

THE LIST OF MOSSES OF BOGDKHAN NATIONAL PARK (MONGOLIA)
СПИСОК МХОВ ЗАПОВЕДНИКА БОГДХАН-УЛА (МОНГОЛИЯ)

TS. TSEGMEД¹

Ц. ЦЭГМЭД¹

Abstract

Research on mosses in the Bogdkhan National Park has revealed that there are 163 species of mosses from 85 genera and 33 families, equal to 42.8% of all mosses in the mountainous regions (Khangai, Khentei and Mongolian Altai Ranges) of Mongolia. These amount to 60.6 % of overall mosses of the Khentei mountain range. The research also discovered some rare and interesting species for moss flora in Mongolia: *Polytrichum commune* var. *perigoniale*, *P. jensenii*, *Bryum alpinum*, *Dichelyma falcatum*, *Rhabdoweisia kusenevae*, *Anomodon minor*, *Weissia platyphylla*, and *Cephalocladium enerve*. The article covers a list of moss species with their ecological and distribution characters in the territory of the Bogdkhan National Park.

Резюме

В результате изучения листостебельных мхов заповедника горы Богдхан-Ула выявлено 163 вида мхов, относящихся 85 родам и 33 семействам, которые составляют 42.8% от всего состава мхов Хэнтэйского горного массива и 60.6% от всего состава мхов горных систем (Хангай, Хэнтэй и Монгольский Алтай) Монголии. В результате исследования на территории заповедника также обнаружены некоторые редкие и интересные, по распространению, виды мхов для флоры Монголии: *Polytrichum commune* var. *perigoniale*, *P. jensenii*, *Bryum alpinum*, *Dichelyma falcatum*, *Rhabdoweisia kusenevae*, *Anomodon minor*, *Weissia platyphylla* и *Cephalocladium enerve*. В статье приведен список видов мхов с указанием их экологии и распространения на территории заповедника Богдхан-Ула.

INTRODUCTION

Bogdkhan Mountain, the oldest protected area of the world, is located at 47°42'–47°54'N, 106°43'–107°13' E and is separated from the rest of the Khentei mountain range by the vast Tuul River valley.

In 1778, Bogdkhan Mountain was officially protected by the Khan and the Minister of the Ikh Huree (now Ulaanbaatar); it was registered in the Worldwide Biosphere Reserve (Ecosystems Atlas... 1998) in 1976. Since 1988, the Administration of the Bogdkhan Protected Area has been periodically taking measures to expel economic entities from the boundaries of the protected area, to identify zones, conduct surveys and encourage protection.

ENVIRONMENTS OF THE AREA

The Bogdkhan Mountain is a mountain range, cut by deep, vast valleys, occupying an area of 41 651 hectares. The highest peaks are: Tsetsee Gun, 2268 m alt.; Tushee Gun, 2256 m alt. (these are raised above the surrounding forests); Baruun Shireet, 2026 m alt., and Zuun Zhireet, 2122 m alt.

Bogdkhan is surrounded by mountain-steppe. The forest occupies 55.8% of its territory, or ca. 22900 hectares.

Similar to other mountains of Mongolia, Bogdkhan has altitudinal zonation. Large numbers of moss species grow in the mountain steppe and rocky steppe on southern slope and in rocky habitats of the summit areas, such as *Phascum cuspidatum*, *Tortula ruralis*, *Rhytidium rugosum*, *Thuidium abietinum*, *Encalypta ciliata*, *Bryum argenteum*, *Polytrichum piliferum*, *Hypnum vaucheri*, *Leptopterigynandrum austroalpinum*, *Fabronia ciliaris*, *Pseudoleskeella tectorum*, *Leskeella nervosa*, etc.

On the northern slope of Bogdkhan, the forest belts appeared above 1400 m, while on the southern slope – above 1600 m (below is steppe vegetation). In some places on the southern slope of the mountain, the steppe goes up to 1800 meters. The upper limit of forest is at about 2100-2150 meters (Tsedendash, 1997). Subtaiga forest dominates in the forest belts of Bogdkhan and is represented mainly by various herb and herb-grass forests, composed mostly by larch (*Larix sibirica* Ledeb.), and sometimes by *Betula platyphylla* Sukacz. and *Pinus sylvestris* L. (which are growing

¹ – Institute of Botany, Mongolian Academy of Sciences, Zhukov Street 7, Ulaanbaatar 51, Mongolia – Институт Ботаники АН Монголии, ул. Жукова 7, Улаанбаатар 51, Монголия

usually mixed with *Larix*). In this forest, *Rhytidium rugosum*, *Entodon concinnus*, *Thuidium abietinum*, *Dicranum brevifolium*, *D. bonjeanii*, *Brachythecium salebrosum*, *Rhodobryum roseum* etc. grow on the ground. Also, the subtaiga is rich in mosses, occurring on rotten logs (*Oncophorus wahlenbergii*, *Dicranum fragilifolium*, *Orthodicranum flagellare*, *Pohlia nutans*, *P. saprophila*, *Plagiothecium laetum* etc.), on tree trunks (*Pylaisiella polyantha*, *Cynodontium asperifolium*, *Haplocladium angustifolium*, *Orthotrichum speciosum*, etc.) and, commonly, on rocks and stones in forest (*Grimmia affinis*, *Hedwigia ciliata*, *Schistidium apocarpum*, *Orthotrichum rupestre*, *O. anomalum*, *Eurohypnum leptothallum*, *Eurhynchium pulchellum*, *Brachythecium velutinum*, *Mnium marginatum*, etc.).

Taiga forest on Bogdkhan Mountain is found in a narrow zone, mainly on the northern slopes of the mountain at 1800-2100 m alt. It is represented by moss-red bilberry (*Vaccinium vitis-idaea* L.) forests, the tree composition being: *Larix+Pinus sibirica* Du Tour., *Larix+Picea obovata* Ledeb.+*Pinus sibirica*, *Picea+Pinus sibirica*, and *Pinus sibirica*. In taiga, mosses cover no more than 30-40(-50)% of its ground (*Aulacomnium palustre*, *Hylocomnium splendens*, *Rhytidium rugosum*, *Pleurozium schreberi*, *Thuidium abietinum*, *Ptilium crista-castrensis*, *Dicranum fuscescens*, *D. scoparium*, etc.).

