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Check-list of the bryophytes of Bulgaria. II. Musci

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Abstract – The present check-list enlists 531 species of mosses that occur in Bulgaria. It is based on literature and herbarium records. The distribution of each species in the floristic regions is presented. *Acaulon muticum* is reported for the first time for Bulgaria. Forty-four additional species are considered threatened.

Musci / mosses / check-list / distribution / Bulgaria

Résumé – La présente liste contient 531 espèces de mousses recensées dans la Bulgarie. La liste a été élaborée à partir de la bibliographie et de l'examen des spécimens d'herbiers. La répartition des espèces est décrite suivant les régions floristiques du pays. *Acaulon muticum* est signalée en Bulgarie pour la première fois. 44 espèces sont considérées comme menacées.

This is the second part of the check-list of Bulgarian bryophytes that enlists the moss species known to occur in Bulgaria. It includes 531 species and one hybrid (*Funaria* × *hybrida*). The first account of Bulgarian mosses listed 501 species (Petrov, 1975). Later, Düll *et al.* (1999) listed 510 taxa at species rank and a number of varieties. The infraspecific taxa have not been treated here because there is a need of more comprehensive studies on Bulgarian bryoflora. Among the bryophytes recorded in the present check-list, *Acaulon muticum* is reported as new for the country. It was found growing on loamy soil in the central park in the city of Sofia. Special interest deserves the finding of the taxon *Hypnum heseleri* Ando & Higuchi. It was found in the Vitosha Mt. at about 1100 m alt. growing on a humid granite boulder in a shady deciduous mixed forest (*Fagus sylvatica* L., *Quercus dalechampii* Ten., *Tilia* sp.) The specimen was collected by A. Ganeva and determined by Nils Cronberg. So far this taxon has been reported from Germany and the Netherlands (van Zanten & Hofman, 1994). Van Zanten & Hofman (1994) hypothesized that it is possibly a recent mutant form of

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Hypnum cupressiforme that does not deserve taxonomic status, and presented isozyme and cultivation data in support of this hypothesis. Therefore, we did not include *H. heseleri* in the list of species but report it here as a new locality in Europe of this curious mutant form.

This check-list has been compiled after a thorough search in the literature as well as a full inventory of the herbarium materials available in Bulgarian herbaria (mainly SOM). Attempt was made to trace specimens collected by foreign bryologists who visited Bulgaria at different periods, especially for species reported only once. Column "Herbarium" in Table 1 shows where these specimens are located. We were unable to find herbarium vouchers of some species, therefore their presence in Bulgaria is based solely on literature records.

Following the adopted system in the check-list of hepatics (Ganeva & Natcheva, 2003), we present the distribution of mosses by floristic regions that are used for Bulgarian vascular flora (Jordanov, 1963-1989). A quick reference to the known distribution of each species as well as the species diversity within each region is provided. The names of the floristic regions and their boundaries are indicated on Fig. 1.

Fig. 1. Map of Bulgaria showing the boundaries of the floristic regions. – Abbreviations: 1. Black See Coast (n – north, s – south) (Bsk), 2. North-eastern Bulgaria (NeB), 3. Danubian Plain (D), 4. Forebalkan (Fb), 5. Stara planina Mts (Balkan Range) (w – western, c – central, e – eastern) (Sp), 6. Sredna gora Mt (w – western, c – central, e – eastern) (Sg), 7. Sofia region (Sf), 8. Znepole region (Zn), 9. West Frontier Mts (Wfm), 10. Strouma river valley (Sv), 11. Belasitsa Mt. (B), 12. Slavyanka Mt (Sl), 13. Mesta river valley (M), 14. Pirin Mt (P), 15. Rila Mt. (R), 16. Vitosha Mt. (V), 17. Rhodopi Mts (w – western, c – central, e – eastern), 18. Thracian Lowland (Tl), 19. Toundzha Hilly Country (Thc), 20. Strandzha Mt. (Sz).

The nomenclature in general follows Corley & *al*. (1981) and Corley & Crundwell (1991) with few exceptions that are commented under the respective species. The nomenclature of the *Calliergon-Scorpidium-Drepanocladus* complex follows Hedenäs (1993), that of *Grimmia* and related taxa, Greven (2003), and that of Pottiaceae, Zander (1993). In Appendix 1 are listed the main synonyms that are used in Bulgarian bryological literature.

The chorological data presented in Table 1 revealed 116 species that are known from a single region with a single locality. Thirty-two of them have not been collected since 1956. It is clear that further floristic studies are needed to update the information on species distribution in Bulgaria. One hundred and thirty six (25.7 %) of the moss species are included in the preliminary list of threatened bryophytes in Bulgaria (Ganeva, 1998). These species were evaluated according to the threat categories used in the Red Data Book of European Bryophytes (ECCB, 1995). Recent data on the distribution of Bulgarian mosses show that attention has to be paid on 44 additional species (marked with "*" in Table 1). They need to be evaluated according to the recent IUCN criteria, and the ones preliminary listed as threatened by Ganeva (1998) need to be reevaluated as well.

Annotations to Table 1.

1. The only known specimen of *Brachythecium oxycladum* Jur. collected by J. Podpěra in 1908 from the Rila Mt. (PR) belongs to *Brachythecium glareosum* (Spruce) Bruch, Schimp. & W. Gümbel (rev. Z. Pilous, R. Natcheva). Thus, *Brachythecium oxycladum* has to be excluded from the list of the Bryophytes of Bulgaria.

2. Very common throughout the country but systematically overlooked.

3. Reported as occasionally occurring in the mountains of the western part of Bulgaria without precise locality (Stefanoff & Petrov, 1962).

4. *Orthotrichum scanicum* was first reported by Vondráček (1993) after a revision of Podpěra's herbarium specimens in PR. This species is endangered throughout Europe. From the Balkans it has been found in Greece, Slovenia, Croatia, Bosnia and Herzegovina, and Romania (Düll 1985, Düll *& al*., 1999; Lara *& al*., 2003).

5. Corley *& al*. (1981) considered *Sphagnum inundatum* Russ. and *S. auriculatum* Schimp. as conspecific and treated them under the name *S. leskurii* Sull. However, *S. inundatum* and *S. auriculatum* are genetically and morphologically distinct (Krzakova & Melosik, 2000) and thus each merits specific status. The often used name *S. denticulatum* Brid. has a priority over *S. auriculatum*. However, the type of *S. denticulatum* consists of atypical plants and is difficult to be distinguished from *S. inundatum* (Dirske & Isoviita, 1986; Flatberg, pers. com.). For this reason the name *Sphagnum auriculatum* Schimp. is preferred.

6. The report of *Sphagnum rubellum* in Ganeva & Düll (1999) is based on the speculation of Petrov (1975) that this species could eventually occur in some of the higher mountains of Bulgaria. So far it has not been found despite of the thorough searches. This species has oceanic preferences (Daniels & Eddy, 1990) and its occurrence in Bulgria is unlikely though other more oceanic species are known from this region. Thus *S. rubellum* has to be excluded from the list of the bryophytes of Bulgaria.

Table 1. Check-list of the mosses of Bulgaria with data on their distribution. Abbreviations: ○ - literature based report before 1956, ● - literature based report after 1956 (incl.), □ - herbarium based record before 1956, ■ - herbarium based record after 1956 (incl.), ( ) – presence uncertain; R – Rare, E – Endangered, V – Vulnerable, K – Insufficiently Known, * - of conservation importance but not evaluated; BP – Hungarian Natural History Museum, PR – National Museum in Prague, S – Swedish Museum of Natural History, SOM – Bulgarian Academy of Sciences, STU/DUIS – Staatliches Museum für Naturkunde/Universität Duisburg; for abbreviations of the floristic regions see Fig. 1.

