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ON BRYOPHYTE FLORA OF ATSINSKY SANCTUARY (ZABAIKAL'SKY TERRITORY, SOUTH SIBERIA)

К БРИОФЛОРЕ АЦИНСКОГО ЗАКАЗНИКА (ЗАБАЙКАЛЬСКИЙ КРАЙ, ЮЖНАЯ СИБИРЬ)

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Abstract

An annotated list of hepatics (47 species) and mosses (126 species) from Atsinsky Sanctuary (southwestern part of Zabaikal'sky Territory) is provided. It resulted from a collection made by the authors during a short-term visit to this locality. One hepatic, *Cephaloziella divaricata* var. *asperifolia,* and 9 mosses (*Dicranella heteromalla, Herzogiella turfacea, Neckera borealis, Pohlia proligera, Schistostega pennata, Sciuro-hypnum curtum, Sphagnum flexuosum, S. russowii, S. wulfianum*) are reported for Zabaikal'sky Territory for the first time.

Резюме

Приводится аннотированный список 47 видов печёночников и 126 видов мхов из Ацинского заказника (юго-запад Забайкальского края). Сводка составлена по результатам обработки коллекций, собранных авторами во время кратковременного флористического исследования. Печёночник *Cephaloziella divaricata* var. *asperifolia* и 9 видов мхов (*Dicranella heteromalla, Herzogiella turfacea, Neckera borealis, Pohlia proligera, Schistostega pennata, Sciuro-hypnum curtum, Sphagnum flexuosum, S. russowii, S. wulfianum*) указываются впервые для Забайкальского края.

KEYWORDS: hepatics, mosses, flora, phytogeography, rare species, Atsinsky Sanctuary, Zabaikal'sky (Trans-Baikal) Territory, South Siberia

The authors had an opportunity to carry out a brief floristic study in Atsinsky sanctuary on August 10-12, 2011. This sanctuary is located in the dissected Khentey-Chikoyskoe nagor'e Highlands in Krasnochikoysky District, the southwest part of Zabaikal'sky Territory (Fig. 1). Its area is ca. 64 000 ha. Its mountainous relief originated from the weathering and denudation of elevated tectonic structures. The average altitudes are ca. 1000-1200 m. The Atsa River and the Yugal River are the biggest in the area, and belong to the Chikoy River basin. The region is characterized by a sharply continental climate with annual precipitation 400-600 mm. The average temperatures are about –33° C in January, and about +18° C in July (Atlas Zabaikaljya, 1967). Soils are of mountainous frozen-taiga-, grey-, forest- and brown-types. The vegetation is composed of coniferous (larch and pine) forests as well as of dwarf-birch shrubs on wetlands and willow thickets on banks of rivers.

Pine forests are most common at high altitudes. They are dominated by *Pinus sibirica* and *Abies sibirica*, while *Picea obovata*, *Larix dahurica,* and *Betula platyphylla* occur as an admixture in these communities. In a ground layer in these forests, the most common are *Dicranum fuscescens, D. montanum, D. polysetum, Hylocomium splendens, Plagiothecium laetum, Pleurozium schreberi, Polytrichum commune, Ptilium crista-castrensis*; in damp depressions *Aulacomnium palustre, Sphagnum girgensohnii, S. warnstorfii, S. wulfianum,* and *Warnstorfia trichophylla* are represented.

Larch forests occur at low altitudes; they are dominated by *Larix dahurica*, with an admixture of *Pinus sibirica*, *Betula platyphylla*, *Populus suaveolens*, *Sorbus sibirica*, and *Padus avium*. In these communities, the most characteristic species are *Dicranum fragilifolium, D. polysetum, D. undulatum, Haplocladium angustifolium, Hylocomium splendens, Pylaisia polyantha,* and *Sanionia uncinata.* On dead wood in forests, hepatics *Anastrophyllum michauxii*, *Crossocalyx hellerianus, Crossogyna autumnalis, Orthocaulis attenuatus, Scapania carinthia-*

