

New locality of the liverwort *Moerckia blyttii* in the Tatra Mts., Slovakia

RUDOLF ŠOLTÉS & ANNA CIRIAKOVÁ

Institute of High Mountain Biology, University of Žilina, 059 56 Tatranská Javorina, Slovak Republic; rudolf.soltes@uniza.sk; anna.ciriakova@uniza.sk

Šoltés R. & Ciriaková A. (2010): New locality of the liverwort *Moerckia blyttii* in the Tatra Mts., Slovakia. – Thaiszia – J. Bot. 20: 99-104. – ISSN 1210-0420.

Abstract: The arcto-alpine liverwort *Moerckia blyttii* has been recorded in the Tatra Mts in nine localities since 1888. A search was made of majority of known localities but the species was only found at the Temnosmrečinová dolina Valley. A new locality in Žiarska dolina Valley in the West Tatra Mts has been discovered and a relevé is included.

Keywords: liverworts, *Moerckia blyttii*, the Tatra Mts, Slovakia.

Introduction

The liverwort *Moerckia blyttii* (MOERCH) BROCKM. is a member of the *Pallaviciniaceae* family with an arcto-alpine distribution (DÜLL & MEINUNGER 1989; DUDA & VÁŇA 1968). Nevertheless, CRANDALL-STOTLER et al (2009) placed the liverwort *Moerckia* in the family *Moerckiaceae*. The species is found growing on siliceous bedrock among grass, in mires, on humus, rocks and in snow-beds. The species is easily recognized by the thallus having margins strongly crisped to convolute (Fig. 1). SMITH (1990) reported the distribution as Germany, the Alps, the Tatra Mts, the Faroes, Norway, Sweden, Finland to Novaya Zemlya, Canada and Washington. In British Islands it occurs scattered in Scottish mountains (SMITH 1990; BBS 1996, 2006). In Slovakia, the liverwort is restricted to the Tatra Mts, where it was first collected KRUPA (1888) in Nefcerka Valley, Temnosmrečinová dolina Valley and in Roháčska dolina Valley around Roháčske plesá Lakes. The second record in the Tatra Mts was made in Furkotská dolina Valley by SZÉPESFALVY (1926) in 1700 a.s.l. In the Mlynická dolina Valley, on the peak Malé Solisko at an altitude of 1870- 2095 m a.s.l.,

the liverwort was recorded by KRAJINA (1933) in the communities *Salicetum herbaceae*, *Philonotidetum tomentellae* and *Geetum montani*. The specimen of Krajina was revised by VÁŇA & DUDA (1965). The next record in the Tatra Mts was made in Velká Studená dolina Valley (DUDA 1958) at an altitude of 1800 m a.s.l. The large population in Temnosmrečinová dolina Valley (in the extend of a few quadrat meters) was confirmed by HADAČ (1956) and by ŠMARDÁ (1961). In Belanian Tatra Mts, the liverwort was reported by ŠMARDÁ (1961) and ŠMARDÁ et al (1962), growing in springs of the Seven Springs Valley, at an altitude of 1200 m a.s.l.

In the Polish side of the Tatra Mts the liverwort *Moerckia blyttii* was collected by KRUPA (1882), LILIENTFELDÓWNA (1910), SZWEYKOWSKI (1960) and in Five Polish Lakes Valley by BALCERKIEWICZ (1984).

In the Czech Republic, *Moerckia blyttii* is rare (DUDA & VÁŇA 1968), with populations in the Krkonoše Mts and in Šumava Mts, but here just over the Czech border. KUČERA et al. (2009) reported *Moerckia blyttii* as new to Hrubý Jeseník Mts, at the locality „Sněžné strže“ in ravines at the eastern slope of Červená Hora Mt. The liverwort is included in the Red list of the Bryophytes of Czech Republic (KUČERA & VÁŇA 2005) as VU (Vulnerable).

