hedw.) Schwägr.	Pa55, Po66, 3, 9, 12
69	<i>Mnium hornum</i> Hedw.	5
70	<i>Neckera besseri</i> (Lobarz) Jur.	3
71	<i>Neckera complanata</i> (Hedw.) Hüb.	Pa55, 3, 9, 14
72	<i>Orthotrichum affine</i> Brid.	2, 6, 16

72 a	<i>Orthotrichum affine</i> Brid. var. <i>fastigiatum</i> (Brid.) Hüb.	Pa55
73	<i>Orthotrichum diaphanum</i> Brid.	3, 6, 10
74	<i>Plagiomnium cuspidatum</i> (Hedw.) T. J. Kop.	Pa55, 5
75	<i>Plagiomnium rostratum</i> (Schrad.) T.J. Kop.	14, 15
76	<i>Plagiomnium undulatum</i> (Hedw.) T.J. Kop.	Po66
77	<i>Plagiothecium cavifolium</i> (Brid.) Z. Iwats	2, 16
78	<i>Plagiothecium curvifolium</i> Limpr.	5, 15
79	<i>Plagiothecium laetum</i> Br. Eur.	3, 6, 16
80	<i>Plagiothecium silvaticum</i> (Huds.) Br. Eur.	Pa, Po, 1
81	<i>Platygyrium repens</i> (Brid.) Br. Eur.	6
82	<i>Pleurozium schreberi</i> (Willd.) Mitt.	Pa55
83	<i>Pogonatum nanum</i> (Hedw.) P. Beauv.	3, 5
84	<i>Polytrichum commune</i> L.	Pa55, Po66, 5
85	<i>Polytrichum formosum</i> Hedw.	5
86	<i>Polytrichum piliferum</i> Schreb.	Pa55, Po66
87	<i>Pottia intermedia</i> (Turn.) Fürnr.	6
88	<i>Pseudoleskeella catenulata</i> (Schrad.) Kindb.	3
89	<i>Pseudoleskeella nervosa</i> (Brid.) Nyh.	2, 3, 9, 16
90	<i>Pseudoscleropodium purum</i> (L.) Flschr.	Pa55, Po66
91	<i>Pterigynandrum filiforme</i> Hedw.	3
92	<i>Pylaisia polyantha</i> (Hedw.) Schimp.	Po66, 1, 14
93	<i>Rhizomnium pseudopunctatum</i> (Schimp.) T. J. Kop.	14
94	<i>Rhizomnium punctatum</i> (Hedw.) T. J. Kop.	Po66, 3
95	<i>Rhynchostegiella curviseta</i> (Brid.) Limpr. †	1
96	<i>Rhynchostegiella teesdalei</i> (Schimp.) Limpr.	5, 7, 14
97	<i>Rhynchostegiella tenella</i> (Dicks.) Limpr.	12, 14, 17
98	<i>Rhynchostegium confertum</i> (Dicks.) Br. Eur.	6
99	<i>Rhynchostegium murale</i> (Hedw.) Br. Eur.	3, 14
100	<i>Rhynchostegium riparioides</i> (Hedw.) Cardot	14, 15
101	<i>Rhytidiadelphus triquetrus</i> (L.) Wstf.	Po66
102	<i>Schistidium apocarpum</i> (Hedw.) Br. Eur.	Pa55, 7, 14
103	<i>Schistidium atrofusum</i> (Schimp.) Limpr.	13
104	<i>Scorpiurium circinatum</i> (Brid.) M. Fleisch.	14
105	<i>Syntrichia calcicola</i> J. J. Amann	10
106	<i>Syntrichia intermedia</i> Brid.	4, 9, 10
107	<i>Syntrichia laevipila</i> Brid.	3
108	<i>Syntrichia papillosa</i> (Wils.) Jur.	6
109	<i>Syntrichia princeps</i> (De Not.) Mitt.	12
110	<i>Syntrichia ruralis</i> (Hedw.) Web. & Mohr.	4
111	<i>Thamnobryum alopecurum</i> (Hedw.) Gang.	15
112	<i>Thuidium abietinum</i> (L.) Br. Eur.	Po66
113	<i>Thuidium tamariscinum</i> (Hedw.) Bruch	Pa55, 15
114	<i>Tortula muralis</i> Hedw.	7, 12, 13
115	<i>Tortula subulata</i> Hedw.	Pa55, 3, 6, 7, 16
116	<i>Trichostomum crispulum</i> (Bruch.) Schimp.	11, 16

* new records for Serbia;

** new records for Serbia and Montenegro;

Pa55 – records from Pavletić (1955);

Po66 – data from Popović (1966).