The upper forestless mountain belt, called in the text below as "subgoltsy", covers a small part of the Bogdkhan Mountain at 2000-2260 m alt. Wide flats in the summit area are occupied by treeless rock fields or rock fields with scattered *Pinus sibirica*, or open *Larix* and *Pinus sibirica* forests with shrubs of *Betula humilis* Schrank. and other open forest with rock fields. These areas are rich in mosses, such as *Hypnum cupressiforme*, *H. revolutum*, *Rhytidium rugosum*, *Thuidium abietinum*, *Dicranum congestum*, *D. spadiceum*, *Mnium spinosum*, *Drepanocladus uncinatus*, *Dichelyma falcatum*, *Pohlia cruda*, *Pohlia longicollis*, *Polytrichum alpinum*, *Pogonatum urnigerum*, *Distichium capillaceum*, *Hylcomium splendens*, *Ptilium crista-castrensis* etc., which grow on rocks and in the crevices of rocks. There are also sedge-shrubby and sedge swampy meadows in valleys in between rock fields and in lowest parts of the summit area. *Drepanocladus examulatus*, *D. intermedius*, *Racomitrium canascens*, *Didymodon asperifolius*, *Aulacomnium turgidum*, *A. palustre*, *Tomentypnum nitens* and also *Sphagnum squarrosum*, *S. teres*, *S. nemoreum*, *S. warnstorffii*, etc. are common in these wetland types of vegetation.

STUDIES ON MOSS FLORA OF THE AREA

Mosses make up a considerable part of the vegetation of Bogdkhan and other high mountains, but up to now they have not been studied sufficiently. An article about the mosses of Mongolia, published

in 1976 by A.A. Abramova and I. I. Abramov, included the names of twelve species of mosses collected by A.A. Yunatov and A.V. Kalinina from Bogdkhan during the period 1941-1947. This was the first report on the mosses of this mountain.

The author studied mosses of the mountain by going up the valleys of Zaisan, Tur Hurah and Zuun Bogino in 1974 and 1977, and published the results of her research in 1979. The report includes 92 species of 54 genera and 30 families. The records in the Conspect of Flora Mosses of the Mongolian National Republic (Abramova, Abramov, 1983), which was published later, contains information about the mountain, based on the above mentioned two articles.

Many years later, in 1994-1995 the author climbed up the valleys of Shashin Hurah and Zalaat to Ar Asgat, the valley of Mandshir Temple to Tsetsee Gun, from valleys Huht to Baruun Shireet and identified mosses as the part of the project "Complex Research of the Bogdkhan's Ecosystem and Its Protection". During these two years, the author collected over 700 samples of mosses, identified them and found 65 new species of mosses from 42 genera and 21 families for moss flora Bogdhan. Among them seven species were new to the Khentei mountain range. Summarizing the results of the two researches, it has been determined that there are 163 species from 85 genera and 33 families, which comprise 42.8% of the mosses of the mountainous regions (Khangai, Khentei and Mongolian Altai Ranges) of Mongolia and 60.6% of the Khentei mountain range itself.

As a result of the research on the territory of Bogdkhan National Park *Polytrichum commune* var. *perigoniale*, *Bryum alpinum*, *Dichelyma falcatum* were found for the first time in Mongolia. Some rare and interesting species, including *Polytrichum jensenii*, *Rhabdoweisia kusenevae*, *Anomodon minor*, *Weissia platyphylla* and *Cephalocladium enerve* were also discovered.

LIST OF THE MOSES OF NATIONAL PARK BOGDKHAN-UL

Specimens are deposited in bryophyte herbarium of Institute of Botany of Mongolian Academy of Sciences. Local name are shown in Fig. 1.

SPHAGNACEAE

- Sphagnum nemoreum* Scop. – In sedge-shrubby and shrubby mire. 2000-2200 m. – Tsetsee Gun.
S. oreintale L. Savicz – In *Larix+Picea* forest near streams, mire, 1950 m. – Mandshiriin hiid.
S. squarrosum Crome – In sedge mire on flat summit mountain, 2000-2200 m. – Zaisan (coll. A.A. Yunatov, 1943.VI.5), Tsetsee Gun.
S. teres (Schimp.) Aongst. – In sedge hummock mire, 2200 m. – Tsetsee Gun.

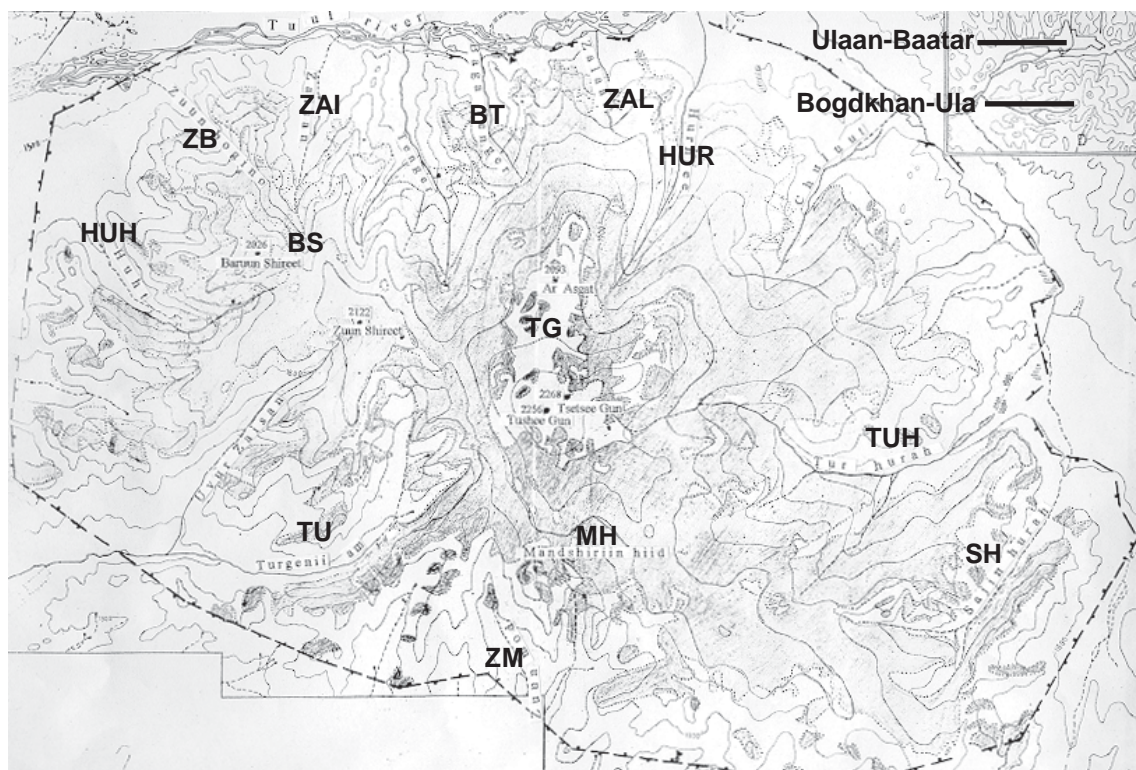


Fig.1. Sheme-map of National Park Bogdkhan-Ul. Names of localities are as follow: ZAI – Zaisan, ZB – Zuun Bogino, ZAL – Zalaat, ZM – Zuun mod; TG – Tsetsee Gun, TUR – Tur Hurah, SH – Shajin Hurah, MH – Mandshiriin hiid, BS – Baruun Shireet, HUH – Huht, HUR – Hurhree T – Turgen, BT – Baga Tenger.