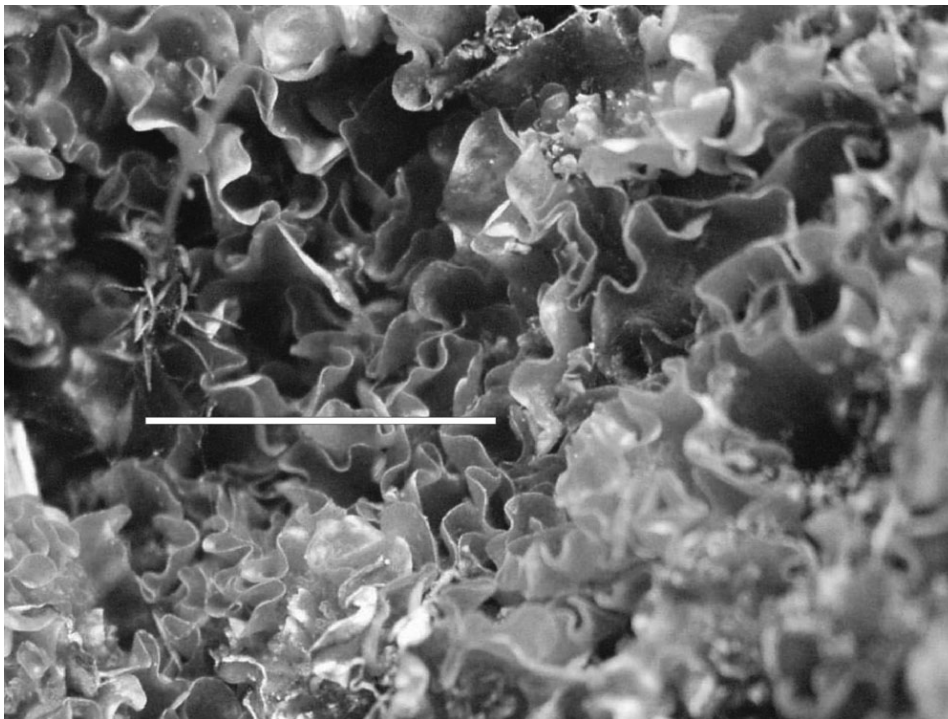


Fig. 1. *Moerckia blyttii*. Scale bar = 1 cm

Methods

The field work for the present study was carried out during the summer of 2010. The relevé was taken following standard procedures of the Zürich-Montpellier School (BRAUN-BLANQUET 1964; WESTHOFF & VAN DEN MAAREL 1978), using the modified 9-degree Braun-Blanquet's sampling scale (BARKMAN et al. 1964). Nomenclature of the taxa follows the Checklist by MARHOLD & HINDÁK (1998), that of the syntaxa follows the List of vegetation units by MUCINA & MAGLOCKÝ (1985). The geographical coordinates are recorded in the system WGS 84, Garmin, Colorado 300 device. The specimen is stored in the Herbarium of the Institute of High Mountain Biology, Tatranská Javorina, Slovakia.

Results and discussion

We found the new site of *Moerckia blyttii* on July 22, 2010, on the right streamside of Smrečianka rivulet in the Žiarska dolina Valley (West Tatra Mts), at the altitude of 1631 m a.s.l (Fig. 2). The liverwort was grown in the plant community *Aronico clusii*–*Luzuletum spadiceae* (BR. – BL. 1930) MUCINA 1985.

Phytosociological relevé

July 22, 2010, 1631 m a.s.l., 49° 11.350'N ; 19° 44.493'E, accuracy 5 m, S aspect, relief inclination 25°, stream shore inclination 10°, area 1 x 4 m, total cover 70%, E₁ 70%. E₀ 25%.

E₁

Luzula alpinopilosa 2b, *Deschampsia cespitosa* 2a, *Avenella flexuosa* 2a, *Athyrium distentifolium* 2m, *Silene pusilla* 2m, *Oreogalum montanum* 1, *Anthoxanthum alpinum* 1, *Ligusticum mutellina* 1, *Solidago virgaurea* subsp. *minuta* +, *Viola biflora* +, *Gentiana punctata* +, *Hypericum maculatum* +, *Cardamine amara* subsp. *opicii* +, *Homogyne alpina* +, *Sempervivum montanum* agg. +, *Taraxacum officinale* agg. r, *Potentilla aurea* r, *Epilobium alsinifolium* r.

