

## Contribution to the Knowledge of Liverworts (Hepaticae) of the Soviet Central Asia (East Sayan Mts., Baikal Lake)

JIRÍ VÁŇA

During the last several years the author had the opportunity to study several collections of liverworts collected in the East Sayan mountain range as well as around the Baikal Lake. The collections in question are these by Z. Soldán from the southern and southwestern part of Baikal Lake collected in 1980, the author's own collections of the southwestern part of Baikal Lake collected in 1982, two specimens collected by Z. Černý in the same area in 1983 and the collection of J. Piňosová and J. Klimeš from the Baikalski Khrebet ridge collected in 1986. The author found the most interesting material collected in the surroundings of the Baikal Lake as well as in the East Sayan mountain range in the herbarium of the Hattori Botanical Laboratory during his visit in 1983. The specimens were collected by L. V. Bardunov and several other botanists and only a small number of them (belonging mainly to the genus *Frullania*) were determined by S. Hattori.

Whereas the moss flora from the Altai — Sayan region as well as from the environs of the Baikal Lake is relatively well known, thanks to the studies of L. V. Bardunov, the present information on the liverwort flora in the above regions is quite insufficient.

The demonstrably first researcher collecting bryophytes in the Altai — Sayan region was I. M. Martyanov (1882). In the study mentioned, which the author unfortunately was not able to obtain, Martyanov mentions reportedly two liverwort species (apart from 53 species of mosses) collected in the Minusinskaya basin (western part of Western Sayan). On the basis of Martyanov's collections deposited in Stockholm (S) Arnell described (1898) three new taxa, viz.: *Frullania jackii* var. *rotundata* (Minusinsk) which belongs to the species *F. davurica*, further *Mastigophora flagellaris* (Tiberkul in East Sayan) synonymized already by Stephani (1906—1909) with the species *Bazzania bidentula* and finally *Cephalozia* (*Cephaloziella*) *parvifolia* (Tiberkul in East Sayan) a sofar unclear taxon (herbarium specimen is missing in both S and UPS).

Another collector who gathered liverworts in the southeastern part of East

Sayan Mts. was A. A. Elenkin. He himself (Elenkin 1902) published only the reports of the species *Marchantia polymorpha* and *Conocephalum conicum* from the locality Nylova Pustyn. Most of his findings were nevertheless published as later as 1931 by Brotherus and Savich. Among Elenkin's collections 104 moss and unfortunately only 10 liverwort species were found, viz.: *Gymnomitrium corallioides* (Kosogol, nowadays Chubsugul in Mongolia), *Frullania dilatata* (Tunkin), *Marchantia polymorpha*, *Apometzgeria pubescens*, *Tritomaria exsectiformis*, *Tritomaria quinquedentata*, *Barbilophozia barbata*, *Plagiochila asplenioides*, *Ptilidium ciliare* and *Frullania jackii* (= *F. davurica*; all from the Nylova Pustyn).

In the Western Sayan in the surroundings of Krasnoyarsk H. Printz (1914), a member of one of the expeditions, collected plants at the beginning of this century. The collections of bryophytes got lost during transportation to Europe, yet numerous bryophytes were isolated by Kaalaas (1918) from the roots of vascular plants collected by Printz. Among them were also 8 liverwort species (*Jungermannia obovata*, *Anastrophyllum minutum*, *Barbilophozia lycopodioides*, *Cephalozia bicuspidata*, *Cladopodiella fluitans*, *Ptilidium ciliare*, *Scapania irrigua*, *Scapania curta*).

Until mid-twentieth century no new data on bryophytes were recorded from the region. There appear only a few isolated data in a phytocenological studies, all concerning solely mosses. Only V. I. Smirnov (1935), who worked in the environs of the Arshan spa in the Tunkin basin reports the species *Ricciocarpus natans*.