S. warnstorffii Russ. – In sedge-shrubby subgoltsy, in bogs on south slope of mountain, 2200 m. – Tsetsee Gun.

ANDREAEEACEAE

Andreaea rupestris Hedw. – On rock in herb *Larix* forest, 1900 m. – Zaisan.

POLYTRICHACEAE

Pogonatum urnigerum (Hedw.) P. Beauv. – On soil, rarely in crevices of rocks in moss-herb *Larix* forest, shrubby mire in subgoltsy, on rocky peak, 1900-2268 m. – Shajin Hurah, Mandshiriin hiid, Tsetsee Gun, Tahil had.

Polytrichum alpinum Hedw. – In crevices of rocks and near rocks and stones, on soil, rarely on rotten logs, at trees bases in herb *Larix*, *Picea-Larix* forest and red bilberry-*Pinus sibirica* and *Larix-Pinus sibirica* open forest, on cliffy crests and rock fields, 1680-2268 m. – Baga Tenger (col. Ch. Dugarjav, 1974.IX.03.), Zuun Bogino, Zaisan, Shajin Hurah, Zalaat, Mandshiriin hiid, Tsetsee Gun-Tahil had, Baruun Shireet, Huht.

P. commune Hedw. var. *perigoniale* (Michx.) B.S.G. – On soil at edge of *Pinus sibirica* forest, 1950 m. – Zaisan.

P. formosum Hedw. – On soil and rocks in *Picea-Larix* open forest with moss-red bilberry, shrub-

by *Pinus sibirica* forest, rock fields in open forest, 2000-2200 m. – Shajin Hurah, Tsetsee Gun, Baruun Shireet.

P. jensenii Hag. – On soil in sedge-shrubby subgoltsy, 2200 m. – Tsetsee Gun.

P. juniperinum Hedw. – On soil in forest, on rocks and stones, rarely on rotten logs, at tree trunk in herb *Larix*, *Pinus sibirica-Larix*, red bilberry *Pinus sibirica*, *Pinus sibirica-Picea*, *Picea-Larix* forest, on cliffy crests and rock fields, 1650-2020 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Baruun Shireet.

P. longisetum Brid. (= *P. gracile* Sm.) – On soil, rocks and stones, rotten logs in moss-red bilberry *Picea-Larix*, red bilberry-*Pinus sibirica* forest, sedgy mire, sedge-shrubby subgoltsy, in middle of forest and rock fields on northern slope and on peak of mountain, 1680-2200 m. – Zaisan, Shajin Hurah, Tsetsee Gun.

P. piliferum Hedw. – On soil and rocks in *Pinus sibirica-Larix*, grass *Larix* forest, rock fields in open forest, in shaded rocks on eastern slope of mountain, 1800-2020 m. – Zaisan, Shajin Hurah.

P. strictum Sm. (= *P. alpestre* Hoppe) – On soil and rotten logs, in bogs among *Pinus sibirica-Larix* forest, in sedge-shrubby subgoltsy, open forest with

rock fields, 2000-2200 m. – Zaisan, Tsetsee Gun, Baruun Shireet.

FISSIDENTACEAE

Fissidens bryoides Hedw. – On rocks in herb *Larix*, *Betula-Picea-Larix* forest, rock fields in forest, rocky summit of mountain, 1400-1800 m. – Zuun Bogino, Zalaat, Shajin Hurah-Saran had, Mandshiriin hiid, Huht.

DITRICHACEAE

Saelania glaucescens (Hedw.) Broth. – On rocks and cliffy crests, 1800 m – Shajin Hurah.

Ceratodon purpureus (Hedw.) Brid. – On rocks and stones, on soil, rotten logs in herb *Betula* and *Larix*, moss-red bilberry *Picea-Larix* forest, shrubby *Larix* open forest, shrubby mire in subgoltsy, in rocky habitats and rock fields in summit area, 1900-2268 m. – Zaisan, (col. U. Tsogt, 1969.IX.08), Shajin Hurah, Tsetsee Gun-Tahil had, Baruun Shireet, Mandshiriin hiid, Huht.

Distichium capillaceum (Hedw.) B.S.G. – On soil near rocks, in rock crevices in herb *Larix*, *Larix-Picea* forest, in mountainous steppe, cliffy crests and rock fields on summit of mountain, 1700-2020 m. – Zaisan, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet.

DICRANACEAE

Campylopus fragilis (Brid.) B.S.G. – On soil in subgoltsy, 2200 m. – Tsetsee Gun.

Rhabdoweisia kusenevae Broth. – On rocks in *Pinus sibirica-Larix* forest, on cliffy crests, 1700-2000 m. – Zaisan, Shajin Hurah.

Cynodontium asperifolium (Arn.) Par. – On tree trunks, rotten logs, rarely on rocks in herb *Larix*, moss-red bilberry *Pinus sibirica* forest and *Pinus sibirica-Larix* open forest, on cliffy crests, 1760-2050 m. – Zaisan, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid.

Dicranoweisia crispula (Hedw.) Milde – On rock in rock field among *Betula-Picea-Larix* forest, 1700 m. – Mandshiriin hiid.

Oncophorus virens (Hedw.) Brid. – On humid soil, on rocks and stones along streams in herb-grass *Larix* forest, shrubby open forest with rock field, sedge mire in subgoltsy, 1650-2200 m. – Zaisan, Zuun Bogino, Zalaat, Tsetsee Gun.

O. wahlenbergii Brid. – On rotten logs, tree trunks, rare on soil, rocks in herb *Larix-Picea* forest, shrubby mire in subgoltsy, 1650-2200 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Tsetsee Gun.

Orthodicranum flagellare (Hedw.) Loeske – On tree trunks, on rocks and stones along streams, on rock field in northern slope of mountain, 1400-1680 m. – Zaisan, Zalaat.

Dicranum bonjeanii De Not. – On soil, rotten logs, rocks and stones in herb *Larix* and *Betula*, moss-red bilberry *Pinus sibirica*, *Picea-Larix* forest, in

rock field in open forest, 1600-2020 m. – Zaisan, Zuun Bogino, Tur Hurah, Shajin Hurah, Tsetsee Gun, Baruun Shireet.

D. brevifolium (Lindb.) Lindb. – On soil, rocks and stones, rarely on stumps and tree trunk in herb *Larix* and *Betula*, red bilberry *Pinus sibirica-Larix*, *Picea-Larix* forest, in rock field within open forest, 1650-2020 m. – Zaisan, Zuun Bogino, Tur Hurah, Shajin Hurah, Baruun Shireet.

D. congestum Brid. – On rocks, stones, rock crevices, on soil, in herb *Larix*, moss-red bilberry *Picea-Larix* forest, *Pinus sibirica-Larix* open forest, sedge mire in subgoltsy, rock field with shrubs in open forest, on cliffy crests, 1680-2268 m. – Zaisan, Zuun Bogino, Zalaat, Shajin Hurah, Mandshiriin hiid, Tsetsee Gun-Tahil had.