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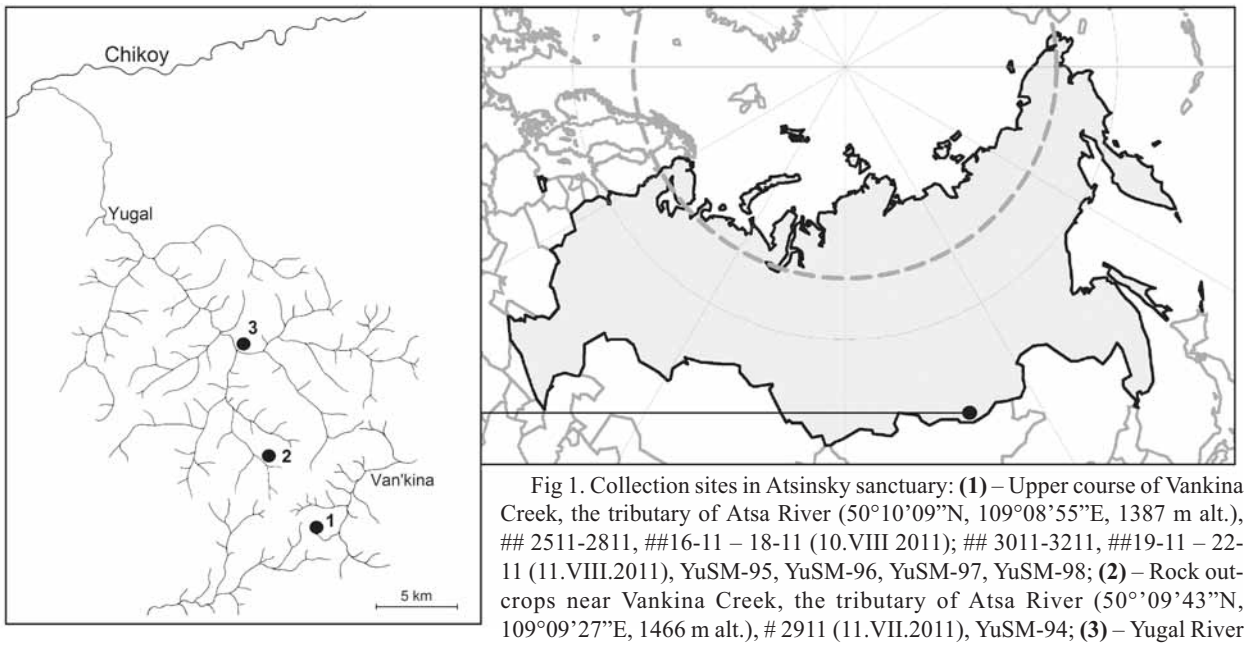

Fig 1. Collection sites in Atsinsky sanctuary: **(1)** – Upper course of Vankina Creek, the tributary of Atsa River (50°10'09"N, 109°08'55"E, 1387 m alt.), ## 2511-2811, ##16-11 – 18-11 (10.VIII 2011); ## 3011-3211, ##19-11 – 22-11 (11.VIII.2011), YuSM-95, YuSM-96, YuSM-97, YuSM-98; **(2)** – Rock outcrops near Vankina Creek, the tributary of Atsa River (50°'09'43"N, 109°09'27"E, 1466 m alt.), # 2911 (11.VII.2011), YuSM-94; **(3)** – Yugal River valley (50°15'56"N, 109°05'30"E, 953 m alt.), rocks on south-facing slope (lower part of slope), ## 3311-3511, river bank, ## 23-11 – 25-11 (12.VIII.2011), YuSM-99, YuSM-100.

ca, *Tritomaria* spp., and mosses *Dicranum flagellare, D. montanum, Herzogiella turfacea, Oncophorus wahlenbergii, Orthotrichum* spp., *Plagiothecium* spp., *Pohlia nutans, Stereodon holmenii, Tetraphis pellucida* are recorded; bare soil covering upturned roots of fallen trees are occupied by *Atrichum tenellum, Dicranella heteromalla, Funaria hygrometrica, Leptobryum pyriforme, Pogonatum dentatum, Pohlia bulbifera, P. elongata, P. nutans, Polytrichum piliferum, Schistostega pennata.*

In wetlands, bush communities of *Betula fruticosa* occur; bryophytes are abundant, among them hepatic *Schljakovia kunzeana* and mosses *Aulacomnium palustre, Bryum pseudotriquetrum, Helodium blandowii, Hylocomium splendens, Paludella squarrosa, Philonotis fontana, Pohlia drummondii, Polytrichum strictum, Pseudobryum cinclidioides, Sanionia uncinata,* and *Straminergon stramineum* are most common; peat mosses (*Sphagnum flexuosum, S. girgensohnii, S. russowii, S. squarrosum, S. teres, S. warnstorfii*) also play a significant role in vegetation.

Rather diverse species composition of bryophytes is in willow thickets along the banks of rivers and streams. Hepatics *Blasia pusilla* and *Marchantia polymorpha* subsp. *polymorpha,* and mosses *Amblystegium serpens, Aulacomnium palustre, Calliergonella lindbergii, Campylidium sommerfeltii, Climacium dendroides, Niphotrichum panschii, Oncophorus wahlenbergii, Plagiomnium ellipticum, Pleurozium schreberi, Pohlia bulbifera, P. cruda, Polytrichum commune, Rhodobryum onthariense, Rhytidiadelphus triquetrus, Sanionia uncinata, Sphagnum angustifolium, Thuidium assimile* occur in this type of habitats.

