

THE STUDY OF CORTICOLOUS BRYOPHYTES COMMUNITIES FROM THE ARIEȘUL MIC BASIN

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Abstract: The present study reveals the existence of 9 corticolous bryophyte associations from the Arieșul Mic basin, classified into 3 classes, 3 orders, 3 alliances, and 3 suballiances. One association - *Orthotrichetum pallentis* Ochn 1928 - has been recorded for the first time in Romania. Three associations - *Orthotrichetum pallentis* Ochn 1928, *Pylaisietum polyanthae* Felf. 1941 and *Pterigynandretum filiformis* Hil. 1925 - are indicators of clean air. The existence of these communities is dependent on the presence of bottomland forests - highly scarce - and of mature beech forests whose optimal structure is preserved only on surfaces difficult of access.

Introduction

Bryophytes represent an essential component of forest habitats and ensure increased biodiversity both by contributing to the richness of species and due to the richness of the communities constituted by mosses.

It is well-known that corticolous bryophytes are sensitive to microclimatic changes (especially as regards humidity), the decrease in number of moss species, and the structural changes of the bryocoenoses they form, thus being early indicators under conditions of interventions that gradually lead to the degradation of the structure and microclimate of forest communities [16]. Often, bryophytes are used as bioindicators of air quality [13], the scientific literature even mentions moss associations that indicate air purity, such associations being on the decline in the industrialized countries [19].

The Arieșul Mic basin is located in the north-western part of Romania, in the Apuseni Mountains at altitudes between 565–1849 m a. s. l. (Biharia Peak). The area has a temperate mountain climate with a multiannual average temperature of 7.46°C and average rainfalls of 724.4 mm in Câmpeni, a city located at the lower altitudinal limit, where the only weather-station of the studied area can be found.

Under these conditions beech, spruce and mixed forests predominate, while along the valleys alder- and willow-groves are restricted to small areas.

The few known studies of floristics on the Arieșul Mic basin are limited to certain localities [17,22,20,14]. Moss species are also mentioned in certain studies regarding the vegetation edified by cormophytes [5]. Studies concerning communities constituted by bryophytes are limited to certain areas of Romania [10], the majority being the results of doctoral studies. Partial results regarding the bryophytic vegetation of the Arieșul Mic basin have indicated the existence of 12 associations on different substrate (only 4 corticolous associations), at that moment; the coenotaxonomic system used for classification was the one proposed by Hübschmann [18] and adapted by Pămadă [21].

Our main object was to continue researches on the corticolous bryocoenoses. Establishing the tree species that host the identified bryophyte communities and establishing the bryophyte associations preferences for a tree species are essential for elaborating certain recommendations that also take into account the bryophyte communities as components of the vegetation from the studied territory.

Methods

The relevés has been carried out according to the methodology of the Central European School. The classification into associations has been accomplished both based on classical methods - with special regard to the characteristic species - and by means of the cladistic analysis [12]. The sampling has been carried out on areas between 0.4 and 300 dm², in each case, the following data have been noted: the aspect, the inclination of the sample surface, the altitude, the species of the host tree¹, the general coverage and the species found; each species has been assigned a note of abundance-dominance, according to the Braun-Blanquet scale modified by Tüxen and Ellenberg [4]. The bryophyte associations has been presented from the ecological point of view - the reference criteria has been the indicator species value established by comparing the indices proposed by Düll (1992), Orban (1993) and the ecological significance proposed by Boros (1968), respectively [12]. The phytogeographical analysis has been accomplished based on the phytogeographical elements proposed by Düll [6,7,8,9]. The species nomenclature was updated according to Grolle [15] for liverworts and Corley *et al.* and Corley & Crundwell [2,3] for mosses, patronym abbreviation follow Brummit et Powell [1].

Results

The present study reveals the existence of 9 bryophytes associations in the Arieșul Mic basin and classified into three suballiances, three alliances, three orders and three classes.