D. elongatum Schleich. – On soil, rotten logs in *Pinus sibirica-Larix* forest, sedge-shrubby subgoltsy, rock fields in summit area, 2050-2200 m. – Zaisan, Zalaat, Tsetsee Gun.

D. fragilifolium Lindb. – On soil, rotten logs, stumps and tree trunks in herb *Larix* and *Betula*, red bilberry *Pinus sibirica*, *Pinus sibirica-Larix* forest, 1700-2000 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah.

D. fuscescens Turn. – On soil and rocks in *Pinus sylvestris-Pinus sibirica*, herb *Larix*, *Pinus sibirica-Picea-Larix* forest and *Pinus sibirica* open forest, rock field in summit area, 1700-2020 m. – Zalaat, Huht (col. A.B. Kalinina, 1947.X.05).

D. groenlandicum Brid. – On soil, rocks and in rock crevices in *Pinus sibirica* and shrubby open forest with rock fields, in rock field in summit area, 2050-2200 m. – Zaisan, Zalaat, Tsetsee Gun.

D. muehlenbeckii B.S.G. – On soil in herb *Larix* and *Picea-Larix* forest, 1700-1800 m. – Zuun Bogino, Baga-Tenger (col. Ch. Dugarjav, 1977.VIII.29).

D. polysetum Sw. – On soil in herb *Larix* forest, rock field in summit area, 1700-2020 m. – Zuun Bogino, Zalaat.

D. scoparium Hedw. – On rotten logs and rocks in red bilberry *Pinus sibirica*, *Pinus sibirica-Picea-Larix* forest, 1800-2020 m. – Zaisan, Zalaat.

D. spadiceum Zett. – On soil in sedge shrubs and shrubby mire in subgoltsy, 2200 m. – Tsetsee Gun.

ENCALYPTACEAE

Encalypta ciliata Hedw. – Common on rocks and stones, on soil near rocks, rotten logs in herb *Betula* and *Larix*, moss-red bilberry *Pinus sibirica*, *Picea-Larix* and *Pinus sibirica-Larix* forest, on cliffy crests and rock fields in summit area, 1670-2268 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Tsetsee Gun-Tahil had, Baruun Shireet.

E. raptocarpa Schwaegr. – On rocks on cliffy crests,

- 1900 m. – Huht.
- POTTIACEAE
- Phascum cuspidatum* Hedw. – On soil in mountain steppe on northern slope of mountain, 1600 m. – Zaisan.
- Stegonia latifolia* (Schwaegr.) Vent. – On humus among rocks on rocky ridge, 1900 m. – Huht.
- Desmatodon laureri* B. S. G. – On rocks on cliffy crests, 2268 m. – Tsetsee Gun-Tahil had.
- Tortula mucronifolia* Schwaegr. – On soil, rocks and stones in herb *Larix*, *Picea-Larix* forest, rock field in forest, on cliffy crests, 1670-2268 m. – Zaisan, Shajin Hurah, Mandshiriin hiid, Tsetsee Gun-Tahil had.
- T. pagorum* Milde – On rocks in herb *Picea-Larix* forest, on rocky southern slope and on cliffy crests, 1700-1900 m. – Zalaat, Huht.
- T. princeps* De Not. – On rocks on rocky southern slope of mountain, 1800 m. – Huht.
- T. ruralis* (Hedw.) Crome – On soil and rocks in herb *Larix*, *Picea-Larix* forest, rock field in forest, sedge mire along streams in forest, rocky southern slope and rock field in summit area, 1670-2268 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Tsetsee Gun – Tahil had, Baruun Shireet.
- T. sinensis* (C. Muell.) Broth. – On rocks and stump in mountain steppe, herb *Larix* forest, among streams, rocky southern slope and on cliffy crests, 1400-1650 m. – Zaisan, Zalaat, Shajin Hurah, Huht.
- Leptodontium flexifolium* (With.) Hampe – In rock crevices on rocky southern slope of mountain, 1700 m. – Shajin Hurah.
- Oxystegus tenuirostris* (Hook et Tayl.) E. Smith. (= *O. cylindricus* (Brid.) Hilp.) – On rocks and soil in herb *Larix* forest, on cliffy crests, 1700-1900 m. – Zalaat, Zuun Bogino, Huht.
- Tortella fragilis* (Hook. et Wils.) Limpr. – On soil and rocks in herb *Larix*, *Betula*, grass *Larix-Picea-Pinus sibirica* forest, open forest with rock field, shrubby subgoltsy, on cliffy crests, 1900-2000 m. – Zaisan, Mandshiriin hiid, Huht, Baruun Shireet.
- Weisia platyphylla* Broth. – On rocks on southern slope of mountain, 1800 m. – Huht
- Didymodon acutus* (Brid.) Saito (= *Barbula acuta* (Brid.) Brid.) – On rocks in mountain steppe, *Pinus sibirica-Larix* forest, on rocky southern slope of mountain, 1900-2000 m. – Zaisan, Shajin Hurah, Baruun Shireet.
- D. asperifolius* (Mitt.) Crum et al. (= *Barbula asperifolia* Mitt.) – On rocks in shrubby *Pinus sibirica* open forest with rock field, 2000 m. – Tsetsee Gun.
- D. icmadophilus* (Schimp.) Saito (= *Barbula icmadophila* Schimp.) – On rocks in *Pinus sibirica-Larix* forest, 2020 m. – Zaisan.
- D. gaochienii* B. Tan et Y. Jia – On rocks in herb *Larix* and *Betula* forest, rock field in forest, on cliffy crests, 1700-1950 m. – Zalaat, Shajin Hurah, Mandshiriin hiid, Huht.
- D. rigidulus* Hedw. (= *B. rigidula* (Hedw.) Milde) – On humus among rocks in open forest with rock fields, 2000 m. – Baruun Shireet.
- Barbula revoluta* Brid. (= *Pseudocrossidium revolutum* (Brid.) Zander) – On soil in between rocks on cliffy cresty crest, 1900 m. – Zaisan.
- Bryoerythrophyllum recurvirostrum* (Hedw.) Chen – On rocks, stones, soil, stump in herb *Larix* and *Betula*, *Pinus sibirica-Larix*, *Picea-Larix* forest, on rocks on southern slope and on cliffy crests, rock fields in summit area, 1700-2268 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Zuun mod (col. CH. Dugarjav, 1974.IX. 04), Huht, Tsetsee Gun-Tahil had, Baruun Shireet.
- B. alpigenum* (Vent.) Chen – On rocks and stones in herb *Larix* and *Picea-Pinus sylvestris-Larix* forest, 1600-1700 m. – Zuun Bogino, Tur Hurah, Shajin Hurah, Mandshiriin hiid.
- GRIMMIACEAE
- Coscinodon cribrus* (Hedw.) Spruce – On rocks in herb-sedge *Pinus sylvestris*, *Pinus sibirica-Larix* forest, on cliffy crests and on southern slope of mountain, 1750-2000 m. – Zaisan, Zuun Bogino, Shajin Hurah, Huht.
- Schisitidium alpicola* (Hedw.) Limpr. – On rocks along streams, in *Larix* and *Pinus sibirica* forest, 1700-1900 m. – Zaisan, Zuun Bogino, Huht.
- S. apocarpum* (Hedw.) B.S.G. – Common on rocks in herb *Larix* and *Betula*, *Pinus sibirica-Larix*, *Picea-Larix* forest, along streams, rock field in forest, cliffy crests and southern slope of mountain, rock field with open forest in summit area, 1630-2020 m. – Zaisan, Zalaat, Zuun Bogino, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet.
- S. gracile* (Roehl.) Limpr. (= *S. strictum* (Turn) Mart.) – On rocks in shrubby open forest, 2000 m. – Tsetsee Gun.
- Grimmia affinis* Hornsch. – Common on rocks and stones in herb *Larix*, *Betula*, *Pinus sibirica-Larix*, *Picea-Larix* forest, rock field in forest and in summit area, on cliffy cresty crests, 1700-2200 m. – Zaisan, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Tsetsee Gun, Baruun Shireet.
- G. anodon* B.S.G. – On rocks on cliffy cresty crests, 1700 m. – Shajin Hurah.
- G. elatior* Bruch ex Bals. et De Not. – Common on rocks and stones in herb *Larix*, moss *Pinus sibirica-Picea-Larix*, *Pinus sibirica* forest, shrubby open forest, shrubby subgoltsy, rock field in forest, on cliffy cresty crests and rock field in summit area, 1680-2268 m. – Zaisan, Zuun Bogino, Zalaat, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet.