The knowledge of the bryophytes from both Sayans was summarized by L. I. Savich-Lyubitskaya (1961). On the basis of literature data altogether 21 liverwort species have been published from the Sayan area so far; of these 14 from the Eastern Sayan (for comparison: 155 moss species, of the 115 from Eastern Sayan). The author reports in the above paper the collections of a group of tourists on their way to the Ergak-Torgan-Taiga range (A. Kashirin, V. Serenkov, A. Krivchikov and V. Lizunova) as well as the collections of an expedition undertaken in 1948—1949 by V. I. Komarov Botanical Institute of the Academy of Sciences of the U.S.S.R. (Al. A. Fedorova, An. A. Fedorova, L. L. Nikitina, P. K. Krasilnikov). The collections of the above tourist group contained only one liverwort species (*Barbilophozia lycopodioides*), the collections of the botanical expedition contained 8 species 3 of which (*Reboulia hemisphaerica*, *Anastrophyllum saxicola* and *Tetralophozia setiformis*) have not yet been reported from the region. The total number of liverwort species known from the Sayan region thus reached 24, which is evidently a clear proof of very insufficient knowledge of the area. Unfortunately, investigation of the liverwort flora in the Sayans has not shown any signs of progress.

The environments of the Baikal Lake are still less investigated from the point of view of liverwort flora than the Sayan region. Bardunov (1961) mentions only two workers of the Eastern Branch of the Siberian Division of the Academy of Sciences of the U.S.S.R. who paid attention to liverworts within the framework of their studies. L. N. Tyulina investigated geobotanically the northern part of Baikal, especially the area of the Barguzinski Zapovednik reserve. The manuscript „Spisok mchov i pechenochnikov“ (List of mosses and liverworts) within the Barguzinski Zapovednik reserve remained unpublished. L. I. Malyshev (1956) mentions also bryophytes within the report on his thesis „Flora of Northern Baikal“ (in Russian). Yet, both authors reported only the most common species with typological importance. Unfortunately, the studies of both authors remain unavailable.

In the following survey the author gives all liverworts presently known to him from the Eastern and Western Sayans and the surroundings of the Baikal Lake. As the literature sources (not only the manuscripts) are very often inaccessible the list cannot be considered as 100 % complete. The author does not even dare to determine how many species are new for the area (the number of these species is very high). The objective of this paper is only to publish the data received and thus contribute to the knowledge of liverworts of the above regions and somewhat fill in the gaps in the knowledge of the distribution of liverworts in Central Asia. In the preceding paper (Váňa and Soldán 1987) a detailed study was submitted of 16 phytogeographically significant taxa of hepatics.

Localities of the collections by L. V. Bardunov and coworkers are given practically completely, those of the other collectors from the environs of the Baikal Lake are mentioned in an abbreviated form. Detailed localities, together with the map of the region, can be found in a parallel study on Baikal mosses by Soldán and Pujmanová (1988). Herbarium specimens are deposited as follows: L. V. Bardunov et al. (NICH), Z. Soldán (herb. Soldán), J. Váňa (herb. Váňa), Z. Černý (herb. Váňa), J. Piňosová and L. Klimeš (BRNM). The author is indebted to Dr. S. Hattori (NICH), Dr. I. Novotný (BRNM) and Dr. Z. Soldán for their kindly supporting the material and to Dr. S. Hattori (Nichinan) for the determination of the *Frullania*, *Porella* and some other species, as well as to Dr. J. Duda, CSc. (Opava) for the determination of the *Scapania* and *Cephaloziella* species.

List of species:

- Anastrophyllum hellerianum** (Nees) Schust.: Baikal: Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa; Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.  
**Anastrophyllum minutum** (Schreb.) Schust.: Kaalaas (1918), Savich-Lyubitskaya (1961). E.