Coenotaxonomical conspect

I. FRULLANIO-LEUCODONTETEA SCIUROIDIS Mohan 1978 em. Marst. 1985

Orthotrichetalia Had. in Kl. et Had. 1944

Ulotion crispae Barkm. 1958

1. *Orthotrichetum pallentis* Ochn. 1928
2. *Pylaisietum polyanthae* Felf. 1941
- *orthotrichetosum obtusifoliae* Marst. 1985

II. NECKERETEA COMPLANATAE Marst. 1986

Neckeretalia complanatae Jez. et Vondr. 1962

Neckerion complanatae Šm. et Had. 1944

Pseudoleskeello nervosae* - *Homomallienion incurvati Marst. 1992

3. *Pterigynandretum filiformis* Hil. 1925
4. *Homalothecio sericei* - *Porelletum platyphyllae* Størm. 1938
- Brachythecio populei* - *Homalienion trichomanoidis*** Marst. 1992

5. *Anomodontetum attenuati* Cain et Sharp 1938

6. *Isothecietum myuri* Hil. 1925

Neckerenion complanato* - *besseri Marst. 1992

7. *Anomodonto viticulosi* - *Leucodontetum sciuroidis* Wisn. 1930

III. CLADONIO - LEPIDOZIETEA REPTANTIS Jez. et Vondr. 1962 em. Marst. 1993

Dicranetalia scoparii Barkm. 1958

Dicrano scoparii - Hypnion filiformis Barkm. 1958

8. *Dicrano scoparii* - *Hypnetum filiformis* Barkm. 1958
- *plagiothecietosum laeti* Marst. 1986
9. *Orthodicrano montani* - *Hypnetum filiformis* Wisn. 1930

The class *Frullanio-Leucodontetea sciuroidis* Mohan 1978 em. Marst. 1985 comprises pioneer associations rich in acrocarpous mosses, generally with lower demand for humidity. In

¹ **Sampled tree species:** **F** = isolated beech; **FP** = beech from the grove; **FR** = beech from glades; **FM** = beech from the skirts of the forest; **SI** = isolated willow; **M** = spruce; **CP** = hornbeam from the forest; **BR** = fir; **MAI** = isolated apple-tree.

the Arieșul Mic basin, this class is represented by the only order *Orthotrichetalia* Had. in Kl. et Had. 1944, the only alliance *Ulotion crispae* Barkm.1958 and the two associations *Orthotrichetum pallentis* Ochs. 1928 and *Pylaisietum polyanthae* Felf. 1941 (Table 1), respectively, both sensitive to atmospherical pollution.

Table 1: 1 - Ass. *Orthotrichetum pallentis* Ochs. 1928, 2 - 10 Ass. *Pylaisietum polyanthae* Felf. 1941