In bryophyte communities along streams, hepatics *Plagiochila porelloides, Scapania irrigua, S. subalpina,* and mosses *Oncophorus virens, Philonotis fontana, Plagiomnium cuspidatum, Plagiothecium cavifolium, Rhizomnium pseudopunctatum, Sphagnum teres* were recorded. On boulders along river banks, *Jungermannia exsertifolia, J. pumila, Scapania mucronata, S. paludicola, Bryum argenteum, Niphotrichum canescens, Pohlia cruda, Sanionia uncinata, Schistidium pulchrum* and *S. sibiricum* were collected; boulders in water are occupied by *Fontinalis antipyretica, Hygrohypnella ochracea, H. polare* and *Ochyraea duriuscula*.

The moss species composition on bare soil of river banks is quite specific; the most characteristic are hepatics *Pellia neesiana and Plectocolea hyalina,* and mosses *Amblystegium serpens, Bryoerythrophyllum recurvirostrum, Bryum pseudotriquetrum, Ceratodon purpureus, Cratoneuron filicinum, Fissidens bryoides, Isopterygiopsis pulchella, Mnium thomsonii, Myuroclada maximowiczii, Pohlia nutans,* and *P. proligera.*

Rock outcrops and different rocky habitats are of particular interest in terms of bryophytes. They are the richest in species composition and, at the same time, quite specific. The communities on rocky outcrops are represented by the following hepatics: *Apometzgeria pubescens, Barbilophozia barbata, Cephaloziella divaricata* var. *asperifolia, C. varians, Frullania* spp., *Lophoziopsis* spp., *Metzgeria* spp., *Porella platyphylla, Radula complanata, Tritomaria* spp., and mosses: *Abietinella abietina, Anomodon minor* subsp. *integerrimus, Bartramia pomiformis, Cynodontium asperifolium, Didymodon zanderi, Eurhynchiastrum pulchellum, Fabronia ciliaris, Fissidens bryoides, Grimmia elatior, G. jacutica, Haplohymenium triste, Hedwigia ciliata, Hypnum cupressiforme, Leptodontium flexifolium, Neckera pennata, Oxystegus tenuirostris, Paraleucobryum longifolium, Platygyrium repens, Pterigynandrum filiforme, Rhytidium rugosum, Struckia enervis, Zygodon sibiricus.*

ANNOTATED LIST OF HEPATICS AND MOSSES

Nomenclature of hepatics follows Konstantinova & Bakalin *et al.* (2009), of mosses – Ignatov, Afonina, Ignatova *et al.* (2006). Species in the list are arranged in alphabetical order, separately for liverworts and mosses. After species name collection sites (according to Fig. 1) are recorded and habitats are listed. The presence of reproductive structures is noted (S+ – sporophytes, ant. – antheridia, arch. – archegonia, per. – perianthia or pseudoperianthia, gemm. – gemmae or propagules). Brief comments on the most interesting findings are given. New records for Zabaikal'sky Territory are marked by asterisk. Specimens of liverworts are deposited in KRABG and LE, specimens of mosses are preserved in LE.

HEPATICAE

Anastrophyllum michauxii (F.Weber) H.Buch – 1, 3: on fallen trees of *Abies sibirica* and *Picea obovata*, mixed with many hepatics, *e.g. Crossocalyx hellerianus, Crossogyna autumnalis, Orthocaulis attenuatus, Scapania carinthiaca*, and *Tritomaria* spp. (ant., per., gemm.).

Apometzgeria pubescens (Schrank) Kuwah. – 2, 3: on surface of large boulders, in partial shade, mixed with many hepatics, usually *Frullania* spp., and *Metzgeria* spp.

Barbilophozia barbata (Schmidel ex Schreb.) Loeske – 1, 2, 3: on rocks and fallen trees; associated with more than 20 hepatics.

Blasia pusilla L. – 3: on stone near the river bank, mixed with *Jungermannia pumila* and *S. mucronata* (gemm.).

Blepharostoma trichophyllum (L.) Dumort. – 1, 3: on fallen tree of *Abies sibirica*, on soil and boulders near river banks; associated with many hepatics (for more than 10 species).

Cephaloziella arctogena (R.M.Schust.) Konstant. – 3: on rotten log lying in a pool, with *Anastrophyllum michauxii*.

**C. divaricata* (Sm.) Schiffn. var. *asperifolia* (Taylor) Damsh. – 2, 3: on rock surface in the clefts and wet niches, mixed with *Frullania* spp., *Apometzgeria pubescens, Metzgeria temperata,* and *Barbilophozia barbata.*

C. rubella (Nees) Warnst. – 2, 3: on peaty soil between large boulders and on rotten wood in the forests (ant., per., gemm.).

C. varians (Gottsche) Steph. – 3: in clefts between large boulders, mixed with *Frullania bolanderi* and *Radula complanata* (ant., arch., per., gemm.).

Chiloscyphus polyanthos (L.) Corda var. *polyanthos* – 3: on stones on river bank (ant., arch.).

