

BRYOPHYTE VEGETATION OF BASHKIRIA, SOUTH URALS. I.
EPIPHYTIC AND EPIXYLIC COMMUNITIES

РАСТИТЕЛЬНОСТЬ МОХООБРАЗНЫХ БАШКИРИИ,
ЮЖНЫЙ УРАЛ. I.
ЭПИФИТНЫЕ И ЭПИКСИЛЬНЫЕ СООБЩЕСТВА

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Abstract

Epiphytic and epixylic bryophyte communities of Bashkiria were studied using Braun-Blanquet approach. The European system of high syntaxa is found to be acceptable for Bashkirian bryophytic vegetation. The presented system of epiphytic and epixylic vegetation of Bashkiria includes 2 classes, 3 orders and 6 alliances. Only one alliance has not been described in Europe. At the same time diagnostic species of higher syntaxa are poorly represented. Two associations, *Plagiothecio-Pohlietum nutantis* and *Brachythecietum reflexi*, have the intermediate position among European alliances. Nine associations are recognized, 6 described as new. The high proportion of the new associations is explained by the absence of many European species.

Резюме

Эпифитные и эпиксильные сообщества мохообразных Башкирии изучены по методике Браун-Бланке. Европейская система высших синтаксонов оказалась приемлемой. Башкирские сообщества отнесены к 2 классам, 3 порядкам и 6 союзам. Лишь 1 союз не был ранее описан в Европе. В то же время диагностические виды высших синтаксонов представлены сравнительно слабо. Две ассоциации, *Plagiothecio-Pohlietum nutantis* и *Brachythecietum reflexi*, занимают промежуточное положение между союзами, установленными для Европы. Из 9 выявленных ассоциаций 6 описаны как новые. Такой высокий процент новых ассоциаций связан с отсутствием многих европейских видов.

INTRODUCTION

The bryoflora of Bashkiria has been studied by Podpera (1921), Selivanova-Gorodkova (1956), Selivanova-Gorodkova & Shljakov (1956), Ignatova & Ignatov (1993). However, these authors provided no or a little data on bryophyte vegetation. The latter is now under special exploration of the senior author. In the present paper epiphytic and epixylic communities are analyzed according to the Braun-Blanquet approach. In further publications we intend to cover all the types of bryophyte communities too. Classification systems developed for Central and Western European countries (Barkman, 1958; Huebschmann, 1986; Marstaller, 1985, 1986a,b) have been used for syntaxo-

nomic analyse, since similar investigations were not carried out in Russia earlier.

The present investigations were carried out in the forest-steppe and mountain-boreal zones of Bashkiria (South Urals). Bashkiria is situated at the border of Europe and Asia, between latitudes of 52-56°N and longitudes of 53-60°E. The taiga mixed forest, broad-leaved forest, forest-steppe and steppe zones replace one another along 500 km from the north to the south. The plane parts of eastern edge of the Russian platform are replaced by the peneplen and highlands of the South Urals along 400 km from the west to the east. The climate is continental. The mean annual precipitation is 400-750 mm. The mean annual sum of temperature is 1400-

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2300°C, the mean annual temperature ranges between 0.6-2.3°C. The frostless period is about 60-120 days (Kadilnikov & al., 1964). The general characteristics of Bashkirian vegetation are presented by Krashennikov (1954), and Krashennikov & Kucherevskaya-Rozhanez (1941). The ecological-floristical classification of investigated forests is presented by Schubert et al. (1979); Khaziakhmetov & al. (1989) and Solometch & al. (1989, 1993).

METHODS

About 300 geobotanical releves were carried out in 1990-1992. The most typical, often repeated sites of bryophytic cover on the tree trunks and decaying wood were selected. The particular attention was paid to ecological homogeneity of sample plots (moisture, illumination, exposition). The area of sample plots ranges from 1 to 8 dm². The abundance of species was evaluated according to the Braun-Blanquet cover abundance scale: r - extremely rare; + - cover not more than 1%; 1 - 1-5%; 2 - 5-25%; 3 - 25-50%; 4 - 50-75%; 5 - 75-100%. Nomenclature of mosses is after Ignatov & Afonina (1992), of hepatics - Konstantinova & al. (1992), lichens - Abramov (1971-1978), vascular plants - Czerepanov (1981). The names of the syntaxa follow the Code of Phytosociological Nomenclature (Barkman & al., 1986). The abbreviations of substrate used in the tables are as follow: T - *Tilia cordata*; QR - *Quercus robur*; UL - *Ulmus laevis*; BP - *Betula pendula*; PT - *Populus tremula*; PN - *Populus nigra*; AI - *Alnus incana*; AG - *Alnus glutinosa*; AP - *Acer platanoides*; AS - *Abies sibirica*; PO - *Picea obovata*; LS - *Larix sibirica*; r before tree abbreviation means that bark is with the first signs of decay; R - rotten wood; RS - rotten wood with soil; St. - stone; the numbers of nomenclature type-releves are marked with "1".

THE LIST OF SYNTAXA OF THE EPIPHYTIC AND EPIXYLIC BRYOPHYTIC VEGETATION OF BASHKIRIA

Cl. HYPNETEA CUPRESSIFORMIS Jezek et Vondracek 1962

Ord. LEUCODONTETALIA v. Huebschmann 1952

All. *Leskeion polycarpae* Barkman 1958

1. Ass. *Leskeetum polycarpae* Horvat. 1952.
2. Ass. *Brachythecio salebrosi-Amblystegietum serpentis* ass. nov.

All. *Tortulion laevipilae* Ochsner 1928

3. Ass. *Pylaisiello to polyanthae-Leskeelletum nervosae* ass. nov.

4. Ass. *Pylaisietum polyanthae* Gams 1927.

Cl. LEPIDOZIO-LOPHOCOLETEA HETEROPHYLLAE v. Huebschmann 1976

Ord. LOPHOCOLETALIA HETEROPHYLLAE Barkman 1958

All. *Blepharostomion trichophylli* (Stefureac 1941) Barkman 1958

5. Ass. *Brachythecietum reflexi* ass. nov.

All. *Tetraphido-Aulacomnion androgynae* (Krusenstjerna 1945) Barkman 1958

6. Ass. *Plagiothecio laeti-Pohlietum nutantis* ass. nov.

Ord. DICRANETALIA Barkman 1958

All. *Dicrano-Hypnion filiformis* Barkman 1958

7. Ass. *Ptilidio-Hypnetum pallescentis* (Herzog 1943) Barkman 1958.

8. Ass. *Orthodicrano-Plagiothecietum laeti* ass. nov.

All. *Sanjonio-Pleurozion schreberii* Solometch all. nov.

9. Ass. *Pleurozio-Ptilietum crista-castrensis* Solometch ass. nov.

DESCRIPTION OF THE SYNTAXA

Class HYPNETEA CUPRESSIFORMIS Jezek et Vondracek 1962

Order LEUCODONTETALIA v. Huebschmann 1952

Diagnostic species of the class and the order: *Pylaisiella polyantha*, *Leskea polycarpa*, *Leucodon sciuroides*, *Platygyrium repens*, *Radula complanata*.

The class unites neutrophilous bryophytic communities on tree trunks. The Urals communities are referred to two alliances of the order *Leucodontetalia*. The releves were made in woods of *Fagetalia* represented in the South Urals by alliances *Aconito-Tilion* Solometch et al. 1993, *Aconito-Piceion* Solometch et al. 1993, *Alno-Padion* Knapp 1942.

Alliance LESKEION POLYCARPAE Barkman 1958

Diagnostic species: *Leskea polycarpa*.

The alliance contains the mesophytic epiphytic communities found on the bark of *Ulmus laevis*, *Alnus incana*, *Padus avium*, *Salix alba*, *Populus nigra* in flood plain woods *Alno-Padion* and *Salicion albae*.

1. Association *Leskeetum polycarpae* Horvat. 1932

subass. *pylaisiellatosum polyanthae* subass. nov. Table 1.

Type-releve - 14.

Diagnostic species: *Leskea polycarpa* (dom.), *Pylaisiella polyantha*.