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Acaulon muticum (Hedw.) Müll.Hal.																■									■				*
Aloina ambigua (Bruch & Schimp.) Limpr.	●										●■																	SOM	R
Aloina rigida (Hedw.) Limpr.				○																									E
Amblystegium confervoides (Brid.) Schimp.							●			●						●													
Amblystegium riparium (Hedw.) Schimp.			●	●		○	●			●						○			●			■		■				SOM	
Amblystegium serpens (Hedw.) Schimp.	■		●			●	●■		■		●							●	●			■		■		■		SOM, S	
Amblystegium subtile (Hedw.) Schimp.							●		●	●								●	●						●				
Amblystegium varium (Hedw.) Lindb.						●										○		●				●■					■	SOM	
Amphidium lapponicum (Hedw.) Schimp.							●■		●■																			SOM	R
Amphidium mougeotii (Bruch & Schimp.) Schimp.	●						●■		●□	●									●■			●□			○			SOM	
Andreaea alpestris (Thed.) Schimp.							●■		●									●	●■									SOM	
Andreaea rupestris Hedw.							●		●■		●							■	●■									SOM	
Anomodon attenuatus (Hedw.) Huebener	●■					●	●		●	●■	●■							○■		■					○	●■		SOM	
Anomodon longifolius (Brid.) C.Hartm.				○■		○			●	●	●														○			SOM	
Anomodon rostratus (Hedw.) Schimp.																			●■									STU/ DUIS	*
Anomodon rugelii (Müll.Hal.) Keissl.									●	■	■								●									SOM	
Anomodon viticulosus (Hedw.) Hook. & Taylor	●■	●				●■	●■		●		●							●■	●	■	●■	●■			○			SOM	
Antitrichia curtipendula (Hedw.) Brid.	●■		●				●■		●■	●■	●■							●■	●■						○	●■		SOM	
Aphanorrhegma patens (Hedw.) Lindb.																								●■				SOM	E
Atrichum angustatum (Brid.) Bruch & Schimp.							●													●									K
Atrichum tenellum (Röhl.) Bruch & Schimp.										○						○													E
Atrichum undulatum (Hedw.) P.Beauv.	●■	■					●□		●■	●■						■		●■	●■						●■	■	■	SOM	
Aulacomnium androgynum (Hedw.) Schwägr.	●■																											SOM	R
Aulacomnium palustre (Hedw.) Schwägr.							●		●	●■	●							●■							●			SOM	
Barbula convoluta Hedw.		○■				○				●	●■								●									SOM	

Taxon	Distribution by floristic regions																										Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
Barbula crocea (Brid.) F.Weber & D.Mohr											●■																	SOM	*
Barbula unguiculata Hedw.		●					●		●		●■					○	■	●		■	●■				○	●		SOM	
Bartramia halleriana Hedw.	●■						●		●■	■	●■							●■	●□						○■			SOM	
Bartramia ithyphylla Brid.	■						●		●■		●							●■	●						○			SOM	
Bartramia pomiformis Hedw.	●■					●	●■		●■		□						●■	●		■					○			SOM	
Blindia acuta (Hedw.) Bruch & Schimp.						●	●		●■										●						○■			SOM	
Blindia caespiticia (F.Weber & D.Mohr) Müll.Hal.									○																○				
Brachydontium trichodes (F.Weber) Fümr.																			●■									SOM	R
Brachythecium albicans (Hedw.) Schimp.			●	●■			●■		○■	■							●											SOM	
Brachythecium campestre (Müll.Hal.) Schim							●											●■										SOM	
Brachythecium geheebii Milde																		●							●□			PR	R
Brachythecium glaciale Schimp.							●																						R
Brachythecium glareosum (Spruce) Schimp. [1)]						○	●		○□							○		●							○		●	PR	
Brachythecium latifolium Kindb.									●□																			SOM	R
Brachythecium mildeanum (Schimp.) Schimp.														■														SOM	*
Brachythecium plumosum (Hedw.) Schimp.									●■	●															○□			SOM, PR	K
Brachythecium populeum (Hedw.) Schimp.							●		●□									○	■						○			SOM	
Brachythecium reflexum (Starke) Schimp.	●■						●■		○																○□			SOM	
Brachythecium rivulare Schimp.	●■		●			●	●■	●■	●■	■				■				●□	■	■		□			□	■		SOM	
Brachythecium rutabulum (Hedw.) Schimp.	■		□			●	■		●	●	●					○■		●	■	■	■	□			○□			SOM	
Brachythecium salebrosum (F.Weber & D.Mohr) Schimp.				■			●		●■	●						■			●								■	SOM	
Brachythecium starkii (Brid.) Schimp.							●		●																				R
Brachythecium velutinum (Hedw.) Schimp.	■					○	●		●■	●■	■	■				■		●	●	■		■			●			SOM	
Breidleria pratensis (Koch ex Spruce) Loeske									○□																			S, PR	*
Bryoerythrophyllum recurvirostre (Hedw.) P.C.Chen						●	●		●	■	■					○		■	■						○			SOM	
Bryum algovicum Sendtn. ex Müll.Hal.									●																				*
Bryum alpinum With.									□	■	○	■					■	●■	●■						○■			SOM	
Bryum argenteum Hedw. [2)]	●	●■					●■		●■		■					○■		●■	●■		■				■			SOM	
Bryum bicolor Dicks.		●				■	■														●■	●		■				SOM	R
Bryum caespiticium Hedw.											●■					○■		●■	●■					■	●■			SOM	
Bryum canariense Brid.							●■														■							SOM	R
Bryum capillare Hedw.	●						●		○■		■							●■	●						○			SOM	

Taxon	Distribution by floristic regions																										Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
Bryum creberrimum Taylor							●																							K
Bryum cyclophyllum (Schwägr.) Bruch & Schimp.										○□															○			SOM	R
Bryum elegans Nee			●			■	●■		●■	■								●	■						○			SOM	
Bryum gemmiparum De Not.																									○				V
Bryum inclinatum (Brid.) Blandow							●																		●				
Bryum intermedium (Brid.) Blandow																○									○				V
Bryum kunzei Hornsch.											●																●		
Bryum mildeanum Jur.											●■														○			SOM	V
Bryum muehlenbeckii Bruch & Schimp.										●■									●■						○■			SOM	V
Bryum neodamense Itzigs.																									●				V
Bryum pallens Sw.							●		○■		●											●			○			SOM	
Bryum pallescens Schleich. ex Schwägr.							●■		○■	●		●							●■						○□			SOM	
Bryum pseudotriquetrum (Hedw.) P.Gaertn., B. Mey. & Scherb.	●						●■		●■	●■	●							●	●	■					●□			SOM	
Bryum radiculosum Brid.											●					●													V
Bryum rubens Mitt.																					●■							SOM	*
Bryum schleicheri Schwägr.							●■		■	●■								●■	●									SOM	
Bryum stirtonii Schimp.											●■																	STU/ DUIS	*
Bryum subapiculatum Hampe																								●■				SOM	
Bryum subelegans Kindb.							●		●	●								●■	●					●■	■		●■	SOM	
Bryum torquescens Bruch ex De Not.																						●							*
Bryum turbinatum (Hedw.) Turner							●		●□		●							●							●			SOM	
Bryum versicolor A.Braun ex Bruch & Schimp.																											●		V
Bryum weigelii Spreng.							●■		■									●							○			SOM	K
Buxbaumia aphylla Hedw.									●■									■										SOM	V
Buxbaumia viridis (DC.) Moug. & Nestl.							●■		●■	●	●■						●■		●									SOM	V
Callicladium haldanianum (Grev.) H.A.Crum							●																						R
Calliergon cordifolium (Hedw.) Kindb.							●		●■	■								●□							●			SOM	
Calliergon giganteum (Schimp.) Kindb.										●■																		SOM	V
Calliergon richardsonii (Mitt.) Kindb.									●□																			SOM	R
Calliergonella cuspidata (Hedw.) Loeske	●■						●□		●	●□				■				●■	●						□			SOM, S	
Calliergonella lindbergii (Mitt.) Hedenäs							●		●	●■	■							●■							●□			SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Campylium chrysophyllum (Brid.) Lange		●					●			●■	●■						■	○	●						○		■	SOM	
Campylium polygamum (Schimp) C.E.O.Jensen							●																						R
Campylium stellatum (Hedw.) C.E.O.Jensen							●■		●□	●□	●■			■				●	●■			●	■		●■	■	●	SOM	
Campylophyllum calcareum (Crundw. & Nyholm) Hedenäs						●	■		■								■	○	●			●■				■		SOM	
Campylophyllum halleri (Hedw.) M.Fleisch.							●■				●								■									SOM	K
Ceratodon conicus (Hampe) Lindb.																									○				*
Ceratodon purpureus (Hedw.) Brid.	●■			□			●		●■	●■	●					■		●	●■	■				■	●			SOM	
Cheilothela chloropus (Brid.) Broth.											○														●				R
Cinclidotus aquaticus (Hedw.) Bruch & Schimp.						●					●							●■										SOM	
Cinclidotus fontinaloides (Hedw.) P.Beauv.							●	●			●							●■				●				■		SOM	
Cinclidotus mucronatus (Brid.).Guim.							●■											●			●□							SOM	
Cinclidotus riparius (Brid.) Arn.						●	●■				●■							●■	●								●	SOM	
Cirriphyllum piliferum (Hedw.) Grout.									○	■									●						○				
Cirriphyllum tommasinii (Sendtn. ex Boulay) Grout.							●			●						○			●										
Climacium dendroides (Hedw.) F.Weber & D.Mohr							●		●	●	●■							●□	■						●■			SOM	
Coscinodon cribrosus (Hedw.) Spruce																		●■	●■						○			SOM	E
Cratoneuron filicinum (Hedw.) Spruce	●■					○	●■			●■	●■					○		●□	●	●■		■					■	SOM, S	
Crossidium squamiferum (Viv.) Jur.											○							●		●	●■			●		●		SOM	
Ctenidium molluscum (Hedw.) Mitt.	●					●	●				○■							●■	●■	■		●						SOM	
Ctenidium procerrimum (Molendo) Lindb.							●																						R
Cynodontium bruntonii (Sm.) Bruch & Schimp.							●		○									●■	●■									SOM	
Cynodontium fallax Limpr.									●■																			BP	R
Cynodontium polycarpum (Hedw.) Schimp.							●		●																●				
Cynodontium strumiferum (Hedw.) Lindb.									●																				*
Dichodontium pellucidum (Hedw.) Schimp.							●■		●■		●■							●■	●■						○			SOM	
Dicranella cerviculata (Hedw.) Schimp.																									○				K
Dicranella heteromalla (Hedw.) Schimp.							●		○■	●■	●					●		●■	●■									SOM	
Dicranella palustris (Dicks.) Crundw. in E.F.Warb.							●■		●■	●■								●	●■						●□	●■		SOM	
Dicranella rufescens (With.) Schimp.									●■	●																		SOM	K
Dicranella schreberiana (Hedw.) H.A.Crum & L.A.Anderson							●		●										●			●		○				BP	
Dicranella subulata (Hedw.) Schimp.									●																				*
Dicranella varia (Hedw.) Schimp.				■							●									■				○				SOM	