- Tsetsee Gun-Tahil had.
G. ovalis (Hedw.) Lindb. – On stones in mountain steppe, 1600 m. – Zaisan.
G. pulvinata (Hedw.) Sm. – On rocks on cliffy cresty crest, 1700 m. – Shajin Hurah.
G. tergestina Tomm. – On rocks in herb-sedge *Pinus sylvestris* forest, 1900 m. – Boginiin am.
G. unicolor Hook. – On rocks in summit area, 2000 m. – Baruun Shireet.
Racomitrium canescens (Hedw.) Brid. – On soil and rocks in sedge shrubs and sedge mire in subgoltsy, shrubby open forest with rock field, 2200 m. – Tsetsee Gun.

FUNARIACEAE

- Funaria hygrometrica* Hedw. – On soil, rotten logs, on root of trees at edge of forest, moss-red bilberry *Picea-Larix* forest, 2000-2268 m. – Zaisan, Shajin Hurah, Tsetsee Gun-Tahil had.

SPLACHNACEAE

- Tayloria acuminata* Hornsch. – On stones in herb *Larix* forest and *Pinus sibirica-Larix* open forest, edge of *Pinus sibirica* forest, 1670-2050 m. – Zaisan, Shajin Hurah.
T. splachnoides (Schwaegr.) Hook. – On root of fallen log in *Larix* forest, 1700 m. – Tur Hurah.
Tetraplodon angustatus (Hedw.) B. S. G. – On humid soil near rocks in herb *Larix, Picea-Larix* forest, 1650-1700 m. – Zalaat, Shajin Hurah.
T. mnioides Hedw. – On rocks on cliffy cresty crest, 1900 m. – Huht.
Splachnum ampullaceum Hedw. – On soil in sedge shrubs in subgoltsy, 2200 m. – Tsetsee Gun.

BRYACEAE

- Leptobryum pyriforme* (Hedw.) Wils. – On trunk, stump, humid soil among rocks in *Larix* forest, on cliffy crests, 1400-2268 m. – Zalaat, Tur Hurah, Tsetsee Gun-Tachil had.
Pohlia annotina (Hedw.) Lindb. – On rotten log in red bilberry *Pinus sibirica* forest, 2020 m. – Zaisan.
P. cruda (Hedw.) Lindb. – Common on soil, rocks and stones, rotten logs, trunks in herb *Larix, Pinus sibirica-Larix*, red bilberry *Pinus sibirica* forest, rock field in open forest at middle elevation, rock field in northern slope and in summit area, on cliffy crests and on southern slope of mountain, 1650-2268 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet, Tsetsee Gun-Tahil had.
P. longicollis (Hedw.) Lindb. – On rocks, rarely on soil in *Betula* forest with young *Pinus sibirica*, rock field in open forest, on cliffy crests and on southern slope of mountain, 1900-2268 m. – Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet, Tsetsee Gun-Tahil had.
P. nutans (Hedw.) Lindb. – On rotten logs, rocks

and stones, trunks and stumps, rarely on soil in herb *Larix*, moss-red bilberry *Picea-Larix, Larix-Picea, Pinus sibirica* forest, edge of *Pinus sibirica* forest, 1700-2000 m. – Zaisan, Zuun Bogino, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht.

- P. saprophila* (C. Muell.) Broth. – On rotten logs, trunks, stumps, rarely on soil in herb *Larix* and *Betula*, moss-red bilberry *Larix-Picea, Picea-Larix* and *Pinus sibirica* forest, rock field in open forest, 1670-2020 m. – Zaisan, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht.

Bryum alpinum Huds. – In crevices of rocks on southern slope of mountain, 1800 m. – Huht. This species for the first record of the species in Mongolia.

B. argenteum Hedw. – On rocks and on roots of trees in herb *Larix, Pinus sylvestris-Pinus sibirica-Larix* forest, on rocky southern slope, 1650-1800 m. – Zalaat, Shajin Hurah, Mandshiriin hiid, Huht.

B. capillare Hedw. – On soil and rocks in herb *Larix* forest, rock field in *Pinus sylvestris-Picea-Larix* forest, 1600-1700 m. – Zuun Bogino, Tur Hurah, Mandshiriin hiid.

B. subelegans Kindb. (= *B. laevifilum* Syed.) – On soil among stones in mountain steppe – Zaisan.

B. pseudotriquetrum (Hedw.) Schwaegr. – On soil, rocks and stones along streams, in mire, herb-grass *Larix* forest, sedge-shrubby subgoltsy, in swampy shrubs in open forest and wet soil along stream in *Larix-Picea* forest, 1700-2000 m. – Zuun Bogino, Mandshiriin hiid, Huht, Tsetsee Gun.

Rhodobryum roseum (Hedw.) Limpr. – On soil in herb *Larix* forest, 1700 m. – Zuun Bogino, Tur Hurah, Shajin Hurah.

MNIACEAE

Trachycystis ussuriensis (Maack et Regel) T. Kop. (= *M. immarginatum* Broth.) – On rocks, rarely on soil in herb *Larix* forest, *Pinus sibirica-Larix* open forest, rock field in summit area, on cliffy crests and on rocky southern slope of mountain, 1680-2268 m. – Zaisan, Zuun Bogino, Zalaat, Mandshiriin hiid, Huht, Tsetsee Gun-Tahil had.

