

BRYOPHYTE VEGETATION OF BASHKIRIA (SOUTH URALS). II.
EPIPHYTIC AND EPIXYLIC COMMUNITIES OF NORTH-EASTERN BASHKIRIA
РАСТИТЕЛЬНОСТЬ МОХООБРАЗНЫХ БАШКИРИИ, ЮЖНЫЙ УРАЛ.
II. ЭПИФИТНЫЕ И ЭПИКСИЛЬНЫЕ СООБЩЕСТВА СЕВЕРО-ВОСТОЧНОЙ
БАШКИРИИ

ELVIRA Z. VAISHEVA¹
ЭЛЬВИРА З. БАИШЕВА¹

Abstract

The bryophytic communities of North-Eastern Bashkiria were studied. The paper presents 5 syntaxa, including two new associations for Bashkiria: *Platygyrietum repentis* Le Blanc 1963 and *Orthotrichetosum speciosi* (Jaggi 1934) Barkman 1958. Three subassociations are described as new. The diagnostic species of high syntaxa often have been used for the establishment of the Urals associations, since the floristic composition of epiphytic and epixylic communities in Bashkiria are rather poor in number of species.

Резюме

Были изучены сообщества мохообразных северо-восточной части Башкирии. Представлена характеристика 5 синтаксонов, в том числе две новые для Башкирии ассоциации *Platygyrietum repentis* Le Blanc 1963 и *Orthotrichetosum speciosi* (Jaggi 1934) Barkman 1958. Впервые описаны также 3 субассоциации. Для выделения многих ассоциаций использованы диагностические виды высших единиц, что связано с общей обедненностью бриофлоры Башкирии.

INTRODUCTION

The present paper continues the series on bryophyte vegetation of Bashkiria, with the use of Braun-Blanquet approach to classification of associations. In the previous paper (Baisheva & al., 1994) epiphytic and epixylic communities were described basing mostly on relevés from flood plains and mountain slopes. However further studies in forests of interfluvial plains and valleys of small rivers in north-eastern Bashkiria need this addition. Two more associations previously described from Western Europe are recognized now in Bashkiria, and three new subassociations are segregated from the previously described syntaxa.

The studied area belongs to the forest and forest-steppe zones of north-eastern part of Bashkiria (Salavat, Kyga, Duvan, Mishkin, Mechetlin, Karaidel Districts), the region with the predominance of agricultural lands. The natural broad-leaved and mixed forests dominated by *Tilia cordata*, *Quercus robur*, *Pinus sylvestris*, *Abies sibirica* remain only fragmen-

tary and alternate with secondary *Populus tremula* and *Populus tremula*+*Betula pendula* forests. The mean annual precipitation is 400-600 mm. The mean annual temperature ranges between 0,8-1,4° C. The frostless period ranges from 60 to 120 days (Kadilnikov & al., 1964). The elevations are 450-500 m.

METHODS

About 100 geobotanical relevés were carried out in 1993. The most typical, often repeated sites of the bryophytic cover on the tree trunks and decaying wood were selected. The particular attention was given to ecological homogeneity of the sample plots (moisture, illumination, exposition). The area of sample plots ranges from 1 to 4 sq. dm. The abundance of species was evaluated according to the Braun-Blanquet abundance scale. The nomenclature of mosses is after Ignatov & Afonina (1992), of hepatics – Konstantinova et al. (1992), lichens – Abramov (1971-1978), vascular plants – Czerepanov (1981). The names of syntaxa follow the Code of Phytosociological Nomencla-

¹ – Institute of Biology, Oktyabr'ya str., 69, Ufa, Bashkortostan 450054 Russia – Россия 450054 Башкортостан, Уфа, просп. Октября, 69, Институт Биологии.

ture (Barkman et al., 1986). The abbreviations of substrata used in the tables are as follow: TC – *Tilia cordata*; QR – *Quercus robur*; BP – *Betula pendula*; PT – *Populus tremula*; PN – *Populus nigra*; AI – *Alnus incana*; AG – *Alnus glutinosa*; AP – *Acer platanoides*; SC – *Salix caprea*, SA – *Sorbus aucuparia*, PS – *Pinus sylvestris*, R – rotten wood; the numbers of nomenclatural type-releves are marked with “!”.

THE LIST OF SYNTAXA

(in boldface are syntaxa, not mentioned for Bashkiria previously; for the description of the other syntaxa in Bashkiria see Baisheva & al., 1994).

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*** Baisheva & al. 1994

subass. ***plagiomnietosum cuspidati*** subass. nov.

All. *Tortulion laevipilae* Ochsner 1928

3. Ass. ***Orthotrichetosum speciosi*** (Jaggi 1934) Barkman 1958

subass. ***orthotrichetosum obtusifolii*** subass. nov.

