

Bryophytes of Travný Nature Reserve in Moravskoslezské Beskydy Mts (Czech Republic)

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Abstract: Bryological survey in Travný Nature Reserve was done in 2019. The total of 138 bryophytes (34 liverworts and 104 moss species) were recorded in the protected area. Among the most important records can be mentioned liverworts *Liochlaena lanceolata*, *Nowellia curvifolia*, *Riccardia latifrons* or *Trichocolea tomentella* and mosses *Brachydontium trichodes*, *Campylostelium saxicola*, *Fissidens pusillus*, *Lewinskya striata*, and *Oxystegus tenuirostris*.

Key words: bryoflora, diversity, liverworts, mosses, Moravia, Silesia, Western Carpathians

Introduction

Travný Nature Reserve is located on the western slope of the Travný Mt. (1203 m a.s.l.), over the Mohelnice river. It is situated in the central part of the Moravian-Silesian Beskydy Mts at an altitude between 530-1203 m a.s.l. The maximum vertical distance is almost 680 m, which is one of the largest elevation difference in the Czech Republic. The northern and southern borders of the Reserve are formed by deep valleys with small mountain streams, the eastern border is led by forests stands along the Travný ridge, and the western border is formed by the Mohelnice river (see fig. 1). This Nature Reserve was established in 2000 on an area of almost 155 ha. The main aim is protection of fragments of natural beech forests in a wide range of vegetation stages.

From the geomorphological point of view, the studied area belongs to the Western Carpathians and is part of the so-called Godul covers (Weissmannová *et al.* 2004). The characteristic features are flysch-type sediments (Chlupáč *et al.* 2002).

Phytogeographically, the area belongs to the Carpathian oreophytic district “Moravian-Silesian Beskydy” (Skalický 1988). The most common there are acid beech forests with the *Luzulo-Fagetum* association. Only in small residue grow communities of flowering beeches (*Eu-Fagenion*). With increasing altitude, the proportion of spruce trees increases in the beech forests and the vegetation type change into *Calamagrostio villosae-Piceetum* association. Dominant spruce forests (but not very valuable) are present only in the lower parts along the Mohelnice river.

Methods

In the period between 26 May and 12 August 2019, ten visits to the study area were made by the author and Petra Pilařová. The territory of the Nature Reserve was divided into two parts, according to the dominant forest vegetation (see fig. 1). The methodology of fieldwork consisted of a detailed survey of each biotopes and substrates on the studied site, e.g. forest floor, valley of streams, waterfalls, spring areas, decaying wood, bark of trees, boulders, rocks, etc.). Moreover, bryophytes occurred on all types of substrates were noted and data evaluated (GPS coordinates, ecological data and abundance of the species). These methods achieved the maximum score of the biodiversity of mosses in this locality and their ecological requirements.

The list of species states at the first the scientific name of the species, followed by the category of endangerment according to the Red List (Kučera *et al.* 2012) and then the data on occurrence in individual forest types (1 - beech forest, 2 - spruce forest) supplemented by substrate (L - forest floor, open soil, T - rotten wood, S - bark of trees, K - stones and rock outcrops, and P - springs and wet banks of streams), and abundance (5-point

scale: **1** - very rare, **2** - sporadically, **3** - scattered, **4** - abundant, **5** - very abundant) of a species on it. For example: **1T/3** means: species occurred in forest type 1 (beech forest), on rotting wood with an abundance of 3 (scattered).

The collected specimens (marked by star in a list) are housed in the herbarium of University of Ostrava (OSTR). Nomenclature of bryophytes corresponds to Kučera *et al.* (2012) with small differences regarding Orthotrichaceae family.