Cololejeunea subkodamae Mizut. – 3: on rock surface in the deep niche (ant., per.)

Crossocalyx hellerianus (Nees ex Lindenb.) Meyl. – 1, 3: on fallen trees in the forests, associated with *Anastrophyllum michauxii* (ant., per., gemm.).

Crossogyna autumnalis (DC.) Schljakov – 1, 2, 3: on rocks in partial shade, mixed with *Apometzgeria pubescens*; on rotten wood in the forest, mixed with *Anastrophyllum michauxii*.

Frullania bolanderi Austin – 2, 3: on rocks in partial shade, mixed with other *Frullania* spp.

F. davurica Hampe – 3: in clefts between large boulders, mixed with other *Frullania* spp. and *Porella platyphylla*.

F. inflata Gottsche – 3: in clefts between large boulders, mixed with *Apometzgeria pubescens, Frullania* spp. and *Cephaloziella divaricata* var. *asperifolia* (ant., per.).

F. koponenii S.Hatt. – 3: in clefts between large boulders, mixed with *Frullania bolanderi*.

F. muscicola Steph. – 1, 3: on rocks, with other *Frullania* spp. (arch.).

F. parvistipula Steph. – 1, 3: on rocks in partial shade, with *Cephaloziella divaricata* var. *asperifolia* and other *Frullania* spp.

Jungermannia exsertifolia Steph. – 3: on stone on the river bank, with *Chiloscyphus polyanthos* var. *polyanthos*.

J. pumila With. – 3: on stones near water of the river, with *Blasia pusilla* and *Scapania mucronata* (ant., per.).

Lepidozia reptans (L.) Dumort. – 2: on wet rock surface in partial shade, with *Tritomaria exsectiformis*.

Lophocolea heterophylla (Schrad.) Dumort. – 1, 3: on fallen trees in the forests, with *Cephaloziella rubella* and *Crossocalyx hellerianus*; on stone lying in the river bed, with *Jungermannia pumila*.

Lophozia silvicola H.Buch – 1, 2: on rocks in partial shade; on fallen trees in the forests, with *Anastrophyllum michauxii* (gemm.).

L. ventricosa (Dicks.) Dumort. var. *longiflora* (Nees) Macoun – 1: on sandy soil on bank of brook in *Salix* sp.-*Carex* sp. community; forming pure mats on soil substrate in a hole in the forest (per., gemm.).

Lophoziopsis excisa (Dicks.) Konstant. & Vilnet – 2, 3: on peaty soil in fissures and on surface of rock outcrops, with *Apometzgeria pubescens* and *Frullania* spp. (ant., arch., per., gemm.).

L. longidens (Lindb.) Konstant. & Vilnet – 2, 3: on cliffs, in partial shade, with *Crossogyna autumnalis* and *Frullania parvistipula*; on stones in the forest near the river bed (gemm.).

Marchantia polymorpha L. subsp. *polymorpha* – 3: on sandy soil and on stone near water of the river, with *Chiloscyphus polyanthos* var. *polyanthos, Jungermannia exsertifolia*.

Metzgeria furcata (L.) Dumort. – 2: on cliffs, in partial shade, with *Apometzgeria pubescens* and *Frullania parvistipula* (gemm.).

M. temperata Kuwah. – 2: on wet rock surface, with *Apometzgeria pubescens* and *Frullania parvistipula* (gemm.).

Orthocaulis attenuatus (Mart.) A.Evans – 2: on fallen tree of *Abies sibirica* in the forest, with, *e.g., Anastrophyllum michauxii, Crossogyna autumnalis,* and *Crossocalyx hellerianus.*

Pellia neesiana (Gottsche) Limpr. – 1, 3: on sandy soil and stones near water of rivers, with *Chiloscyphus polyanthos* var. *polyanthos* and *Jungermannia exsertifolia* (per.)

Plagiochila porelloides (Torr. ex Nees) Lindenb. – 1, 3: on sandy soil and stones along brook banks; on shaded surface of cliffs; associated with more than 15 hepatics.

Plectocolea hyalina (Lyell) Mitt. – 1: on sandy soil in *Salix* sp.-*Carex* sp. community on brook bank, with *Pellia neesiana, Scapania irrigua,* and *S. subalpina* (per.).

Porella platyphylla (L.) Pfeiff. – 3: on cliff surface, with *Frullania davurica, F. koponenii,* and *F. muscicola*.

Ptilidium pulcherrimum (Weber) Vain. – 1, 2, 3: on rocks and fallen trees in forests, associated with more than 15 hepatics.