4. Ass. *Pylaisielloleto polyanthae-Leskeelletum nervosae* Baisheva & al. 1994

5. Ass. *Pylaisietum polyanthae* Gams 1927

Cl. **LEPIDOZIO-LOPHOCOLETEA HETEROPHYLLAE** v. Huebschmann 1976

Ord. **LOPHOCOLETALIA HETEROPHYLLAE** Barkman 1958

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

6. Ass. ***Brachythecietum reflexi*** Baisheva & al. 1994

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

7. ***Tetraphis pellucida*** – community

8. Ass. ***Plagiothecio laeti-Pohlietum nutantis*** Baisheva & al., 1994

Ord. **DICRANETALIA** Barkman 1958

All. *Dicrano-Hypnion filiformis* Barkman 1958

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

subass. ***callicladietosum haldanani*** subass. nov.

10. Ass. ***Platygyrietum repentis*** Le Blanc 1963

11. Ass. ***Orthodicrano-Plagiothecietum laeti*** Baisheva & al., 1994

All. *Sanionio-Pleurozium schreberii* Solometch in

Baisheva & al., 1994

12. Ass. ***Pleurozio-Ptilietum crista-castrensis*** Solometch in Baisheva & al., 1994

DESCRIPTION OF SYNTAXA

Class **HYPNETEA CUPRESSIFORMIS** Jezek et Vondracek 1962

Order **LEUCODONTETALIA** v. Huebschmann 1952

Alliance **LESKEION POLYCARPAE** Barkman 1958

Association ***Brachythecio salebrosi-Amblystegietum serpentis*** Baisheva et al. 1994

subass. ***plagiomnietosum cuspidati*** subass. nov. Table 1

Type-releve – 6.

Diagnostic species: *Brachythecium salebrosum*, *Amblystegium serpens*, *Plagiomnium cuspidatum*.

The subassociation unites sciophytic and mesophytic communities on rotten wood, often with soil. Such substratum is rich in mineral substances. The releves have been made in broad-leaved forests (*Aconito-Tilion*) and in the flood plain forests (*Alno-Padion*, *Salicion albae*).

The high constancy of *Plagiomnium cuspidatum*, of diagnostic species of *Lepidozio-Lophocoletea heterophyllae* (*Lophocolea heterophylla*, *L. minor*, *Plagiothecium denticulatum*) and the lower presence of epiphytic species differ these communities from *Brachythecio salebrosi-Amblystegietum serpentis* (Baisheva et al., 1994) and allow to segregate the new subassociation *plagiomnietosum cuspidati*. Probably, *plagiomnietosum cuspidati* is developing from communities of subass. *typica* on the next stage of wood destruction. The mean average cover is 96%, average number of species in releve is 7.

The association *Mnietosum cuspidati* Feldy 1941 (*Anomodontion*) described on the bases of leaved trees in plane forests of Western Europe (Huebschmann, 1986) and var. *Mnium cuspidatum* of association *Brachythecio-Hypnetum cupressiforme* Norr 1969 are the similar syntaxa (Marstaller, 1987). The Urals communities differ from the former, ass. *Mnietosum cuspidati*, in (1) the absence of diagnostic species of *Anomodontion*; (2) the presence of diagnostic species of *Lepidozio-Lophocoletea Brachythecietalia* (*Brachythecium salebrosum*, *B. reflexum*, *Amblystegium serpens*); (3) the occurrence on rotten wood. From the latter, ass. *Brachythecio-Hypnetum cupressiforme*, Ural

Table 1. *Brachythecium salebrosi* – *Amblystegium serpentis* Baisheva et al. 1994 subass. *plagiomnietosum cuspidatae* subass. nov.

Number of releve	1	2	3	4	5	6!	7	8	9	10	11	12	13	14	15	C
Length of the plot, cm	10	15	15	15	15	15	15	15	10	15	15	15	15	10	10	O
Width of the plot, cm	10	15	10	15	15	15	15	15	10	15	15	15	15	10	10	N
Cover, %	100	100	70	80	100	100	100	100	100	100	100	100	100	100	100	S
Substratum	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	T
Number of species in releve	8	15	5	4	10	8	7	4	5	11	6	10	4	6	4	
Diagnostic species of association and subassociation																
<i>Brachythecium salebrosum</i>	2	2	+	2	3	3	2	2	1	1	3	2		1		V
<i>Amblystegium serpens</i>	3	+	4	3	1	1	3	4	4	3	2	1	3	+	2	V
<i>Plagiomnium cuspidatum</i>	1	3	1	2	3	3	1	1	2	2	3	3	3	4	3	V
Diagnostic species of Lepidozio-Lophocoletea heterophyllae																
<i>Lophocolea heterophylla</i>		1			1		+			1		1				II
<i>Lophocolea minor</i>	r	1			1					+						II
<i>Plagiothecium denticulatum</i>	3	+								2		+			+	II
Diagnostic species of Brachythecietalia rutabulo-salebrosi																
<i>Brachythecium reflexum</i>	1	3					2	1	2	1	2	1			3	IV
<i>Campylium hispidulum</i> s. l.			+							1		2				II
Other species:																
<i>Hypnum pallescens</i>		+			+	1	2				1				2	III
<i>Sanionia uncinata</i>	+					+				+	1	2		+		III
<i>Callicladium haldanianum</i>		+			1		1			1		+				II
<i>Ceratodon purpureus</i>						+	r									I
<i>Leskeella nervosa</i>				r					r				1			I
<i>Pohlia nutans</i>	r				2					+						I

Low constancy species: *Amblystegium varium* (13-2); *Brachythecium albicans* (6-r); *B. rutabulum* (2-1); *B. oedipodium* (14-2); *B. velutinum* (2-+); *B. starkei* (5-+); *Climacium dendroides* (1-+); *Eurhynchium hians* (2-+); *Leptodictyum riparium* (3-1); *Leskea polycarpa* (6-1); *Orthodicranum montanum* (2,12-+); *Pleurozium schreberi* (2-+).

communities differ in (1) the presence of *Hypnum pallescens*, *Campylium hispidulum*, *Callicladium haldanianum*, *Sanionia uncinata*, *Brachythecium reflexum* and (2) the lower constancy of *Brachythecium rutabulum* and *B. velutinum*.