Taxon	Distribution by floristic regions																										Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
Dicranodontium denudatum (Brid.) E.Britton																			●■									BP	R
Dicranoweisia crispula (Hedw.) Milde	■						●		●	●■	●							■	●						●			SOM	
Dicranum bergeri Blandow																		●							○□			SOM	
Dicranum bonjeanii De Not.									●■	●■								●□							●□			SOM	
Dicranum brevifolium (Lindb.) Lindb.									○																				*
Dicranum elongatum Schleich. ex Schwägr.							●		●										●										R
Dicranum flexicaule Brid.									○■										■						○			SOM	
Dicranum fulvum Hook.										●								○□							●			SOM	
Dicranum fuscescens Turner							●		●■																○■			SOM	
Dicranum montanum Hedw.							●		○									●										BP	
Dicranum muehlenbeckii Bruch & Schimp.						●	●■		○	○	●■			●■											○			SOM	
Dicranum polysetum Sw.										■	●■							●■										SOM	R
Dicranum scoparium Hedw.	●■					○	●□		●■	●■	●■						●■	●■	●	■					●			SOM	
Dicranum spadiceum J.E.Zetterst.									●■																			SOM	*
Dicranum tauricum Sapiegin							●■		●■	●■	●■							●■							○			SOM	
Dicranum viride (Sull. & Lesq.) Lindb.							●												●										K
Didymodon acutus (Brid.) K.Saito						●■	●■				○						■				■			○			●	SOM	
Didymodon cordatus Jur.						●■										○												SOM	V
Didymodon fallax (Hedw.) R.H.Zander										●	●■							○										SOM	
Didymodon ferrugineus (Schimp. ex Besch.) M.O.Hill											●																		*
Didymodon luridus Hornsch.		○	○					●			○											□		○			●	SOM	
Didymodon rigidulus Hedw.			●			○		●■	●	●	●					○	■	○										SOM	
Didymodon sinuosus (Mitt.) Delogne		○	●							●																			
Didymodon spadiceus (Mitt.) Limpr.									●		●■							○	●■									SOM	
Didymodon tophaceus (Brid.) Lisa		○	●								●							●				■						SOM	
Didymodon vinealis (Brid.) R.H.Zander				■		■	■		●	○	○	■					●■	○□		■		■		■				SOM	
Diphyscium foliosum (Hedw.) D.Mohr							●		●■	●■	●■							■	●■	■		●			●■			SOM	
Distichium capillaceum (Hedw.) Bruch & Schimp.							●■		●	●■	●■						●■		●	■					●			SOM	
Distichium inclinatum (Hedw.) Bruch & Schimp.							●												●										
Ditrichum cylindricum (Hedw.) Grout.									○□																□			PR	V
Ditrichum flexicaule (Schwägr.) Hampe						●	●■	○		●■	●■					○	■	●	●	●■							●	SOM	
Ditrichum heteromallum (Hedw.) E.Britton									●■		●							●	●■						●		●	SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
Ditrichum lineare (Sw.) Lindb.							●		○																			BP	R
Ditrichum pallidum (Hedw.) Hampe																				■		●						SOM	K
Ditrichum pusillum (Hedw.) Hampe	●■								●■	●	●																	SOM	
Ditrichum zonatum (Brid.) Kindb.									●■																			STU/ DUIS	*
Drepanocladus aduncus (Hedw.) Warnst.		●					●		●	●■	●							●						●■	○			SOM, S	
Drepanocladus sendtneri (Schimp.) Warnst.							●		●																			BP	R
Encalypta alpina Sm.							●■										●■											SOM	
Encalypta ciliata Hedw.	●								●■	●■	●								●						○			SOM, S	
Encalypta microstoma Bals.-Criv. & De Not.									●□																			SOM	*
Encalypta rhaptocarpa Schwägr.							●		■		●■						●		●■						○		●■	SOM	
Encalypta streptocarpa Hedw.						●	●■	●		●■	●■						●■	○□	●	●■		□						SOM	
Encalypta vulgaris Hedw.						●	●■		■	●■	●						●■	●		■					○		■	SOM, S	
Entodon concinnus (De Not.) Paris										●	●■								●■									SOM	R
Entosthodon fascicularis (Hedw.) Müll.Hal.	●■			■			●■					●■					●■					●■						SOM	
Ephemerum recurvifolium (Dicks.) Boulay																○													E
Ephemerum serratum (Hedw.) Hampe																○													E
Eucladium verticillatum (Brid.) Bruch & Schimp.	●■	○	□						●		●■	■						○□						■				SOM	
Eurhynchium angustirete (Broth.) T.J.Kop.							●		●■	●■	●							●										SOM	
Eurhynchium crassinervium (Taylor) Schimp.											●■								●■	●■		●■						SOM, S	
Eurhynchium flotowianum (Sendtn.) Kartt.	●									●								●											K
Eurhynchium hians (Hedw.) Sande Lac.						●	●■		○		●							○	●■		■	●				■		SOM	
Eurhynchium praelongum (Hedw.) Schimp.				■		○				■								○			■							SOM	
Eurhynchium pulchellum (Hedw.) Jenn.							●■		●	■	●						●■	●								●■		SOM	
Eurhynchium pumilum (Wilson) Schimp.														●												●			
Eurhynchium schleicheri (R.Hedw.) Milde										●																			V
Eurhynchium speciosum (Brid.) Jur.	●■								●■		●					●■				●						■		SOM	
Eurhynchium striatulum (Spruce) Schimp.		●																○		●		●							
Eurhynchium striatum (Hedw.) Schimp.									●	●	●					○		●							●				
Fabronia ciliaris (Brid.) Brid.																		○□										PR	E
Fabronia pusilla Raddi																				●									V
Fissidens adianthoides Hedw.			○						○■	○								●■							○			SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Fissidens bryoides Hedw.	●■						●■										●	●							●			SOM	
Fissidens crassipes Wilson ex Bruch & Schimp.											○							●■						○				SOM	
Fissidens dubius P.Beauv.	●■						●■		○	□	●■						●■	●		■		□			○			SOM	
Fissidens exilis Hedw. [3)]																													
Fissidens fontanus (Bach-Pyl.) Steud.						○																							E
Fissidens gracilifolius Brugg.-Nann. & Nyholm											●■																	STU/ DUIS	*
Fissidens incurvus Starke ex Röhl.							●■																					SOM	R
Fissidens osmundoides Hedw.																			●■									BP	R
Fissidens pusillus (Wilson) Milde											●							●■		□								SOM	
Fissidens rivularis (Spruce) Schimp.																						●■						SOM	R
Fissidens taxifolius Hedw.	●						●■		■		○■					■		●				■		■	●■			SOM	
Fontinalis antipyretica Hedw.							●■		●■	○								●	○						●■			SOM	
Fontinalis hypnoides Hartm.					●■			●			○								□	○			○						SOM	
Funaria hygrometrica Hedw.	●			■			■		●	●	●						■	●				□			●		●	SOM	
Funaria muhlenbergii Turner							●■										●■	●				●□						SOM	
Funaria x *hybrida* R.Ruthe in Limpr.	●																												
Grimmia alpestris (F.Weber & D.Mohr) Schleich.							●■		●■		●■								●						○■			SOM	
Grimmia anodon Bruch & Schimp.						○				●								■	■								●■	SOM	
Grimmia caespiticia (Brid.) Jur.							●■		●■		●■						■	●■	●■						○			SOM	R
Grimmia crassifolia Lindb. ex Broth.											●■																	STU/ DUIS	*
Grimmia crinita Brid.						○																							E
Grimmia decipiens (Schultz) Lindb. in Hartm.							●															●						BP	R
Grimmia donniana Sm.			●				●		○■	●								●■							○			SOM, S	
Grimmia elatior Bruch ex Bals.-Criv. & De Not.																		●											R
Grimmia elongata Kaulf.									●																●				K
Grimmia funalis (Schwägr.) Bruch & Schimp.							●		●																●				
Grimmia fuscolutea Hook.							■		●■																			SOM	
Grimmia hartmanii Schimp.	●■						●■		○									○		●■					●□			SOM	
Grimmia incurva Schwägr.							●		●■										●■						○■			SOM	
Grimmia laevigata (Brid.) Brid.			●						■		○					○	■	●■			●■		●		○		■	SOM, S	
Grimmia longirostris Hook.									●■																			STU/	*