The present association occurs in flood plain forests *Alno-Padion* and *Salicion albae* on *Tilia cordata*, *Ulmus laevis*, *Populus tremula*, *Populus nigra*. The communities were mainly found on the tree bases and tree trunks reaching up to 0.5 m above the ground, and on rotten wood (rel. 2, 13). Two releves (8, 9) were carried out in the shaded broad-leaved forests of *Aconito-Tilion*. The average cover is 90%, average number of species in releve is 3.

Table 1. *Leskeetum polycarpae* Horvat. 1932 subass. *pylasielletosum polyanthae* subass. nov.

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	C
Length of the plot, cm	15	15	15	15	20	20	20	10	15	15	20	15	5	10	10	15	15	15	O
Width of the plot, cm	15	15	30	40	25	20	20	20	20	20	20	15	20	10	10	25	15	10	N
Cover, %	70	85	80	75	100	90	80	90	90	70	85	85	90	95	80	70	80	85	S
Height above the ground, cm	50	-	-	30	40	50	50	30	30	50	-	50	-	-	40	30	-	-	T
Substrate	T	rT	UL	PN	UL	UL	T	PN	PN	T	T	T	rT	PT	T	T	PT	PT	
Number of species in releve	4	2	2	3	2	2	3	4	4	4	3	2	5	7	3	5	2	6	
Diagnostic species of association, alliance, order, and class																			
<i>Leskea polycarpa</i>	4	5	5	4	5	5	4	4	4	2	3	3	3	3	2	2	2	3	V ³
<i>Pylaisiella polyantha</i>	r	+	+	+	+		1		1	2	2	3	3	3	3	+	4	3	V ²
Other species																			
<i>Amblystegium serpens</i>						+	1					2	1				+		II ¹
<i>Pseudoleskeella catenulata</i>										2	2				2				I ²
<i>Brachythecium salebrosum</i>				+							r			1			+		I ¹
<i>Tortula ruralis</i>														r					I ⁺
<i>Amblystegium juratzkanum</i>							+					2							I ¹
<i>Leptodictyum humile</i>								2											I ²
<i>Leskeella nervosa</i>														1					I ¹
<i>Orthotrichum obtusifolium</i>														+					I ⁺
<i>Orthotrichum speciosum</i>														+					I ⁺
<i>Radula complanata</i>		+																	I ⁺
<i>Anomodon viticulosus</i>																2			I ²
<i>Ceratodon purpureus</i>												1							I ¹
<i>Hypnum pallescens</i>									r								1		I ¹
<i>Calicladium haldanianum</i>																	1		I ¹
<i>Frullania bolanderi</i>		+																	I ⁺

The Urals communities differ from the type subassociation from Germany, Netherlands, Romania and Slovakia (Marstaller, 1985; Huebschmann, 1986) by the poorer floristic composition. *Hypnum cupressiforme* is the codominant and accompanying species of *Leskea polycarpa* in Central Europe. *Pylaisiella polyantha* replaces it in the Urals communities. *Bryum subelegans*, *Amblystegium serpens*, *Brachythecium velutinum*, *Radula complanata*, *Orthotrichum spp.* have the low presence or are absent in the Urals communities. These differences allow to segregate the new subassociation *pylasielletosum polyanthae*. The similar syntaxa is ass. *Leskeetum polycarpae* subass. typicum var. *Pylaisia polyantha* described from Germany (Marstaller, 1985), which differs from our subassociation by the presence of the group of species mentioned above.

2. Association *Brachythecio salebrosi* - *Amblystegietum serpentis* ass. nov. Table 2.

Type-releve - 5.

Diagnostic species: *Amblystegium serpens* (dom.), *Brachythecium salebrosum*.

The communities have been found on the rotten logs and stumps in flood plain forests of *Alno-Padion* and *Salicion albae*. The average cover is 85%, average number of species in releve is 6.

This association belongs to *Leskeion polycarpae* due to the composition of high-constancy species. On the other hand, it differs from other associations of *Leskeion polycarpae* in the presence of some species growing typically on rotten wood. Huebschmann (1986) classified communities with *Amblystegium serpens* as the subassociation of *Leskeetum polycarpae* while Marstaller (1985) - as the variant of this association. Perhaps, these placements are appropriate for the communities with predominance of *Amblystegium serpens* on living tree trunks. They are connected with the initial stage of woods destruction. The species of *Lophocolealia* appear here among epiphytic species of *Leskeion polycarpae* and *Leucodontetalia*. On the other hand, newly suggested association is similar to *Amblystegietum juratzkani* Sjogren ex Marstaller 1987 (alliance *Bryo-Brachythecion* Lecointe 1975 em. Marstaller 1987, order *Brachythecietalia rutabulo-salebrosi* Marstaller 1987, class *Lepidozietea reptantis* Hertel ex Marstaller 1984 (= *Lepidozio-Lophocoletea*) by the presence of *Brachythecium salebrosum*, *Sanionia uncinata*, *Ceratodon purpureus*, *Lophocolea heterophylla*. The distinguishing features include the dominance of *Amblystegium serpens*, the high constancy of *Leskea polycarpa*,

Table 2. *Brachythecio salebrosi* - *Amblystegietum serpentis* ass. nov.

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	C
Length of the plot, cm	25	15	15	20	15	20	30	20	20	40	15	20	25	40	O
Width of the plot, cm	15	15	15	10	15	10	15	10	10	40	10	15	10	15	N
Cover, %	90	90	90	90	80	80	90	70	90	30	90	90	100	100	S
Substrate	R	R	R	R	R	R	R	R	R	R	R	R	RS	R	T
Number of species in releve	2	5	4	7	4	3	5	5	6	6	5	9	12	6	
Diagnostic species of association															
<i>Amblystegium serpens</i>	5	5	5	4	3	3	3	4	3	2	4	3	3	3	V ³
<i>Brachythecium salebrosum</i>				+	3		r	+		1	2	2	3	+	IV ¹
Diagnostic species of <i>Leucodontetalia</i>															
<i>Leskea polycarpa</i>		r	+		1	3		+	2	2	2	+		+	IV ²
<i>Pylaisiella polyantha</i>				1	2				+	1		+	+		III ⁺
Other species															
<i>Ceratodon purpureus</i>	r	+	r	+		2						1			III ⁺
<i>Sanionia uncinata</i>				1								+	+		II ⁺
<i>Plagiomnium cuspidatum</i>								+			+	r	r		II ⁺
<i>Bryum</i> sp.		r	r	r									1	1	II ⁺
<i>Brachythecium oedipodium</i>									2						I ²
<i>Lophocolea heterophylla</i>							+					+			I ⁺

Low constancy species: *Brachythecium starkei* (12-+); *B. velutinum* (14-1); *Campylium sommerfeltii* (2-1); *Hypnum pallescens* (9-1); *Mnium stellare* (13-r); *Orthotrichum obtusifolium* (10-r); *Plagiothecium denticulatum* (7-2); *P. laetum* (7-2); *Platygyrium repens* (13-+); *Pleurozium screberi* (4-+); *Pohlia nutans* (13-r); *Radula complanata* (13-r).

the low constancy of species of rotten wood. Thus, *Brachythecio salebrosi* - *Amblystegietum serpentis* has the intermediate place between *Leskeetum polycarpae* var. *Amblystegium serpens* (*Leskeion*) and *Amblystegietum juratzkani* (*Bryo-Brachythecion*).

Alliance TORTULION LAEVIPILOE Ochsner 1928

Diagnostic species: *Orthotrichum speciosum*, *O. affine*, *O. obtusifolium*, *O. fastigiatum*.

The alliance unites xero-mesophytic epiphytic communities. They were described on the bark of *Acer platanoides*, *Quercus robur*, *Tilia cordata* in the broad-leaved forests of *Quercetalia pubescentis* (*Lathyro-Quercion*) and *Fagetalia* (*Aconito-Tilion*). These forests occur in the forest-steppe zone of South Urals on plains and slopes.

3. Association *Pylaisiello to polyanthae* - *Leskeelletum nervosae* ass. nov. Table 3.

Type-releve - 14.

Diagnostic species: *Leskeella nervosa*, *Pylaisiella polyantha*.