References

- Casas, C., Brugués, M. & Cros, R. M.** 2001. Bryophyte flora of Catalan lands. Part I. Institute of Catalan Studies, Barcelona (in Catalan).
- Corley, M. F. V. & Crundwell, A. C.** 1991. Additions and amendments to the mosses of Europe and the Azores. – *J. Bryol.*, **16**: 337-356.
- Corley, M. F. V.** 1981. Mosses of Europe and the Azores; an annotated list of species, with synonyms from recent literature. – *J. Bryol.*, **11**: 609-689.
- Cortini Pedrotti, C.** 2001. Flora dei muschi d'Italia (I parte). Pp. 817. Antonio Delfino Editore, Roma.
- Dragičević, S., Veljić, M., Marin, P. D. & Petković, B.** 2001. New moss taxa for the flora of Montenegro. – *Fl. Medit.*, **11**: 109-113.
- Düll, R.** 1983. Distribution of the European and Macronesian liverworts (*Hepatocophytina*). – *Bryol. Beitr.*, **2**: 1-114.
- Düll, R.** 1984. Distribution of the European and Macronesian mosses (*Bryophytina*) I. – *Bryol. Beitr.*, **4**: 1-113.
- Düll, R.** 1985. Distribution of the European and Macaronesian mosses (*Bryophytina*) II. – *Bryol. Beitr.*, **5**: 110-232.
- Düll, R.** 1991. Indicator values of mosses and liverworts. – In: **Ellenger, H., Weber, H. E., Düll, R., Wirth, V. Werner, W. & Paulissen, D.** (eds), Indicator values of plants in Central Europe. Pp. 175-214. Erich Goltze, Göttingen.
- Grolle, R. & Long, D. G.** 2000. An annotated check list of the Hepaticae and Anthocerotae of Europe and Macaronesia. – *J. Bryol.*, **22**: 103-140.
- Obradović, M. S.** 1966. Biogeographical analyses of the flora of Fruška Gora. Matica Srpska, Novi Sad (in Serbian).
- Papp, B. & Sabovljević, M.** 2001. Contribution to the knowledge of the bryoflora of the region of Petnica (W. Serbia, Yugoslavia). – *Studia Bot. Hung.*, **32**:107-120
- Pavletić, Z.** 1955. Synopsis of the bryophyte flora in Yugoslavia. Yugoslav Acad. Sci. & Arts, Zagreb (in Croatian).
- Petrov, S.** 1975. Bryophyta Bulgarica. Clavis diagnostica. In *Aedibus Acad. Sci. Bulgaricae*, Sofia (in Bulgarian).
- Popović, M.** 1966. Contribution to the moss flora of reserves and protected areas in Serbia. – *Zašt. Prir.*, **33**: 219-228 (in Serbian).
- Sabovljević, M.** 1999. *Anastrophyllum minutum* (Schreb.) Schust., new to Serbia (FR Yugoslavia), and its distribution in the Balkans. – *Phytol. Balcan.*, **5**(2-3): 93 – 96.
- Sabovljević, M.** 2000. Checklist of hepatics of the Federal Republic of Yugoslavia. – *Lindbergia*, **25**: 128 – 133.
- Sabovljević, M. & Cvetić, T.** 2003. Bryophyte flora of Mt Avala (C. Serbia, Yugoslavia). – *Lindbergia*, **28**: 90-96.
- Sabovljević, M. & Stevanović, V.** 1998. Bryophyte synopsis of *Bryopsida* with synonyms. – *Zašt. Prir.*, **50**:147-168 (in Serbian).
- Sabovljević, M. & Stevanović, V.** 1999. Moss Conspectus of the Federal Republic of Yugoslavia. – *Fl. Medit.*, **9**: 65-95.
- Smith, A. J. E.** 1991. The Liverworts of Britain and Ireland. Cambridge Univ. Press, Cambridge.
- Smith, A. J. E.** 1993. The Moss Flora of Britain and Ireland. Cambridge Univ. Press, Cambridge.
- Stevanović, V.** 1984. Ecology, phytocoenology and floristic structure of steppe vegetation in Fruška Gora. *PhD Thesis*, Faculty of Biology, Belgrade University, Belgrade (in Serbian, unpubl.).
- Veljić, M., Marin, P. D., Petković, B. & Ljubić, B.** 2001. New species for the bryophyte flora of Yugoslavia. – *Cryptog. Bryol.*, **22**(4): 275-277.

