

CONTRIBUTION TO THE HEPATIC FLORA OF MONGOLIA. 3
ДОПОЛНЕНИЕ К ФЛОРЕ ПЕЧЕНОЧНЫХ МХОВ МОНГОЛИИ. 3

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Abstract

In the course of identification of Mongolian hepatic collections about 100 specimens were studied and 51 hepatic species were revealed. Among them 15 species are new for the hepatic flora of Mongolia: *Cephaloziella varians*, *Chiloscyphus polyanthos*, *Conocephalum conicum*, *Crossocalyx hellerianus*, *Crossogyna autumnalis*, *Frullania sinensis*, *Hattoriella morrisoncola*, *Jungermannia exsertifolia*, *J. cf. polaris*, *Lophozia silvicola*, *Lophoziopsis polaris*, *Marsupella emarginata*, *Pellia neesiana*, *Scapania crassiretis*, and *S. subalpina*.

Резюме

Продолжена обработка ранее собранных печеночных мхов Монголии. В результате определения около 100 образцов выявлен 51 вид. Из них следующие 15 видов оказались новыми для флоры печеночников Монголии: *Cephaloziella varians*, *Chiloscyphus polyanthos*, *Conocephalum conicum*, *Crossocalyx hellerianus*, *Crossogyna autumnalis*, *Frullania sinensis*, *Hattoriella morrisoncola*, *Jungermannia exsertifolia*, *J. cf. polaris*, *Lophozia silvicola*, *Lophoziopsis polaris*, *Marsupella emarginata*, *Pellia neesiana*, *Scapania crassiretis*, *S. subalpina*.

KEYWORDS: hepatics, flora, Mongolia.

INTRODUCTION

In the course of collecting of bryophytes in Mongolia by the second author and other collectors during last three decades both mosses and liverworts were gathered. The results of identification of mosses were summarized and published by Tsegmed, while rather numerous hepatic collections remained unattended for a long time. Since 2011, some Mongolian liverwort specimens were identified and these materials were published (Tsegmed et al., 2012; Tsegmed & Bai X.-L., 2013).

An additional portion of previously collected specimens were identified by the first author. Most of these collections were made in 1980-1990 by the second author, mainly from Khangai and Khentei floristic regions (see Grubov, 1955). Some samples collected by G. Tsedendash during his study of Mongolian forests, few specimens of E. Enkhjargal from Hubsugul Lake area and several specimens of other collectors were also included in the current study.

About 100 hepatic specimens were studied, 51 species were identified. Among them 15 species are newly reported for the hepatic flora of Mongolia. This fact reflects an insufficient knowledge of Mongolian liverwort flora.

Nomenclature of hepatics in the list follows Konstantinova, Bakalin et al. (2009). Following abbreviations

are used: ant. – antheridia, arch. – archegonia, per. – perianths, gemm. – gemmae. In case if collection was made by Ts. Tsegmed, only Herbarium number is indicated; in other cases collector's name is provided.

Species new for Mongolia are marked with asterisk.

Specimens are deposited in the Herbarium of Institute of botany, Ulaanbaatar, Mongolia, duplicates in LE.

ANNOTATED LIST OF SPECIES

MARCHANTIACEAE

Marchantia polymorpha L. subsp. *ruderalis* Bischl. & Boissel.-Dub. (gemm.) – **Khangai**: Bulgan aimag, Teshig sum, range Khantai, basin of Tarbagatai River, 1420 m, *Vaccinium vitis-idea-herb-Larix* forest, on soil, 18.VII.1987, # 9890, coll. G. Tsedendash; **Khentei**: Selenge aimag, Khuder sum, NW Khentei, upper course of Khuder River, Khertsiiin-gol River, along river, on moist soil, 18.VI.1987, # 9850, coll. G. Tsedendash; same aimag, Eroo sum, Bugantai River, 1000 m, along river on moist soil, 14.VI.1987, # 9822, coll. G. Tsedendash; same aimag, Zuun Kharaa sum, north edge of range Mungulug, Yalbaga River, 1000 m, along river on moist soil, 23.VI.1986, # 9596, coll. G. Tsedendash; Tuv aimag, Mungunmorit sum, East Khentei, Zuun Burkhiin gol River, shrubs-*Betula* swampy forest, in water, 9.VIII.1990, # 10339.