The association was described in the *Tilia* + *Ulmus* forests of *Aconito-Tilion* on the bark of *Tilia cordata*, *Acer platanoides*, *Quercus robur*. The communities grow on trunks of living trees at 0.5-1 m above the ground and rarely also on destructed bark. The average cover is 85%, average number of species in releve is 4.

The basophilous species *Leskeella nervosa*, *Leucodon sciuroides*, *Orthotrichum speciosum*, *O. obtusifolium*, *Radula complanata*, and indifferent ones (*Pylaisiella polyantha*, *Hypnum*

pallescens) take the important place in the floristical composition of communities. The diagnostic species of *Leucodontetalia* (*Pylaisiella polyantha*, *Leucodon sciuroides*) have the high constancy. The association is classified within *Tortulion* by the presence of *Orthotrichum affine*, *O. speciosum*, *O. obtusifolium*. The diagnostic groups of all European alliances have the low occurrence. *Leskeella nervosa* is diagnostic species of *Madotheco-Leskeelletum nervosae* (Gams 1927) Barkman 1958 (*Anomodontion*) described on basophilous substrata in the shaded mesophilous deciduous forests (*Carpinion*) in the continental part of Western Europe (Barkman, 1958). The ecological preferences of both associations are similar. The absence of diagnostic species of *Anomodontion*, i.e. *Porella platyphylla*, *Frullania dilatata*, *Metzgeria furcata*, *Isoetecium alopecuroides*, *Pterygynandrum filiforme* differs our association from *Madotheco-Leskeelletum*. The presence of basophilous species and codominance of *Leskeella nervosa* and *Leucodon sciuroides* differ *Pylaisiello to polyanthae-Leskeelletum nervosae* from other associations of *Tortulion*. There are two variants within association: *Leucodon sciuroides* (rel.1-10) and typical (rel.11-18).

4. Association *Pylaisietum polyanthae* Gams 1927 Table 4.

Diagnostic species - *Pylaisiella polyantha* (dom.).

Table 3. *Pylaisiella polyantha* - *Leskeella nervosa* ass. nov.

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	C
Length of the plot, cm	10	15	15	15	15	15	15	10	20	15	10	10	10	10	10	10	10	10	O
Width of the plot, cm	30	15	15	15	15	20	15	30	20	15	20	20	20	10	10	15	10	20	N
Cover, %	90	100	80	100	90	100	100	80	100	100	100	100	90	90	100	100	90	100	S
Height above the ground, cm	30	-	50	-	30	-	40	-	100	50	120	-	100	50	-	50	40	-	T
Substrate	AP	rT	AP	rAP	AP	AP	T	rT	T	AP	AP	rT	T	QR	QR	AP	AP	AP	
Number of species in releve	2	2	4	4	4	4	4	8	3	6	2	4	3	4	3	3	2	2	
Diagnostic species of association																			
<i>Leskeella nervosa</i>	4	4	4	4	5	4	2	3	2	4		5	5	5	4	5	5	5	V ⁴
Diagnostic species of Leucodontetalia																			
<i>Pylaisiella polyantha</i>				+	+	2	+	2	3	2	1	2	+	+	2	r			IV ²
<i>Leucodon sciuroides</i>	2	3	2	3	2	1	3	3	3	3									III ³
<i>Radula complanata</i>												+							I ⁺
Diagnostic species of Tortulion																			
<i>Orthotrichum fastigiatum</i>		1	+	1						2									II ¹
<i>Orthotrichum affine</i>													2						I ⁺
<i>Orthotrichum speciosum</i>							+				1					2			I ¹
<i>Orthotrichum obtusifolium</i>								2									r		I ¹

Low constancy species: *Brachythecium reflexum* (18-2); *Hypnum pallescens* (14,15-+); *Hypogymnia physodes* (8,11,12-+); *Cladonia coniocraea* (14-+); *Physcia orbicularis* (8-+); *Physconia grisea* (3,10-+); *P. detersa* (8,10-+); *Xanthoria candelaria* (6,8-+).

Table 4. *Pylaisiella polyantha* Gams 1927

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	C
Length of the plot, cm	30	20	25	20	15	15	15	25	45	15	20	15	15	25	20	25	20	20	20	15	O
Width of the plot, cm	15	20	15	20	15	15	15	25	15	15	15	15	5	15	15	10	15	20	20	15	N
Cover, %	100	90	100	100	90	90	90	90	100	90	100	100	90	90	80	100	80	70	100	90	S
Height above the ground, cm	100	-	-	-	170	-	-	50	100	-	7	-	-	70	25	-	50	15	-	-	T
Substrate	A	T	rT	B	QR	T	PT	QR	B	B	A	T	T	PN	B	PN	T	B	AI		
Number of species in releve	2	4	5	3	3	4	6	3	6	3	3	2	3	4	4	10	5	9	4	4	
Diagnostic species of association																					
<i>Pylaisiella polyantha</i>	5	5	5	5	5	4	4	5	4	4	5	4	3	3	3	4	3	4	3	3	V ³
Diagnostic species of Tortulion																					
<i>Orthotrichum speciosum</i>		+		+	1		1	+	1								+	2			III ⁺
<i>Orthotrichum obtusifolium</i>													1								I ⁴
<i>Orthotrichum affine</i>														1							I ¹
Diagnostic species of Leucodontetalia																					
<i>Leskea polycarpa</i>		+			1	+	+						+						r		II ⁺
<i>Leucodon sciuroides</i>							r			2							1				I ¹
<i>Platygyrium repens</i>						2									2						I ²
Other species																					
<i>Callicladium haldanianum</i>			+	r		+			+								+				II ⁺
<i>Hypnum pallescens</i>			r				2		+						+		1	1			II ¹
<i>Sanionia uncinata</i>		+					2											3	3		I ²
<i>Leskeella nervosa</i>	+						1			2	2	3		+							II ²
<i>Amblystegium serpens</i>									2				2			+					I ⁺
<i>Orthotrichum fastigiatum</i>												1									I ¹

Low constancy species: *Amblystegium varium* (17-2); *Brachythecium reflexum* (8,20-1); *B. salebrosum* (17-+); *Ceratodon purpureus* (7,21-r); *Cladonia coniocraea* (16-+); *C. fimbriata* (16-+); *Hypogymnia physodes* (16,21-r); *Lophocolea heterophylla* (3-+); *Orthodicranum montanum* (6,16-r); *Parmelia sulcata* (18-+); *Physconia detersa* (18-+); *P. tenella* (18-+); *Plagiomnium cuspidatum* (14-2,16-r); *Pseudoleskeella catenulata* (18-r); *Ptilidium pulcherrimum* (9,16-1); *Zygodon viridissimus* (3-1).

The association unites the communities with predominance of *Pylaisiella polyantha* on the bark of *Acer platanoides*, *Tilia cordata*, *Betula pendula*, *Alnus incana*. These communities are widespread in xerophytic and mesophytic forests of the South Urals. The moisture and illumination of the habitats vary considerably. The average cover is 90%, average num-

ber of species is 4.

The Urals communities differ from those described from Germany (Marsteller, 1985), Romania, Slovakia (Huebschmann, 1986) by the absence of *Hypnum cupressiforme*, *Bryum subelegans*, *B. capillare*, *Frullania dilatata*, *Orthotrichum*

Table 5. *Brachythecietum reflexi* ass. nov.