- Sayan: Urik river, in the middle part, 1000—1500 m, 3., 5. and 11. VIII. 1959 L. V. Bardunov; Tunkinski khrebet ridge, Ulabor, 1500 m, 1. VIII. 1960 L. V. Bardunov; near the lake Kutyr-go-Khol, 1650 m, 28. VI. 1961 L. V. Bardunov; Bolshoi Shibit river, 2100 m, 29. VI. 1961 L. V. Bardunov; near the pass Kadyr-Oruk, 1800 m, 21. VII. 1961 L. V. Bardunov. Baikal: Teplye ozera base, 900 m, 8. VII. 1980 Z. Soldán; Bukhta Peschanaya bay, 650—900 m, 13. and 15. VIII. 1980 Z. Soldán; Baikalski khrebet ridge, 1370—2115 m, 23., 25. and 28. VII. 1986 J. Piňosová and L. Klimeš.
- Anastrophyllum saxicola** (Schrad.) Schust.: Savich-Lyubitskaya (1961). E. Sayan: Erma river, in the middle part (the basin of the river Belaya), 900 m, 15. VI. 1959 L. V. Bardunov. Baikal: Teplye ozera base, 900 m, 8. VIII. 1980 Z. Soldán; Bukhta Peschanaya bay, 650—900 m, 13. and 15. VII. 1980 Z. Soldán; Baikalski khrebet ridge, 1660 m, 25. VII. 1986 J. Piňosová and L. Klimeš.
- Anthelia julacea** (L.) Dum.: Baikal: Polovinka river, 1800 m, 27. VIII. 1958 L. V. Bardunov and S. Popova.
- Anthelia juratzkana** (Limpr.) Trev.: E. Sayan: Uda river, in the upper part, 1700—1900 m, 4. and 21. VIII. 1961 L. V. Bardunov.
- Apometzgeria pubescens** (Schrank) Kuwah.: Brotherus and Savich (1931). Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa.
- Barbilophozia attenuata** (Mart.) Loeske: Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Barbilophozia barbata** (Schmid. ex Schreb.) Loeske: Brotherus and Savich (1931), Savich-Lyubitskaya (1961). E. Sayan: Urik river, in the middle part near the mouth of the river Zegengol, 900 m, 19. VIII. 1959 N. Vyssokovski; Uda river, in the upper part near the mouth of the river Khangorok, 1100 m, 1. VIII. 1961 L. V. Bardunov; near the village Alygdger, 900 m, 6. VIII. 1961 L. V. Bardunov. Baikal: Slyudyanka river, 600—700 m, 7. VIII. 1980 Z. Soldán; Bolshaya Kadilnaya valley, 550 m, 19. VIII. 1982 J. Váňa; Baikalski khrebet ridge, 1460 m, 25. VII. 1986 J. Piňosová and L. Klimeš.
- Barbilophozia floerkei** (Web. et Mohr) Loeske: Tyulina (1976).
- Barbilophozia hatcheri** (Evans) Loeske: Baikal: Polovinka river, 500 m, 24. VII. 1958 L. V. Bardunov and S. Popova; Slyudyanka river, 600—700 m, 7. VII. 1980 Z. Soldán; Baikalski khrebet ridge, 1360—1370 m, 25. and 28. VII. 1986 J. Piňosová and L. Klimeš.
- Barbilophozia kunzeana** (Hueb.) K. Müll.: E. Sayan: Tunkinski khrebet ridge, Ulabor, 2300 m, 1. VII. 1960 L. V. Bardunov, det. S. Hattori.
- Barbilophozia lycopodioides** (Wallr.) Loeske: Kaalaas (1918), Savich-Lyubitskaya (1961), Tyulina (1976). Baikal: Baikalski khrebet ridge, 850 m, 28. VII. 1986 J. Piňosová and L. Klimeš.
- Bazzania bidentula** (Steph.) Steph.: Arnell (1898), Váňa and Soldán (1987).
- Blasia pusilla** L.: E. Sayan: Uda river, in the upper part, 900 m, 9. VIII. 1961 L. V. Bardunov.
- Blepharostoma trichophyllum** (L.) Dum.: E. Sayan: Uda river in the upper part, Uda's tributary Bolshoi Khangorok, 1900 m, 25. VII. 1961 L. V. Bardunov; Uda river, in the upper part, 1750—1900 m, 4., 12. and 21. VIII. 1961 L. V. Bardunov; Tchelo-Mongo river (the tributary of the river Uda), 1800 m, 16. VIII. 1961 L. V. Bardunov. Baikal: Teplye ozera base, 900 m, 8. VII. 1980 Z. Soldán; Utulik river, 490 m, 9. and 10. VII. 1980 Z. Soldán; Baikalski khrebet ridge, 850 m, 28. VII. 1986 J. Piňosová and L. Klimeš.
- Calypogeia intergristipula** Steph.: Baikal: Telegrafnyi kap cape, 11. IX. 1957 L. V. Bardunov; Teplye ozera base, 900 m, 8. VII. 1980 Z. Soldán; Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Calypogeia suecica** (H. Arnell et J. Perss.) K. Müll.: Váňa and Soldán (1987).
- Cephalozia ambigua** Mass.: Tyulina (1976).