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AUTONIACEAE

Mannia fragrans (Balb.) Frye & L. Clark – **Mongol Daur.**: Khentei aimag, Zhargaltkhan sum, SE basin of Kerulen River, mountain 31 km SE from sum centre, herb-grass stony steppe, on soil, 7.VII.1979, # 6162; **Middle Khalha**: Uburkhangai aimag, Bayan-Undur sum, in 30 km to SW from Bayan-Undur sum, rocky hill among rocky steppe, in crevices of rock, 29.VI.1984, # 8231.

Reboulia hemisphaerica (L.) Raddi – **Khangai**: Bulgan aimag, Khyalganat sum, Khantai Range, east tributary of Khartsain gol River, 1050 m, pine forest, on soil, 7.VII.1986, # 9650 coll. G. Tsedendash; **Khentei**: Tuv aimag, Erdene sum, East Khentei, locality Gorkhi, mountain Chingis, *Betula-Larix* forest on northern slope of mountain, on rock, 21.VIII.1982, # 8202; **East Mongol**: Dornod aimag, Ereentsav sum, north outskirts of mountain Khyh Uul, granite outcrops, 24.VIII.1985, # 9734, coll. R.V. Kamelin.

CLEVEACEAE

Athalamia hyalina (Sommerf.) S. Hatt. – **Mongol Altai**: Gobi Altai aimag, Tonkhil sum, main range Mongol Altai, pass Derstiin davaa, rocky field along dry stream bed, 2.VIII.1984, # 9343.

CONOCEPHALACEAE

***Conocephalum conicum** (L.) Dumort. s. str. – **Mongol Altai**: Bayan Ulgii aimag, Kara-Tyr (black Kobdo), forest near lake, 1.VIII.1908, coll. V. Sapojnikov.

TARGONIACEAE

Targionia hypophylla L. – **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, 1530 m, near river, on rock, 16.VI.1989, # 10094.

PELLIACEAE

***Pellia neesiana** (Gottsche) Limpr. – **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, along stream Kheremt, 1400 m, on rock, 30.VI.1980, # 7036.

ANEURACEAE

Riccardia palmata (Hedw.) Carruth. – **Khangai**: Bulgan aimag, Khyalganat sum, range Buteeliin nuruu, upper course of Shavart River, grass-herb-*Larix* forest with *Betula*, on rotten log, 29.VII.1991, # 10574.

METZEGIARACEAE

Apometzgeria pubescens (Schrank) Kuwah. – **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, along stream Kheremt, moss-*Vaccinium vitis-idea-Pinus sibirica* forest with fir, 1400 m, on rock, 29.VI.1980, # 6951.

RADULACEAE

Radula complanata (L.) Dumort. – **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, along stream Kheremt, moss-*Vaccinium vitis-idea-Pinus sibirica* forest with fir, 1400 m, on rock, 29.VI.1980, # 6951.

PORELLACEAE

Porella platyphylla (L.) Pfeiff. – **Khangai**: Arkhangai aimag, Tariat sum, lake Terkhiin Tsagaan nuur, Volcanic plateau Khorgo, 2090 m, on rock, 23.VI.1977, # 3125; Bulgan aimag, Khutag sum, mouth of Itaid River,

herb-*Larix* forest, on rock, 4.VIII.1974, # 1767; same aimag, Gurvanbulag sum, south slope of mountain Khugne Khan, *Betula* forest on NW slope spurs of mountain, on rock, 23.IX.1975, ## 2891, 2916.

FRULLANACEAE

Frullania inflata Gottsche – **Mongol Daur.**: Khentei aimag, Zhargaltkhan sum, basin of Kerulen River, mountain in 31 km to SE from the sum centre by highway to Undurkhan, herb-grass rocky steppe, 7.VII.1979, # 6170; same aimag, Dadal sum, range Ereen davaa, up to on Dadal from Norovlin sum, pine forest, on rock, 10.VII.1979, # 6289; **Middle Khalha**: Khentei aimag, Kerulen sum, in 34 km from Undurkhan up to on Norovlin sum, herb dry steppe on hill, on rock, 8.VII.1979, # 6210; **Prikhyangan**: Dornod aimag, Sumber sum, mountain Numrug, along Numrug River, on soil, 18.VIII.2008, coll. A.A. Korobkov.