Radula complanata (L.) Dumort. – 2, 3: on shady rocks, associated with more than 10 hepatics (per., gemm.).
Scapania carinthiaca J.B. Jack ex Lindb. – 1, 3: on rotten wood in the forests, with *Anastrophyllum michauxii*, *Crossocalyx hellerianus*, and *Orthocaulis attenuatus* (ant., per., gemm.).
S. irrigua (Nees) Nees – 1, 3: on sandy soil and stones on river banks (ant., per., gemm.).
S. mucronata H.Buch – 3: on rotten logs and stones near the water of the river, associated with more than 17 hepatics (ant., per., gemm.).
S. paludicola Loeske & Müll. Frib. – 3: on stones near the water of the river, with *S. mucronata*.
S. subalpina (Nees ex Lindenb.) Dumort. – 1, 3: on sandy soil and stones on river banks, usually with *Scapania irrigua*.
Schljakovia kunzeana (Huebener) Konstant. & Vilnet – 1: in pure mats on moist turf in boggy brook valley with *Betula fruticosa*-*Carex* sp.-*Sphagnum* sp. community.
Sphenolobus minutus (Schreb.) Berggr. – 2: on fallen tree of *Abies sibirica* in forest, with *Anastrophyllum michauxii* and *Orthocaulis attenuatus*.
Tritomaria exsecta (Schmidel) Loeske – 1, 2: on rocks and rotten wood in forests, associated with many hepatics (over 13 species) (gemm.).
T. exsectiformis (Breidl.) Loeske – 1, 2, 3: on wet rocks and stones, with *Lepidozia reptans* and *Scapania mucronata*, on moist rotten wood in forests, with, *e.g.*, *Anastrophyllum michauxii* and *Orthocaulis attenuatus* (gemm.).
T. quinquedentata (Huds.) H.Buch – 2: on rocks and boulders, with *Barbilophozia barbata* and *Tritomaria exsecta*.

MUSCI

Abietinella abietina (Hedw.) M.Fleisch. – 2, 3: on rock outcrops and rocks on slope.
Amblystegium serpens (Hedw.) Bruch et al. – 3: on eroded soil along river bank; on soil in flood-land with willow stand. S+
Anomodon minor (Hedw.) Fürnr. subsp. *integerrimus* (Mitt.) Z. Iwats. – 3: on rock outcrops on south-facing slope.
Atrichum tenellum (Roehl.) Bruch et al. – 1: on eroded soil covering upturned roots in *Pinus sibirica* forest.
Aulacomnium palustre (Hedw.) Schwägr. – 1, 3: on soil in flood-land bush community of *Betula fruticosa*, in willow stand, in mossy birch forest and in *Pinus sibirica* and *Larix dahurica* forest; on brook bank.
Bartramia pomiformis Hedw. – 3: on rocks covered by mosses on slope. S+.
Brachytheciastrum velutinum (Hedw.) Ignatov & Huttunen – 2: on big boulders at cliff base.
Bryoerythrophyllum recurvirostrum (Hedw.) P.C. Chen – 3: on eroded soil along river bank. S+.
Bryum argenteum Hedw. – 3: on boulder along river bank.
B. moravicum Podp. – 3: on eroded soil along river bank.
B. pseudotriquetrum (Hedw.) P. Gaertn. et al. – 3: on soil along river bank and in *Betula fruticosa* community. S+.
Buxbaumia aphylla Hedw. – 1: on eroded soil covering upturned root in *Pinus sibirica* forest with *Bergenia crassifolia.* S+.
Calliergon cordifolium (Hedw.) Kindb. – 3: on river bank.
Calliergonella lindbergii (Mitt.) Hedenäs – 3: on eroded soil along river bank; on soil in flood-land willow stand.
Campylidium sommerfeltii (Myrin) Ochyra – 3: on soil in flood-land willow stand.
Ceratodon purpureus (Hedw.) Brid. – 1, 3: on eroded soil and on decaying wood in birch forests, *Pinus sibirica* forests, flood-land willow stands, flood-land bush of *Betula fruticosa*; on river bank. S+.
Climacium dendroides (Hedw.) F.Weber & D.Mohr – 3: on soil in flood-land willow stand.
Cratoneuron filicinum (Hedw.) Spruce – 3: on eroded soil along river bank.
Cynodontium asperifolium (Lindb. & Arnell) Paris – 1, 2: on rocks covered by mosses, on decaying wood in mossy birch forest. S+.
**Dicranella heteromalla* (Hedw.) Schimp. – 1: on eroded soil covering upturned roots in *Pinus sibirica* forest with *Bergenia crassifolia.* S+.
Dicranum flagellare Hedw. – 1, 3: on decaying wood and on base of trunks in *Pinus sibirica* forests and birch forests, on rocks covered by mosses.
D. fragilifolium Lindb. – 1, 2: on decaying wood and on base of trunks in *Pinus sibirica* forests and birch forests, on big boulders under rocks.
D. fuscescens Turner – 1: on trunk bases in *Pinus sibirica* forest with *Bergenia crassifolia.* S+.
D. montanum Hedw. – 1: on decaying wood and on trunk bases in *Pinus sibirica* forests.
D. polysetum Sw. – 1: on soil in *Pinus sibirica* forests and in birch forests.
D. undulatum Schrad. ex Brid. – 1: on soil in birch forest.
Didymodon zanderi Afonina & Ignatova – 2: on rocks and big boulders.
Distichium capillaceum (Hedw.) Bruch et al. – 3: on boulders on slope. S+.
Encalypta ciliata Hedw. – 3: on boulders on slope. S+.
Eurhynchiastrum pulchellum (Hedw.) Ignatov & Huttunen – 2, 3: on rocks and on soil in flood-land willow stands.
Eurohypnum leptothallum (Müll. Hal.) Ando – 3: on boulders on slope.
Fabronia ciliaris (Brid.) Brid. – 3: on rock outcrops on south-facing slope and on boulder at cliff base on slope. S+.
Fissidens bryoides Hedw. – 3: on eroded soil along river bank, in niches among rocks.
Fontinalis antipyretica Hedw. – 3: on boulders in water along river bank.
Funaria hygrometrica Hedw. – 1: on eroded soil covering upturned roots in *Pinus sibirica* forest. S+.
Grimmia elatior Bruch ex Bals.-Criv. & De Not. – 2, 3: on rocks.
G. jacutica Ignatova et al. – 2: on rocks and boulders.
G. longirostris Hook. – 2, 3: on rocks, on boulder along river bank and on rocks on slope. S+.
Haplocladium angustifolium (Hampe & Müll. Hal.) Broth. – 1, 3: at base of tree trunks in forests, on rocks.
Haplohymenium triste (Ces.) Kindb. – 2: on rocks and big boulders under rocks.
Hedwigia ciliata (Hedw.) P.Beauv. – 3: on boulders on slope.
Helodium blandowii (F. Weber & D. Mohr) Warnst. – 1: on soil in *Pinus sibirica* forests and flood-land bush of *Betula fruticosa*; on brook bank.