Mnium marginatum (With.) P. Beauv. (= *M. serratum* Brid.) – On rocks in herb *Larix*, red bilberry *Pinus sibirica* forest, rock field in forest, 1650-2050 m. – Zaisan, Zuun Bogino, Shajin Hurah.

M. spinosum (Voit) Schwaegr. – On rocks and stones, soil among rocks, rarely on rotten logs in herb *Larix*, red bilberry *Pinus sibirica* forest, on cliffy crests, rock field in summit area and in forest, 1700-2268 m. – Zaisan, Zalaat, Shajin Hurah, Mandshiriin hiid, Huht, Tsetsee Gun-Tahil had.

M. thomsonii Schimp. (= *M. orthorrhynchum* Brid.) – On rocks, rarely on rotten logs in herb *Larix* forest, rock field along streams, 1680-1700 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Huht.

Plagiomnium acutum (Lindb.) T.Kop. (= *Mnium acutum* Lindb., *M. trichomanes* Mitt.) – On soil in herb-grass *Larix* forest, 1700 m. – Zuun Bogino.

P. confertidens (Lindb. et Arn.) T.Kop. (= *Mnium confertidens* (Lindb. et Arn.) Kindb.) – On soil, rocks and stones along streams near of forest, in herb *Larix*, *Pinus sibirica-Larix*, red bilberry *Pinus sibirica* forest, 1650-2000 m. – Zaisan, Zuun Bogino, Shajin Hurah, Huht.

P. cuspidatum (Hedw.) T.Kop. (= *Mnium cuspidatum* Hedw.) – On soil and rocks in herb-*Betula*, moss-grass *Pinus sibirica-Picea-Larix* forest, 1700-1900 m. – Tur Hurah, Mandshiriin hiid.

P. ellipticum (Brid.) T.Kop. (= *Mnium ellipticum* Brid., *M. rugicum* Laur.) – Common on wet soil, rarely on rocks along streams, in herb *Larix*, moss-grass *Picea-Larix* and *Pinus sibirica* forest, swampy forest, 1670-2050 m. – Zaisan, Zalaat, Zuun Bogino, Hurhree (col. Sh. Dariimaa, 1974. IX. 09), Tur Hurah, Shajin Hurah, Mandshiriin hiid, Zuun mod (col. Ch. Dugarjav, 1974. IX. 04.), Huht.

P. medium (B.S.G.) T. Kop. (= *Mnium medium* B.S.G.) – On soil in moss-grass *Larix-Picea-Pinus sibirica* forest, 1900 m. – Mandshiriin hiid.

AULACOMNIACEAE

Aulacomnium palustre (Hedw.) Schwaegr. – Usually on soil, rarely on rocks and stones, stump in herb *Larix*, red bilberry *Pinus sibirica-Larix-Picea-Pinus sibirica* forest, *Pinus sibirica-Larix* open forest, sedge mire, sedge shrubs and shrubby subgoltsy, rock field in open forest in summit area, 1700-2200 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Baruun Shireet, Tsetsee Gun.

A. turgidum (Wahlenb.) Schwaegr. – On soil in sedge-shrubby subgoltsy, rock field with open forest in summit area, 2020-2200 m. – Baruun Shireet, Tsetsee Gun.

BARTRAMIACEAE

Bartramia ithyphylla Brid. – On rocks on cliffy crests, 2020-2268 m. – Mandshiriin hiid, Tsetsee Gun-Tahil had.

TIMMIACEAE

Timmia bavarica Hessel. – On soil, rocks in herb *Larix* forest, 1700 m. – Zuun Bogino, Tur Hurah.

ORTHOTRICHACEAE

Ulota curvifolia (Wahlenb.) Lilj. – On rocks on cliffy crests, 1950-2020 m. – Shajin Hurah, Mandshiriin hiid.

Orthotrichum anomalum Hedw. – On rocks in herb *Larix*, herb-sedge *Pinus sylvestris* forest, on cliffy crests and on rocky southern slope of mountain, 1400-2000 m. – Zaisan, Zalaat, Shajin Hurah, Huht, Boginun am, Baruun Shireet.

O. rupestre Schleich. – On rocks and stones in herb

Larix, Betula forest, rock field in forest, on cliffy crests, 1650-2000 m. – Shajin Hurah, Mandshiriin hiid, Baruun Shireet.

O. speciosum Nees – On rocks, stones in herb *Larix* and *Betula*, moss-grass *Picea-Larix, Pinus sibirica-Larix* forest, rock field in forest and in summit area, on cliffy crests, 1650-2020 m. – Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht.

FONTINALACEAE

Dichelyma falcatum (Hedw.) Myr. – In shrubby subgoltsy along streams and in summit area, and on soil among rock field, 1950-2200 m. – Mandshiriin hiid, Tsetsee Gun, Baruun Shireet.

CLIMACIACEAE

Climacium dendroides (Hedw.) Web. et Mohr – On soil, rare on rocks in herb *Larix*, moss-grass *Picea-Larix, Pinus sibirica-Larix* forest, peatland in forest, sedge mire, sedge-shrubby subgoltsy, marshy among rock field with open forest, 1760-2200 m. – Zalaat, Shajin Hurah, Baruun Shireet, Tsetsee Gun.

HEDWIGIACEAE

Hedwigia ciliata (Hedw.) P. Beauv. – On rocks and stones in herb *Larix* and *Betula, Pinus sylvestris-Pinus sibirica* forest, rock fields in forest and in summit area, on cliffy crests, 1650-2200 m. – Zalaat, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet, Tsetsee Gun.

NECKERACEAE

Neckera oligocarpa Bruch – On rocks in herb *Larix, Pinus sibirica-Larix, Picea-Larix* forest, rock field in forest, on cliffy crests, 1700-2268 m. – Zaisan, Zalaat, Zuun Bogino, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Tsetsee Gun-Tahil had.

THELIACEAE

Myurella julacea (Schwaegr.) B.S.G. – On rocks in sedge mire in subgoltsy, 2200 m. – Tsetsee Gun.

FABRONIACEAE

Cephalocladium nerve (Broth.) A.Abr. et I. Abr. – On rocks in rock field on northern slope of mountain, 1680 m. – Zaisan.

Fabronia ciliaris (Brid.) Brid. – On rocks in herb *Larix* forest, on cliffy crests and on southern slope of mountain, 1650-2000 m. – Shajin Hurah, Huht, Baruun Shireet.

LESKEACEAE

Leskeella nervosa (Brid.) Loeske var. *rigidula* (Kindb.) Podp. – On rocks and stones along streams, in herb *Larix* and *Betula, Larix-Pinus sibirica* forest, rock field in *Pinus sibirica-Larix* forest, on cliffy crests, 1700-2000 m. – Zaisan, Zuun Bogino, Mandshiriin hiid, Huht, Baruun Shireet.