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	C
Length of the plot, cm	15	20	15	15	15	15	20	15	20	15	15	15	10	O
Width of the plot, cm	15	15	15	10	10	15	10	10	10	15	15	10	10	N
Cover, %	100	100	90	100	100	100	100	100	100	100	90	100	100	S
Substrate	AS	PA	St	AS	AS	AS	R	BP	R	UL	TC	AS	BP	T
Number of species in releve	4	3	9	7	8	16	9	3	8	4	4	3	5	
Diagnostic species of association														
<i>Brachythecium reflexum</i>	5	4	3	4	3	4	4	3	3	5	5	4	3	V ³
Diagnostic species of Lepidozio-Lophocoletea heterophyllae and Lophocoletea heterophyllae														
<i>Lophocolea heterophylla</i>			2	+	+	+	+			r	+			III ⁺
<i>Plagiothecium laetum</i>			+	2		1								II ¹
<i>Cladonia coniocraea</i>					1	+	+							II ⁺
<i>Lophocolea minor</i>					+	+								I ⁺
<i>Orthodicranum flagellare</i>									+					I ⁺
<i>Lepidozia reptans</i>				+										I ⁺
Diagnostic species of Blepharostomion														
<i>Blepharostoma trichophyllum</i>			2			+								I ¹
Diagnostic species of Dicranetalia														
<i>Dicranum scoparium</i>				+		+	1		2					II ¹
<i>Dicranum fuscescens</i>	+			+	3									II ⁺
<i>Ptilidium pulcherrimum</i>							2							I ¹
<i>Orthodicranum montanum</i>						+								I ⁺
Other species														
<i>Sanionia uncinata</i>			+	2	2	+	+		2			3	+	IV ¹
<i>Hypnum pallescens</i>							r	1	+			r	2	II ⁺
<i>Plagiothecium denticulatum</i>					3	1			+					II ¹
<i>Pohlia nutans</i>		3	+			+								II ⁺
<i>Brachythecium oedipodium</i>	r					1			3		+			II ¹
<i>Paraleucobryum longifolium</i>			3						+					I
<i>Lophozia longidens</i>			2			1								I
<i>Callicladium haldanianum</i>								r					3	I
<i>Brachythecium starkei</i>				2	+									I
<i>Brachythecium salebrosum</i>						+			1					I
<i>Cladonia rei</i>						+	+							

Low constancy species: *Amblystegium serpens* (13-2); *A. varium* (1-r); *Cladonia cenotea* (5-+); *C. fimbriata* (2-+); *C. grei* (6-+); *Hypogymnia bitteriana* (7-+); *Peltigera canina* (3-+); *Pleurozium schreberi* (9,13-+); *Rhodobryum roseum* (5-+).

diaphanum, the low constancy of *Amblystegium serpens*, *Ceratodon purpureus*, *Orthotrichum affine* and hepatics. There are three variants within the association: 1) var. *typica*; 2) the basophilous, comparatively poor in species composition var. *Leskeella nervosa*; 3) var. *Sanionia uncinata*, growing on the extreme base of trees and including both acidophilous and indifferent species: *Sanionia uncinata*, *Hypnum pallescens*, *Callicladium haldanianum*. *Pylaisiella polyantha* has the wide ecological amplitude and occurs also in the flood-plain associations of *Leskeion polycarpae* (*Leskeetum polycarpae* and *Brachythecio salebrosi-Amblystegietum serpentis*). The *Pylaisietum polyanthae* differs from the associations mentioned above by the predominance of *Pylaisiella polyantha*, the lower constancy of *Leskea polycarpa* and the high constancy of xerophytic species of genus *Orthotrichum*, the

diagnostic species of *Tortulion*.

CLASS LEPIDOZIO-LOPHOCOLETEA HETEROPHYLLAE v. Huebschmann 1976 Order LOPHOCOLETALIA HETEROPHYLLAE Barkman 1958

Diagnostic species: *Lophocolea heterophylla*, *L. minor*, *Plagiothecium laetum*, *Tetraphis pellucida*.

The order unites the acidophytic bryophytic associations on the rotten wood and tree bases. These communities are widespread in the various regions of Europe and North America (Barkman, 1958). The order consists of two alliances, *Blepharostomion* and *Tetraphido-Aulacomnion*. Two diagnostic species of *Lophocoletalia*, *Lophocolea heterophylla* and *Plagiothecium laetum*, have the high constancy in the Urals communities while the diagnostic combinations of the alliances have the low presence.

Alliance BLEPHAROSTOMION TRICHOPHYLLI
(Stefureac 1941) Barkman 1958

Table 6. *Plagiothecio laeti-Pohlietum nutantis* ass.nov.

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	C
Length of the plot, cm	15	15	60	60	20	40	30	20	15	25	30	35	20	40	15	20	15	15	10	10	15	40	O
Width of the plot, cm	15	15	15	15	15	35	15	20	15	15	25	15	15	20	10	15	10	15	10	10	15	40	N
Cover, %	100	100	90	80	80	90	90	90	90	80	90	100	100	100	100	100	100	90	100	80	100	40	S
Substrate	RS	RS	RS	RS	RS	RS	RS	RS	R	RS	RS	RS	RS	RS	RS	RS	RS	RS	R	RS	RS	R	T
Number of species in releve	6	6	6	4	4	8	6	8	7	8	6	6	8	9	5	5	6	6	4	4	3	6	
Diagnostic species of association and variant																							
<i>Pohlia nutans</i>	5	4	5	4	3	+	3	4	2	3	3	3	3	3	3	3	2	4	+	4	4	1	V ³
<i>Plagiothecium laetum</i>	+	+	1	+	+	4	+	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	IV ²
<i>Polytrichum juniperinum</i>	1	2	+	2	2	+	3	+	2	+	+	+	+	+	+	+	+	+	+	+	+	+	III ²
Diagnostic species of Lophocoletea heterophyllae																							
<i>Lophocolea heterophylla</i>	+	+	+	+	1	1	+	+	+	+	2	1	+	+	+	+	+	+	+	+	+	+	IV ⁺
<i>Orthodicranum flagellare</i>								r		+	1			+									I
<i>Tetraphis pellucida</i>					2	2																	I
<i>Herzogiella seligeri</i>													1										I
Diagnostic species of Dicranetalia																							
<i>Orthodicranum montanum</i>														+					r				I
<i>Dicranum scoparium</i>		+											+	+									I
<i>Cladonia coniocraea</i>							+			+				+	+								I
Other species																							
<i>Brachythecium mildeanum</i>	+					1		1		+	1			1			2						II ¹
<i>Leptobryum pyriforme</i>							+	1		+	+												I ⁺
<i>Plagiomnium cuspidatum</i>												3	3				2						I ³
<i>Ceratodon purpureus</i>																+	1	+	+				I
<i>Aulacomnium palustre</i>					+				+	1													I
<i>Sanionia uncinata</i>									r											+	3	r	I

Diagnostic species: *Blepharostoma trichophyllum*, *Dicranodontium denudatum*, *Novellia curvifolia*, *Calypogeia suecica*, *Buxbaumia viridis*, *Riccardia latifrons*, *Cephalozia media*, *C. leucantha*, *C. raclusa*, *Icmadophila ericetorum* (Barkman, 1958).

The *Blepharostomion* utilizes hygrophilous communities distributed in regions with the humid climate and cool summers, namely in hyperatlantic, boreal, subarctic, montane and subalpine regions of Europe and North America (Barkman, 1958). These communities are very rich in hepatics.

5. Association *Brachythecietum reflexi* ass. nov.

Type-releve - 6.

Diagnostic species: *Brachythecium reflexum*.

The association was recorded in highland broad-leaved and mixed forests of the South Urals. The annual temperature of investigated area is 1°C, the annual precipitation - 500-650 mm. The communities grow on the bases of trunks of *Abies sibirica*, *Picea obovata*, *Tilia cordata*, *Betula pendula* and rarely on rocks. The average cover is 98%, the average number of species in releve is 6.

Brachythecium reflexum is characteristic of *Brachythecium starkei*-Gesellschaft (Huebsch-

mann, 1986) and ass. *Hypno-Xylarietum hypoxyli* Philippi 1965 subass. *brachythecietosum rutabulisalebrosum* Philippi 1965 var. *Brachythecium reflexum* (Marstaller, 1989). The dominance of *Brachythecium reflexum*, presence of *Hypnum pallescens* and absence of *Brachythecium starkei*, *Herzogiella seligeri*, *Plagiothecium curvifolium* and *Rhizomnium punctatum* differ *Brachythecietum reflexi* from the former syntaxa. The absence of *Xylaria hypoxyla* differs the Urals association from the latter syntaxa. The species composition of *Brachythecietum reflexi* is not typical of the communities of *Blepharostomion*. We classified this association within *Blepharostomion* because the similar syntaxa *Brachythecium starkei* - Gesellschaft had been included to this alliance by Huebschmann (1986). Perhaps, the syntaxonomical position of *Brachythecietum reflexi* will be reconsidered.