Alliance TORTULION LAEVIPILOE Ochsner 1928

Association **Orthotrichetum speciosi** (Jag-gli 1934) Barkman 1958

subass. *orthotrichetosum obtusifolii* subass. nov.

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

Type-releve – 11

The communities have been described in the flood plain forests of *Alno-Padion* and in the *Populus tremula*, *Populus tremula*+*Betula pendula* forests, which replace the natural broad-leaved and mixed forests of *Aconito-Tilion*, *Aconito-Piceon*, *Trollio-Pinion* in Southern Urals (Solometch et al., 1989, 1993; Fedorov, 1991). The communities have been mainly found on *Populus tremula*, rarely also on another leaved trees and on destructed bark. They occur mainly on the N and NE sides of the trunks, often in rain-tracks. The bryophytes of the association usually form the facies of 15-20 cm wide reaching up to 2 m and more above the ground. The mean

average cover is 85%, average number of species in releve is 4.

The basiphilous epiphytic species *Orthotrichum obtusifolium*, *O. speciosum*, *Leskea polycarpa* and *Pylaisiella polyantha*, a diagnostic species of *Hypnetea cupressiforme*, take the important place in the floristical composition of these communities. There are two variants within subassociation: var. *typica* (rel. 1-7) and var. *Leskea polycarpa* (rel. 8-24), the latter found in flood plain forests. The Urals communities differ from those described from Western Europe (Barkman, 1958; Huebschmann, 1986) in the high constancy of *Orthotrichum obtusifolium*, *Leskea polycarpa*, *Hypogymnia physodes*, the absence of *Hypnum cupressiforme*, *Bryum flaccidum*, *Orthotrichum affine*, *O. pumilum* and the poorer floristical composition (the mean number of species is 4). *Orthotrichetosum obtusifolii* differs from Urals communities of *Tortulion* (Baisheva et al., 1994) in the dominance of *Orthotrichum obtusifolium*, the position usually on *Populus tremula* trunks and the poor floristical composition.

Class LEPIDOZIO-LOPHOCOLETEA

Table 2. *Orthotrichetosum speciosi* (Jaggi 1934) Barkman 1958 subass. *orthotrichetosum obtusifolii* subass. 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	23	24	C		
Length of the plot, cm	15	15	10	15	10	10	15	15	10	10	10	10	15	10	10	10	15	15	10	15	15	15	10	15	O		
Width of the plot, cm	15	15	10	15	10	10	15	15	10	10	10	10	15	10	10	10	15	10	10	15	15	15	10	15	N		
Cover, %	100	90	70	70	70	100	60	90	100	100	90	80	60	100	100	70	80	80	80	100	90	80	90	90	S		
Height above the ground, cm	40	130	60	150	60	160	-	100	150	150	170	110	40	70	120	50	-	40	30	70	-	20	50	120	T		
Substratum	PT	BP	PT	TC	PT	SC	BP	SC	PT	PT	PT	PT	AI	R	R	PN	R	SA	PN	PN	SC	PT	SC	PT			
Number of species in releve	2	2	2	3	4	4	5	3	4	5	4	4	6	4	7	5	4	5	5	5	5	4	3	5			
Exposition	E	NE	-	-	E	E	SE	E	NE	-	NE	NE	W	-	-	N	-	NE	N	N	E	N	E	NW			
Diagnostic species of association, subassociation and variant																											
<i>Orthotrichum speciosum</i>					r	2	+	1	1	2	2	2	2	2	2		r	1	r	+	+	1		2	IV		
<i>Orthotrichum obtusifolium</i>	1	2	4	3	3	3	+	2	4	2	2	4	1	4	2	3	2	3	3	2	2	2	2	2	V		
<i>Leskea polycarpa</i>									+	+	+	1	1	1	2	2	2	3	3	3	3	3	4	4	IV		
Diagnostic species of Hypnetea cupressiformis and Leucodontetalia																											
<i>Pylaisiella polyantha</i>	5	4	+	2	3	2	2	3	2	4	4	2	2	2	3	3	4	2	2	3	3	3	2	2	V		
<i>Orthotrichum fastigiatum</i>					2																				I		
<i>Platygyrium repens</i>													+		+										I		
Other species:																											
<i>Hypogymnia physodes</i>					2	3									+			+	2					+	II		
<i>Brachythecium salebrosum</i>				1										2											I		

Low constancy species: *Amblystegium serpens* (4+); *Brachythecium velutinum* (18-1); *Frullania bolanderi* (7+); *Leskeella nervosa* (13-1); *Heterocladium dimorphum* (16+); *Myrinia pulvinata* (21+); *Plagiomnium cuspidatum* (10-2); *Sanionia uncinata* (15+).