Taxon	Distribution by floristic regions																										Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
																												DUIS	
Grimmia montana Bruch & Schimp.							●		●										■									SOM, BP	R
Grimmia muehlenbeckii Schimp.											●■																	SOM, S	*
Grimmia orbicularis Hornsch. ex Wilson						○■					○								●		■			■	●■		○	SOM	
Grimmia ovalis (Hedw.) Lindb.							●■		●■	●	●□	■						●	■	●■					●			SOM, S	
Grimmia pulvinata (Hedw.) Sm.	●■		□			●	■			●■	●	■				○	●■	●	●	■		●		■	○	■	●■	SOM, S	
Grimmia ramondii (Lam. & DC) Margad							○		○■																○			SOM	
Grimmia sessitana De Not.							●■		●■										■						■			SOM	R
Grimmia teretinervis Limpr.						●																							V
Grimmia tergestina Tomm. ex Bruch & Schimp.						●			●	●								●									●■	SOM	
Grimmia torquata Drumm.									●■										●■									SOM	R
Grimmia trichophylla Grev.							●		■	■	●								●■		■				○■			SOM	
Grimmia unicolor Hook. in Grev.									●■										●■									SOM	R
Gymnostomum aeruginosum Sm.							●	●		●■									●■	●■								SOM	
Gymnostomum calcareum Nees & Hornsch.		●									●■					○				●□								SOM	
Gymnostomum viridulum Brid.											●■																	STU/ DUIS	*
Hamatocaulis vernicosus (Mitt.) Hedenäs							●		●	●				■											○			M.Hajek	
Hedwigia ciliata (Hedw.) P.Beauv.	●■						●■		●■	■	●■	■						●■	●■	●■		●□			○	■	●■	SOM	
Hedwigia stellata Hedenäs									●■																			BP	*
Helodium blandowii (F.Weber & D.Mohr) Warnst.																									●■			SOM	R
Herzogiella seligeri (Brid.) Z.Iwats.							●■		●■	●■	●■							●	●■									SOM	
Heterocladium dimorphum (Brid.) Schimp.	●■						●		●□	●■	●■							●■	●■						●			SOM	
Heterocladium heteropterum (Brid.) Schimp.							●											■	●	●								SOM	
Homalia besseri Lobarz.	●■								■	●■	■						●	■	■	●■		■					□	SOM	
Homalia trichomanoides (Hedw.) Bruch, Schimp. & W.Gümbel																		●■	●■			●■			●			SOM	
Homalothecium aureum (Spruce) H.Rob.																					●■							SOM	
Homalothecium lutescens (Hedw.) H.Rob.						●■	○		●	●	■						●■	●■	●	●■	■	●		■	○		●	SOM, S	
Homalothecium philippeanum (Spruce) Schimp.	●■			■			●			●	●■						■	●	●■			□					□	SOM	
Homalothecium sericeum (Hedw.) Schimp.	●	●		■		●	●		●■		■							●	●		■	□						SOM, S	
Homomallium incurvatum (Brid.) Loeske							●		○	●■								●				●			○			SOM	
Hydrogrimmia mollis (Bruch & Schimp.) Loeske							●■		●□																			SOM	