Alliance TETRAPHIDO-AULACOMNION (Krusenstjerna 1945) Barkman 1958.

Diagnostic species: *Plagiothecium curvifolium*, *Plagiotheciella latebricola*, *Aulacomnium androgynum*,

Table 7. *Ptilidio pulcherrimi-Hypnetum pallescentis* (Herzog 1943) Barkman 1958

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	C	
Length of the plot, cm	20	20	15	15	25	20	15	15	30	20	15	10	20	15	15	15	15	15	15	15	15	10	20	20	15	45	25	15	15	O	
Width of the plot, cm	10	20	15	10	20	15	10	10	15	10	10	20	15	15	10	15	10	15	15	15	15	10	20	10	10	15	15	15	10	N	
Cover, %	100	100	100	100	100	70	100	100	70	40	100	100	90	100	100	100	100	100	100	100	100	100	100	60	90	100	100	100	80	S	
Substrate	BP	R	R	BP	R	R	RS	R	BP	AS	R	BP	BP	BP	BP	BP	BP	BP	BP	BP	BP	BP	AS	AS	BP	R	R	BP	BP	T	
Number of species in releve	8	5	3	3	7	6	5	7	11	8	6	8	6	8	6	8	7	6	5	9	7	7	11	7	7	9	8	4	3		
Diagnostic species of association																															
<i>Hypnum pallescens</i>	4	3	4	4	4	3	3	3	2	1	2	4	4	4	4	3	4	4	4	4	3	2	1	2	+	+	+	+	+	V ³	
<i>Ptilidium pulcherrimum</i>												+	+	+	1	+	1	2	2	1	3	2	1	+	+	2	3	4	4	IV ¹	
Diagnostic species of Lepidozio-Lophocoletea heterophyllae																															
<i>Lophocolea heterophylla</i>				3	1	2	1	2	2	+	2	+	+	+	+	+	1	+	1	+	+	+	+	+	+	+	+	2	2	III ⁺	
<i>Plagiothecium laetum</i>				1	1	1	3	+				+													+	+	2	2	II ¹		
<i>Orthodicranum flagellare</i>				2								+	+	+	1															I	
<i>Lophozia longidens</i>																														I	
<i>Blepharostoma trichophyllum</i>																														I	
Diagnostic species of Dicranetalia																															
<i>Orthodicranum montanum</i>				+				+	1	+					3		2			+	+	+	1	+	1	+	2	2	2	III ¹	
<i>Dicranum fuscescens</i>	+							2		2	2	2	+	2	+			2	+	1	3				2	1				II ¹	
<i>Dicranum scoparium</i>	1			2					+		2	1			+	3	1	+	+			+			2	1	+			II ⁺	
<i>Cladonia coniocraea</i>	+										1					+	+	+	1			3		2		2	1			I	
Other species																															
<i>Sanionia uncinata</i>	2	2		r	2			+	2	1	2	1	+			+	2	+	+	+	+	+	2	+	+					III ¹	
<i>Brachythecium reflexum</i>	+										1	+			2		+		2			3	+							II ¹	
<i>Callicladium haldanianum</i>	+	1											+			3														I	
<i>Pohlia nutans</i>																														I	
<i>Brachythecium oedipodium</i>																														I	
<i>Pleurozium schreberi</i>																														I	
<i>Pylaisiella polyantha</i>																														I	
<i>Brachythecium salebrosum</i>																														I	
<i>Cladonia cenotea</i>																														I	
<i>Hypogymnia physodes</i>																														I	

Low constancy species: *Alectoria sarmentosa* (16-+); *Amblystegium serpens* (2-r,3-1); *A. varium* (14-1); *Brachythecium starkei* (1-1); *B. velutinum* (1-+); *Cladonia amaroocraea* (27-+); *C. chlorophaea* (26-+); *C. fimbriata* (18,24-+); *C. parvatica* (26-1); *C. rei* (11,28-+); *C. scabrinscula* (19-+); *Cetraria pinastri* (25-+); *Evernia furfuracea* (16-+); *Herzogella seligeri* (14-1); *Hylacomium splendens* (14-+); *Paraleucobryum longifolium* (12,21-+); *Parmelia sulcata* (16-+); *Plagiomnium cuspidatum* (15-1); *Plagiothecium denticulatum* (11-2); *Ramalina farinacea* (13-+); *Usnea glabrescens* (25-+).

Dicranodontium denudatum. The differential species are *Pohlia nutans*, *Mnium hornum*, *Polytrichum formosum*, *Dicranella heteromalla* (Barkman, 1958; Huebschmann, 1986).

It is a less hygrophytic alliance than the *Blepharostomion*. *Tetraphido-Aulacomnion* unites the associations on decaying wood and on bases of living trees with strongly acid bark, occurring in plains of subatlantic, continental and boreal Europe (Barkman, 1958).

6. Association **Plagiothecio laeti - Pohlietum nutantis** ass. nov. Table 6.

Type-releve - 8.

Diagnostic species: *Pohlia nutans* (dom.), *Plagiothecium laetum*.

The association unites the communities on decaying, strongly destructed wood. The communities have been described in the swamps in northern Bashkiria. These swamps are the result of the antropogenous transformation (drainage) of *Vaccinietea uliginosi* - communities (*Ledo-Pinion*), the rare type of vegetation in the South Urals. *Betula pubescens* usually dominates there and the bryophytic communities grow, mostly, on its rotten wood. The average cover is 90%, average number of species in releve is 6.

The definition of the syntaxonomical position of association is difficult. *Plagiothecio laeti-Pohlietum nutantis* belongs to *Lophocoletalia* because of the high constancy of *Lophocolea heterophylla* and *Plagiothecium laetum*. However, the diagnostic species of both *Blepharostomion* and *Tetraphido-Aulacomnion* are of rare occurrence in this association. *Pohlia nutans* has the higher constancy in communities of *Tetraphido-Aulacomnion*, and we provisionally refer our communities to this alliance, though hepatics are of low occurrence in *Plagiothecio-Pohlietum*.

ORDER DICRANETALIA Barkman 1958

Alliance DICRANO-HYPNION FILIFORMIS Barkman 1958

Diagnostic species: *Orthodicranum montanum*, *Ptilidium pulcherrimum*, *Dicranum scoparium*, *D. fuscescens*, *Cladonia coniocraea*, *Hypnum pallescens*.

The order unites the epiphytic and epilithic acidophytic associations. The communities of *Dicranetalia* differ from the *Lophocoletalia* ones in the occurrence on bark of living trees (Barkman, 1958). The communities of *Dicrano-Hypnion* occur mainly on the bark of conifer trees (*Picea obovata*, *Abies sibirica*, *Larix sibirica*) and also on *Betula pendula* и *B. pubescens*. *Hypnum cupressiforme*, *H. cupressiforme* var. *filiforme* and *Isothecium myosuroides*, being typical for the West-European communities of

Dicranetalia, are absent in Urals. *Hypnum pallescens* has been included as a regional species within the diagnostic combination of *Dicrano-Hypnion*.

7. Association **Ptilidio-Hypnetum pallescentis** (Herzog 1943) Barkman 1958 Table 7.

Diagnostic species: *Ptilidium pulcherrimum*, *Hypnum pallescens*.

The association unites the widespread in the South Urals acidophilous bryophytic communities, occurring on the tree bases and rotten wood. The average cover is 70%, average number of species in releve is 6.

The Urals communities in species composition are similar to the Central-European ones (Barkman, 1958; Huebschmann, 1986; Marstaller, 1986b, 1989). *Ptilidio-Hypnetum pallescentis* presented on *Pinus*, *Abies*, *Picea* and *Betula* in northern mountainous regions of Europe (Barkman, 1958). In Bashkiria these communities are widespread everywhere, especially in relatively dry habitats on *Betula pendula* and rarely on *Abies sibirica*. *Plagiothecium laetum* and *Orthodicranum montanum* have the low constancy and abundance in *Ptilidio-Hypnetum pallescentis*. The similar European association is *Orthodicrano-Hypnetum filiformis* Wisniewski 1930.