Relevé number	1	2	3	4	5	6	7	8	9	10
Relevé code	200	113	119	116	114	135	115	117	118	146
Altitude (m)	680	770	640	640	770	800	640	640	640	880
Aspect	E	N	N	NE	N	N	NE	SV	N	N
Slope (°)	15	60	75	90	60	15	90	85	90	75
Surface (dm²)	0,4	1	67,5	9	1	100	200	15	45	12
Cover (%)	65	95	80	70	95	87	70	60	60	90
Host tree	SI	SI	SI	SI	SI	SI	FM	SI	SI	SI
<i>Orthotrichum pallens</i>	2	.	.	.	.	.	.	.	.	.
<i>Pylaisia polyantha</i>	.	2	2	3	4	1	1	2	+	1
<i>Orthotrichum obtusifolium</i>	+	+	+	+	+	+	.	.	.	.
Ulotion										
<i>Orthotrichum lyellii</i>	.	.	+	.	.	.	+	.	.	+
<i>O. speciosum</i>	.	1	.	.	.	+	+	.	.	+
<i>O. stramineum</i>	.	.	+	.	.	+	+	.	+	+
Orthotrichetalia										
<i>Pylaisia polyantha</i>	1	.	.	.	.	.	.	.	.	.
<i>Leucodon sciuroides</i>	+	.	4	1	+	4	4	3	3	1
<i>Orthotrichum affine</i>	.	.	.	.	2	.	+	1	+	.
Frullanio-Leucodontetea										
<i>Frullania dilatata</i>	+	.	+	.	.	+	1	.	+	1
<i>Radula complanata</i>	.	.	+	.	.	.	+	.	+	.
D-Bryo-Brachythecion										
<i>Bryum subelegans</i>	3	.	.	.	.	.	.	.	.	.
Brachythecio populei-Homalienion										
<i>Brachythecium populeum</i>	.	.	.	.	.	+	.	.	.	.
<i>Plagiomnium cuspidatum</i>	.	.	.	+	.	.	.	+	.	.
Neckeretalia - <i>Amblystegiella subtilis</i> : 117 (+); <i>Homalothecium sericeum</i> : 135 (+); <i>Porella platyphylla</i> : 119 (+); <i>Rhynchostegium murale</i> : 114 (+).										
Bryo-Brachythecion										
<i>Brachythecium salebrosum</i>	.	.	.	+	+	.	.	.	.	+
D-Amblystegium serpens	.	.	.	1	+	.	.	+	.	.
D-Brachythecium rutabulum	.	4	.	.	.	.	.	+	.	.
D-B. velutinum	.	+	.	.	.	.	.	.	.	.
D-Bryum subelegans	.	+	.	.	+	.	.	1	.	+
Dicranetalia (optimal)										
<i>Hypnum cupressiforme</i>	.	+	+	.	+	1	+	.	+	3
Companion										
<i>Amblystegium varium</i>	.	+	+	.	.	.	.	+	.	.
<i>Brachythecium campestre</i>	.	.	.	+	.	.	.	1	.	.
<i>Hypnum cupressiforme</i> var. <i>filiforme</i>	.	.	2	.	.	1	.	.	.	1
<i>Orthotrichum pumilum</i>	.	+	.	2	.	.	.	.	.	+
<i>O. striatum</i>	.	.	.	.	.	.	.	.	.	+
<i>Pseudoleskeella nervosa</i>	.	.	.	.	.	+	.	.	+	+
<i>Pterigynandrum filiforme</i>	.	.	.	.	.	+	.	.	.	+
<i>Sanionia uncinata</i>	.	.	.	.	+	.	.	.	.	+
<i>Tortula papillosa</i>	.	.	+	1	+	.	+	+	+	.
<i>Homomallium incurvatum</i> : 119 (+); <i>Leskea polycarpa</i> : 114 (+); <i>Platygyrium repens</i> : 115 (+); <i>Ulota crispa</i> : 146 (+).										
Localities and data of the relevés - 113: Lucia cave, 13.08.1994; 114: Morii Valley, 13.08.1994; 115, 116, 117, 118, 119: Popeștilor Valley, 15.08.1994; 135, 146: Drăghiței Valley, 20.08.1994; 200: Vidrișoara Valley, 2.06.1995;										

Table 2: 1-11 Ass. *Pterigynandretum filiformis* Hil. 1925, 12-14 Ass. *Homalothecio sericeae* – *Porelletum platyphyllae* Storm. 1938