- Cephalozia bicuspidata** (L.) Dum.: Kaalaas (1918). E. Sayan: Uda river, in the upper part, 1750 m, 21. VIII. 1961 L. V. Bardunov, Baikal: Baikalski khrebet ridge, 1440—2115 m, 23. and 25. VII. 1986 J. Piňosová and L. Klimeš.
- Cephalozia leucantha** Spruce: Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Cephalozia lunulifolia** (Dum.) Dum. E. Sayan: Badar river, low part (basin of the river Belaya), 600 m, 12. VI. 1959 L. V. Bardunov; near the lake Mety-Khol, 1650 m, 3. VII. 1961 L. V. Bardunov; Uda river, in the upper part, Uda's tributary Bolshoi Khangorok, 1900 m, 25. VIII. 1961 L. V. Bardunov. Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Cephalozia pleniceps** (Aust.) Lindb.: Baikal: Polovinka river, 500 m, 22. VII. 1958 L. V. Bardunov and S. Popova.
- Cephaloziella divaricata** (Sm.) Schiffn. var. *scabra* (M. A. Howe) S. Arnell: Váňa and Soldán (1987).
- Cephaloziella elegans** (Heeg) Schiffn.: Baikal: Bolshie Koty village, 600—700, 16. VIII. 1982 J. Váňa, det. J. Duda.
- Cephaloziella hampeana** (Nees) Schiffn.: Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa, det. J. Duda.
- Cephaloziella** (sub *Cephalozia*) *parvifolia* H. W. Arnell: Arnell (1898).
- Cladopodiella fluitans** (Nees) Buch: Kaalaas (1918).
- Conocephalum conicum** (L.) Lindb.: Elenkin (1902), Savich-Lyubitskaya (1961).
- Diplophyllum taxifolium** (Wahlenb.) Dum.: Baikal: Teplye ozera base, 900 m, 8. VII. 1980 Z. Soldán; Baikalski khrebet ridge, 850 m, 28. VII. 1986 J. Piňosová and L. Klimeš.
- Frullania bolanderi** Aust.: Váňa and Soldán (1987).
- Frullania davurica** Hampe: Arnell (1898) sub *F. jackii* var. *rotundata*, Brotherus and Savich (1931) sub *F. jackii*. E. Sayan: Urik river, 800—1000 m, 29. VII. and 6. VIII. 1959 L. V. Bardunov, det. S. Hattori; near the village Turan (the river Irkut), Nylova Pustyn, 900 m, 15. VII. 1960 L. V. Bardunov, det. S. Hattori. Baikal: Bolshaya Kadilnaya valley, 550 m, 19. VIII. 1982 J. Váňa, det. S. Hattori.
- Frullania dilatata** (L.) Dum.: Brotherus and Savich (1931).
- Frullania inflata** Gott.: Váňa and Soldán (1987).
- Frullania kopenhagenii** Hatt.: Váňa and Soldán (1987).
- Frullania muscicola** Steph.: Váňa and Soldán (1987).
- Frullania parvistipula** Steph.: Váňa and Soldán (1987).
- Gymnomitrion concinatum** (Lightf.) Corda: E. Sayan: Tunkinski khrebet ridge, Ulabor, 1900—2200 m, 25. VI. and 1. VII. 1960 L. V. Bardunov; Bolshoi Shibit river, in the middle part, 2100 m, 29. VI. 1961 L. V. Bardunov; near the pass Kadyr-Oruk, 1800 m, 21. VII. 1961 L. V. Bardunov; Uda river, in the upper part, Uda's tributary Bolshoi Khangorok, 2000 m, 26. VII. 1961 L. V. Bardunov. Baikal: Polovinka river, 500 m, 26. VII. 1958 L. V. Bardunov and S. Popova.
- Gymnomitrion coralloides** Nees: Brotherus and Savich (1931). E. Sayan: Tunkinski khrebet ridge, Ulabor, 2100—2300 m, 26. VI. and 1. VII. 1960 L. V. Bardunov and I. Ivanova.
- Harpanthus flotovianus** (Nees) Nees: Tyulina (1976).
- Herbertus aduncus** (Dicks.) S. F. Gray: Váňa and Soldán (1987).
- Jamesoniella autumnalis** (DC.) Steph.: Baikal: Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa; Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Jungermannia obovata** Nees: Kaalaas (1918).