Table 3. *Tetraphis pellucida* – community.

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	C		
Length of the plot, cm	15	15	15	15	15	15	15	15	10	15	15	15	20	10	O		
Width of the plot, cm	15	15	15	15	15	15	15	15	10	10	15	15	10	10	N		
Cover, %	100	100	80	100	100	90	100	100	90	100	100	80	90	70	S		
Substratum	R	R	R	R	R	R	R	R	R	R	R	R	R	R	T		
Number of species in releve	10	6	9	10	9	5	5	8	7	7	7	7	3	11			
<i>Tetraphis pellucida</i>			4	5	3	5	4	3	4	4	4	+	2	1	4	2	V
Diagnostic species of Lepidozio-Lophocoletea heterophyllae and Lophocoletalia																	
<i>Plagiothecium laetum</i>				2	2	2	3	3	2		2	2	+		1	IV	
<i>Lophocolea minor</i>				+	+		+						3			III	
<i>Cephalozia lunulifolia</i>		r	2	+	+					1		+	+			III	
<i>Plagiothecium denticulatum</i>	1	1					+			+	1					II	
<i>Lophocolea heterophylla</i>	+		+	+											+	II	
<i>Blepharostoma trichophyllum</i>					r						3				+	II	
<i>Lepidozia reptans</i>												2			+	I	
Diagnostic species of Dicranetalia																	
<i>Orthodicranum montanum</i>		2	2	3	+	+		+							+	III	
<i>Dicranum scoparium</i>					+			+	+				+			II	
Other species:																	
<i>Callicladium haldanianum</i>		+	1	1	+	1	+		+	2					+	IV	
<i>Pohlia nutans</i>					+	+	+		+	+	2	3	3	+	+	III	
<i>Cladonia sp.</i>						2					3	2		1	+	II	
<i>Plagiomnium cuspidatum</i>		r								2						I	
<i>Brachythecium starkei</i>									1	1						I	
<i>Dicranum bonjeani</i>				+					1							I	
<i>Hypnum pallescens</i>		r			r	r										II	

Low constancy species: *Amblystegium serpens* (1+); *Brachythecium oedipodium* (2+); *B. salebrosum* (1-2); *B. reflexum* (14+); *B. velutinum* (12+); *Campylium hispidulum* (1+); *Cephaloziella rubella* (10+); *Platygyrium repens* (8-1); *Pleurozium schreberi* (3-1); *Sanionia uncinata* (14-r); *Sphagnum capillifolium* (11-2).

HETEROPHYLLAE Huebschmann 1976

Order LOPHOCOLETALIA HETEROPHYLLAE Barkman 1958

Alliance TETRAPHIDO-AULACOMNION ANDROG-

YNAE (Krusenstjerna 1945) Barkman 1958

Tetraphis pellucida – community Table 3

Diagnostic species: *Tetraphis pellucida*.

The mesophytic and acidophytic communities on decaying, fully destructed wood have been found in

coniferous and mixed forests and in the swamps. The mean average cover is 93%, average number of species in releve is 7.

The floristical composition of communities is characterized by the predominance of *Tetraphis pellucida*, and the high constancy of diagnostic species of *Lepidozio-Lophocoletea heterophyllae* (*Plagiothecium laetum*, *P. denticulatum*, *Lophocolea minor*, *Cephalozia lunulifolia*). However, the diagnostic species of both alliances, *Blepharostomion* and *Tetraphido-Aulacomnion*, are of rare occurrence in these communities. The association *Lepidozio-Tetraphidetum pellucidae* (Barkman 1958) Maurer 1961 is the similar European syntaxon (Huebschmann, 1986); Bashkirian communities differ from it in (1) the absence of *Dicranodontium denudatum*, *Calypogeia neesiana*, *Plagiothecium curvifolium*, *Hypnum cupressiforme*; (2) the lower presence of *Lepidozia reptans*; (3) the higher constancy of *Callicladium haldanianum*, *Lophocolea minor*, *Cephalozia lunulifolia*. The *Tetraphis pellucida* – community is classified here within *Tetraphido-Aulacomnion* because *Tetraphis pellucida* is the diagnostic species of this alliance. Probably, the syntaxonomic position of this community should be reconsidered.

Alliance DICRANO-HYPNION FILIFORMIS Barkman 1958

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

subass. *callicladietosum haldaniani* subass. nov. Table 4

Type releve – 7.

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

The communities have been found on *Betula pendula*, *Quercus robur*, *Tilia cordata*, *Alnus glutinosa*, often on the destructed bark. The majority of releves have been made on the tree bases, but in the moist and shady habitats it reaches the height of 70-130 cm above the ground. The mean average cover is 98%, average number of species in releve is 7.