Relevé number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Relevé code	172	189	171	195	14a	52	12	111	190	130	152	141	5	90
Altitude (m)	1280	660	1280	665	1340	900	1300	780	660	580	1210	900	650	890
Aspect	0	NV	V	E	V	NV	NNV	N	N	N	S	0	NV	0
Slope (°)	0	70	90	70	90	90	85	45	90	60	90	0	45	0
Surface (dm ²)	1,5	10,5	300	75	300	50	200	100	2,2	45	180	25	300	40
Cover (%)	100	90	100	80	90	100	100	100	70	90	90	60	90	90
Host tree	FR	CP	FR	CP	FP	FP	FP	F	CP	SI	FP	F	FP	F
<i>Pterigynandrum filiforme</i>	2	4	4	4	3	+	3	3	+	.	+	1	+	2
<i>Pseudoleskeella nervosa</i>	1	.	+	+	2	.	2	1	.	1	4	+	1	.
<i>Porella platyphylla</i>	.	.	.	1	1	.	+	.	.	+	2	+	1	1
<i>Homalothecium sericeum</i>	.	.	.	.	.	.	+	.	.	.	.	2	1	2
Brachythecio populei – Homalienion														
<i>Brachythecium populeum</i>	+	.	+	.	.	.	.	.	.	.	1	.	.	.
<i>Isothecium alopecuroides</i>	1	1	1_2	.	.	.	.	.	.	.	1	.	.	1
Neckerion complanatae														
<i>Anomodon viticulosus</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	1
Neckeretalia														
<i>Amblystegiella subtilis</i>	.	.	+	.	.	3	+	.	.	.	.	.	.	.
<i>Metzgeria furcata</i>	.	.	+	+	+	+	+	.	1	.	+	.	+	1
Ulotion														
<i>Orthotrichum stramineum</i>	.	+	.	+	+	.	.	.	.	.	2	+	.	.
Orthotrichetalia														
<i>Leucodon sciuroides</i>	.	.	3	.	1	.	2	.	.	.	+	4	+	+
<i>Pylaisia polyantha</i>	.	.	.	+	.	.	.	.	.	.	.	.	.	.
Frullanio-Leucodontetea														
<i>Frullania dilatata</i>	.	2	+	1_2	+	2	+	+	1	+	+	+	.	+
<i>Radula complanata</i>	.	+	.	1	1	1	+	2	2	2	+	+	.	1
Bryo-Brachythecion														
<i>Brachythecium salebrosum</i>	+	.	.	.	2_3	2	.	.	.	.	.	.	.	.
D-Amblystegium serpens														
<i>D-Amblystegium serpens</i>	.	.	.	.	.	.	.	+	.	3	.	.	.	.
D-Brachythecium reflexum														
<i>D-Brachythecium reflexum</i>	2	.	.	.	+	.	1	.	.	.	.	.	.	.
D-B. rutabulum														
<i>D-B. rutabulum</i>	.	.	.	.	.	.	.	.	+	.	.	.	.	.
D-B. velutinum														
<i>D-B. velutinum</i>	+	.	.	.	.	.	.	.	+	.	+	.	.	.
D-Bryum subelegans														
<i>D-Bryum subelegans</i>	.	.	+	.	+	1	2	+	.	.	1	.	.	.
Dicrano-Hypnion (optimal)														
<i>Hypnum cupressiforme</i>	.	.	.	.	.	+	1	2	3	4	.	.	3	1
Cladonio-Lepidozietea														
<i>Anastrophyllum minutum</i>	.	.	.	.	.	.	.	.	.	.	.	+	.	.
<i>Lophocolea heterophylla</i>	.	.	.	.	.	.	.	+	.	.	.	+	.	.
Companion														
<i>Anomodon attenuatus</i>	.	+	.	.	.	.	.	.	.	.	.	+	1	.
<i>Ctenidium molluscum</i>	.	.	.	.	.	+	.	2	.	.	.	.	.	.
<i>Hypnum cupressiforme</i> var. <i>filiforme</i>	.	+	.	.	.	.	.	.	.	.	.	.	+	.
<i>Neckera complanata</i>	.	.	.	.	.	3	1	3	.	.	.	.	.	.
<i>Paraleucobryum longifolium</i>	+	.	+	.	+	.	.	.	.	.	.	.	.	.
<i>Plagiochila porelloides</i>	.	.	.	.	.	.	1	+	.	.	.	.	.	.
<i>Tortella tortuosa</i>	.	.	.	.	.	1	1	.	.	.	.	.	.	.
Anomodon longifolius: 90 (1); Brachythecium glareosum: 111 (+); Ceratodon purpureus: 141 (+); Homalothecium lutescens: 172 (4); Hypnum mamillatum: 172 (+); Neckera crispa: 90 (+); Orthotrichum obtusifolium: 130 (+); O. pumilum: 130 (+); Plagiothecium denticulatum: 12 (+); Pleurozium schreberi: 141 (+); Pogonatum aloides: 141 (+); Polytrichum juniperinum: 141 (2); Pseudoleskea incurvata: 172 (+); P. saviana: 12 (+); Sanionia uncinata: 172 (+); Scapania aequiloba: 111 (+); Schistidium apocarpum: 12 (+); Tortula ruralis: 52 (+); T. virescens: 12 (+); Glechoma hirsuta: 172 (+); Oxalis acetosella: 172 (+); Antitrichia curtipendula: 171 (+); Platismatia glauca: 5 (+); Lecanora argentata: 171 (+);														
Localities and data - 5, 12, 14a: Vidișoara Valley, 20.08.1992; 52: Cheia Valley, 31.07.1994; 90: Morii Valley, 7.08.1994; 111: Morii Valley, 13.08.1994; 130: Arieșul Mic Valley, 16.08.1994; 141: Drăghița Valley, 20.08.1994; 152: Arieșul Mic Valley, 20.08.1994; 171, 172: Divaia Valley, 21.08.1994; 189, 190, 195: Pojar Hill, 25.08.1994;														

Orthotrichetum pallentis Ochs. 1928 has been identified on willow in a single sample from the Vidrișoara Valley. This is the first record of this species in Romania, while its range is rather limited in Europe, having been reported only in Thuringia, Sweden and Switzerland [19]. In the structure of this bryocoenoses acrocarpous mosses predominate. Most species exhibit a xerophilous, micro-mesothermal character, with preferences for a weakly acidophilic bark. From the phytogeographical point of view, well represented are temperate elements.