The syntaxonomical position of *Ptilidio-Hypnetum pallescentis* is differently treated by geobotanists. Barkman (1958) includes it into *Tetraphido-Aulacomnion*, Huebschmann (1986) - into *Blepharostomion*, Marstaller (1986b) - into *Dicrano-Hypnion filiformis*. We follow the latter conception taking into account the high constancy of *Dicranum* - species and the position of communities on the bark of living trees.

8. Association **Orthodicrano-Plagiothecietum laeti** ass. nov. Table 8.

Type-releve - 18.

Diagnostic species: *Plagiothecium laetum* (dom.), *Orthodicranum montanum* (dom.).

The association unites the bryophytic communities on the base of trunks of *Abies sibirica*, *Larix sibirica* and *Betula pendula*. The communities were recorded in the shady wet mountain forests of the alliances *Vaccinio-Piceion* (*Vaccinio-Piceetalia*) and *Aconito-Piceion* (*Fagetalia*). The average cover is 90%, average number of species in releve is 6.

The similar syntaxa are *Ptilidio-Hypnetum pallescentis* (in the Urals) and European *Orthodicrano-Plagiothecietum latebricolae* Barkman 1958 (Barkman, 1958; Huebschmann, 1986; Doll, Richter, 1993) and *Orthodicrano-Hypnetum filiformis* Wisniewski 1930 (Marstaller, 1986).

Table 8. *Orthodicrano-Plagiothecietum laeti* ass. nov.

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	C
Width of the plot, cm	5	10	10	15	10	10	5	10	5	15	10	5	15	10	15	15	10	5	15	5	10	O
Cover, %	100	80	80	80	100	70	100	100	100	100	100	80	70	100	100	90	90	100	100	100	70	N
Substrate	AS	St	AS	BP	AS	LS	BP	BP	AS	AS	AS	LS	R	BP	BP	AS	AS	BP	AS	BP	BP	S
Number of species in releve	3	8	6	8	5	3	7	5	5	13	6	3	11	6	6	8	7	6	10	10	6	T
Diagnostic species of association																						
<i>Plagiothecium laetum</i>	5	3	2	3	3	4	3	3	3	3	3	3	2	2	2	2	2	2				V ³
<i>Orthodicranum montanum</i>					2	2	2	2	+	1	2	3	+	5	4	3	3	4	3	3	5	V ²
Diagnostic species of Lepidozio-Lophocoletea heterophyllae and Lophocoleta heterophyllae																						
<i>Lophocolea heterophylla</i>	2		+						+	+	2	+					r	+	2	+		III ⁺
<i>Lophocolea minor</i>	+			+					+	+									2			I
<i>Lepidozia reptans</i>													+								r	I
<i>Tetraphis pellucida</i>													3									I
Diagnostic species of Dicranetalia																						
<i>Cladonia coniocraea</i>			2				1	2	2				+		2		2	+		2		II
<i>Dicranum fuscescens</i>	+						2	2						r				2			+	II
<i>Dicranum scoparium</i>				1						2	1					+		+	+	1		II
<i>Ptilidium pulcherrimum</i>				r													r		r		+	II
<i>Hypnum pallescens</i>	+															+	r		+	2		I
Other species																						
<i>Brachythecium reflexum</i>	2		2	3			r		3	+	3		+	1		3	+		+			III ²
<i>Sanionia uncinata</i>		2	3	2						2			r						2	+		II ²
<i>Pohlia nutans</i>					2	+	+			+			1		2							II ⁺
<i>Brachythecium oedipodium</i>	r			1						2				+		2				+		II ⁺
<i>Lophozia longidens</i>			1						+	+			+			+	+				+	II ⁺
<i>Paraleucobryum longifolium</i>															2					1		I
<i>Cladonia cenotea</i>							+		+						+		+					I
<i>Blepharostoma trichophyllum</i>									+				+							+		I
<i>Cladonia rei</i>		+																	+			I

Low constancy species: *Amblystegium varium* (9-+); *Brachythecium velutinum* (19-+); *Callicladium haldanianum* (13,20-r); *Cladonia chlorophaea* (10-+); *C. parasitica* (7-+); *Mnium marginatum* (5-r); *M. stellare* (5-1); *Plagiochila porelloides* (5-+); *Pleurozium schreberi* (2-r); *Radula complanata* (2-+).

The absence of *Plagiotheciella latebricola*, and the high constancy of *Brachythecium reflexum* and the position on the conifer trees differ our association from *Orthodicrano-Plagiotheciellum latebricolae*. The absence of *Hypnum cupressiforme*, *H. cupressiforme* var. *filiforme*, *Plagiothecium denticulatum*, *Lepraria incana*, the higher constancy and abundance of *Plagiothecium laetum* differ *Orthodicrano-Plagiothecietum laeti* from *Orthodicrano-Hypnetum filiformis*.

Alliance SANONIO-PLEUROZION SCHREBERI SOLOMETCH all. nov.

The type-association - *Pleurozio-Ptilietum crista-castrensis* ass. nov. (Table 9).

Diagnostic species: *Pleurozium schreberi*, *Sanionia uncinata*, *Ptilium crista-castrensis*, *Dicranum scoparium*, *Hylacomium splendens*.

The diagnostic composition includes the typical taiga species forming the continuous ground cover in the *Vaccinio-Piceetea* forests. This moss layer is classified as a moss synusia - the part of vascular plants communities (Huebschmann, 1986).

The alliance unites the bryophytic communities on rotten wood occurring in the Urals nemoral spruce

and fir forests (*Fagetalia*). The nemoral species *Aegopodium podagraria*, *Cerastium pauciflorum*, *Myosotis sylvatica*, *Cacalia hastata*, *Aconitum septentrionale* dominate in the ground layer while the mosses are absent there. We consider that in this particular case the groups of boreal mosses on rotten wood are the autonomous bryophytic communities. The alliance has been included into *Dicranetalia* due to the high constancy of *Dicranum scoparium*, the presence of *Ptilidium pulcherrimum*, *Orthodicranum montanum*.

9. Association **Pleurozio-Ptilietum crista-castrensis** Solometch ass. nov. Table 9.

Type-releve - 24.

Diagnostic species of association = diagnostic species of alliance.

The communities were described on rotten logs and stumps of *Picea obovata*, *Abies sibirica* and *Betula pendula* in the forests of association *Cerastio pauciflorae* - *Piceetum obovatae* Solometch et al. 1993 (alliance *Aconito-Piceion* Solometch et al. 1993, order *Fagetalia*). There are three variants within association: 1. var. *Sanionia uncinata* (rel. 1-10);

2. var. *Pleurozium schreberi* (rel. 11-13);

3. var. *Ptilium crista-castrensis* (rel. 14-26).

The cover and the floristical composition de-

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	C
Length of the plot, cm	20	20	20	40	20	20	20	20	20	20	40	40	40	40	40	40	40	40	40	20	40	40	40	20	30	40	O
Width of the plot, cm	20	20	20	20	15	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	30	20	N
Cover, %	100	100	90	100	90	100	100	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	S
Substrate	AS	BP	BP	PO	PO	BP	BP	PO	PO	AS	AS	BP	St	AS	R	PO	AS	PO	PO	BP	AS	AS	PO	AS	St	St	T
Number of species in releve	4	10	9	7	7	5	10	11	6	6	9	9	4	8	9	6	7	5	5	10	7	7	5	10	11	5	
Diagnostic species of association																											
<i>Sanionia uncinata</i>	5	4	3	5	3	3	4	4	4	3	+	+	r	+	1	2	+	+	3	1	+	+	+	+	r	+	V ¹
<i>Pleurozium schreberi</i>	+	+	+	+	+	+	r	+	+	2	5	4	3	2	2	1	1	1	1	+	+	+	+	+	1	+	V ¹
<i>Ptilium crista-castrensis</i>	+	+	+	+	1			+	1	+	1	+	2	2	3	2	4	4	4	4	5	5	4	4	2	2	V ⁴
<i>Dicranum scoparium</i>	1		1		r	1	+	r	+	+	+	+	+	+	+	1	+	+	1	+	+	r	+	+	+	3	V ⁺
<i>Hylocomium splendens</i>	1	+	+	+	+	+					+	+	+	+	+	+	+	+	1	+	1	2	+		+		III ⁺
Diagnostic species of Lophocolealia heterophyllae																											
<i>Lophocolea minor</i>		r		r		2	r						+							+				r			II ⁺
<i>Tetraphis pellucida</i>																								r			I
<i>Lepidozia reptans</i>																			+								I
Diagnostic species of Dicranetalia																											
<i>Ptilidium pulcherrimum</i>						+		r							r					r				r			I
<i>Orthodicranum montanum</i>							+		2			x															I
Other species																											
<i>Oxalis acetosella</i>	+	r	+							+	+	1			r		2	1		r		1			2		III ¹
<i>Brachythecium reflexum</i>	1	2		r			1	r				+					+			r			+	+	r		III ⁺
<i>Cladonia coniocraea</i>					+		+	r	1						r	r		+	+					r			II ⁺
<i>Rhytidadelphus triquetrus</i>								r			r				r							+	+	+	2		II ⁺
<i>Betula pubescens</i>		r					r								r									+			I ⁺
<i>Brachythecium salebrosum</i>				+			r								r										+		I ⁺
<i>Plagiomnium cuspidatum</i>			+							+															1		I ¹
<i>Plagiothecium denticulatum</i>							+																				I
<i>Hypogymnia physodes</i>																											I
<i>Lophozia cf. ventricosa</i>						2		r							r				+								I