F. parvistipula Steph. – **Khangai**: Bulgan aimag, Gurvanbulag sum, south slope of mountain Khugne Khan, *Betula* forest on NW slope spurs of mountain, on rock, 23.IX.1975, # 2893.

***F. sinensis** Steph. – **Prikhyangan**: Dornod aimag, Sumber sum, mountain Numrug, along Numrug River, on soil, 18.VIII.2008, coll. A.A. Korobkov.

PTILIDIACEAE

Ptilidium ciliare (L.) Hampe – **Khentei**: environs Ulaanbaatar, mountain Bogdkhan uul, valley Zalaat, 1400 m, herb-*Larix* forest, on soil, 9.VII.1994, # 11374; Tuv aimag, Mungunmorit sum, East Khentei, Baruun Burkh River, *Vaccinium vitis-idea-moss-Larix-Pinus sibirica* forest, on soil, 13.VIII.1990, # 10439; Selenge aimag, Zuun Kharaa sum, northern edge range Mungulug, Yalbaga River, 1200 m, grass-moss-*Vaccinium vitis-idea-Larix* forest, on soil, 24.VI.1986, # 9611, coll. G. Tsedendash; **Mongol Daur.**: Selenge aimag, Shaamar sum, mountain Delgerkhan, boulders on northern slope of mountain, on rock, 3.VIII.1979, # 6793; Khentei aimag, Binder sum, low hills in 10 km to east from Binder sum up to Batshireet, grass-herb-*Larix* forest with *Betula*, on soil, 13.VII.1979, # 6357.

P. pulcherrimum (Weber) Vain. – **Khentei**: Selenge aimag, Eroo sum, NW Khentei, Bugantai River, 1000 m, along river, on moist soil, 14.VI.1987, # 9846, coll. G. Tsedendash; Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, along stream Kheremt, 1630 m, moss-herb-fir forest with *Betula*, on soil, 27.VI.1980, # 6882, same place, herb-*Betula-Larix* forest, on tree trunk, 27.VI.1980, # 6918.

PSEUDOLEPICOLEACEAE

Blepharostoma trichophyllum (L.) Dumort. – **Prikhubsugul**: Khubsugul aimag, Renchinlchumbe sum, hollow Darkhad, mountain Bugatyn Tsookhor, *Larix*-fir shrubby forest, on soil, 14.VII.2006 # 715, coll. E. Enkhjargal; **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, along stream Kheremt, 1600 m, moss-herb-*Betula* forest with *Larix*, on rotten log, 29.VI.1980, # 6902; same West Khentei, Bayangol Riv-

er, along river, on moist soil, and rocky ledge in edge of forest, on rocky, 3.VII.1980, # 7241; same aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 1800 m, *Larix-Pinus sibirica* forest, on rock, 16.VI.1989, # 10136.

LEPIDOZIACEAE

Lepidozia reptans (L.) Dumort. – **Khangai**: Bulgan aimag, Khyalganat sum, range Buteeliin nuruu, upper course of Orookh River, grass-herb-*Larix* forest with *Betula*, on rotten log, 29.VII.1991, ## 10574, 10615; **Khentei**: Tuv aimag, Batsumber sum, West Khentei, river Sugnugur, along stream Kheremt, 1600 m, moss-herb-*Larix* forest with *Betula*, on rotten log, 29.VI.1980, # 6929; same aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 1740 m, moss-*Larix-Pinus sibirica* forest, on trunk of trees, 16.VI.1989, # 10118.

LOPHOCOLEACEAE

Chiloscyphus pallescens (Ehrh. ex Hoffm.) Dumort. var. *pallescens* – **Khentei**: Selenge aimag, Eroo sum, NW Khentei, Bugantai River, 1000 m, along river, on moist soil, 14.VI.1987, # 9833, coll. G. Tsedendash.

C. polyanthos* (L.) Corda var. *polyanthos* – **Khentei: Tuv aimag, Batsumber sum, West Khentei, Bayangol River, willows along river, on willow trunk, 3.VII.1980, # 7176.

Lophocolea minor Nees (gemm.) – **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, along stream Kheremt, 1600 m, moss-*Vaccinium vitis-idea-Pinus sibirica* forest with fir, on rock, 29.VI.1980, # 6950.