Pylaisietum polyanthae Felf. 1941 is wide-spread in the studied territory and it is associated with willows, consequently it can be found at medium altitudes (640 - 880 m s. m.). The bryocoenoses of this association are rich in species of *Orthotrichum*, *O. obtusifolium*, outlining even a subassociation: *orthotrichetosum obtusifoliae* Marst. 1985. From the physiognomical point of view, pleurocarpous mosses predominate, the aspect being most frequently marked by the abundance of the capsules of the constituent species. As opposed to the previous association, the demand for humidity is stronger, thus mesophilous species predominate, and - from the phytogeographical point of view - suboceanic species also infiltrate.

The class *Neckeretea complanatae* Marst. 1986 is the best represented in the Arieșul Mic basin, comprising associations that can be found both on tree bark and on saxicolous substratum. It is represented by only one order - *Neckeretalia complanatae* Jez. et Vondr. 1962 - and one alliance - *Neckerion complanatae* Šm. et Had. 1944 - with three suballiances.

The suballiance *Pseudoleskeello nervosae* - *Homomallienion incurvati* Marst. 1992 is represented by the bryocoenoses of two mesophilous associations (tab. 2) with well represented xero-mesophilous and xerophilous species. The bryocoenoses of the association *Pterigynandretum filiformis* Hil. 1925 occur frequently on beech and hornbeam, generally preferring lighter forests. It is very sensitive to atmospherical pollution, its presence being a bioindicator of clean air. Micro-mesothermal species predominate, while from the phytogeographical point of view temperate elements are well represented, which, in addition to boreal and subboreal ones, endow this association with a temperate-subboreal character. The temperate character is stronger in the case of the biocoenoses of the association *Homalothecio sericei* - *Porelletum platyphyllae* Størm. 1938. The samples were taken only from beech. Physiognomically, massive pleurocarpous moss species predominate in the bryocoenoses of this association.

The suballiance *Brachythecio populei* - *Homalienion trichomanoidis* Marst. 1992 (tab. 3) comprises mesophilous to meso-hygrophilous associations. The bryocoenoses of the association *Anomodontetum attenuati* Cain et Sharp 1938 have been found on beech, and are dominated by strong pleurocarpous mosses, two layers being delimited: one of mosses adherent to the substratum - *Metzgeria furcata*, *Porella platyphylla*, *Amblystegiella subtilis*, *Hypnum cupressiforme* var. *filiforme* - and another one of pleurocarpous mosses with ascending ramifications - *Anomodon attenuatus*, *A. viticulosus*, *Homalothecium sericeum*, *Antitrichia curtispindula* -, the very last species being very sensitive to air pollution. Acrocarpous mosses are weakly represented. From the ecological point of view, mesophilous species predominate, followed by xerophilous and xero-mesophilous, micro-mesothermal species, respectively euryionic species followed by the neutro-basophilous ones. From a phytogeographical point of view, the analysed bryocoenoses exhibit a temperate-boreal character. The association *Isothecietum myuri* Hil. 1925 has been identified on beech and hornbeam bark, and its physiognomy resembles that of the previous association, but is more demanding for humidity - reflected in the predominance of mesophytes, while from the phytogeographical point of view boreal elements are better represented.

The suballiance *Neckerenion complanato* - *besseri* Marst. 1992 is represented in the Arieșul Mic basin by only one association - *Anomodonto viticulosi* - *Leucodontetum sciuroidis* Wisn. 1930 (tab. 4) - whose bryocoenoses have been found on beech, hornbeam, willow and apple. Physiognomically, this association is dominated by strong species of pleurocarpous