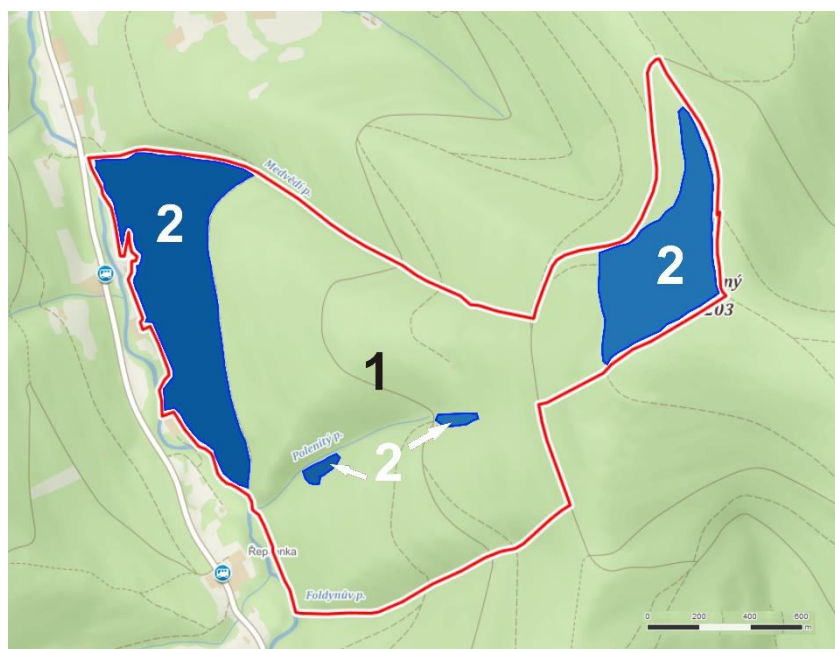


Fig 1: Map of the studied area with marking of boundaries (red line) and the forest types: **1**: beech forest, **2**: spruce forest.

Results

A LIST OF RECORDED BRYOPHYTES (2019)

Liverworts

Aneura pinguis - **1P/2**; **2P/2**
Barbilophozia barbata - **2L/1**
Bazzania trilobata - **2P/2**
Blepharostoma trichophyllum - **1T/1**; **2T/3**
Calypogeia azurea - **1P/1**; **2P/2**
Calypogeia integristipula* - **2P/1
Cephalozia bicuspidata* - **1T/2; **2T/4**
Chiloscyphus coadunatus - **1P/1**; **2P/2**
Chiloscyphus polyanthos - **1P/1**; **2P/3**
Chiloscyphus pallescens* - **LC-att - **2P/1**
Chiloscyphus profundus - **1T/2**; **2T/4**
Conocephalum conicum - **2P/1**
Diplophyllum albicans - **2K/1**
Frullania dilatata - **1S/3**
Lepidozia reptans - **1T/2**; **2T/4**
Liochlaena lanceolata* - **LR-nt - **1T/2**
Lophozia ventricosa - **1K/2**; **2K/2**

Marchantia polymorpha ssp. *ruderalis* - **1P/1**; **2P/1**
Metzgeria furcata - **1S/2**
Nowellia curvifolia* - **LC-att - **2T/1**
Pellia epiphylla - **1L/3**; **2L/3**
Pellia neesiana* - **2L/1
Plagiochila asplenoides - **1L/2**; **2L/2**
Plagiochila porelloides - **2L/2**
Porella platyphylla - **1S/2**
Ptilidium ciliare - **2K/1**
Ptilidium pulcherrimum - **1S/1**; **2S/3**
Radula complanata - **1S/1**
Riccardia latifrons* - **LC-att - **2T/2**
Scapania irrigua* - **1L/1
Scapania nemorea* - **1K/2; **2K/3**
Scapania undulata* - **1P/1; **2P/4**
Solenostoma gracillimum* - **1L/1; **2L/2**
Trichocolea tomentella* - **LC-att - **2P/1**