PLAGIOCHILACEAE

Plagiochila porelloides (Torr. ex Nees) Lindenb. – **Khangai**: Zabkhan aimag, Aldarkhan sum, northern slope mountain Ogtontenger, upper course of Bogd gol River, 2660 m, lichen-moss shrubs with *Larix*, on rock, 7.VII.1974, # 1255; **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 1800 m, moss-*Larix-Pinus sibirica* forest, on rock, 16.VI.1989, # 10136; same aimag, Batsumber sum, West Khentei, Bayangol River, herb-*Betula-Larix* forest, on rock, 3.VII.1980, # 7250.

CEPHALOZIACEAE

Cephaloziella hampeana (Nees) Schiffn. (ant., arch., autoecious) – **Mongol Altai**: Bayan Ulgii aimag, Kara-Tyr (black Kobdo), forest near lake, on *Sphagnum* turf, 1.VIII.1908, coll. V. Sapojnikov.

C. varians* (Gottsche) Steph – **Khentei: Tuv aimag, Mungunmorit sum, East Khentei, Zuun Burkhiin gol River, shrub-*Betula* swampy forest, in water, 9.VII.1990, # 10339.

ANASTROPHYLLACEAE

Barbilophozia barbata (Schmidel ex Schreb.) Loeske – **Prikhubsugul**: Khubsugul aimag, Tsagaan Uur sum, Uuriin gol River, shrubby swamp near river, on trunk of tree, 6.VIII.1987, # 9925, coll. G. Tsedendash; **Khangai**: Zabkhan aimag, Tosontsengel sum, northern slope

range Tarbagatai, mountain Nalchgar, near stream, in swamp, 22.VIII.1978, # 5819; Bulgan aimag, Teshig sum, pass Bayasgalan, 1500 m, herb *Betula-Larix* forest, on soil, 14.VII.1986, # 9662, coll. G. Tsedendash; Arkhangai aimag, Erdene-Mandal sum, northern slope of mountain Khan-Undur, 2260 m, moss-grass-*Larix* forest with *Pinus sibirica*, on soil, 10.VII.1974, # 1953; Bulgan aimag, Khyalganat sum, range Buteeliin nuruu, upper course of Zelter River, stream Khutsuun, 1300 m, herb-*Larix* forest with *Betula*, on soil, 6.VII.1987, ## 9888, 9889, coll. G. Tsedendash; same sum, range Khantai, basin rivet Khartsain gol, 1350 m, sedge-herb-*Larix* forest, on soil, 8.VII.1987, # 9653, coll. G. Tsedendash; **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, along stream Kheremt, 1600 m, moss-*Vaccinium vitis-idea-Larix* forest with *Betula*, on soil, 29.VI.1980, # 6915; environs Ulaanbaatar, mountain Bogdkhan uul, valley Tur Khurakh, *Larix* forest, on rock, 9.IX.1974, # 2459; same mountain, valley Zuun Bogino, herb-grass-*Larix* forest, on soil and on rock, 9.IX.1974, ## 2369, 2381, 23848; Tuv aimag, Mungunmorit sum, East Khentei, Zuun Burkhiin gol River, moss-*Vaccinium vitis-idea-Larix* forest, on trunk of tree, 13.VIII.1990, # 10409; **Mongol Daur**: Selenge aimag, Shaamar sum, mountain Delgerkhan, shrub-*Vaccinium vitis-idea-Pinus sylvestris-Pinus sibirica-Larix* forest, on rock, 3.VIII.1979, # 6787; Tuv aimag, Bornuur sum, locality Dugan Khad, Pine-Betula-*Larix* forest, on rotten log, 29.VIII.1973, # 843.

B. hatcheri (A.Evans) Loeske (gemm.) – **Khovd**: Uvs aimag, Khovd sum, range Kharkhiraa, mountain Umnu-Otor uul, Granit Rocky massive, on rock, 29.VII.1977, # 4556; **Mongol Altai**: Bayan Ulgii aimag, Sagsai sum, lake Dayan nuur, mountain Sugsai, valley Khuiten salaa, 2450 m, on rock, 26.VII.1977, ## 4428, 4429; **Khangai**: Zabkhan aimag, Tosontsengel sum, range Tarbagatai, valley Ubur Shibertei, mountain Nalchgar, swampy place near river, 22.VIII.1978, # 5819; **Khentei**: Tuv aimag, Mungunmorit sum, East Khentei, upper course of Baruun Burk River, *Vaccinium vitis-idea-moss-Larix-Pinus sibirica* forest, on rock, 17.VIII.1990, # 10479.