- Jungermannia subelliptica** (Lindb. ex Kaal.) Lev.: Baikal: Utulik river, 490 m, 9. VII. 1980 Z. Soldán.
- Lepidozia reptans** (L.) Dum: E. Sayan: Badar river, low part (basin of the river Belaya), 600 m, 12. VI. 1959 L. V. Bardunov; Uda river, in the upper part, 1150 m, 1. VIII. 1961 L. V. Bardunov. Baikal: Polovinka river, 500 m, 24. VII. 1958 L. V. Bardunov and S. Popova; Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa; Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Lophocolea heterophylla** (Schrad.) Dum.: Baikal: Telegrafnyi kap cape, 11. IX. 1957 L. V. Bardunov; Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa; Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Lophozia ascendens** (Warnst.) Schust.: Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Lophozia bicrenata** (Schmid. ex Hoffm.) Dum.: Baikal: Baikalski khrebet ridge, 2120 m, 23. VII. 1986 J. Piňosová and L. Klimeš.
- Lophozia excisa** (Dicks.) Dum.: Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa.
- Lophozia heterocolpos** (Thed.) M. A. Howe: Baikal: Utulik river, 490 m, 9. and 10. VII. 1980 Z. Soldán.
- Lophozia incisa** (Schrad.) Dum.: E. Sayan: near the lake Kutyrgo-Khol, 1650 m, 28. VI. 1961 L. V. Bardunov; Uda river, in the upper part, Uda's tributary Bolshoi Khangorok, 1900 m, 25. VII. 1961 L. V. Bardunov.
- Lophozia longiflora** (Nees) Schiffn.: E. Sayan: Belaya river, near the mouth of the river Urik, 12. VI. 1959 L. V. Bardunov; near the lake Mety-Khol, 1650 m, 3. VII. 1961 L. V. Bardunov. Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa; Baikalski khrebet ridge, 1440—1660 m, 25. VII. 1986 J. Piňosová and L. Klimeš.
- Lophozia sudetica** (Nees) Grolle: Baikal: Baikalski khrebet ridge, 2115 m, 23. VII. 1986 J. Piňosová and L. Klimeš.
- Lophozia ventricosa** (Dicks.) Dum.: E. Sayan: near the lake Mety-Khol, 1700 m, 3. VII. 1961 L. V. Bardunov. Baikal: Teplye ozera base, 900 m, 8. VII. 1980 Z. Soldán.
- Lophozia wenzelii** (Nees) Steph.: Tyulina (1976). E. Sayan: Uda river, in the upper part, Uda's tributary Bolshoi Khangorok, 1900 m, 25. VII. 1961 L. V. Bardunov. Baikal: Polovinka river, 1800 m, 27. VIII. 1958 L. V. Bardunov and S. Popova; Baikalski khrebet ridge, 1660—1935 m, 23. and 25. VII. 1986 J. Piňosová and L. Klimeš.
- Macrodiplophyllum microdontum** (Mitt.) H. Perss.: Váňa and Soldán (1987).
- Mannia pilosa** (Hornem.) Frye et Clark: E. Sayan: Erma river, in the middle part, 750 m, 18. VI. 1959 L. V. Bardunov; Kara-Buren river in the middle part (basin of the river Uda), 1000 m, 7. VII. 1961 L. V. Bardunov. Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa; Chernaya valley, 540 m, 17. VIII. 1982 J. Váňa; Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa.
- Marchantia polymorpha** L.: Elenkin (1902), Brotherus and Savich (1931). Baikal: Utulik river, 490 m, 9. and 10. VII. 1980 Z. Soldán; Chernaya valley, 540 m, 17. VIII. 1982 J. Váňa.
- Marsupella adusta** (Nees emend. Limpr.) Spruce: Tyulina (1976).
- Marsupella emarginata** (Ehrh.) Dum.: E. Sayan: Urik river, in the middle part, 800—1000 m, 6. and 20. VIII. 1959 L. V. Bardunov; Tunkinski khrebet ridge, Ulabor, 2000—3000 m, 1. VII. 1960 L. V. Bardunov; near the lake Mety-Khol, 2000 m, 3. VII. 1961 L. V. Bardunov; Uda river in the upper part, 1750 m, 22. VIII. 1961 L. V. Bardunov. Baikal: Polovinka river, 500 m, 26. VII. 1958 L. V. Bardunov and S. Popova, 1800 m, 27. VIII. 1958 A. Resnenko; Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa; Bialski khrebet ridge, 2115 m, 23. VII. 1986 J. Piňosová and L. Klimeš.