The diagnostic species of *Dicranetalia* (*Orthodicranum montanum*, *Ptilidium pulcherrimum*, *Hypnum pallescens*) and *Brachythecietalia rutabulo-salebrosi* Marstaller 1987 (*Brachythecium reflexum*, *Sanionia uncinata*, *Brachythecium salebrosum*) take the important place in the floristical composition of communities. Subass. *callicladietosum haldaniani* is

more mesophytic and differs from the Urals typical communities of *Ptilidio-Hypnetum* (Baisheva et al., 1994) in predominance of *Callicladium haldanianum*.

Association **Platygyrietum repentis** Le Blanc 1963 Table 5

Diagnostic species: *Platygyrium repens*.

The association unites the communities with the predominance of *Platygyrium repens* growing in shady wet forests (*Aconito-Piceion*, *Aconito-Tilion*). The releves have been made on the bark of *Tilia cordata*, *Quercus robur*, on fallen trunks and on the roots of *Pinus sylvestris*. The mean average cover is 100%, average number of species in releve is 7.

The characteristics of these association include the high constancy of *Pylaisiella polyantha* (*Leucodontetalia*) and *Ptilidium pulcherrimum* and *Orthodicranum montanum* (*Dicranetalia*). The Urals communities of association differ from those described from Germany (Marstaller, 1986) in the high constancy of *Pylaisiella polyantha*, *Sanionia uncinata*, *Leskeella nervosa*, *Callicladium haldanianum*, and in the rare occurrence of the *Lepidozio-Lophocoletea heterophyllae* diagnostic species, lichens and in the absence of *Dicranum viride* and *Dicranoweisia cirrata*. Also, in Western Europe *Platygyrietum repentis* is presented on the middle part of trunks and on the bases of tree branches (Marstaller, 1986), while in the Urals – mostly on tree bases and rarely exceed the height of herb layer (45-50 cm).

Platygyrietum repentis differs from the associations *Pylaisietum polyanthae* Gams 1927 and *Pylaisiello-leskeelletum nervosae* Baisheva et al. 1994 by the predominance of *Platygyrium repens*, the presence of diagnostic species of *Dicranetalia* and indifferent species – *Sanionia uncinata*, *Callicladium haldanianum*, *Brachythecium salebrosum*.

DISCUSSION

In the early studies on bryosyntaxonomy in Western Europe the diagnostic species of higher syntaxa (alliances, orders and classes) often have been used for distinguishing of associations (Barkman, 1958). Later, as the data accumulating, the diagnostic groups of associations became more specific, involving the species with narrower ecological amplitude (Huebschmann, 1986).

Table 5. *Platygyrietum repentis* Le Blanc 1963

Number of releve	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	C
Length of the plot, cm	15	15	30	10	10	20	15	10	10	15	15	15	15	15	20	O
Width of the plot, cm	15	15	5	10	10	10	15	10	10	15	15	15	15	15	10	N
Cover, %	100	90	100	100	100	100	90	100	100	100	100	100	100	100	100	S
Height above the ground, cm	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	T
Substratum	R	R	R	TC	R	R	TC	TC	TC	TC	PS	PS	R	PS	QR	
Number of species in releve	8	6	7	7	7	10	5	5	7	7	7	7	8	7	6	
Diagnostic species of association																
<i>Platygyrium repens</i>	3	3	3	1	2	3	4	2	3	2	4	3	3	4	4	V
Diagnostic species of Hypnetaea cupressiformis and Leucodontetalia																
<i>Pylaisiella polyantha</i>			2	3		2	2	4	3	1	1	2	2	2	1	IV
<i>Radula complanata</i>						+				1						I
<i>Orthotrichum speciosum</i>								1	2							I
<i>Leucodon sciuroides</i>								1								I
Diagnostic species of Dicranetalia																
<i>Hypnum pallescens</i>	2		2	1	1	2	1							+	2	III
<i>Ptilidium pulcherrimum</i>	1	2		1		+									+	II
<i>Orthodicranum montanum</i>	+					+									2	I
Other species:																
<i>Sanionia uncinata</i>	2		+	2	1		1			1	2	+	+	2	1	IV
<i>Callicladium haldanianum</i>	+	2			2	1					2	3	2			III
<i>Leskeella nervosa</i>				3	4	2	2	3	3	3						III
<i>Pleurozium schreberi</i>												2	+	+	+	II
<i>Brachythecium salebrosum</i>	+		2						+	1	r					II
<i>Pohlia nutans</i>											1	2	+			I
<i>Cladonia coniocraea</i>						1					+	2				I
<i>Hypogymnia physodes</i>	2	+				2										I
<i>Plagiothecium laetum</i>			+										+			I

Low constancy species: *Amblystegium serpens* (3-2); *Brachythecium reflexum* (5-+); *B. rutabulum* (2-3); *Eurynchium pulchellum* (2-2); *Frullania bolanderi* (9-r); *Hypnum cupressiforme* (9-r); *Leskea polycarpa* (4-+); *Lophocolea heterophylla* (14-+); *L. minor* (5-1); *Myrinia pulvinata* (10-2); *Tetraphis pellucida* (13-1).

In Bashkiria, due to its continental climate, the bryophyte flora is much poorer than in Western Europe. So, the possibilities for characterization of epiphytic and epixylic syntaxa are obviously more limited. Therefore the diagnostic species of higher units have been used for establishment of associations from Southern Urals.