Pseudoleskeella tectorum (Funk) Lindb. – On rocks in *Larix* forest, 1700 m. – Tur Hurah.

THUIDIACEAE

- Leptopterigynandrum austro-alpinum* C. Muell. – On rocks and stones along streams, in herb *Larix*, *Picea-Larix* forest, rock field in forest, on cliffy crests and on southern slope of mountain, 1400-2000 m. – Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet,
- Anomodon minor* (Hedw.) Fuernr. – In rock crevices on cliffy crests and on southern slope of mountain, 1400 m. – Shajin Hurah.
- Haplocladium angustifolium* (Hampe) Broth. – On stump in herb *Betula* forest, 1900m. – Huht.
- Thuidium abietinum* (Hedw.) B. S. G. – On soil, rotten logs, rocks and stones in different types of forest, rock fields within open forest, on cliffy crests, 1400-2200 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet.
- T. philibertii* Limpr. – On soil, rocks, stones, and stumps in marshy, herb *Larix*, red bilberry *Pinus sibirica*, *Picea-Larix*, *Larix-Picea-Pinus sibirica* and *Pinus sibirica-Larix* forest, on cliffy crests, 1670-2000 m.-Zaisan, Zuun Bogino, Zalaat, Shajin Hurah, Mandshiriin hiid, Zuun mod. (Ch. Dugarjav, 1974. IX. 04).
- Helodium paludosum* (Web. et Mohr) Warnst. – On wet soil, in sedge mire and sedge-shrubby subgoltsy, 2200 m. – Tsetsee Gun.

CRATONEURACEAE

- Cratoneurum filicinum* (Hedw.) Spruce – In water and rotten log along streams, in herb *Larix* forest, 1700 m. – Zuun Bogino, Huht.

AMBLYSTEGIACEAE

- Campylium sommerfeltii* (Myr.) J. Lange – On rocks in herb *Larix* forest, 1700 m. – Zuun Bogino.
- C. stellatum* (Hedw.) J. Lange – On soil and rocks in sedge mire and sedge swampy subgoltsy, 2200 m. – Tsetsee Gun.
- Leptodictyum kochii* (B.S.G.) Warnst. – On soil in herb *Larix* forest, 1700 m. – Zuun Bogino.
- Amblystegium juratzkanum* Schimp. – On rocks and stones, rotten logs along streams, at edge of forest, herb *Larix* forest, rocky gorge, 1600-1700 m. – Zuun Bogino, Shajin Hurah-Saran had.
- A. serpens* (Hedw.) B.S.G. – On soil, rocks and stones in herb *Larix* forest, on cliffy crests, 1700-2020 m. – Shajin Hurah, Mandshiriin hiid.
- Drepanocladus aduncus* (Hedw.) Moenk. – On wet soil, in marshy *Pinus sibirica-Larix* forest, sedge mire in forest, rock field within open forest, 1900-2020 m. – Zaisan, Baruun Shireet.
- D. exannulatus* (B.S.G.) Warnst. – In mire in sedge shrubs and sedge subgoltsy, 2200 m. – Tsetsee Gun.
- D. intermedius* (Lindb.) Warnst. – On soil in sedge and shrubby subgoltsy, 2200 m. – Tsetsee Gun.
- D. sendtneri* (Schimp.) Warnst. – On wet soil near

rocks on cliffy crests, 1900 m. – Mandshiriin hiid.

- D. uncinatus* (Hedw.) Warnst. – Common on the ground in forest, marshy, wet soil on river banks, wet rocks and stones, rarely on rotten logs, stump in herb *Larix*, *Larix-Picea*, red bilberry *Pinus sibirica*, *Larix-Picea-Pinus sibirica* and *Pinus sibirica-Larix* forest, shrubby open forest, sedge mire, sedge-shrubby subgoltsy, rock field with open forest, on cliffy crests, 1670-2200 m. – Zaisan, Baga-Tenger (Ch. Dugarjav, 1974. IX. 03.), Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Tsetsee Gun, Baruun Shireet.
- D. vernicosus* (Lindb.) Warnst. – On soil in sedge-shrubby subgoltsy, 2200 m. – Tsetsee Gun.
- Hygrohypnum luridum* (Hedw.) Jenn. – On rocks and stones along stream, 1600 m. – Huht.
- H. ochraceum* (Wils.) Loeske – On rock and stones in water and on wet soil along streams, 1670-1700 m. – Zaisan, Zuun Bogino.
- H. polare* (Lindb.) Loeske – On wet soil, rock and stones in water streams in forest, 1670-1700 m. – Zaisan, Zuun Bogino, Huht.
- Calliergon cordifolium* (Hedw.) Kindb. – In mire among rock field in shrubby open forest, sedge mire in summit area, 2050-2200 m. – Shajin Hurah, Tsetsee Gun.
- C. stramineum* (Brid.) Kindb. – In mire and sedge-shrubby subgoltsy, 2200 m. -Tsetsee Gun.

BRACHYTHECIACEAE

- Tomentypnum nitens* (Hedw.) Loeske – On wet soil, in sedgy-shrubby mire and sedgy subgoltsy, 2200 m. – Tsetsee Gun.
- Brachythecium albicans* (Hedw.) B.S.G. – On soil in *Pinus sylvestris-Pinus sibirica* forest. – Huht (col. A.B. Kalinina, 1947.X.05).
- B. salebrosum* (Web. et Mohr) B.S.G. – On rocks, stones, rotten logs and soil in herb *Larix* and *Betula*, moss-red bilberry *Picea-Larix-Pinus sibirica* and *Pinus sibirica-Larix* forest, edge of forest, rock field with open forest, cliffy crests, southern slope of mountain, 1700-2050 m. – Zaisan, Zalaat, Tur Hurah, Shajin Hurah, Huht, Baruun Shireet.
- B. rotaeantum* De Not. (= *B. salebrosum* var. *capilla-ceum* Web. et Mohr.) – On stones along streams, 1400 m. – Zalaat.
- B. velutinum* (Hedw.) B.S.G. – On rocks, stones, in crevices of rocks, stumps along streams, on cliffy crests, 1400-2020 m. – Zalaat, Shajin Hurah, Tsetsee Gun-Tahil had.
- Cirriphyllum cirrosum* (Schwaegr.) Grout. var. *molendoi* (Schimp.) Limpr. – On rocks in herb *Larix* forest, 1700 m. – Zuun Bogino, Shajin Hurah.
- Myuroclada maximoviczii* (Borszcz.) Steere et Schof. – On rocks along streams, in herb *Larix* forest, on cliffy crests, 1400-1800 m. – Zuun Bogino, Zalaat, Shajin Hurah.
- Eurhynchium pulchellum* (Hedw.) Jenn. – On soil,

on rocks and stones in herb *Larix*, *Pinus sylvestris*-*Pinus sibirica* forest, 1700-1760 m. – Zalaat, Huht (col. A.B. Kalinina, 1947. X. 05.).