- Marsupella revoluta** (Nees) Dum.: E. Sayan: Tunkinski khrebet ridge, Ulabor, 2200 m, 1. VII. 1960 L. V. Bardunov; Bolshoi Khangorok river, in the upper part (basin of the river Uda), 2100 m, 26. VIII. 1961 L. V. Bardunov.
- Mesoptychia sahlbergii** (Lindb. et H. Arnell) Evans: Váňa and Soldán (1987).
- Mylia taylorii** (Hook.) S. Gray: E. Sayan: Erminski Sphil khrebet ridge, 2000 m, 21. VI. 1959 L. V. Bardunov; Bolshoi Shibit river, in the upper part, 1800 m, 30. VI. 1961 L. V. Bardunov; near the pass Kadyr-Oruk, 1800 m, 21. VII. 1961 L. V. Bardunov. Baikal: Bolshaya Bystraya valley, 23. IX. 1954 L. Malyshev; Polovinka river, 500 m, 22. VII. 1958 L. V. Bardunov and S. Popova; Slyudyanka river, 16. VI. 1962 M. Ivanova.
- Odontoschisma denudatum** (Nees) Dum.: E. Sayan: Tunkinski khrebet ridge, Ulabor, 20. VI. 1957 N. Missyura.
- Pellia epiphylla** (L.) Corda: Baikal: Baikalski khrebet ridge, 1440 m, 25. VII. 1986 J. Piňosová and L. Klimeš.
- Plagioclada porelloides** (Torrey ex Nees) Lindenb.: Brotherus and Savich (1931) sub *P. asplenoides*. E. Sayan: Erma river (basin of the river Belaya), 700 m, 13. and 18. VI. 1959 L. V. Bardunov; Khobol stream (the tributary of the river Irkut), 1000 m, 22. VI. 1960 L. V. Bardunov. Baikal: Bolshaya Bystraya valley, 23. IX. 1954 L. Malyshev; Bukhta Peschanaya bay, 650—900 m, 13. and 15. VII. 1980 Z. Soldán; Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa.
- Pleurocladula albescens** (Hook.) Grolle: Baikal: Polovinka river, 1800 m, 27. VIII. 1958 L. V. Bardunov and S. Popova; Baikalski khrebet ridge, 850 m, 28. VII. 1986 J. Piňosová and L. Klimeš.
- Porella gracillima** Mitt.: Váňa and Soldán (1987) without localities data. E. Sayan: Urik river, 800—1000 m, 29. VII. and 6. VIII. 1959 L. V. Bardunov, det. S. Hattori; near the village Turan (the river Irkut), Nylova Pustyn, 900 m, 15. VII. 1960 L. V. Bardunov, det. S. Hattori; Kara-Buren river (basin of the river Uda), 1000 m, 8. VII. 1961 L. V. Bardunov, det. S. Hattori; Uda river, near the village Alygdger, 900 m, 5. IX. 1961 L. V. Bardunov, det. S. Hattori. Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa, det. S. Hattori; Bolshaya Kadilnaya valley, 550 m, 19. VIII. 1982 J. Váňa, det. S. Hattori.
- Porella platyphylla** (L.) Pfeiff.: E. Sayan: Kara-Buren river (basin of the river Uda), 1000 m, 7. VII. 1961 L. V. Bardunov, det. S. Hattori. Baikal: Slyudyanka river, 600—700 m, 7. VII. 1980 Z. Soldán; Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa, rev. S. Hattori; Bolshaya Kadilnaya valley, 550 m, 19. VIII. 1982 J. Váňa, rev. S. Hattori.
- Preissia quadrata** (Scop.) Nees: Baikal: Utulik river, 490 m, 9. and 10. VII. 1980 Z. Soldán.
- Ptilidium ciliare** (L.) Hampe: Kaalas (1918), Brotherus and Savich (1931), Savich-Lyubitskaya (1961), Tyulina (1976). E. Sayan: Erma river, in the middle part, 700 m, 18. VI. 1959 L. V. Bardunov; Bolshoi Shibit river, in the upper part, 1800 m, 30. VI. 1961 L. V. Bardunov. Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa; Between Bolshie Koty village and Chernaya valley, 520 m, 22. VIII. 1982 J. Váňa; Maritui village, VII. 1983 Z. Černý.
- Ptilidium pulcherrimum** (G. Web.) Vainio: Baikal: Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa; Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa; Bolshie Koty village, VII. 1983 Z. Černý.
- Radula complanata** (L.) Dum.: E. Sayan: Urik river, in the middle part, 1600 m, 6. VI. 1959 L. V. Bardunov; Khobol stream (the tributary of the river Irkut), 1000 m, 22. VI. 1960 L. V. Bardunov; Uda river, in the upper part, 1600 m, 13. VIII. 1961 L. V. Bardunov. Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa.
- Reboulia hemisphaerica** (L.) Raddi: Savich-Lyubitskaya (1961).
- Riccardia latifrons** (Lindb.) Lindb.: Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.