Low constancy species: *Atragea sibirica* (25-r); *Brachythecium oedipodium* (4-+); *B. rutabulum* (2-+); *Chiloscyphus pallescens* (5-+); *Circaea alpina* (11-r); *Dicranum polysetum* (14-+); *Goodiera repens* (11-+); *Linnaea borealis* (13-+); *Milium effusum* (12-r); *Parmelia sulcata* (2-r); *Picea abies* (18-r); *Stellaria nemorum*

Table 9. *Pleurozio-Ptilietum crista-castrensis* ass. nov.

Table 10. Syntaxa of classes HYPNETEA CUPRESSIFORMIS and LEPIDOZIO-LOPHOCOLETEA HETEROPHYLLAE

	1	2	3	4	5	6	7	8	9
Number of syntaxa	18	14	18	20	13	40	21	22	26
Number of releves in syntaxa	90	84	95	90	98	90	90	88	90
Mean cover, %	21	24	11	25	28	35	27	32	34
Total number of species	3	6	3	4	6	6	6	6	7
Mean number of species in releve	Diagnostic species of associations								
<i>Leskea polycarpa</i>	V ³	IV ²		II ⁺					
<i>Amblystegium serpens</i>	II ¹	V ³			I	I		I	
<i>Brachythecium salebrosum</i>	I	IV ¹		I	I	I		I	I
<i>Leskeella nervosa</i>	I		V ⁴	II ²					
<i>Leucodon sciuroides</i>			III ²	I					
<i>Orthotrichum speciosum</i>	I		I	III ¹					
<i>Brachythecium reflexum</i>			I	I	V ³	II ¹	III ²	I	III ⁺
<i>Hypnum pallens</i>	I	I	I	II ⁺	II ⁺	V ³	I		
<i>Ptilidium pulcherrimum</i>				I	I	IV ²	II ¹		
<i>Orthodicranum montanum</i>		I		I	I	III ¹	V ²	I	I
<i>Plagiothecium laetum</i>		I			II ¹	II ¹	V ³	IV ²	
<i>Pohlia nutans</i>		I			II ⁺	I	II ⁺	V ³	
<i>Polytrichum juniperinum</i>								III ²	
<i>Sanionia uncinata</i>		II ⁺		I	IV ¹	III ¹	II ²	I	V ¹
<i>Pleurozium schreberi</i>		I			I	I	I	I	V ¹
<i>Ptilium crista-castrensis</i>					I	I			V ⁴
<i>Dicranum scoparium</i>					II ¹	II ⁺	II ⁺	I	V ⁺
<i>Hylacomium splendens</i>						I			III ⁺
Diagnostic species Hypnetea cupressiformis and Leucodontetalia									
<i>Pylaisiella polyantha</i>	V ²	III ⁺	IV ²	V ⁴		I			
<i>Platygyrium repens</i>	I	I		I		I			
<i>Orthotrichum affine</i>			I	I					
<i>Orthotrichum obtusifolium</i>	I	I	I	I					
<i>Radula complanata</i>	I	I	I			I	I		
<i>Orthotrichum fastigiatum</i>			II ¹	I					
Diagnostic species of Lepidozio-Lophocoletea heterophyllae and Lophocoletea heterophyllae									
<i>Lophocolea heterophylla</i>		I		I	III ⁺	III ⁺	III ⁺	IV ⁺	
<i>Lophocolea minor</i>					I	I	I		II ⁺
<i>Cladonia coniocraea</i>				I	II ⁺	I ¹	II ²	I	II ⁺
<i>Dicranum fuscescens</i>					II ⁺	II ¹	II ¹	I	
<i>Plagiothecium denticulatum</i>		I			II ¹	I		I	I
<i>Lophozia longidens</i>					I	I	II ⁺		
<i>Blepharostoma trichophyllum</i>					I	I	I		
<i>Orthodicranum flagellare</i>					I	I	I	I	I
<i>Lepidozia reptans</i>					I				I
<i>Tetraphis pellucida</i>							I	I	I
<i>Paraleucobryum longifolium</i>					I	I	I		
Other species:									
<i>Callicladium haldanianum</i>	I			II ⁺	I	I ²	I	I	
<i>Plagiommium cuspidatum</i>	I	II ⁺		I	I		I	I	I
<i>Amblystegium varium</i>				I	I	I	I	I	I
<i>Brachythecium starkei</i>		I			I	I		I	I
<i>Ceratodon purpureus</i>	I	III ⁺		I				I	
<i>Bryum aggr. caespiticeum</i>		II ¹							
<i>Brachythecium oedipodium</i>		I			II ⁺	I	II ¹	I	I
<i>Cladonia cenotea</i>					I	I	I	I	
<i>Cladonia fimbriata</i>				I	I	I	I	I	
<i>Cladonia rei</i>					I	I	I	I	
<i>Campylidium sommerfeltii</i>		I						I	
<i>Brachythecium velutinum</i>		I				I	I	I	I
<i>Hypogymnia physodes</i>			I	I					I
<i>Parmelia sulcata</i>				I		I			
<i>Cladonia chlorophaea</i>						I	I	I	
<i>Cladonia parasitica</i>						I	I	I	
<i>Rhytidiadelphus triquetrus</i>									II ⁺
<i>Herzogiella seligeri</i>						I		I	

Low constancy species: *Abietinella abietina* (6-I); *Alectoria sarmentosa* (8-I); *Amblystegium juratzkanum* (1-I); *Anomodon attenuatus* (3-I); *A. viticulosus* (1-I); *Atragene sibirica* (11-I); *Aulacomnium palustre* (8-I, 9-I); *Brachythecium milecanum* (8-II¹); *Bryum capillare* (3-I); *Cetraria pinastri* (8-I); *Chiloscyphus pallescens* (11-I); *Circaea alpina* (11-I); *Cladonia amaurocraea* (8-I); *C. bacillaris* (8-I); *C. grei* (7-I); *C. macilenta* (10-I); *C. scabrinscula* (8-I); *Climacium dendroides* (8-I); *Dicranum polysetum* (6-I, 8-I); *Eurhynchium hians* (3-I); *Evernia furfuracea* (8-I); *Frullania bolanderi* (1-I); *Goodyera repens* (11-I); *Hypnum lindbergii* (3-I); *Hypogymnia bitteriana* (7-I); *Leptobryum pyriforme* (10-I); *Leptodictyum humile* (1-I); *Linnaea borealis* (11-I); *Lophozia cf. ventricosa* (9-I); *Milium effusum* (11-I); *Mnium marginatum* (9-I); *M. stellare* (2-I, 7-I); *Neckera pennata* (3-I); *Oxalis acetosella* (11-I); *Parmelia sulcata* (11-I); *Physcia orbicularis* (7-I); *Physconia tenella* (6-I); *P. detera* (3-I, 4-I); *P. grisea* (3-I); *Plagioclila porelloides* (6-I, 7-I); *Plagiomnium ellipticum* (10-I); *Picea abies* (11-I); *Polytrichum longisetum* (10-I); *Pseudobryum cinchidoides* (8-I); *Pseudoskeella catenulata* (1-I); *Ramalina farinacea* (8-I); *Rhizomnium punctatum* (8-I); *Rhodobryum roseum* (7-I); *Stellaria nemorum* (11-I); *Tetraplodon angustatus* (11-I); *Trientalis europaea* (11-I); *Usnea glabrescens* (8-I); *Xanthoria candelaria* (5-I); *Zygodon viridissimus* (6-I).

pend on the degree of wood destruction. *Sanionia uncinata* is the pioneer of a settlement, then *Pleurozium schreberi*, *Hylocomium splendens*, *Ptilium crista-castrensis*, *Dicranum scoparium* appear. We often found the communities of *Sanionia uncinata*-variant near the top of fallen trunks. Near the base of same trunks the moss mat composed mostly by *Pleurozium schreberi* and *Ptilium crista-castrensis*.