ENTODONTACEAE

Entodon concinnus (De Not.) Par. – Common on soil, rarely also on rocks and stones in herb *Larix*, *Picea-Larix*, *Larix-Picea-Pinus sibirica* and *Pinus sylvestris-Pinus sibirica* forest, on cliffy crests, 1400-2268 m. – Zaisan, Zalaat, Baga-Tenger (col. Ch. Dugarjav, 1974. IX. 03.), Zuun Bogino, Hurhree (col. Sh. Dariimaa, 1974. IX. 05), Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Tsetsee Gun-Tahil had.

E. schleicheri (Schimp.) Demet. – On soil in grass *Larix* forest, 1700 m. – Zuun Bogino.

Pleurozium schreberi (Brid.) Mitt. – On soil, rotten logs in herb *Larix*, *Pinus sibirica-Larix* forest, 1700-2000 m. – Zaisan, Zuun Bogino, Huht (col. A.B. Kalinina, 1947. X. 05).

Pterigynandrum filiforme Hedw. – On rotten log and on rocks in red bilberry *Pinus sibirica* forest, on cliffy crests, 2020 m. – Zaisan, Mandshiriin hiid.

PLAGIOTHECIAEAE

Isopterygium pulchellum (Hedw.) Jaeg. – On rotten logs, rocks and stones in herb *Larix*, red bilberry *Pinus sibirica*, *Pinus sibirica-Larix* forest, rock field in forest and in summit area, on cliffy crests, 1670-2268 m. – Zaisan, Zalaat, Shajin Hurah, Mandshiriin hiid, Huht, Tsetsee Gun-Tahil had.

Plagiothecium denticulatum (Hedw.) B.S.G. – On rocks and in hollow of rocks in shrubby mire in subgoltsy, on cliffy crests, 2020-2200 m. – Mandshiriin hiid, Tsetsee Gun.

P. laetum B.S.G. – On rotten log, stump in herb *Larix*, red bilberry *Pinus sibirica* forest, 1700-2020 m. – Zaisan, Tur Hurah.

HYPNACEAE

Pylaisiella polyantha (Hedw.) Grout – Usually on rotten logs, tree trunks, rarely on rocks and stones along streams, in mountain steppe, common in herb *Larix* and *Betula* forest, edge of forest, rock field in forest, *Pinus sibirica-Larix* open forest and rock fields in summit area, 1400-2200 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, shajin Hurah, Mandshiriin hiid, Huht.

Homomallum incurvatum (Brid.) Loeske – in *Larix* forest on northern slope of mountain. – Zaisan ? (col. B. Shubert, 1966. VII. 04).

Eurohypnum leptothallum (C.Muell.) Ando (= *Hypnum leptothallum* (C. Muell.) Par.) – On rocks and stones, on soil of rocks in mountain steppe, herb *Larix* forest, rock field in forest, on cliffy crests and on southern slope of mountain, 1650-1800 m. – Zaisan, Shajin Hurah, Mandshiriin hiid, Huht.

Hypnum cupressiforme Hedw. – Common on soil, rocks and stones, rarely on rotten logs in herb *Larix*, *Pinus sibirica-Larix*, *Picea-Larix* and *Picea* forest, rock field in forest and in summit area, on cliffy crests and on southern slope of mountain, 1400-2200 m. – Zaisan, Zuun Bogino, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Huht, Baruun Shireet, Tsetsee Gun-Tahil had.

H. revolutum Mitt. – On rocks, in crevices of rocks in rock field, on cliffy crests, shrubby mire in subgoltsy, rock field in open forest on summit of mountain, 2020-2268 m. – Zalaat, Tsetsee Gun-Tahil had.

H. vaucheri Lesq. – On rocks, in crevices of rocks in mountain steppe, rock field in forest, cliffy crests and on southern slope of mountain, 1800-1900 m. – Zaisan, Mandshiriin hiid, Huht.

H. lindbergii Mitt. – On soil in sedgy-shrubby subgoltsy, 2200 m. – Tsetsee Gun.

Ptilium crista-castrensis (Hedw.) De Not. – On soil, rotten logs, on rocks and stones in herb *Larix*, *Pinus sibirica-Larix* forest, rock field on northern slope and on cliffy crests, 1680-2050 m. – Zaisan, Zuun Bogino, Huht.

RHYTIDIACEAE

Rhytidium rugosum (Hedw.) Kindb. – On soil, rocks and stones, on tree trunks, in mountain steppe, herb *Larix*, moss-grass *Picea-Pinus sibirica* and *Pinus sibirica-Larix*, *Larix-Picea-Pinus sibirica*, red bilberry *Pinus sibirica* forest, shrubby mire in subgoltsy, rock field with open forest, rock field in forest and in summit area, on cliffy crests and on southern slope of mountain, 1670-2268 m. – Zaisan, Zalaat, Tur Hurah, Shajin Hurah, Mandshiriin hiid, Turgen, Huht, Baruun Shireet, Tsetsee Gun-Tahil had.

HYLOCOMIACEAE

Hylocomium splendens (Hedw.) B.S.G. – On soil and rocks in *Larix-Picea-Pinus sibirica*, red bilberry *Pinus sibirica* forest, on cliffy crests, 1800-2268 m. – Mandshiriin hiid, Turgen, Tsetsee Gun-Tahil had.

LITERATURE CITED

[ABRAMOVA, A.L. & I.I. ABRAMOV] АБРАМОВА, А.Л., И. И. АБРАМОВ 1976. Материалы флоры мхов Монголии. – [On the moss flora of Mongolia] *Новости сис. низш. раст.* [Novosti Sist. Nizsh. Rast.] **13**: 193-208.

[ABRAMOVA, A.L. & I. I. ABRAMOV] АБРАМОВА А.Л., И. И. АБРАМОВ 1983. Конспект флоры мхов Монголькой Народной Республики. – [Conspectus of moss flora of Mongolian People Republic] *Л., Наука* [Lenungrad, Nauka], 222 pp.

ECOSYSTEMS ATLAS OF BOGDKHAN MOUNTAIN
1998. *Ulaanbaatar*, 40 pp.

[TSEDENDASH, G.] ЦЭДЭНДАШ, Г. 1997. Изучение леса
горы Богдхан-Ула. – [Study of the forest of Bogdkhan-
Ula] *В кн.: Экоцистем горы Богдхан-Ула, Улаанбаатар*

[In: *Ecosystem Bogdkhan mountain, Ulaanbaatar*] 24-27.

[TSEGMED, TS.] ЦЭГМЭД, Ц. 1979. К бриофлоре горы
Богд-Ула. – [On the bryoflora of Bogdo-Ula moun-
tain] *Тр. Ин-та Ботаники АН МНР [Trudy Inst. Bot.
Akd. Nauk Mongolskoi Narodnoi Respubliki]* 5: 172-
189.