Table 4: Ass. *Anomodonto viticulosi* - *Leucodontetum sciuroidis* Wisn. 1930

Relevé number	1	2	3	4	5	6	7	8
Relevé code	178	170	201	29	192	193	136	145
Altitude (m)	960	1280	670	800	660	660	810	1100
Aspect	S	V	N	V	N	N	NE	N
Slope (°)	90	90	87	90	89	90	90	85
Surface (dm ²)	187	300	25	100	30	50	50	50
Cover (%)	100	60	75	80	75	70	70	75
Host tree	FR	FP	MAI	SI	CP	CP	FI	F
<i>Leucodon sciuroides</i>	5	2_3	4	4	4	3	2	2
Brachythecio populei - Homalienion								
<i>Isothecium alopecuroides</i>	.	+	.	.	.	.	.	.
<i>Brachythecium populeum</i>	.	.	.	.	.	+	.	.
Neckerion complanatae								
<i>Amblystegiella subtilis</i>	+	.	.	.	.	.	.	.
<i>Metzgeria furcata</i>	+	+	.	.	.	.	.	+
<i>Porella platyphylla</i>	1	2	.	.	.	.	.	.
<i>Homalothecium sericeum</i>	.	+	.	+	.	.	.	.
Ulotion								
<i>Orthotrichum speciosum</i>	.	.	+	+	.	.	.	.
<i>O. stramineum</i>	.	.	.	.	+	+	+	.
Orthotrichetalia								
<i>O. affine</i>	.	.	.	+	.	.	.	.
<i>Pylaisia polyantha</i>	.	.	.	+	+	+	.	.
Frullanio-Leucodontetea								
<i>Frullania dilatata</i>	+	.	.	.	1	2_3	1	+
<i>Radula complanata</i>	.	.	.	.	1	1	1	+
Dicrano-Hypnion (optimal)								
<i>Hypnum cupressiforme</i>	.	1	.	.	.	.	3	4
Bryo-Brachythecion								
<i>Brachythecium salebrosum</i>	.	.	.	+	.	.	.	.
D-Amblystegium serpens	.	.	.	1	.	.	.	.
D-Brachythecium reflexum	.	1	.	.	.	.	.	.
D-Bryum subelegans	.	1	.	1	.	.	.	+
Dicranellion								
<i>Atrichum undulatum</i>	.	.	.	+	.	.	.	.
Cladonio-Lepidozietea								
<i>Cladonia coniocraea</i>	.	+	.	.	.	.	.	.
Companion								
<i>Anomodon attenuatus</i>	+	.	.	.	.	.	.	+
<i>Antitrichia curtipendula</i>	1	2	.	.	.	.	.	.
<i>Hypnum cupressiforme</i> var. <i>filiforme</i>	+	.	.	.	+	+	.	.
<i>Orthotrichum obtusifolium</i>	.	.	+	+	.	.	.	.
<i>O. pallens</i>	.	+	.	+	.	.	.	.
<i>Paraleucobryum longifolium</i>	.	1	.	.	.	.	.	1
<i>Pseudoleskeella nervosa</i>	1	2	1	.	+	.	.	+
<i>Pterigynandrum filiforme</i>	.	+	.	.	1	+	1	+
<i>Orthotrichum striatum</i> : 136 (+); <i>Plagiochila porelloides</i> : 170 (+); <i>Plagiomnium elatum</i> : 29 (+); <i>Platygyrium repens</i> : 29 (+).								
Localities and data of the relevés - 29: Pătroieștilor Valley, 22.08.1992; 136, 145: Drăghița Valley, 20.08.1996; 170, 178: Divaia Valley, 21.08.1994; 192, 193: Pojar Valley, 25.08.1994; 201: Morii Valley, 2.06.1995;								

Table 5: 1-4 Ass. *Orthodicrano montani* - *Hypnetum filiformis* Wisn. 1930, 5 - Ass. *Dicrano scoparii* - *Hypnetum filiformis* Barkm. 1958