- Riccardia palmata* (Hedw.) Carruth.: Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Riccocarpos natans* (L.) Corda: Savich-Lyubitskaya (1961).
- Scapania apiculata* Spruce: Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa, det. J. Duda.
- Scapania crassiretis* Bryhn: Baikal: Baikalski khrebet ridge, 2115 m, 23. VII. 1986 J. Piňosová and L. Klimeš.
- Scapania curta* (Mart.) Dum.: Kaalaas (1918) sub *S. c.* var. *rosacea*.
- Scapania cuspiduligera* (Nees) K. Müll.: E. Sayan: Uda river, in the upper part, 1800—1900 m, 4. and 12. VIII. 1961 L. V. Bardunov; Burgutuy stream (basin of the river Uda), 1800 m, 12. VIII. 1961 L. V. Bardunov; Uda river, in the upper part, Uda's tributary Tchelo-Mongo, 1800 m, 16. VIII. 1961 L. V. Bardunov. Baikal: Baikalski khrebet ridge, 2000 m, 23. VII. 1986 J. Piňosová and L. Klimeš.
- Scapania degenii* Schiffn.: Baikal: Utulik river, 500 m, 13. VIII. 1964 L. V. Bardunov, det. J. Duda, 490 m, 8. VII. 1980 Z. Soldán, det. J. Duda.
- Scapania hirosakiensis* Steph.: Váňa and Soldán (1987).
- Scapania irrigua* (Nees) Nees: Kaalaas (1918). E. Sayan: Burgutuy stream (basin of the river Uda), 1800 m, 12. VIII. 1961 L. V. Bardunov, det. J. Duda. Baikal: Bolshie Koty village, 600—700 m, 16. VIII. 1982 J. Váňa, det. J. Duda.
- Scapania cf. mucronata* Buch (sterile plants) Baikal: Chernaya valley, 540 m, 17. VIII. 1982 J. Váňa; Bolshaya Sennaya valley, 600 m, 18. VIII. 1982 J. Váňa.
- Scapania rufidula* Warnst.: Váňa and Soldán (1987).
- Scapania sphaerifera* Buch et Tuomik.: Váňa and Soldán (1987); in this publication the erroneous locality (pass Kadyr-Oruk) is given. The correct locality is E. Sayan: Uda river, in the upper part, 1800 m, 11. VIII. 1961 L. V. Bardunov, det. J. Duda (NICH-286440).
- Scapania undulata* (L.) Dum.: E. Sayan: Tchuglyn stream (upper part of Uda's basin), 1150 m, 13. VII. 1961 L. V. Bardunov, det. J. Duda; near the pass Kadyr-Oruk, 2100 m, 19. VII. 1961 L. V. Bardunov, det. J. Duda. Baikal: Polovinka river, 500 m, 24. VII. 1958 L. V. Bardunov and S. Popova.