**Herzogiella turfacea* (Lindb.) Z.Iwats. – 1: on decaying wood in swampy *Pinus sibirica* forest; on boulder in *Pinus sibirica* forest with herbs. S+.

Homalia trichomanoides (Hedw.) Bruch et al. – 2: in niches among big boulders under rocks.

Hygrohypnella ochracea (Turner ex Wilson) Ignatov & Ignatova – 1, 3: on boulders in water along river bank, in bush of *Betula fruticosa*.

H. polare (Lindb.) Ignatov & Ignatova – 3: on boulders in water along river bank.

Hylocomium splendens (Spruce) M. Fleisch. – 1, 3: on soil in *Pinus sibirica* and birch forests, flood-land willow stand.

Hypnum cupressiforme Hedw. – 3: on rocks and boulders.

Isopterygiopsis pulchella (Hedw.) Z. Iwats. – 3: on eroded soil of river bank.

Leptobryum pyriforme (Hedw.) Wilson – 1, 3: on eroded soil covering upturned roots in *Pinus sibirica* forest and along river bank. S+.

Leptodontium flexifolium (Dicks.) Hampe – 2, 3: on rocks and boulder on slope.

Mnium spinosum (Voit.) Schwägr. – 2: among boulders under rocks.

M. thomsonii Schimp. – 3: on eroded soil of river bank.

Myuroclada maximowiczii (G.G. Borshch.) Steere & W.B. Schofield – 3: on eroded soil along river bank.

**Neckera borealis* Nog. – 3: in cracks of outcrops.

N. pennata Hedw. – 3: in crevices and niches of rocks on slope. S+.

Niphotrichum canescens (Hedw.) Bednarek-Ochyra & Ochyra – 3: on boulders along river bank.

N. panschii (Müll. Hal.) Bednarek-Ochyra & Ochyra – 3: on boulders in willow thicket along roadside.

Ochyraea duriuscula (De Not.) Ignatov & Ignatova – 3: on boulders in water of river.

Oncophorus virens (Hedw.) Brid. – 1, 3: in moss turf along stream in *Pinus sibirica* forest; on river bank. S+.

O. wahlenbergii Brid. – 1: on soil, on decaying wood and on base of trunks in *Pinus sibirica* forests, birch forests, flood-land bush of *Betula fruticosa*. S+.

Orthotrichum obtusifolium Brid. – 1: on decaying wood in mossy birch forest.

O. rupestre Schleich ex Schwägr. – 2: on rocks. S+.

O. speciosum Nees – 1: on decaying wood in mossy birch forest, on roof shelter. S+.

Oxystegus tenuirostris (Hook. & Taylor) A.J.E. Smith – 2, 3: on rocks and boulders on slope.

Paludella squarrosa (Hedw.) Brid. – 1: in depression of flood-land bush of *Betula fruticosa*.

Paraleucobryum longifolium (Hedw.) Loeske – 2, 3: in niches on rocks and among big boulders under rock.