B. lycopodioides (Wallr.) Loeske – **Khangai**: Zabkhan aimag, Tosontsengel sum, range Tarbagatai, valley Ubur Shibertei, mountain Nalchgar, shrub-moss-*Larix* forest, on soil, 22.VIII.1978, # 5929; **Mongol Daur**: Selenge aimag, Shaamar sum, mountain Delgerkhan uul, boulders on northern slope of mountain, in crevices of rock, 3.VIII.1979, # 6793.

Crossocalyx hellerianus* (Nees ex Lindenb.) Meyl. (per.) – **Khangai: Bulgan aimag, Khyalganat sum, range Buteeliin nuruu, northern slope pass Shavart, upper course of Orookh River, grass-herb-*Larix* forest with *Betula*, on rotten log, 29.VII.1991, # 10574.

Sphenolobus saxicola (Schrad.) Steph. – **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, shrubby valley, boulders among forest, on rock, 15.VI.1989, # 10071; same place, summit mountain Ouyut, 2300 m, rocky cliff, on rock, 16.VI.1989, # 10218;

same aimag, Mungunmorit sum, East Khentei, rivet Baruun Burkh, *Vaccinium vitis-idea*-moss-*Larix-Pinus sibirica* forest, on rock, 17.VIII.1990, # 1049.

SCAPANIACEAE

Lophozia silvicola* H. Buch (gemm.) – **Prikhubsugul: Khubsugul aimag, Ulaan Uul sum, hollow Darkhad, Middle Taiga, mountain Temeen Chuluut, 2462 m, *Pinus sibirica-Larix* shrubby forest, on rock, 13.VI.2008, # 2484, coll. E. Enkhjargal; **Khangai**: Zabkhan aimag, Tosontsengel sum, range Tarbagatai, valley Ubur Shiberterei, mountain Nalchgar, shrubby-moss-*Larix* rarely forest, on soil, 22.VIII.1978, # 5929; Arkhangai aimag, Tuvshruuleh sum, Khuh Sum River valley, 2000 m, moss-*Vaccinium vitis-idea-Larix-Pinus sibirica* forest, 26.VI.1978, # 5334; **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 1740 m, moss-*Larix-Pinus sibirica*-silver fir forest, on stump, 16.VI.1989, # 10118.

Lophozia longidens (Lindenb.) Konstant. et Vilnet – **Prikhubsugul**: Khubsugul aimag, Tsagaan Nuur sum, hollow Darkhad, West Taiga, mountain Bor Khoeg uul, 2500 m, *Betula-Pinus sibirica-Larix* forest, on trunk of tree, 29.VI.2007, # 1383, coll. E. Enkhjargal.

L. polaris* (R.M.S chust.) Konstant. & Vilnet (gemm.) – **Khentei: Tuv aimag, Batsumber sum, West Khentei, Bayangol River, foot of mountain, boulders near swamp of stream, 6.VII.1980, # 7351; same aimag, Mungunmorit sum, East Khentei, upper course of Baruun Burkh River, *Vaccinium vitis-idea*-moss-*Larix-Pinus sibirica* forest, on soil, 17.VIII.1990, # 10448; **Mongol Altai**: Bayan Ulgii aimag, Kara-Tyr (black Kobdo), Forest near lake, 1.VIII.1908, coll. V. Sapojnikov.

L. propagulifera (Gottsche) Konstant. & Vilnet (gemm.) – **Prikhubsugul**: Khubsugul aimag, Renchinlkhumbe sum, hollow Darkhad, mountain Khar Murugu uul, locality Ulaan Shoroot, *Betula-Larix* forest, on rotten log, 21.VI.2006, # 372, coll. E. Enkhjargal.

Scapania cuspiduligera (Nees.) Müll. Frib. – **Mongol Altai**: Khovd aimag, Uench sum, range Shaazgaityn nuruu, mountain Atsag, 3150 m, sedges, on soil, 23.VII.1984, # 9116.

S. crassiretis* Bryhn – **Khentei: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 2250 m, shrubby tundra, on rock and summit of mountain, 2290 m, on rock, 16.VI.1989, ## 10198, 10209.