CONCLUSION

The syntaxonomical systems developed for European countries (Barkman, 1958; Huebschmann, 1986; Marstaller, 1985, 1986a,b) have been used for classification of Urals epiphytic bryophytic vegetation. The European system of high syntaxa is found acceptable and reflects well the main floristical alteration of Bashkirian bryophytic vegetation of the habitat discussed. The present system of bryophytic vegetation contains 2 classes, 3 orders and 5 alliances the same as in Europe and 1 newly described alliance. The Urals communities have the poorer presence of diagnostic composition of the high syntaxa. The association *Plagiothecio - Pohlietum nutantis* and *Brachythecietum reflexi* have the intermediate place between European alliances. Among 9 accepted associations 6 are described as new. Perhaps the great amount of new associations is explained by the absence of many widespread European species.

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LOCALIZATION OF RELEVES.

The relevés of the tables 1-8 have been carried out by E. Baisheva, of the table 9 - by E. Ignatova and A. Solometch.

Table 1: 1 - 18.VII.92. Kyga Distr., Ai River, 15 km SW from Mezjevoi, 55 11'N, 58 51'E; 2,10,11,12,13,16 - 16.VII.92. Kaltasy Distr., Manjak, right bank of Bystryi Tanyp River, 55 43'N, 54 33'E; 6,7 - 11.VII.92. Janaul Distr., 2 km S from Kaimasha, 56 10'N, 54 57'E; 8,9 - 20.VIII.92. Meleuz Distr., Nugush Water-Reservoir, 53 5'N, 56 27'E; 14,17,18 - 2.VII.92. Kushnarenkovo Distr., left bank of Tchernasan River, 55 9'N, 55 15'E.

Table 2: 1,2,3,4,6,11,12 - 16.VII.92. Kaltasy Distr., Manjak, right bank of Bystryi Tanyp River, 55 43'N, 54 33'E; 5 - 2.VII.92. Kushnarenkovo Distr., left bank of Tchernasan River, 55 9'N, 55 15'E; 8,10 - 4.VII.92. Krasnokamsk Distr., Tcherlak Bog; 9 - 21.VIII.92. Meleuz Distr., Nugusch, 53 2'N, 56 28'E; 13 - 22.VII.92. Salavat Distr., 3 km from the Alekseevka downstream along Ai River, 55 14'N, 58 32'E; 14 - 27.VII.92. Salavat Distr., left bank of Ai River, 8 km N from Lagerevo, 55 18'N, 58 28'E.

Table 3: 1-16 - 21.VIII.92. Meleuz Distr., Nugusch, 53 2'N, 56 28'E; 11,17,18 - 25.VIII.92. Meleuz Distr., 10 km SE from Nugusch, 52 58'N, 56 35'E;

Table 4: 1,5,8,13,15 - 25.VIII.92. Meleuz Distr., 10 km SE from Nugusch, 52 58'N, 56 35'E; 2 - 16.VII.92. Kaltasy Distr., Manjak, right bank of Bystryi Tanyp River, 55 43'N, 54 33'E; 3,4,6,18 - 19.VII.92. Salavat Distr., 3 km from Alekseevka down-stream along Ai River, 55 14'N, 58 32'E; 7 - 3.VII.92. Dyurtyuli Distr., flood plain of Bystryi Tanyp River, 55 43'N, 54 39'E; 9,10,14,19 - 18.VII.92. Kyga Distr., Ai River, 15 km SW from Mezjevoi, 55 11'N, 58 51'E; 11,12 - 24.VIII.92. Meleuz Distr., Nugusch, 53 2'N, 56 28'E; 16 - 6.IX.92. Belorezk Distr., Shushpa-1, 54 3'N, 58 30'E; 17 - 27.VII.92. Salavat Distr., Lagerevskoe Bog, 55 15'N, 58 27'E; 20 - 7.IX.92. Belorezk Distr., flood plain of Belaja River, 54 5'N, 58 32'E;

Table 5: 1,12 - 9.IX.92. Belorezk Distr., Avaljak Mt. Range, 54 30'N, 58 57'E; 2 - 10.IX.92. Belorezk Distr., Iremel Peak, 54 32'N, 58 56'E; 3-7,9 - 14.IX.92. Belorezk Distr., at the foot of hill Elongas, 54 7'N, 58 28'E; 8 - 6.IX.92. Belorezk Distr., Shushpa-1, 54 3'N, 58 30'E; 10,11 - 23.VIII.92. Meleuz Distr., Nugusch, 53 2'N, 56 28'E; 13 - 7.IX.92. Belorezk Distr., flood plain of Belaja River, 54 5'N, 58 32'E;

Table 6: 1-4,7,8,10,11 - 8.VII.92. Krasnokamsk Distr., 5 km E from Novo-Janzigitovo, 55 50'N, 54 12'E; 5,6,12-19,22 - 27.VII.92. Salavat Distr., Lagerevskoe Bog, 55 15'N, 58 27'E; 20,21 - 14.IX.92. Belorezk Distr., at the foot of hill Elongas, 54 7'N, 58 28'E.

Table 7: 1,4,14,15,17,20,21,25 - 6.IX.92. Belorezk Distr., Shushpa-1, 54 3'N, 58 30'E; 2 - 22.VII.92. Salavat Distr., left bank of Ai River, 2 km N from Lakly, 55 12'N, 58 35'E; 3 - 21.VIII.92. Meleuz Distr., Nugusch, 53 2'N, 56 28'E; 5,6,7,9 - 27.VII.92. Salavat Distr., Lagerevskoe Bog, 55 15'N, 58 27'E; 11,19,22,23 - 14.IX.92. Belorezk Distr., at the foot of hill Elongas, 54 7'N, 58 28'E; 8,26 - 13.IX.92. Belorezk Distr., upper course of Tirlja River, 54 14'N, 58 30'E; 10,24,28 - 12.IX.92. Belorezk Distr., Meselja River, 54 19'N, 58 42'E; 12,18 - 9.IX.92. Belorezk Distr., at the foot of hill Avaljak, 2 km W from Karakuzhino, 54 26'N, 58 48'E; 13 - 19.VII.92. Salavat Distr., 3 km from Alekseevka downstream along Ai River, 16,27 - 7.IX.92. Belorezk Distr., flood plain of Belaja River, 54 5'N, 58 32'E.

Table 8: 1,3,6-9,12,15 - 9.IX.92. Belorezk Distr., Avaljak Mountain Range, 54 30'N, 58 57'E; 2,4,10,11,13,16,17 - 14.IX.92. Belorezk Distr., at the foot of hill Elongas, 54 7'N, 58 28'E; 5,21 - 13.IX.92. Belorezk Distr., upper course of Tirlja River, 54 14'N, 58 30'E; 14,18,20 - 9.IX.92. Belorezk Distr., at the foot of hill Avaljak, 2 km W from Karakuzhino, 54 26'N, 58 48'E; 19 - 12.IX.92. Belorezk Distr., Meselja River, 54 19'N, 58 42'E.

Table 9: All relevés have been carried out in Belorezk Distr., on Iremel Peak at 800-1000 m alt., 54 32'N, 58 56'E.

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