ACKNOWLEDGEMENTS

I am grateful to A. Solometch and M. Ignatov for valuable remarks and comments, and to M. Saitov for correction the English of the manuscript.

LOCALIZATION OF RELEVES

Table 1: 1,2 – 3.VIII.93. Mishkin Distr., Novotroizkoe, 55° 43'N, 56 14 E; 3,4 – 30.VII.93. Salavat., Arkaulskoe Bog, 55° 23'N, 57° 48'E; 5 – 5.VI.93. Duvan Distr., Ozero, 55° 29'N, 58° 5'E; 6 – 8.VI.93. Belokatai River, 4 km from Shigaevka, left bank of Ik River, 55° 56'N, 58° 25'E; 7,8 – 12.VI.93. Belokatai distr., 2 km from Maigasa NW, 55° 37'N, 58° 55'E; 9 – 12.VI.93. Belokatai Distr., at the foot of hill Jamaza, 110 quarter of Belokatai forestry, 55° 42'N, 59° 15'E; 10,12 – 30.VII.93. Salavat Distr., at the foot of

hill Karatau, Osinovka, 55° 19'N, 57° 35'E; 11 – 9.VI.93. Belokatai Distr., 6 km from Karlyshanovo n, 56° 0'N, 58° 35'E; 13 – 13.VI.93. Kyga Distr., Leuza, 55° 29'N, 58° 43'E; 14 – 3.VI.93. Salavat Distr., 3 km from Iltjaevo S, 55° 11'N, 58° 10'E; 15 – 7.VI.93. Mechetlinsk Distr., flood plain of Ai River, Sosnovka, 56° 0'N, 58° 0'E.

Table 2: 1,9,10,11,12,23 – 15.VI.93. Salavat Distr., 2 km W from Staro-Mukhametovo, 55° 19'N, 58° 23'E; 2,8,14,15,18 – 11.VI.93. Belokatai Distr., 2 km from Medjatovo down-stream along Bolshoi Ik River, 55° 40'N, 59° 5'E; 3,4 – 22.VIII.92. Meleuz Distr., Nugush, 53° 2'N, 56° 28'E; 5 – 12.VI.93. Belokatai Distr., 98 quarter of Belokatai Forestry, 55° 38'N, 59° 0'E; 6 – 7.VI.93. Mechetlinsk Distr., flood plain Ai-River, Sosnovka, 56° 0'N, 58° 0'E; 7 – 15.VI.93. Salavat Distr., Lakly, 55° 11'N, 58° 30'E; 8,16,19,20,24, – 2.VI.93. Salavat Distr., flood plain of Yuryuzan River, Jangan-Tau, 55° 16'N, 58° 6'E.;13,17 – 8.VI.93. Belokatai Distr., 4 km from Shigaevka, flood plain Ik-River, 55° 56'N, 58° 25'E.

Table 3: 1-7 – 31.VII.93. Salavat Distr., at the the foot of hill Karatau, Osinovka, 55° 19'N, 57° 35'E; 8 – 2.VIII.93. Duvan Distr., Tchernosharskoe Bog, 55° 50'N, 57° 55'E; 12 – 3.VIII.93. Mishkin Distr., Novotroizkoe, 55° 43'N, 56° 14'E; 13 – 27.VII.92. Salavat Distr., Lagerevskoe Bog, 55° 15'N, 58° 27'E; 14 – 14.IX.92. Belorezk Distr., at foot of hill Elongas, 57° 7'N, 58° 28'E.

Table 4: 1,4,9,12,15,16,17,21,22,24 – 6.VI.93. Duvan Distr., right bank of Lemoza River, Lukjanovka, 55° 43'N,

Table 6. Syntaxa of *Hypnetea cupressiformis* and *Lepidozio-Lophocoletea*.

1. Ass. *Orthotrichetosum speciosi* (Jaggi 1934) Barkman 1958 subass. *orthotrichetosum obtusifoli* subass. nov.;
 2. *Platygyrietum repentis* Le Blanc 1963;
 3. Ass. *Ptilidio-Hypnetum pallescens* (Herzog 1943) Barkman 1958 subass. *callicladietosum haldanani* subass. nov.;
 4. Ass. *Brachythecio salebrosi-Amblystegietum serpentis* Baisheva et al. 1994 subass. *plagiomnietosum cuspidati* subass. nov.;
 - 5 – *Tetraphis pellucida* – community.
- //OLeuc – d.s. of *Leucodontetalia*; //OLoph – d.s. of *Lophocoletalia*; //ODicr – d.s. of *Dicranetalia*; //OBrach – d.s. of *Brachythecietalia*; //ALesk – d.s. of *Leskeion*.