S. degenii Schiffn. ex Müll. Frib. – **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Bayangol River, shrubby swamp along river, on trunk of shrub, 23.VII.1980, # 7176; same aimag, Mungunmorit sum, East Khentei, upper course of Baruun Burkh River, swamp near river, on soil, 17.VIII.1990, # 10533.

S. irrigua (Nees) Nees – **Khangai**: Zabkhan aimag, Zhargalant sum, range Tarbagatai, pass Solongot, Deed Tsatsukhei River, 2370 m, moss-*Larix* forest, on moist soil near river, 24.VI.1977, # 3310; **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii,

1500 m, moss-*Vaccinium vitis-idea-Larix*-pine forest, on soil, 14.VI.1989, # 10007; same place, southern slope of mountain Ouyut, 1800 m, *Larix-Pinus sibirica* forest, on rock, 16.VI.1989, # 10136; Tuv aimag, Mungunmorit sum, East Khentei, upper course of Baruun Burkh River, *Vaccinium vitis-idea*-moss-*Larix-Pinus sibirica* forest, on soil, 17.VIII.1990, # 10448.

S. mucronata H. Buch (gemm.) – **Khangai**: Arkhangai aimag, Erdene-Mandal sum, southern slope of mountain Khan-Undur, Larix forest, on rotten log, 9.VIII.1974, # 1862; same aimag, Tuvshruuleh sum, Khuh Sum River valley, 2000 m, moss-*Vaccinium vitis-idea-Larix-Pinus sibirica* forest, on soil, 26.VI.1978, # 5351; **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Bayangol River, foot of mountain, rocky cliff near swamp along river, 5.VII.1980, # 7326, 7370; same place, shrubby swamp along river, on moist soil, on rock, 23.VII.1980, # 7197, 7241; environs Ulaanbaatar, mountain Bogdkhan uul, valley Zalaat, 1400 m, herb-*Larix* forest, on moist soil, 9.VII.1994, # 11374.

S. parvifolia Warnst. – **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 2250 m, shrubby tundra, on rock, 16.VI.1989, # 10198.

S. subalpina* (Nees ex Lindenb.) Dumort. – **Khentei: Selenge aimag, Eroo sum, WE Khentei, Bugantai River, 1000 m, along river, on moist soil, 14.VI.1987, # 9847, coll. G. Tsedendash; Tuv aimag, Batsumber sum, West Khentei, upper course of Sugnugur River, along stream Kheremt, 1400 m, along river, on moist soil and on rock, 30.VI.1980, ## 6982, 7028, 7036.

Schistochilopsis incisa (Schrad.) Konstant. – **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, shrubby swamp near streams, 1430 m, 15.VI.1989, # 10019; same aimag Mungunmorit sum, East Khentei, upper course of Baruun Burkh River, in swamp near river, 17.VIII.1990, # 10533; same sum, Zuun Burkh River, swampy shrub-*Larix* forest, in water, 9.VIII.1990, # 10339.

S. opacifolia (Culm. ex Meyl.) Konstant. – **Prikhubsugul**: Khubsugul aimag, Renchinlkhumbe sum, range Khoridol Saridag, mountain Bugatyn Tsookhor, *Larix*-shrub-fir open forest, mossy swamp, 14.VII.2006, # 716, coll. E. Enkhjargal.

Tritomaria exsecta (Schmidel) Loeske (gemm.) – **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 1740 m, moss *Larix-Pinus sibirica*-silver fir forest, on trunks of trees, 16.VI.1989, # 10118; same place, 1800 m, *Larix-Pinus sibirica* forest, on rock, 16.VI.1989, ## 10133, 10134, same place summit mountain Ouyut, 2300 m, rocky cliff, on rock, 16.VI.1989, # 10218.

T. exsectiformis (Bredl.) Loeske (gemm.) – **Khangai**: Arkhangai aimag, Tuvshruulekh sum, Khuh Sum River valley, moss-*Vaccinium vitis-idea-Larix-Pinus sibirica* forest, on rotten log, 26.VI.1978, # 5334; **Khentei**: Tuv aimag, Eroo sum, WN Khentei, Bugantai River, 1000

m, along river, on rotten log, 14.VI.1987, ## 9841, 9844; Tuv aimag, West Khentei, Bayangol River, shrubs along river, on moist soil, 3.VII.1980, # 7198.