E₀

Racomitrium sudeticum 2b, *Philonotis seriata* 1, *Chiloscyphus polyanthos* 1, *Rhizomnium magnifolium* 1, *Scapania undulata* +, *Polytrichum alpinum* +, *Brachythecium rivulare* +, *Kiaeria falcata* +, *Moerckia blyttii* +.

The community *Aronico clusii*–*Luzuletum spadiceae* is ranked in the alliance *Festucion pictae* KRAJINA 1933, where snow-bed communities of acid bedrocks are also placed. The population in Žiarska dolina Valley is small and only of 30 cm in diameter.

ODLAND & MUNKEJORD (2008) consider *Moerckia blyttii* as an important chionophilous species. Classification of the snow-bed plant communities of the Lapland Nature Reserve (Murmansk Region, Russia) which included a specific study of mosses was carried out by KOROLEVA (1999). The author recorded the presence of *Moerckia blyttii* in the snow-bed community *Anthoxantho* -

Deschampsietum flexuosae. KONSTANTINOVA (1992) included *Moerckia blyttii* in the list of bryophytes requiring monitoring in the Murmansk Region.

The liverwort *Moerckia blyttii* has been evaluated in the old IUCN system in Slovakia (KUBINSKÁ et al. 2001) as EN (Endangered). Under the revised IUCN threat categories (ECCB 1995 ; HALLINGBÄCK 1998; HALLINGBÄCK et al. 1998; IUCN 1994) the species meets the criteria for „DD“ (Data Deficient), we have too little relevant information on the occurrence in the old, in the past published localities. Despite intensive searching, only the locality in Temnosmrečinová dolina Valley has been confirmed, the others need revision.



Fig. 2. The site of *Moerckia blyttii* in the Žiarska dolina Valley (empty circle)

Acknowledgement

The fieldwork was supported by the Norwegian Financial Mechanisms. The authors are indebted to Peter Martin, Gloucestershire, UK, for correcting the English.