Philonotis fontana (Hedw.) Brid. – 1, 3: in bush of *Betula fruticosa* along stream, on river bank. S+.

Plagiomnium cuspidatum (Hedw.) T.J. Kop. – 3: on river bank.

P. ellipticum (Brid.) T.J. Kop. – 3: on soil in flood-land willow stand.

Plagiothecium cavifolium (Brid.) Z. Iwats. – 1: in moss community along stream in forest.

P. denticulatum (Hedw.) Bruch et al. – 1: on decaying wood and on base of trunks in *Pinus sibirica* forest with herbs. S+.

P. laetum Schimp. – 1: on soil, on decaying wood and on base of trunks in *Pinus sibirica* forests. S+.

Platygyrium repens (Brid.) Bruch et al. – 3: on rocks on slope.

Pleurozium schreberi (Brid.) Mitt. – 1, 3: in *Pinus sibirica* forests, mossy birch forests, and flood-land willow stand.

Pogonatum dentatum (Brid.) Brid. – 1: on eroded soil covering upturned roots in *Pinus sibirica* forest with *Bergenia crassifolia*. S+.

Pohlia bulbifera (Warnst.) Warnst. – 1: on eroded soil covering upturned roots in *Pinus sibirica* forests and in flood-land bush of *Betula fruticosa;* in depression in forest.

P. cruda (Hedw.) Lindb. – 1, 3: on eroded soil covering upturned roots in *Pinus sibirica* forests; on eroded soil along river bank; on boulder on rocks on slope. S+.

P. drummondii (Müll. Hal.) A.L. Andrews – 1: in bush of *Betula fruticosa*.

P. elongata Hedw. – 1: on eroded soil of upturned roots in *Pinus sibirica* forest. S+.

P. longocollis (Hedw.) Lindb. – 2, 3: on boulders under rocks on slope. S+.

P. nutans (Hedw.) Lindb. – 1, 3: on eroded soil of upturned roots in *Pinus sibirica* forests; on decaying wood in *Pinus sibirica* forests; on eroded soil along river bank. S+.

**P. proligera* (Kindb.) Lindb. & Broth. – 1, 3: on eroded soil covering upturned roots in *Pinus sibirica* forest; on eroded soil along river bank and in bush along stream.

P. wahlenbergii (F. Weber & D. Mohr) A.L. Andrews – 1: in depression in *Pinus sibirica* forest.

Polytrichastrum alpinum (Hedw.) G.L. Sm. – 1: in bush of *Betula fruticosa* along stream.

P. longisetum (Sw. ex Brid.) G.L. Sm. – 1: on eroded soil in flood-land bush of *Betula fruticosa*.

Polytrichum commune Hedw. – 1, 3: on soil in *Pinus sibirica* forests, mossy birch forests and flood-land willow stands.

P. juniperinum Hedw. – 1, 3: on soil in *Pinus sibirica* forests, mossy birch forests and flood-land willow stands.

P. piliferum Hedw. – 1: on eroded soil covering upturned roots in *Pinus sibirica* forest.

P. strictum Brid. – 1: on hummock in flood-land bush of *Betula fruticosa*.

Pseudobryum cinclidioides (Huebener) T.J. Kop. – 1, 3: in depression of flood-land bush; on river bank.

Pterigynandrum filiforme Hedw. – 2: on rocks and on big boulders under rocks.

Ptilium crista-castrensis (Hedw.) De Not. – 1: on soil in *Pinus sibirica* forests and mossy birch forests.

Pylaisia polyantha (Hedw.) Bruch et al. – 1, 3: on bark in birch forests; on boulder along river bank. S+.

Rhabdoweisia crispata (Dicks. ex With.) Lindb. – 2: in niches among big boulders under rocks. S+.

Rhizomnium pseudopunctatum (Bruch & Schimp.) T.J. Kop. – 1: on brook bank. S+.

Rhodobryum ontariense (Kindb.) Kindb. – 3: on soil in flood-land willow stand.

Rhytidiadelphus triquetrus (Hedw.) Warnst. – 3: on soil in flood-land willow stands.

Rhytidium rugosum (Hedw.) Kindb. – 3: on rocks and boulders on slope.

Sanionia uncinata (Hedw.) Loeske – 1, 2, 3: on soil, decaying wood and base of trunks in *Pinus sibirica* forests, birch

forests, flood-land bush and flood-land willow stands; on river bank. S+.

Schistidium lancifolium (Kindb.) H.H. Blom – 2: on rocks and on big boulders under rocks.

S. papillosum Culm. – 1: on boulders in *Pinus sibirica* forest with herbs. S+.

S. pulchrum H.H. Blom – 2, 3: on boulders along river bank and on big boulders under rocks. S+.

S. sibiricum Ignatova & H.H. Blom – 3. On boulders along river bank. S+.

**Schistostega pennata* (Hedw.) F. Weber & D. Mohr – 1: on eroded soil covering upturned roots in *Pinus sibirica* forest with herbs.