Taxon	Distribution by floristic regions																										Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
Hygroamblystegium fluviatile (Hedw.) Loeske																								●■				SOM	*
Hygroamblystegium tenax (Hedw.) Jenn.						●				●	●■							●		●				■	○			SOM	
Hygrohypnum duriusculum (De Not.) D.W.Jamieson							●■		●■	●■	●■							■	●						○□	●■		SOM	
Hygrohypnum luridum (Hedw.) Jenn							●■		○■	●	●■														○			SOM	
Hygrohypnum norvegicum (Schimp.) J.J.Amann							●												●										R
Hygrohypnum smithii (Sw.) Broth.							●		●■																			SOM	
Hylocomium brevirostre (Brid.) Schimp.																		●■	●									SOM	
Hylocomium pyrenaicum (Spruce) Lindb.									●										●										
Hylocomium splendens (Hedw.) Schimp.	●■					○	●		●■	●■							●■	●■	□						○□			SOM	
Hymenostylium recurvirostre (Hedw.) Dixon								●		●	●							●								●		SOM	
Hypnum callichroum Brid.							●		○□																			PR	R
Hypnum cupressiforme Hedw.	●					○	●■		●■	●■	●■						■	●■	●	■			●		■			SOM	
Hypnum fertile Sendtn.							●■																					BP	R
Hypnum jutlandicum Holmen & E.Warncke						●																							
Hypnum pallescens (Hedw.) P.Beauv.							●							●						●									
Hypnum revolutum (Mitt.) Lindb.							●		●□																			SOM, BP	R
Hypnum sauteri Schimp.																			●										*
Hypnum vaucheri Lesq.											●								●				●	●					
Isopterygiopsis muelleriana (Schimp.) Z.Iwats.							●																						R
Isopterygiopsis pulchella (Hedw.) Z.Iwats.									○□									●										PR	R
Isothecium alopecuroides (Dubois) Isov.	●■		●			●	●■		●■	●	■							●■	●	■		□			●□			SOM	
Isothecium myosuroides Brid.																						●							R
Kiaeria blyttii (Bruch & Schimp.) Broth.	●■								●■																●■			SOM	K
Kiaeria falcata (Hedw.) I.Hagen									●																●				K
Kiaeria starkei (F.Weber & D.Mohr) I.Hagen							●■		●■										●■						○			SOM	
Leptobryum pyriforme (Hedw.) Wilson			●□				■			○	●					○					■				●			SOM	
Leptodictyum humile (P.Beauv.) Ochyra												●																	*
Leptodon smithii (Hedw.) F.Weber & D.Mohr	●■		●				●■				●■								●	●■						●■		SOM	
Lescuraea mutabilis (Brid.) Lindb.							●□																		○□			SOM, PR	
Lescuraea saxicola (Schimp.) Molendo							●■		○□																○□			SOM, PR	
Leskea polycarpa Hedw.		■		■		■										○		●							○			SOM, S	
Leucobryum glaucum (Hedw.) Ångstr.											●■			■		●□			●■	●		●■			■			SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Leucodon sciuroides (Hedw.) Schwägr.	●■	■				○	●■		●■					■				●■	●□	■					●	■		SOM, S	
Meesia triquetra (Jolycl.) Ångstr.									○	●									■						○			SOM	
Meesia uliginosa Hedw.																			●						○				
Metaneckera menziesii (Drumm.) Steere	●■						●■				●■						●■					●■					●■	SOM	
Microbryum curvicolle (Hedw.) R.H.Zander																								○					E
Microbryum davallianum (Sm.) R.H.Zander											●					○					■			○■				SOM	
Microbryum starkeanum (Hedw.) R.H.Zander																					●■							SOM	K
Mielichhoferia mielichhoferiana (Funck) Loeske																									○□			SOM	E
Mnium ambiguum H.Müll.									●■																			STU/ DUIS	*
Mnium blyttii Bruch & Schimp.							●		●																				
Mnium marginatum (Dicks. ex With.) P.Beauv.							●		○	●	●■							■	●	●■								SOM	
Mnium spinosum (Voit) Schwägr.									●■	●■															●			SOM	
Mnium stellare Hedw.	●■						●		●■	●							●■	●■	●			●■			○	■		SOM	
Mnium thomsonii Schimp.							●■				■						●		●■			■						SOM	
Myurella julacea (Schwägr.) Schimp.							●				●■						●■		●	●■					○			SOM	
Neckera complanata (Hedw.) Huebener	●■					●	●■		●■	●■	■	■					■	●■	●□	■		●■					■	SOM	
Neckera crispa Hedw.	●■					○				■	●■						●■	●■	●■	■		■						SOM, S	
Neckera pennata Hedw.										●								●	●■			●					●	SOM	
Neckera pumila Hedw.										●■																		SOM	*
Oligotrichum hercynicum (Hedw.) Lam. & DC.									●■										●■						●■			SOM	
Oncophorus virens (Hedw.) Brid.							●■		●■																●			SOM	
Orthothecium intricatum (Hartm.) Schimp.							●			●■	●■																	SOM	
Orthothecium rufescens (Brid.) Schimp.																			●■									SOM	R
Orthotrichum affine Brid.						●■	●■		○■	●■	■							○		■	■	●■			●■			SOM	
Orthotrichum anomalum Hedw.						■	●■	●■	■					●	●		●■	○■		■		●	■		○■	■	●■	SOM	
Orthotrichum cupulatum Brid											■						○					■					■	SOM	
Orthotrichum diaphanum Brid.	●			■		■			●■			●■						○			■	●		●■				SOM	
Orthotrichum gymnostomum Brid.									●■																			SOM	R
Orthotrichum lyellii Hook. & Taylor							■		●■									●				●				●■		SOM	
Orthotrichum obtusifolium Brid.									○							○		●■									○	SOM	
Orthotrichum pallens Brid.						■			○								●■	●							○			SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
Orthotrichum patens Bruch & Brid.						○■																			●			SOM	R
Orthotrichum pumilum Sw.				■					■							○						□						SOM	V
Orthotrichum rupestre Schleich. ex Schwägr							●■		●■	●■	●■	■				○		○	●□	■					○□			SOM, S	
Orthotrichum scanicum Gronvall [4)]									●□																			PR	*
Orthotrichum speciosum Nees							●		○■	●						○	■	●■							○		●	SOM	
Orthotrichum stellatum Brid.											■														○			SOM	R
Orthotrichum stramineum Hornsch.																○		●	●						○				
Orthotrichum striatum Hedw.	●■						●■		●■	●■							■	■	●		■	■			○			SOM	
Orthotrichum tenellum Bruch ex Brid.							●■		●■																●			SOM	
Orthotrichum urnigerum Myrin																									○				E
Palustriella commutata (Hedw.) Ochyra							●■	■	■		●							●	●■	■		■						SOM, S	
Palustriella decipiens (De Not.) Ochyra							●■		●□		■								●■						○			SOM	
Palustriella falcata (Brid.) Hedenäs							●■		○■	●■	●■														○■			SOM, S	
Paraleucobryum enerve (Thed.) Loeske							●■		●■										●■						●			SOM	
Paraleucobryum longifolium (Hedw.) Loeske							●■		●■	■								●■	●■						○□			SOM	
Paraleucobryum sauteri (Bruch & Schimp.) Loeske																									○				*
Philonotis arnellii Husn.																								●■				SOM	E
Philonotis caespitosa Jur.									■	●■																		SOM	R
Philonotis calcarea (Bruch & Schimp.) Schimp.							●□				●						●■	●		■					●			SOM	
Philonotis fontana (Hedw.) Brid.	●■						●■		●■	○■	●							●■	●									SOM	
Philonotis marchica (Hedw.) Brid.							●			●							■					○						SOM	
Philonotis rigida Brid.									●																				*
Philonotis seriata Mitt.							●■		●■		●■							●	●■						○□			SOM	
Philonotis tomentella Molendo							●□		○■	●■	■											■			○■			SOM	
Physcomitrium eurystomum Sendtn.						●□													●■					○■				SOM	
Physcomitrium pyriforme (Hedw.) Hampe		●				■										○								●	○			SOM	
Plagiobryum demissum (Hook.) Lindb.									●																				R
Plagiobryum zieri (Hedw.) Lindb.									○□																●□			PR	R
Plagiomnium affine (Blandow ex Funck) T.J.Kop.	●						●■		●■	■								●■	●			●■			●	■		SOM, S	
Plagiomnium cuspidatum (Hedw.) T.J.Kop.						■	●■		●	●■	●■							●				●■			○			SOM	
Plagiomnium elatum (Bruch & Schimp.) T.J.Kop.							●		●	●■																		SOM	
Plagiomnium ellipticum (Brid.) T.J.Kop.										■				■					■									SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Plagiomnium medium (Bruch & Schimp.) T.J.Kop.			●			●	●□			●								●							○			SOM	
Plagiomnium rostratum (Schrad.) T.J.Kop.									●	●■	●		●			○		●				●■			○			SOM	
Plagiomnium undulatum (Hedw.) T.J.Kop.	●■					■	●■		●■		●							●	●■	□		□			●□			SOM	
Plagiopus oederianus (Sw.) H.A.Crum & L.E.Anderson							●■		●	●	●■						●	○	□	■		■			○			SOM	
Plagiothecium cavifolium (Brid.) Z.Iwats.	●■								●■	●	●■					■		●■							○□			SOM	
Plagiothecium denticulatum (Hedw.) Schimp.									●■	●■								●	●■						○■			SOM	
Plagiothecium laetum Schimp.							●		●■	●				●				●											
Plagiothecium nemorale (Mitt.) A.Jaeger	●								●■		■							●	●						■			SOM	
Plagiothecium platyphyllum Mönk.	●								●																				R
Plagiothecium ruthei Limpr.									●□										●■									SOM	R
Plagiothecium undulatum (Hedw.) Schimp.																		●■	●									SOM	
Platydictya jungermannoides (Brid.) H.A.Crum										●■																		STU/ DUIS	
Pleuridium acuminatum Lindb.	■						○		□	○								●										PR	
Pleuridium subulatum (Hedw.) Rabenh.	●■		■	■			■									○■	●	●					■		○		■	SOM	
Pleurochaete squarrosa (Brid.) Lindb.	●		●			●	■	●		●■	●■							●■	●	●	●■		●	○■			■	SOM	
Pleurozium schreberi (Brid.) Mitt.	●■								●■	●	■							●□	■						○□			SOM	
Pogonatum aloides (Hedw.) P.Beauv.	●■						●		●■	●■						○		●■	●			●□						SOM	
Pogonatum nanum (Hedw.) P.Beauv.							●									●		●■		●■		●■			○			SOM	
Pogonatum urnigerum (Hedw.) P.Beauv.	●								●■	●■	■							●	●						●			SOM	
Pohlia cruda (Hedw.) Lindb.	●■						●□		●■	●■	●■							●	●						●			SOM	
Pohlia drummondii (Müll. Hal.) A.L.Andrews							●		●■										●■									SOM	
Pohlia elongata Hedw.	●						●		●	●								□							○			SOM	
Pohlia filum (Schimp.) Martesson							●		●■	●	●							●										SOM	
Pohlia longicollis (Hedw.) Lindb.																									○				K
Pohlia melanodon (Brid.) A.J.Shaw							■			●								●							●				
Pohlia nutans (Hedw.) Lindb.							●■		●■	●	●					■		●■							●			SOM	
Pohlia obtusifolia (Brid.) L.F.Koch							●■																					BP	R
Pohlia proligera (Kindb.) Broth.												■						●							●■			SOM	R
Pohlia wahlenbergii (F.Weber & D.Mohr) A.L.Andrews							●										●	●■							○				
Polytrichum alpinum Hedw.	●						●■		●□									■	●						○			SOM, S	
Polytrichum commune Hedw.	●■						●		●	●■								●■	●						●□			SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Polytrichum formosum Hedw.							●		●■									●	●	■		●			●			SOM	
Polytrichum juniperinum Hedw.	●						●		●■	●	■							●■	●		■	●			●			SOM, S	
Polytrichum longisetum Brid.									●																○□			PR	R
Polytrichum perigoniale Michx.							●																						
Polytrichum piliferum Hedw.	●			□			●		●■									●■	●	■	■				●	■		SOM, S	
Polytrichum sexangulare Brid.							●□		●■																			SOM	
Polytrichum strictum Brid.									●	●□	●							●■							●□			SOM	
Pseudephemerum nitidum (Hedw.) Reimers																○													E
Pseudocalliergon trifarium (F.Weber & D.Mohr) Loeske									●																				*
Pseudocrossidium hornschuchianum (Schultz) R.H.Zander										●								●			●■	●■		■				SOM	
Pseudocrossidium revolutum (Brid.) R.H.Zander						●■			●	●	●■					○		●										SOM	
Pseudoleskea incurvata (Hedw.) Loeske							●■		●■	●	●						●■		●■						○			SOM	
Pseudoleskea radicosa (Mitt.) Macoun & Kindb.							●				■								●									SOM, BP	K
Pseudoleskea saviana (De Not.) Latzel	●■						■		■	●	●■								●■									SOM	
Pseudoleskeella catenulata (Brid. ex Schrad.) Kindb.						○	●■		■	●	●■							●■	●■								●□	SOM	
Pseudoleskeella nervosa (Brid.) Nyholm		●					●		○									●■	●						○				
Pseudoleskeella tectorum (Funk exBrid.) Kindb. ex Broth.									●									●											
Pseudotaxiphyllum elegans (Brid.) Z.Iwats.																		■	●									SOM, BP	
Pterigynandrum filiforme Hedw.	●■						●■		●■	●■	●■							●■	●■	■					●■		●	SOM	
Pterogonium gracile (Hedw.) Sm.	●■		●		●		●■		●■										●■	●■	●■	●				■		SOM	
Pterygoneurum ovatum (Hedw.) Dixon						●	●				■									●■	●■						■	SOM	
Ptilium crista-castrensis (Hedw.) De Not.										●■																		SOM	
Ptychodium plicatum (F.Weber & D.Mohr) Schimp.							●																						R
Pylaisia polyantha (Hedw.) Schimp.				■		○	●				●■	■						●		■					○□			SOM	
Racomitrium aciculare (Hedw.) Brid.	●■						●■		●■	■								●□	●■	●■					○			SOM	
Racomitrium affine (F.Weber & D.Mohr) Lindb.							●■																					SOM,BP	*
Racomitrium aquaticum (Schrad.) Brid.							●		■									●■	●■									SOM	
Racomitrium canescens (Hedw.) Brid.	●						●		●■		●■							●■	●■			●■			○■			SOM	
Racomitrium ericoides (Hedw.) Brid.									○									■										SOM	
Racomitrium fasciculare (Hedw.) Brid.									●																				K
Racomitrium heterostichum (Hedw.) Brid.	●■						●		●■		●							●■	●■						○			SOM	
Racomitrium lanuginosum (Hedw.) Brid.									●■			●■						●■	●■						○				