- Targionia hypophylla* L.: Váňa and Soldán (1987).
- Tetralophozia setiformis* (Ehrh.) Schljak.: Savich-Lyubitskaya (1961), Tyulina (1976). E. Sayan: Erminski Sphil khrebet ridge, 1900 m, 21. VI. 1959 L. V. Bardunov; Urik river in the middle part, Chortova gora Mt., 1600—1850 m, 7. VIII. 1959 L. V. Bardunov; Tunkinski khrebet ridge, Ulabor, 2300 m, 1. VII. 1960 L. V. Bardunov; Tunkinski khrebet ridge, the river Arkhut, 1250 m, 2. VII. 1960 L. V. Bardunov; near the pass Kadyr-Oruk, 1800 m, 21. VII. 1961 L. V. Bardunov; Uda river, in the upper part, 1800 m, 11. VIII. 1961 L. V. Bardunov; Bolshoi Khangorok river, in the upper part (basin of the river Uda), 2100 m, 26. VIII. 1961 L. V. Bardunov. Baikal: Baikalski khrebet ridge, 1660—1835 m, 23.—25. VII. 1986 J. Piňosová and L. Klimeš.
- Tritomaria excesta* (Schmid. ex Schrad.) Schiffn. ex Loeske: E. Sayan: Urik river, in the middle part, 1000 m, 6. VIII. 1959 L. V. Bardunov. Baikal: Teplye ozera base, 900 m, 8. VII. 1980 Z. Soldán.
- Tritomaria exsectiformis* (Breidl.) Schiffn. ex Loeske: Brotherus and Savich (1931). Baikal: Khar Khatai Mt., V Grokhotakh, 750—900 m, 21. VIII. 1982 J. Váňa.
- Tritomaria quinquedentata* (Huds.) Buch: Brotherus and Savich (1931), Savich-Lyubitskaya (1961). E. Sayan: Urik river, in the middle part, 1000 m, 6. and 11. VIII. 1959; near the village Turan (the river Irkut), Nylova Pustyn, 900 m, 15. VII. 1960 L. V. Bardunov; near the pass Kadyr-Oruk, 1750 m, 26. VII. 1961 L. V. Bardunov; Uda river, in the upper part, 1800 m, 12. and 21. VIII. 1961 L. V. Bardunov. Baikal: Slyudyanka river, 600—700 m, 7. VII. 1980 Z.



Soldán; Baikalski khrebet ridge, 850—2115 m, 23., 25. and 28. VII. 1986 J. Piňosová and L. Klimeš.

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*Prof. RNDr. Jiří Váňa, DrSc.*

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