Relevé number	1	2	3	4	5
Relevé code	194	23	180	149	159
Altitude (m)	660	830	900	1050	1000
Aspect	N	NV	S	O	E
Slope (°)	90	25	90	0	90
Surface (dm²)	25	100	100	100	200
Cover (%)	80	100	95	70	55
Host tree	CP	FP	F	M	BR
Dicranum (Orthodicranum) montanum	.	+	+	+	1
Hypnum cupressiforme var. filiforme	4	1	3	3	+
Dicrano-Hypnion (optim)					
Dicranum montanum	.	.	.	.	1
Hypnum cupressiforme	.	4	2	+	.
Bryo-Brachythecion					
D-Amblystegium serpens	.	.	1	.	.
Nowellion					
Herzogiella seligeri	.	.	.	.	3
Cladonio-Lepidozietalia					
Blepharostoma trichophyllum	.	.	.	+	1
Lepidozia reptans	.	.	.	+	2
Cladonio-Lepidozietea					
Plagiothecium laetum	.	.	.	+	+
Orthotrichetalia					
Leucodon sciuroides	.	.	2	.	.
Frullanio-Leucodontetea					
Frullania dilatata	2	.	.	.	.
Radula complanata	1	+	.	.	.
Brachythecio populei – Homalienion					
Brachythecium populeum	.	.	+	.	.
Isothecium alopecuroides	.	.	+	2	.
Neckeretalia					
Metzgeria furcata	.	+	1	.	.
Companion					
Anomodon attenuatus	.	.	1	.	.
Pseudoleskeella nervosa	.	1	2	.	.
Pterigynandrum filiforme	.	+	1	.	.
Localities and data of the relevés - 23: Pătroiștilor Valley, 22.08.1992; 149: Arieșul Mic Valley down from the mine, 20.08.1994; 159: Arieșul Mic Valley up from the mine, 20.08.1994; 180: Divaia Valley, 21.08.1994; 194: Pojar Hill, 25.08.1994;					

The class *Cladonio - Lepidozietea reptantis* Jez. et Vondr. 1962 em. Marst. 1993 comprises predominantly saprolignicolous communities, but they can also be identified on trees with more acid bark or on soils rich in humus. In the Arieșul Mic basin two associations have been identified on tree bark, both belonging to the order *Dicranetalia scoparii* Barkm. 1958 and to the alliance *Dicrano scoparii - Hypnion filiformis* Barkm. 1958 (tab. 5). The association *Dicrano scoparii - Hypnetum filiformis* Barkm. 1958 has been revealed in only one sample, the analysed bryocoenoses being classified into the subassociation *plagiothecietosum laeti* Marst. 1986. Physiognomically, this bryocoenoses is dominated by creeping moss species. It has a temperate subboreal, mesophilous, micro-mesothermal to microthermal, acidophilic character. The association *Orthodicrano montani - Hypnetum filiformis* Wisn. 1930 has been found on spruce, beech and hornbeam; from the ecological point of view, the bryocoenoses of this association settle into lighter biotopes which are slightly drier and less acid than in the case of the preceding association.

Most associations can be found on beech (8 associations) due to the higher atmospherical humidity at the mountain level (fig. 1). Four associations have been identified on hornbeam and willow. Less propitious for the development of bryophyte communities are the spruce and the fir, probably due to the resin content. Only one association constituted by bryophytes has been recorded on apple trees.

THE STUDY OF CORTICOLOUS BRYOPHYTES COMMUNITIES FROM THE ARIEȘUL MIC BASIN

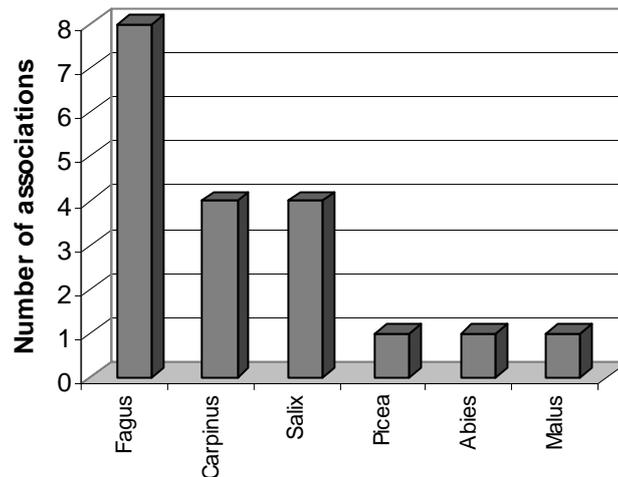


Fig. 1: The relations between tree species and number of bryophyte associations

As for the dependence of bryophyte communities on a certain host tree, the most widespread association is *Anomodontum viticulosi - Leucodontetum sciuroidis* Wisn. 1930, followed by *Pterigynandretum filiformis* Hil. 1925 and *Pterigynandretum filiformis* Hil. 1925 (Fig. 2).