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Racomitrium macounii Kindb.							●		●																				
Racomitrium microcarpum (Hedw.) Brid.							●		○																○				
Racomitrium sudeticum (Funck) Bruch & Schimp.							●■		●■		●■							●■	●						○□			SOM	
Rhabdoweisia crispata (With.) Lindb.																		●■										SOM	R
Rhabdoweisia fugax (Hedw.) Bruch, Schimp. & W.Gümbel							●		●■									●■	●■	●■					○			SOM	
Rhizomnium pseudopunctatum (Bruch & Schimp.) T.J.Kop.	●■						●■		●■										●■									SOM	
Rhizomnium punctatum (Hedw.) T.J.Kop.							●		●■	●								●■	●						●□			SOM	
Rhodobryum roseum (Hedw.) Limpr.							■		○■	●■								●							●□			SOM	
Rhodobryum spathulatum (Hornsch.) Pócs																			●■	●■		●■						SOM	
Rhynchostegiella tenella (Dicks.) Limpr.																		●											V
Rhynchostegiella tenuicaulis (Spruce) Kartt.									●																				K
Rhynchostegium confertum (Dicks.) Schimp.	●■										●																	SOM	R
Rhynchostegium megapolitanum (F.Weber & D.Mohr) Schimp.						●					●									●■						■		SOM, S	
Rhynchostegium murale (Hedw.) Schimp.	●■		□				●■					●■					■					●■			○			SOM	
Rhynchostegium riparioides (Hedw.) C.E.O.Jensen	●■						●■		●	■	■							●	●■	■		●□			○			SOM	
Rhynchostegium rotundifolium (Brid.) Schimp.																○		●											V
Rhytidiadelphus loreus (Hedw.) Warnst.									●									●■	●■									SOM	
Rhytidiadelphus squarrosus (Hedw.) Warnst.									●■	●								●■	●■						●			SOM	
Rhytidiadelphus triquetrus (Hedw.) Warnst.	●■					○	●		●■	●■	●■						●■	●	●■			■			●□			SOM	
Rhytidium rugosum (Hedw.) Kindb.							●	■	●□	●■	■							●■	●■	●					○		●□	SOM	
Saelania glaucescens (Hedw.) Broth.							●				■							●							○			SOM	
Sanionia uncinata (Hedw.) Loeske	●						●□		●■	●■	■							●	●■					●□				SOM	
Schistidium agassizii Sull. & Lesq.									●■																			SOM	R
Schistidium apocarpum (Hedw.) Bruch & Schimp.	●					●	●■		●■	●	●■	■					●■	●■	●	■		●■	■	■	●			SOM, S	
Schistidium atrofuscum (Schimp.) Limpr.							●											■									●		
Schistidium brunescens Limpr.						●				●																			
Schistidium confertum (Funck) Bruch & Schimp.																		○											*
Schistidium flaccidum (De Not.) Ochyra							●		■									■	●									SOM, S	R
Schistidium rivulare (Brid.) Podp.							●		○■										■						○■			SOM	
Scleropodium purum (Hedw.) Limpr.	●■		■				●■		○■	■	■						●■	○	■		■	●■			■			SOM	
Scleropodium touretii (Brid.) L.F.Koch	○■						●														●■					■		SOM	R
Scorpidium revolvens (Sw.) Rubers									●□																			SOM, BP	R

Taxon	Distribution by floristic regions																										Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Scorpidium scorpioides (Hedw.) Limpr.																			●■									SOM	R
Scorpiurium circinatum (Brid.) M.Fleisch. & Loeske			●□																			□						SOM	
Seligeria acutifolia Lindb.											●■																	SOM	R
Seligeria campylopoda Kindb.											●																		R
Seligeria donniana (Sm.) Müll.Hal.											●■																	SOM	R
Seligeria pusilla (Hedw.) Bruch & Schimp.											●■						●											SOM	
Seligeria recurvata (Hedw.) Bruch & Schimp.																			●■						○			SOM	R
Seligeria tristichoides Kindb.											■																	SOM	*
Sphagnum angustifolium (Russow) C.E.O.Jensen									●■	●□								■							○■			SOM	
Sphagnum auriculatum Schimp. [5]							●		●	●															□			SOM	
Sphagnum capillifolium (Ehrh.) Hedw. [6]							●■		●■	●	●■							●□	●						●■			SOM	
Sphagnum centrale C.E.O.Jensen							●■		●■	●■				■				●	●						●■			SOM	
Sphagnum compactum Lam. & DC.							●■		●■	●■								●■							■			SOM	
Sphagnum contortum Schultz							●■		●■	●				■				●■							●■			SOM	
Sphagnum cuspidatum Ehrh. ex Hoffm.							●											●□										SOM	R
Sphagnum fallax (H.Klinggr.) H.Klinggr.										●■								●■							□			SOM	R
Sphagnum flexuosum Dozy & Molk.										○■	●■							●■							□			SOM	
Sphagnum fuscum (Schimp.) H.Klinggr.							●			●■															●			SOM	
Sphagnum girgensohnii Russow							●		●■	●■	●							●■	●■						●■			SOM	
Sphagnum inundatum Russow [5]									●■																●			SOM	
Sphagnum magellanicum Brid.										●■	■							●■							●□			SOM	
Sphagnum obtusum Warnst.											●																		*
Sphagnum palustre L.										●■	●			■				●							○			SOM	
Sphagnum papillosum Lindb.							●			●■								●■							●			SOM	
Sphagnum platyphyllum (Lindb.) Warnst.							●■		●□	●■	●■								●■						○■			SOM	
Sphagnum quinquefarium (Lindb.) Warnst.							●		●□		●														○			SOM	
Sphagnum riparium Ångstr.									○																				R
Sphagnum russowii Warnst.							●□		●■									●	●						○■			SOM	
Sphagnum squarrosum Crome									●■	●■	■								●■						●□			SOM	
Sphagnum subfulvum Sjörs							●■		●■																			SOM	R
Sphagnum subnitens Russow & Warnst.							●																						R
Sphagnum subsecundum Nees							●■		●■	●■	●			■				●■	●■						●■			SOM	