Number of syntaxa	1	2	3	4	5
Number of releves in syntaxa	24	15	30	15	14
Mean cover, %	85	100	98	96	93
Total number of species	16	28	31	26	28
Mean number of species in releve	4	7	7	7	7
Diagnostic species of associations, subassociations and variants					
<i>Orthotrichum speciosum</i> //OLeuc	IV ¹	I			
<i>Orthotrichum obtusifolium</i> //OLeuc	V ³				
<i>Leskea polycarpa</i> //ALesk	IV ²	I		I	
<i>Platygyrium repens</i>	I	V ³	I		I
<i>Ptilidium pulcherrimum</i> //ODicr		II	IV ²		
<i>Hypnum pallescens</i>		III ²	V ³	III ¹	II
<i>Callicladium haldanianum</i>		III ²	V ²	II	IV ⁺
<i>Amblystegium serpens</i> //OBrach	I	I	I	V ³	I
<i>Brachythecium salebrosum</i> //OBrach	I	II	II	V ²	I
<i>Plagiomnium cuspidatum</i>	I		I	V ²	I
<i>Tetraphis pellucida</i> //OLoph		I	I		V ³
Diagnostic species of <i>Hypnetea cupressiformis</i>					
<i>Pyralisiella polyantha</i>		V ³	IV ²		
Diagnostic species of <i>Lepidozio-Lophocoletea heterophyllae</i>					
<i>Lophocolea heterophylla</i>		I	IV ¹	II	II
<i>Lophocolea minor</i>		I	I	II ⁺	III ⁺
<i>Cladonia coniocraea</i>	I	I			
<i>Plagiothecium laetum</i>		I	I		IV ²
<i>Plagiothecium denticulatum</i>			I	II	II
Diagnostic species of <i>Lophocoletalia</i>					
<i>Lepidozia reptans</i>					I
<i>Blepharostoma trichophyllum</i>					II
<i>Cephalozia lunulifolia</i>			I		III ¹
Diagnostic species of <i>Dicranetalia</i>					
<i>Orthodicranum montanum</i>		I	II	I	III ¹
<i>Dicranum scoparium</i>		I	II		II
Diagnostic species of <i>Brachythecietalia</i>					
<i>Brachythecium reflexum</i>		I	III ²	IV ²	I
<i>Brachythecium velutinum</i>	I		I	I	I
<i>Brachythecium starkei</i>			I	I	I
<i>Brachythecium rutabulum</i>		I	I	I	I
<i>Brachythecium oedipodium</i>			I	I	I
Other species					
<i>Sanionia uncinata</i>	I	IV	II	III ⁺	I
<i>Hypogymnia physodes</i>	II	I	I		
<i>Leskeella nervosa</i>	I	III		I	
<i>Myrinia pulvinata</i>	I	I			
<i>Eurhynchium pulchellum</i>		I	I		
<i>Pohlia nutans</i>		I	I	I	III
<i>Pleurozium schreberi</i>		II	II	I	I
<i>Campyllum hispidulum</i>				II	I

Low constancy species: *Amblystegium varium* (4-1); *Brachythecium albicans* (4-1); *Campyllum sommerfeltii* (4-1); *Cephalozia rubella* (5-1); *Ceratodon purpureus* (4-1); *Cladonia* sp. (3-1;5-II); *Climacium dendroides* (4-1); *Dicranum bonjeani* (5-1); *D. fuscescens* (3-1); *Eurhynchium hians* (4-1); *Frullania bolanderi* (1,2-1); *Hypnum cupressiforme* (2-1); *Leptodictyum riparium* (4-1); *Leucodon sciuroides* (2-1); *Myurella julacea* (1-1); *Orthodicranum flagellare* (3-1); *Orthotrichum fastigiatum* (1-1); *Paraleucobryum longifolium* (3-1); *Sphagnum capillifolium* (5-1); *Radula complanata* (2-1).

58° 5'E; 2,11,13, 19 – 12.VI.93. Belokatai distr., 2 km from Maigasa NW, 55° 37'N, 58° 55'E; 3 – 13.VI.93. Kyga Distr., 7 km from Leuza NW, 55° 32'N, 58° 40'E; 5,6 – 12.VI.93. Belokatai Distr., at the foot of hill Jamaza, 110 quarter of Belokatai forestry, 55° 42'N, 59° 15'E; 7 – 3.VI.93. Salavat Distr., 3 km from Iltjaevo S, 55° 11'N, 58° 10'E; 8,27 – 4.VI.93. Duvan Distr., Ozero, 55° 29'N, 58° 5'E; 10,18,28,29 – 30.VII.93. Salavat Distr., at the the foot of hill Karatau, Osinovka, 55° 19'N, 57° 35'E; 14,20,25,26,30 – 9.VI.93. Belokatai Distr., 5 km from Nogushi N, 55° 54'N, 58° 40'E; 23 – 7.VI.93. Mechetlinsk Distr., the right bank of Ai-River, Sosnovka, 56° 0'N, 58° 0'E; 27 – 5.VI.93. Duvan Distr., Karakulevskoe Bog, 55° 32'N, 58° 3'E.