T. quinquedentata (Huds.) H. Buch – **Prikhubsugul.**: Khubsugul aimag, Renchinlkhumbе sum, hollow Darkhad locality Ulaan Shoroot, near river, *Larix-Pinus sibirica* forest, on stone, 24.VI.2007, # 930, coll. E. Enkhjargal; same aimag, Chandmana-Undur sum, northern slope of mountain Atsan Zurkh uul, Bugat River, herb-*Vaccinium vitis-idea-Larix* forest, 28.VII.1986, # 9679, coll. G. Tsedendash; **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, 1550 m, boulders among forest, on rock, 15.VI.1989, # 10073; same aimag Batsumber sum, West Khentei, Sugnugur River, upper part of mountain, 1800 m, boulders, on rock, 29.VI.1980, # 6960; same place, upper course of Bayangol River, southern slope of mountain, boulders, on rock, 3.VII.1980, # 7370.

JUNGERMANNIACEAE

***Crossogyna autumnalis** (DC.) Schljakov – **Khentei**: Selenge aimag, Eroo sum, NW Khentei, rivet Bugant, 1000 m, along river, on rotten log, 14.VI.1987, # 9841, coll. G. Tsedebdash; same sum, northern slope mountain Khalzan uul, upper course of Bugant River, goltsy, *Vaccinium vitis-idea-Pinus sibirica* forest, on rotten log, 2.VII.1986, # 9628, coll. G. Tsedebdash; Tuv aimag, Batsumber sum, West Khentei, Sugnugur River, stream Kheremt, grass-herb-*Betula-Larix* forest, on rotten log, 29.VI.1980, # 6929.

***Jungermannia exsertifolia** Steph. (per., ant., dioecious) – **Khangai**: Zabkhan aimag, Tosontsengel sum, northern slope range Tarbagatai, valley Ubur Shibertei, mountain Nalchgar, in swamp near river, 22.VIII.1980, # 5839.

***J. cf. polaris** Lindb. (ant., per., paroecious) – **Prikhubsugul.**: Khubsugul aimag, Renchinlkhumbе sum, range Khoridol Saridag, mountain Khar Zurkh uul, fir-*Pinus sibirica-Larix* forest with rock-fields, in crevices of rock, 15.VII.2006, # 812, coll. E. Enkhjargal.

***Hattoriella morrisoncola** (Horik.) Bakalin – **Prikhubsugul.**: Khubsugul aimag, Ulaan Uul sum, Hol-low Darkhad, hulastai River valley, stream Bakhtakh, *Larix-fir* forest, on soil, 26.VI.2008, # 2243, coll. E. Enkhjargal.

Leiocolea badensis (Gottsche) Jørg. (ant.) – **Prikhubsugul.**: Khubsugul aimag, Renchinlkhumbе sum, range Khoridol Saridag, mountain Khonog Tsol uul, valley Deed Khonog Tsol, along river, on soil, 7.VII.2006, # 1534, coll. E. Enkhjargal;

L. heterocolpos (Thed. ex C.Hartm.) H. Buch – **Prikhubsugul.**: Khubsugul aimag, Renchinlkhumbе sum, range Khoridol Saridag, mountain Bugatyn Tsookhor, *Larix-fir* shrubby forest, mossy swamp, 14.VII.2006, # 716, coll. E. Enkhjargal; **Khentei**: Tuv aimag, Batsumber sum, West Khentei, Bayangol River, foot of mountain, rocky cliff near swamp along river, 5.VII.1980, ## 7326, 7351, 7370.

GYMNOMITRIACEAE

Gymnomitrium coralloides Nees – **Prikhubsugul.**: Khubsugul aimag, Ulaan Uul sum, Hollow Darkhad, mountain Khusht Zurkh Uul, upper course Baruum Ukhert, 2460 m, rocky summit of mountain, under rock, 9.VI.2009, # 2445, coll. E. Enkhjargal.

***Marsupella emarginata** (Ehrh.) Dumort. – **Khentei**: Tuv aimag, Erdene sum, North Khentei, medical spring Estii, southern slope of mountain Ouyut, 2250 m, shrubby tundra, on rock, 16.VI.1989, # 10198.

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