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e									
Sphagnum teres (Schimp.) Ångstr.							●■		●■		●							●□							●■			SOM	
Sphagnum warnstorfii Russow							●■		●■	■									●■						●■			SOM	
Stegonia latifolia (Schwägr.) Venturi ex Broth.							●																						*
Straminergon stramineum (Brid.) Hedenäs							●■		●■		●■																	SOM	
Syntrichia inermis (Brid.) Huebener							□		■	■	●				○			■	■					○■				SOM	
Syntrichia intermedia Brid.							●			●						○		■				□			○			SOM	
Syntrichia laevipila Brid.			●						●																				
Syntrichia latifolia (Bruch ex Hartm.) Huebener											●																		*
Syntrichia norvegica F.Weber							●■		●■																○			SOM	
Syntrichia pagorum (Milde) Amann																					●■							SOM	R
Syntrichia papillosa (Wilson) Jur.																					●■	●						SOM	R
Syntrichia princeps (De Not.) Mitt.							●■																					BP	K
Syntrichia ruraliformis (Besch.) Cardot			■																									S	*
Syntrichia ruralis (Hedw.) F.Weber & D.Mohr	●	■					●■	■	●■	●	■					○	■	●	●■	■	■				□			SOM, S	
Syntrichia virescens (De Not.) Ochyra							■		●■																			SOM, BP	R
Taxiphyllum wissgrillii (Garov.) Wijk & Margad.									●		●							●	●										R
Tayloria froelichiana (Hedw.) Mitt. ex Broth.							●																						*
Tayloria splachnoides (Schleich. ex Schwägr.) Hook.									●■																			STU/ DUIS	*
Tetraphis pellucida Hedw.							●		●■	●■	●■							●	●■						○			SOM	
Thamnobryum alopecurum (Hedw.) Gangulee	●■		●				●■	●□	●						●□			■				●■			○■			SOM	
Thuidium abietinum (Hedw.) Schimp.						○	●	■	○	●	●■						●	●	●■	■				■	●□		□	SOM, S	
Thuidium delicatulum (Hedw.) Schimp.									○									●□				●						SOM	
Thuidium philibertii Limpr.									●	●■	●■					●		○	●						○			SOM	
Thuidium recognitum (Hedw.) Lindb.							●■			■	●■						●	●■				■			●	■		SOM	
Thuidium tamariscinum (Hedw.) Schimp.									●																○				
Timmia austriaca Hedw.	●■						●■		●■	●■	●														○□			SOM	
Timmia bavarica Hessl.							●		●■	●	●■						■					●□			○		●	SOM	
Timmia norvegica J.E.Zetterst.							●																						K
Tomentypnum nitens (Hedw.) Loeske														■											●■			SOM, PR	
Tortella flavovirens (Bruch) Broth.			■			●					●											●						SOM	
Tortella fragilis (Hook. & Wilson) Limpr.							●■																					BP	R

Taxon	Distribution by floristic regions																											Herbarium	Conser-vation status
	B	Bsk		D	M	NeB	P	Fb	R	Rh			Sg			Sf	Sl	Sp			Sv	Sz	Thc	Tl	V	Wfm	Zn		
		n	s							w	c	e	w	c	e			w	c	e										
Tortella humilis (Hedw.) Jenn.																	●												R
Tortella inclinata (R.Hedw.) Limpr.						●	●■				●								●					■			●■	SOM	
Tortella nitida (Lindb.) Broth.		●																											E
Tortella tortuosa (Hedw.) Limpr.	●■						●	■	●	●■	●■						■	●■	●■	■					○		■	SOM	
Tortula atherodes H.R.Zander	●■	●					●■				○					■	■	●■			●■			○	■		■	SOM	
Tortula atrovirens (Sm.) Lindb.																		●■			■							SOM	
Tortula canescens Mont.		●																			■							SOM	
Tortula cuneifolia (Dicks.) Turner	●																							○					R
Tortula eucalyptrata Lindb.							●■		●■		●■								●						○			SOM	
Tortula lanceolata R.H.Znder	●					●■	■				■						●				●■				○			SOM	
Tortula leucostoma (R.Br.) Hook. & Grev.							●		●■																			STU/ DUIS	R
Tortula marginata (Bruch & Schimp.) Spruce		○	●			○																●							
Tortula modica R.H.Zander	■															○■					■				■			SOM	
Tortula mucronifolia Schwägr.									●																				K
Tortula muralis Hedw.						●	■		■	■	●■					○		●	●			■			○			SOM	
Tortula obtusifolia (Schwägr.) Mathieu			●								○										■					●		SOM	
Tortula protobryoides R.H.Zander	●										○										■							SOM	
Tortula subulata Hedw.	●						●■		●■	●	●■					○		●	●	■		■			○			SOM	
Tortula truncata (Hedw.) Mitt.	●■						●■									■		●			■			■	○			SOM	
Trematodon ambiguus (Hedw.) Hornsch.																									○□			PR	V
Trichostomum brachydontium Bruch																			●■			●						SOM	V
Trichostomum crispulum Bruch							●		●		■							○	■			●□						SOM	
Trichostomum tenuirostre (Hook. & Taylor) Lindb.						○			●												●				○		■		
Ulota crispa (Hedw.) Brid.																			■						○			SOM	
Ulota hutchinsiae (Sm.) Hammar									●									○							○				
Warnstorfia exannulata (Schimp.) Loeske							●■		●■	●■								●	●■						●□			SOM	
Warnstorfia fluitans (Hedw.) Loeske							●																						R
Warnstorfia sarmentosa (Wahlenb.) Hedenäs									●■	●■															○			SOM	
Weissia brachycarpa (Nees & Hornsch.) Jur.	●■					●			○											●■		●■		○■	○			SOM	
Weissia condensa (Voit) Lindb.						●■	●				●■							●				●						SOM	
Weissia controversa Hedw.	●						●■		○	●■	■			■		■	●	●■							●		■	SOM	
Weissia levieri (Limpr.) Kindb.																					●■							SOM	*
Weissia longifolia Mitt.						○												■			●■			○■	■		●■	SOM	
Weissia wimmeriana (Sendtn.) Bruch & Schimp.									●																●				K
Zygodon forsteri (Dicks. ex With.) Mitt.																						●							*

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Appendix 1. Main synonyms used in Bulgarian bryological literature

Abietinella abietina (Hedw.) M.Fleisch. = ***Thuidium abietinum***
Amblystegium fluviatile (Hedw.) Schimp. = ***Hygroamblystegium fluviatile***
Amblystegium humile (P.Beauv.) Crundw. = ***Leptodictyum humile***
Amblystegium tenax (Hedw.) C.E.O. Jensen = ***Hygroamblystegium tenax***
Anisothecium palustre (Dicks.) I.Hagen = ***Dicranella palustris***
Anisothecium rufescens (With.) Lindb. = ***Dicranella rufescens***
Anisothecium schreberianum (Hedw.) Dixon = ***Dicranella schreberiana***
Anisothecium varium (Hedw.) Mitt. = ***Dicranella varia***
Astomum crispum (Hedw.) Hampe = ***Weissia longifolia***
Atrichum haussknechtii Jur. & Milde = ***Atrichum undulatum***
Barbula acuta (Brid.) Brid. = ***Didymodon acutus***
Barbula cordata (Jur.) Loeske = ***Didymodon cordatus***
Barbula fallax Hedw. = ***Didymodon fallax***
Barbula hornschuchiana Schultz = ***Pseudocrossidium hornschuchianum***
Barbula revoluta Brid. = ***Pseudocrossidium revolutum***
Barbula rigidula (Hedw.) Milde = ***Didymodon rigidulus***
Barbula sinuosa (Mitt.) Grav. = ***Didymodon sinuosus***
Barbula spadicea (Mitt.) Braithw. = ***Didymodon spadiceus***
Barbula tophacea (Brid.) Mitt. = ***Didymodon tophaceus***
Barbula trifaria (Hedw.) Mitt. = ***Didymodon luridus***
Barbula vinealis Brid. = ***Didymodon vinealis***
Breidleria arcuata (Molendo) Loeske = ***Calliergonella lindbergii***
Bryum angustirete Kindb. = ***Bryum algovicum***
Bryum capillare var. *flaccidum* (Brid.) Bruch & Schimp = ***Bryum subelegans***
Bryum microerythrocarpum Müll.Hal. & Kindb. = ***Bryum subapiculatum***
Calliergon sarmentosum (Wahlenb.) Kindb. = ***Warnstorfia sarmentosa***
Calliergon stramineum (Brid.) Kindb. = ***Straminergon stramineum***
Calliergon trifarium (F.Weber & D.Mohr.) Kindb. = ***Pseudocalliergon trifarium***
Camptothecium philippeanum (Spruce) Kindb. = ***Homalothecium philippeanum*** *Camptohecium sericeum* (Hedw.) Kindb. = ***Homalothecium sericeum***
Campylium calcareum Crundw. & Nyholm = ***Campylophyllum calcareum***
Campylium halleri (Hedw.) Lindb. = ***Campylophyllum halleri***
Campylium sommerfeltii (Myryn) Lange = ***Campylophyllum calcareum***
Ceratodon purpureus var. *conicus* (Hampe) Dixon = ***Ceratodon conicus***
Cinclidotus nigricans (Brid.) Wijk & Margad. = ***Cinclidotus riparius***
Cirriphyllum crassinervium (Taylor) Loeske & M.Fleisch. = ***Eurhynchium crassinervium***
Cirriphyllum germanicus (Grebe) Loeske & M.Fleisch. = ***Rhynchostegiella tenuicaulis***
Cirriphyllum reichenbachianum (Huebener) Wijk & Margad. = ***Eurhynchium flotowianum***
Cirriphyllum tenuinerve (Lindb.) Wijk & Margad. = ***Cirriphyllum tomasinii***
Cratoneuron commutatum (Hedw.) G.Roth = ***Palustriella commutata***
Cratoneuron commutatum var. *falcatum* (Brid.) Mönk. = ***Palustriella falcata***
Cratoneuron decipiens (De Not.) Loeske = ***Palustriella decipiens***
Desmatodon latifolius (Hedw.) Brid. = ***Tortula eucalyptrata***
Desmatodon leucostoma (R.Br.) Berggr. = ***Tortula leucostoma***
Dialytrichia mucronata (Brid.) Broth. = ***Cinclidotus mucronatus***
Dichodontium palustre (Dicks.) M.Stech = ***Dicranella palustris***
Dicranum affine Funck = ***Dicranum bergeri***
Dicranum congestum Brid.=***Dicranum flexicaule***
Dicranum muehlenbeckii var. *brevifolium* Lindb. = ***Dicranum brevifolium***
Dicranum rugosum (Funck) Brid. = ***Dicranum polysetum***
Ditrichum heteromallum var. *zonatum* (Brid.) Podp. = ***Ditrichum zonatum***
Dolichotheca seligeri (Brid.) Loeske = ***Herzogiella seligeri***
Drepanocladus exannulatus (Schimp.) Warnst. = ***Warnstorfia exannulata***
Drepanocladus fluitans (Hedw.) Warnst. = ***Warnstorfia fluitans***