Table 5: 1,2 – 6.VI.93., Duvan Distr., right bank of Lemoza River, Lukjanovka, 55° 43'N, 58° 5'E; 3 – 7.VI.03. Mechetlinsk Distr., right bank Ai River, Sosnovka, 56° 0'N, 58° 0'E; 4,6 – 9.VI.93. Belokatai Distr., 8 km from the Nogushi S, 55° 54'N, 58° 40'E; 5 – 12.VI.93. Belokatai Distr., 110 quarter of Belokatai Forestry, 55° 38'N, 59° 0'E; 7 – 4.VI.93. Salavat Distr., at the the foot of hill Karatau, Osinovka, 55° 19'N, 57° 35'E; 8,9 – 13.VI.93. Kyga Distr., 8 km from Allaguzovo S, 55° 32'N, 58° 40'E; 10 – 10.VI.93. Belokatai Distr., 5 km from Karlykhanovo upstream Nogushi River, 56° 0'N, 58° 35'E; 11,12,13 – 2.VIII.93. Duvan Distr., Tchernosharskoe Bog, 55° 50'N, 57° 55'E; 14 – 3.VIII.93. Karaidel Distr., 5 km from Karaidel, left bank Karaidel River, 55° 48'N, 56° 55'E.

LITERATURE CITED

- [ABRAMOV, I.I.(ed)] АБРАМОВ, И.И. 1971-1978. Определитель лишайников СССР. Т. 1-5. – [Handbook of lichens of the USSR. Vols.1-5]. Л., Наука [Leningrad, Nauka].
- BAISHEVA, E. Z., A. I. SOLOMETCH, E. A. IGNATOVA 1994 Bryophyte vegetation of Bashkiria, South Urals. I. Epiphytic and epixylic communities. – *Arctoa* 3: 139-152.
- BARKMAN, J. J. 1958. Phytosociology and ecology of cryptogamic epiphytes. – *Assen*, 628.
- BARKMAN, J.J., J. MORAVEC & S. RAUSCHERT 1986. Code of phytosociological nomenclature. – *Vegetatio* 67: 145-195.
- [CZEREPANOV, S. K.] ЧЕРЕПАНОВ, С. К. 1981. Сосудистые растения СССР. – [Vascular plants of the USSR]. Л., Наука [Leningrad, Nauka], 510.
- [FEDOROV, N. I.] ФЕДОРОВ, Н. И. 1991. К синтаксономии сосново-березовых лесов Южного Урала. I. Класс Quercio-Fagetea.- [To syntaxonomy of pine-birch forests of South Urals. I.Class Quercio-Fagetea] *Рукопись деп. в ВИНТИ 15.1.91. 255-B91* [Msc. reserved in VINI-TI 15.1.91. 255-B91, 33].
- HUEBSCHMANN, A von 1986. Prodröm der Moosgesellschaften Zentraleuropas. – *Bryoph. Bibl.*, 32:1-313.
- IGNATOV, M. S. & O. M. AFONINA (eds.) 1992. Check-list of mosses of the former USSR. – *Arctoa* 1(1-2): 1-85.
- [KADILNIKOV, I. P.(ed.)] КАДИЛЬНИКОВ, И. П. (ред.) 1964. Физико-географическое районирование Башкирской АССР. – [Physiographic regions of Bashkiria Republic] Уфа, Башкирский госуниверситет [Ufa, Bashkirskij Gos. Univ.], 210.
- [KONSTANTINOVA, N. A., A. D. ПОТЕМКИН & R. N. ШЛЯКОВ] КОНСТАНТИНОВА, Н. А., А. Д. ПОТЕМКИН, Р. Н. ШЛЯКОВ 1992. Список печеночников и антоцеротовых территории бывшего СССР. – [Check-list of the Hepaticae and Anthocerotae of the former USSR]. *Arctoa* 1(1-2): 87-127.
- MARSTALLER, R. 1986. Die Moosgesellschaften der Verbände Dicrano-Hypnion filiformis Barkman 1958 und Antitrichion curtispindulæ v. Krusenstjerna 1945. 20. Beitrag zur Moosvegetation Thüringens. – *Gleditschia* 14(1), 197-225.
- MARSTALLER, R. 1987. Die Moosgesellschaften auf morschem Holz und Rohhumus. 25. Beitrag zur Moosvegetation Thüringens. – *Gleditschia* 15(2), 73-138.
- [SOLOMETCH, A. I., I. N. GRIGORJEV & R. M. КХАЗИАХМЕТОВ] СОЛОМЕЩ, А. И., И. Н. ГРИГОРЬЕВ, Р. М. ХАЗИАХМЕТОВ 1989. Синтаксономия лесов Южного Урала. IV. Порядок Fagetalia sylvaticae. – [Syntaxonomy of forests of Southern Ural. IV. Order Fagetalia sylvaticae] *Рукопись деп. в ВИНТИ 12.X.89. 6234-B89*, 21. [Msc. reserved in VINI-TI 12.X.89. 6234-B89], 21.
- [SOLOMETCH, A. I., I. N. GRIGORJEV, R. M. КХАЗИАХМЕТОВ, & E. Z. VAISHEVA] СОЛОМЕЩ, А. И., И. Н. ГРИГОРЬЕВ, Р. М. ХАЗИАХМЕТОВ, Э. З. БАЙШЕВА 1993. Синтаксономия лесов Южного Урала.V. Хвойно-широколиственные леса. – [Syntaxonomy of forests of Southern Ural. V. Conifer-deciduous forests.] *Рукопись деп. в ВИНТИ 02.V.93 1464-B93*. [Msc. reserved in VINI-TI 02.VI.93 1464-B93], 68.