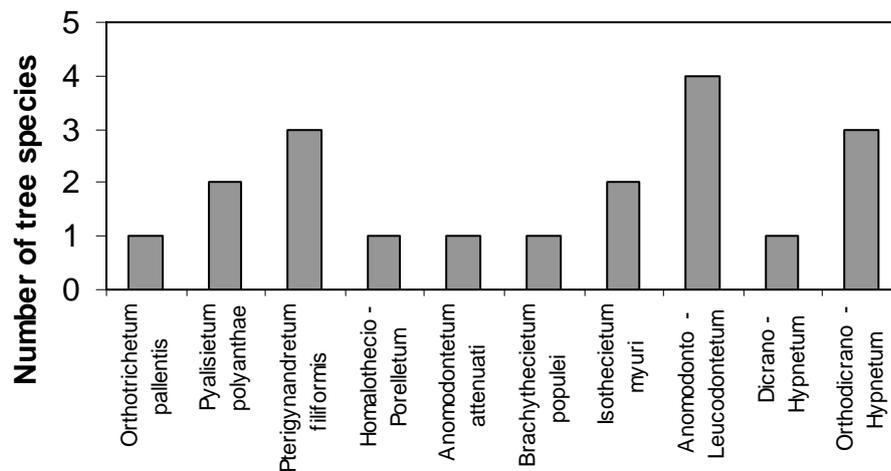


Fig. 2: The dependence of bryophyte communities on a certain host tree

Conclusions

Our researches reveal a large number of communities constituted by bryophytes, as compared to other similar studies from Romania. The existence of the association *Orthotrichetum pallentis* Ochns 1928 has been recorded for the first time in Romania. This, as well as *Pylaisietum polyanthae* Felf. 1941 and *Pterigynandretum filiformis* Hil. 1925, are considered bioindicators of good air quality. In the case of the first two associations, their presence is dependent on the existence of bottomland forests - highly impoverished, the bottoms being used as pastures, hayfields, agricultural lands or building sites. In the case of the other associations identified, the conservation of extensive mature beech forests and the protection of the existing mature trees are essential for preserving this diversity.

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STUDIUL COMUNITĂȚILOR DE BRIOFITE CORTICOLE DIN BAZINUL ARIEȘULUI MIC

(Rezumat)

Briofitele constituie o componentă esențială a formațiunilor forestiere, asigurând o biodiversitate ridicată atât prin contribuția la bogăția de specii, cât și pe baza comunităților pe care mușchii le edifică.

Aprofundarea cercetărilor despre vegetația corticolă edificată de briofite a constituit principalul nostru obiectiv. Stabilirea esențelor lemnoase care adăpostesc cele mai multe comunități edificate de briofite și stabilirea speciei de arbore „preferată” de fiecare dintre asociațiile de briofite identificate sunt esențiale pentru elaborarea unor recomandări care să aibă în vedere și comunitățile de briofite, componente ale vegetației teritoriului studiat.

Cercetările noastre pun în evidență existența a 9 asociații edificate de briofite pe ritidomul arborilor din bazinul Arieșului Mic, încadrate în 3 clase, 3 ordine, 3 alianțe și 3 subalianțe, număr mare de comunități edificate de briofite, în comparație cu alte studii similare din țară. Cele mai multe dintre asociațiile identificate (8 asociații) preferă ca specie de arbore gazdă fagul, probabil datorită umidității atmosferice mai ridicate din etajul montan. Patru asociații au fost identificate pe carpen, respectiv salcie. Mai puțin propice dezvoltării comunităților de briofite este ritidomul coniferelor, aspect datorat probabil conținutului de taninuri și rășini.

Este semnalată pentru prima dată în România existența asociației *Orthotrichetum pallentis* Ochn. 1928. Aceasta, împreună cu *Pylaisietum polyanthae* Felf. 1941 și *Pterigynandretum filiformis* Hil. 1925 sunt considerate bioindicatori ai unei bune calități a aerului. În cazul primelor două asociații, prezența lor este dependentă de existența pădurilor de luncă, care sunt mult pauperizate, luncile fiind utilizate ca pășuni, fânațe, terenuri agricole sau de construcții. În cazul celorlalte asociații identificate menținerea unor suprafețe extinse de păduri mature edificate de fag și protecția arborilor maturi existenți este esențială menținerii acestei diversități.