Drepanocladus revolvens (Sw.) Warnst. = ***Scorpidium revolvens***
Drepanocladus uncinatus (Hedw.) Warnst. = ***Sanionia uncinata***
Drepanocladus vernicosus (Mitt.) Warnst. = ***Hamatocaulis ventricosus***
Dryptodon patens (Hedw.) Brid. = ***Grimmia ramondii***
Eurhynchium swartzii (Turner) Curn. = ***Eurhynchium hians***
Eurhynchium zetterstedtii Størmer = ***Eurhynchium angustirete***
Fissidens cristatus Wilson & Mitt. = ***Fissidens dubius***
Fissidens mildeanus Schimp. = ***Fissidens crassipes***
Grimmia affinis Hornsch. = ***Grimmia longirostris***
Grimmia africana Arn. = ***Grimmia orbicularis***
Grimmia apiculata Hornsch. = ***Grimmia fuscolutea***
Grimmia curvata (Brid.) De Sloover = ***Grimmia ramondii***
Grimmia holleri Molendo = ***Grimmia fuscolutea***
Grimmia trichophylla var. *tenuis* (Wahlenb.) Wijk & Margad. = ***Grimmia muelenbeckii***
Heterophyllium haldanianum (Grev.) M.Fleisch. = ***Callicladium haldanianum***
Homalothecium geheebii (Milde) Wigh = ***Brachythecium geheebii***
Homalothecium nitens (Hedw.) H.Rob. = ***Tomentypnum nitens***
Hygrohypnum molle (Hedw.) Loeske = ***Hygrohypnum duriusculum***
Hymenostomum microstomum (Hedw.) R. Br. = ***Weissia brachycarpa***
Hymenostomum tortile (Schwägr.) Bruch & Schimp. = ***Weissia condensa***
Hypnum arcuatum Lindb. = ***Calliergonella lindbergii***
Hypnum lindbergii Mitt.= ***Calliergonella lindbergii***
Hypnum pratense Koch ex Spruce = ***Breidleria pratensis***
Isopterygium elegans (Brid.) Lindb. = ***Pseudotaxiphyllum elegans***
Isopterygium pulchellum (Hedw.) A.Jaeger = ***Isopterygiopsis pulchella***
Isothecium myurum Brid. = ***Isothecium alopecuroides***
Lescuraea incurvata (Hedw.) E.Lawton = ***Pseudoleskea incurvata***
Lescuraea plicata (F.Weber & D.Mohr) Lindb. = ***Ptychodium plicatum***
Lescuraea saviana (De Not) E.Lawton = ***Pseudoleskea saviana***
Leskea nervosa (Brid.) Myrin = ***Pseudoleskeella nervosa***
Meesia trifaria H.A.Crum, Steere & L.E.Anderson = ***Meesia triquetra***
Mielichhoferia mielichhoferi (Hook.) Wijk & Margad. = ***Mielichhoferia mielichhoferiana***
Mniobryum wahlenbergii (F.Weber & D.Mohr) Jenn. = ***Pohlia wahlenbergii***
Mnium affine Blandow ex Funck = ***Plagiomnium affine***
Mnium cuspidatum Hedw. = ***Plagiomnium cuspidatum***
Mnium medium Bruch & Schimp. = ***Plagiomnium medium***
Mnium pseudopunctatum Bruch & Schimp. = ***Rhizomnium pseudopunctatum***
Mnium punctatum Hedw. = ***Rhizomnium punctatum***
Mnium rostratum Schrad.= ***Plagiomnium rostratum***
Mnium seligeri Jur. = ***Plagiomnium elatum***
Mnium undulatum Hedw.= ***Plagiomnium undulatum***
Neckera besseri (Lobarz.) Jur. = ***Homalia besseri***
Neckera menziesii Hook. = ***Metaneckera menziesii***
Octodiceras fontanum (Bach-Pyl.) Lindb. = ***Fissidens fontanus***
Orthodicranum montanum (Hedw.) Loeske = ***Dicranum montanum***
Orthodicranum tauricum (Sapjegin) Smirnova = ***Dicranum tauricum***
Orthotrichum fastigiatum Brid. = ***Orthotrichum affine***
Oxystegus cylindricus (Brid.) Hilp. = ***Trichostomum tenuirostre***
Oxystegus tenuirostris (Hook. & Taylor) A.J.E.Sm. = ***Trichostomum tenuirostre***
Phascum curvicolle Hedw. = ***Microbryum curvicolle***
Phascum cuspidatum Hedw. = ***Tortula atherodes***
Phascum piliferum Hedw. = ***Tortula atherodes***
Philonotis capillaris Lindb. = ***Philonotis arnellii***
Physcomitrella patens (Hedw.) Bruch & Schimp. = ***Aphanorrhegma patens***
Plagiopus oederi (Brid.) Limpr. = ***Plagiopus oederiana***
Plagiothecium denticulatum var. *undulatum* R.Ruthe ex Geh. = ***Plagiothecium ruthei***
Plagiothecium roeseanum Schimp. = ***Plagiothecium cavifolium***

Pohlia delicatula (Mitt.) Broth. = ***Pohlia melanodon***
Pohlia gracilis (Bruch & Schimp.) Lindb. = ***Pohlia filum***
Pohlia minor Schleich. ex Schwägr. = ***Pohlia elongata***
Polytrichum alpestre Hoppe = ***Polytrichum strictum***
Pottia bryoides (Dicks.) Mitt. = ***Tortula protobryoides***
Pottia davalliana (Sm.) C.E.O.Jensen = ***Microbryum davallianum***
Pottia intermedia (Turner) Fürnr. = ***Tortula modica***
Pottia lanceolata (Hedw.) Müll.Hal. = ***Tortula lanceolata***
Pottia starkeana (Hedw.) Müll.Hal. = ***Microbryum starkeanum***
Pottia truncata (Hedw.) Bruch & Schimp. = ***Tortula truncata***
Pseudoscleropodium purum (Hedw.) M.Fleisch. = ***Scleropodium purum***
Pseudostereodon procerrimus (Molendo) M.Fleisch. = ***Ctenidium procerrimum***
Racomitrium canescens var. *ericoides* Hedw. = ***Racomitrium ericoides***
Racomitrium heterostichum var. *affine* (F.Weber & D.Mohr) Lesq. = ***Racomitrium affine***
Racomitrium patens (Hedw.) Huebener = ***Grimmia ramondii***
Rhodobryum ontariense (Kindb.) Paris = ***Rhodobtyum spathulatum***
Schistidium alpicola (Hedw.) Limpr. = ***Schistidium agassizii***
Schistidium alpicola var. *rivulare* (Brid.) Limpr. = ***Schistidium rivulare***
Schistidium pulvinatum var. *flaccidum* (De Not.) De Not. = ***Schistidium flaccidum***
Scorpidium vernicosum (Mitt.) Tuom. = ***Hamatocaulis vernicosus***
Sphagnum crassicladum Warnst. = ***Sphagnum subsecundum***
Sphagnum nemoreum Scop. = ***Sphagnum capillifolium***
Syntrichia montana Nees = ***Syntrichia intermedia***
Syntrichia mucronifolia (Schwägr.) Brid. = ***Tortula mucronifolia***
Syntrichia pulvinata (Jur.) Jur. = ***Syntrichia virescens***
Syntrichia subulata (Hedw.) F.Weber & D.Mohr. = ***Tortula subulata***
Thamnium alopecurum (Hedw.) Schimp. = ***Thamnobryum alopecurum***
Thuidium erectum Duby = ***Thuidium delicatulum***
Timmia megapolitana var. *bavarica* (Hesselbo) Brid. = ***Timmia bavarica***
Tortula laevilila var. propagulifera Lindb. = ***Syntrichia pagorum***
Ulota crispula Bruch = ***Ulota crispa***