**Sciuro-hypnum curtum* (Lindb). Ignatov – 3. On soil in flood-land willow stand.

Sphagnum angustifolium (C.E.O. Jensen ex Russow) C.E.O. Jensen – 1: on soil in mossy birch forests and flood-land bush community of *Betula fruticosa*.

**S. flexuosum* Dozy & Molk. – 1: on soil in flood-land bush of *Betula fruticosa*. S+.

S. girgensohnii Russow – 1: in forest with *Pinus sibirica* and *Larix dahurica*.

**S. russowii* Warnst. – 1: in bush of *Betula fruticosa* along stream.

S. squarrosum Crome – 1: on soil in flood-land bush community of *Betula fruticosa*.

S. teres (Schimp.) Ångstr. – 1, 3: on soil in flood-land bush community of *Betula fruticosa*; on river bank.

S. warnstorfii Russow – 1: on soil in flood-land bush of *Betula fruticosa,* in forest with *Pinus sibirica* and *Larix dahurica.*

**S. wulfianum* Girg. – 1: on soil in birch forests with moss cover, in forest with *Pinus sibirica* and *Larix dahurica*.

Stereodon holmenii (Ando) Ignatov & Ignatova – 1, 2: on decaying wood in *Pinus sibirica* forest with herbs, in niches among big boulders.

S. pallescens (Hedw.) Mitt. – 2: on boulders near cliffs. S+

Straminergon stramineum (Dicks. ex Brid.) Hedenäs – 1: in depression in flood-land bush community of *Betula fruticosa.*

Struckia enervis (Broth.) Ignatov, T.J. Kop. & D.G. Long – 3: on rocks on south-facing slope.

Syntrichia laevipila Brid. – 2: in niches among big boulders under rocks.

Tetraphis pellucida Hedw. – 1: on decaying wood and on base of trunks in *Pinus sibirica* forests. S+.

Thuidium assimile (Mitt.) A. Jaeger – 3: on soil in flood-land willow stand.

Ulota curvifolia (Wahlenb.) Lilj. – 2: on rocks. S+.

Warnstorfia exannulata (Bruch et al.) Loeske – 1: in depression in flood-land bush of *Betula fruticosa*.

W. trichophylla (Warnst.) Tuom. & T.J. Kop. – 1: in depression in *Pinus sibirica* forest.

Weissia brachycarpa (Nees & Hornsch.) Jur. – 2: in niches among big boulders under rocks. S+.

Zygodon sibiricus Ignatov, Ignatova & B.C. Tan – 2, 3: on rocks. S+.

In total, 47 species of hepatics and 126 species of mosses are revealed in Atsinsky Wildlife Sanctuary. One hepatic, *Cephaloziella divaricata* var. *asperifolia,* and 9 mosses (*Dicranella heteromalla, Herzogiella turfacea, Neckera borealis, Pohlia proligera, Schistostega pennata, Sciuro-hypnum curtum, Sphagnum flexuosum, S. russowii, S. wulfianum*) are reported for the first time for Zabaikal'sky Territory. The hepatics *Metzgeria temperata, Scapania carinthiaca*, and a moss species *Schistidium lancifolium* have mainly suboceanic distribution (Damsholt, 2002; Blom, 1996). In the continental part of Eurasia only few findings of these species in Baikal Siberia are known (Blom *et al.*, 2006; Afonina *et al.*, 2012).

Climatic conditions of the sanctuary differ greatly from other regions of the southern part of Zabaikal'sky Territory, including the nearby Sokhondinsky State Reserve. Steppe communities are not represented in the sanctuary and hence a xerophytic complex of both mosses and hepatics is absent. The latter is common in Sokhondinsky State Reserve and especially in the southeast of Zabaikal'sky Territory, where the steppe and forest-steppe communities occupy significant areas.

On the whole, though bryoflora of the sanctuary could not be revealed completely during a short-term study, its specific features were shown. *Crossogyna autumnalis, Homalia trichomanoides,* and *Orthocaulis attenuatus* characteristic species of broadleaf and dark coniferous forests, were found. Their distribution ranges extend from European Russia to Western Siberia, reach Altai Mts. and Lake Baikal, have a gap in Zabaikal'sky Territory (which is caused by the absence of suitable habitats) and continues in the Southern Russian Far East. The presence of some boreal species characteristic for mountain dark coniferous forests, the hepatics *Anastrophyllum machauxii, Crossocalyx hellerianus, Scapania carinthiaca,* and mosses *Sphagnum wulfianum, Herzogiella turfacea, Schistostega pennata,* and *Dicranella heteromalla,* is probably connected with the wide distribution of *Pinus sibirica* forests within the territory of the sanctuary.

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