References

- BALCERKIEWICZ S. (1984): Roślinność wysokogórska Doliny Pięciu Stawów Polskich w Tatrach i jej przemiany antropogeniczne. - *Seria Biologia UAM*, 25: 1-91
- BARKMAN J. J., DOING H. & SEGAL S. (1964): Kritische Bemerkungen und Vorschläge zur quantitativen Vegetationsanalyse. - *Acta Bot. Nederl.* 13: 394-419.
- BBS (British Bryological Society) (1996): Summer field meeting. Ballachulish, Caenlochan Glen. - <http://rbg-web2.rbge.org.uk/bbs/meetings/mtgs96.htm>.
- BBS (British Bryological Society) (2006): Summer field meeting. East Sutherland and Orkney. - <http://rbgweb2.rbge.org.uk/bbs/meetings/mtgs06/Scotland/mtgs063.htm#Orkney>
- BRAUN-BLANQUET J. (1964): Pflanzensoziozoologie. Grundzüge der Vegetationskunde. Ed. 3. - Springer-Verlag, Wien, New York, pp. 865.
- CRANDALL-STOTLER B., STOTLER R.E & LONG D. G. (2009): Phylogeny and classification of the Marchantiophyta. - *Edinburgh Journal of Botany* 66: 155-198.
- DUDA J. (1958): K Rozšíření játrovek v Československu. - *Čas. Slez. Muz. Opava (A)* 7: 31-63.
- DUDA J. & VÁŇA J. (1968): Die Verbreitung der Lebermoose in der Tschechoslowakei - III. - *Čas. Slez. Muz. Opava (A)* 17: 89-114.
- DÜLL R. & MEINUNGER L. (1989): Deutschlands Moose. 1. Teil. IDH - Verlag, Bad Münstereifel – Ohlerath. pp. 368.
- ECCB (European Committee for Conservation of Bryophytes) (1995): Red Data Book of European Bryophytes. Trondheim, pp. 291.
- HADAČ E. (1956): Rostlinná spoločenstva Temnosmrečínové doliny ve Vysokých Tatrách. - *Biologické práce SAV*, 2: 1-78.
- HALLINGBÄCK T. (1998): The new IUCN categories tested on the Swedish bryophytes. - *Lindbergia* 23: 13-27.
- HALLINGBÄCK T., HODGETTS N., RAEYMAEKERS G., SCHUMACKER R., SÉRGIO C., SÖDERSTRÖM L., STEWART N. & VÁŇA J. (1998): Guidelines for application of the revised IUCN threat categories to bryophytes. - *Lindbergia* 23: 6-12.
- IUCN, 1994: IUCN Red List Categories. IUCN, Gland.
- KONSTANTINOVA N. (1992): Protection of bryophytes in the Murmansk Region (Russia). - *Biological Conservation* 59: 191-195.
- KOROLEVA N. E. (1999): Snow-bed plant communities of the Lapland Nature Reserve (Murmansk region, Russia). - *Chemosphere: Global Change Science* 1: 429-437
- KRAJINA V. (1933): Die Pflanzengesellschaften des Mlynica-Tales in den Vysoké Tatry (Hohe Tatra). - *Beihefte Bot. Zentralblatt, I.*, 60: 774-975.
- KRUPA J. (1882): Zapiski bryjologiczne. - *Sprawozdanie Komisji fizyjoğraficznej* 16: 170-204.
- KRUPA J. (1888): Zapiski bryjologiczne z Tatr i Przedtatrza. - *Sprawozdanie Komisji fizyjoğraficznej* 21: 65-94.
- KUBINSKÁ A., JANOVICOVÁ K. & ŠOLTÉS R. (2001): Červený zoznam machorastov Slovenska, pp. 31-43. In BALÁŽ D., MARHOLD K. & URBAN P. (eds.), Červený zoznam rastlín a živočíchov Slovenska. - *Ochrana prírody* 20, Supplement.
- KUČERA J., ZMRHALOVÁ M., SHAW B., KOŠNAR J., PLÁŠEK V. & VÁŇA J. (2009): Bryoflora of selected localities of the Hrubý Jeseník Mts summit region. - *Čas. Slez. Muz. Opava (A)* 58: 115-167.
- KUČERA J. & VÁŇA J. (2005): Seznam a červený seznam mechorostů České republiky 2005. - *Příroda*, Praha, 23: 1-104.
- LILIENTHAL F. (1910): Hepaticae Poloniae exsiccate. - *Kozmos*. Vol. 35: 732-738.

- MARHOLD K. & HINDÁK F. [eds] (1998): Zoznam nižších a vyšších rastlín Slovenska. – Veda, Bratislava, pp 687.
- MUCINA L. & MAGLOCKÝ Š. (eds) (1985): A list of vegetation units of Slovakia. - Documents phytosociologues, Camerino, 9: 175–220.
- ODLAND A. & MUNKEJORD H. K. (2008): Plants as indicators of snow layer duration in southern Norwegian mountains. - Ecological Indicators 8: 57-68.
- SMITH A.J.E. (1990): Liverworts of Britain and Ireland. Cambridge, pp. 362.
- SZWEYKOWSKI J. (1960): Materiały do flory wątrobowców Tatr. - Pr. Komis. Biol. 21: 1-92.
- ŠMARDA J. (1961): Příspěvky k rozšíření játrovek v Československu VI. - Biol. práce VII/1: 5 – 45.
- ŠMARDA J., JEŽEK V. & VONDRÁČEK M. (1962): Machy a pečeňovky Kotliny Siedmich prameňov v Belanských Tatrách. - Sborník prác o TANAPu 5: 5-36.
- VÁŇA J. & DUDA J. (1965): Revize játrovek uveřejnených ve fytosociologické studii V. Krajiny z roku 1933. - Čas. Slez. Muz. Opava (A) 14: 171-176.
- WESTHOFF V. & VAN DEN MAAREL E. (1978): The Braun-Blanquet approach. In: WHITTAKER R. H. (ed.): Classification of plant communities, pp. 289–399. W Junk, The Hague.

Received: August 17th 2010
Revised: September 16th 2010
Accepted: September 20th 2010