Mosses

- *Alleniella complanata* - 1S/2
Amblystegium serpens - 1T/2, 1K1; 2K/3, 2L/3
Anomodon viticulosus - 1K/1
Atrichum undulatum - 1L/4; 2L/4
**Barbula unguiculata* - 1L/1
Brachydontium trichodes* - **LC-att - 2K/1
Brachytheciastrum velutinum - 1L/1; 2L/3, 2S2
Brachythecium rivulare - 1K/3; 2K/4, 2P/3
Brachythecium rutabulum - 1L/3; 2L/2
Brachythecium salebrosum - 1T/2; 2T/3
Bryum argenteum - 1L/1
Bryum caespitium - 1L/2
Bryum moravicum - 1S/3; 2S/4
Bryum pseudotriquetrum - 1P/2; 2P/3
Calliergonella cuspidata - 1P/1; 2P/3
Campylostelium saxicola* - **LR-nt - 1K/1; 2K/1
Ceratodon purpureus - 1L/2
Cirriphyllum piliferum - 1L/2; 2L/2
Climacium dendroides - 1P/2; 2P/1
**Cratoneuron filicinum* - 1P/1; 2P/1
Ctenidium molluscum - 1K/2; 2K/2
Cynodontium polycarpon - 1K/3
Dicranella heteromalla - 1L/4; 2L/4
Dichodontium pellucidum - 1P/1; 2K/2
Dicranodontium denudatum - 1T/1; 2T/3
Dicranum montanum - 1S/2, 1K/2; 2S/3, 2K/4
Dicranum polysetum - 1L/1; 2L/2
Dicranum scoparium - 1L/4; 2L/4
**Ditrichum heteromallum* - 1L/1
Eurhynchium angustirete - 1L/1; 2P/2
**Fissidens dubius* - 1K/1; 2K/1
Fissidens pusillus* - **LC-att - 1K/1; 2K/2
Fissidens taxifolius - 1L/1; 2L/1
Grimmia hartmanii - 1K/3
Grimmia pulvinata - 1K/1
Herzogiella seligeri - 1T/4; 2T/4
Heterocladium heteropterum - 2K/3
Homalia trichomanoides - 1S/1
Hylocomium splendens - 1L/1
Hypnum cupressiforme - 1L/4, 1S4; 2L/3, 2S4
Isoetecium alopecuroides - 1S/1; 2S/1
**Kindbergia praelonga* - 1L/1; 2L/1
Leskea polycarpa - 1S/2
Leucobryum glaucum - 2L/1
Leucodon sciuroides - 1S/2; 2S/2
**Lewinskya affinis* - 1S/3
**Lewinskya speciosa* - 1S/3
Lewinskya striata* - **LC-att - 1S/1
Mnium hornum - 1P/2; 2P/3
Mnium stellare - 2K/3
**Nyholmiella obtusifolia* - 1S/1
**Orthotrichum diaphanum* - 1S/1
**Orthotrichum pallens* - 1S/2
**Orthotrichum pumilum* - 1S/2
**Orthotrichum stramineum* - 1S/2
Oxyrrhynchium hians - 1L/2; 2L/2
Oxystegus tenuirostris* - **LC-att - 1K/1; 2P/2
Paraleucobryum longifolium - 1K/2
**Philonotis fontana* - 2P/2
Plagiomnium affine - 1P/2; 2P/2
Plagiomnium undulatum - 1P/2, 1L/1; 2P/2
Plagiothecium curvifolium - 1L/4; 2L/3
**Plagiothecium denticulatum* - 1L/2; 2L/2
Plagiothecium laetum - 1L/3; 2L/4
**Plagiothecium succulentum* - 1L/2; 2L/2
Plagiothecium undulatum - 1P/1; 2P/2
Platygyrium repens - 1S/3
Pleurozium schreberi - 1L/1; 2L/2
Pogonatum aloides - 1L/1; 2L/1
Pogonatum urnigerum - 1L/1; 2L/1
Pohlia nutans - 1L/4; 2L/4
**Pohlia wahlenbergii* - 1P/1; 2P/1
Polytrichum commune - 2P/1
Polytrichum formosum - 1L/3; 2L/4
Polytrichum juniperinum - 1L/2; 2L/2
**Pseudoleskeella nervosa* - 1S/3
Pseudotaxiphyllum elegans - 2L/1
**Pterigynandrum filiforme* - 1S/3
**Pylaisia polyantha* - 1S/2
Racomitrium aciculare - 1K/1; 2K/2
Rhizomnium punctatum - 1L/2; 2P/4, 2L/3
Rhynchostegium murale - 2P/2
Rhynchostegium riparioides 2S/3
Rhytidiadelphus loreus - 1L/1
Rhytidiadelphus squarrosus - 1L/1; 2L/3
Sanionia uncinata - 1T/3; 2T/2, 2S/2
**Schistidium apocarpum* - 1K/1
**Schistidium crassipilum* - 1K/2
**Schistidium dupretii* - 2S/2
Sciuro-hypnum plumosum - 1L/2
Sciuro-hypnum populeum - 1L/1; 2L/1
Sciuro-hypnum reflexum - 1L/3; 2L/2
Sciuro-hypnum starkii - 1L/1
**Seligeria recurvata* - 2K/1
Sphagnum girgensohnii 2L/2
Sphagnum palustre - 2P/1
Sphagnum squarrosum - 2P/2
Syntrichia ruralis - 1K/3; 2K/2
Tetraphis pellucida - 1T/4; 2T/4
Thuidium tamariscinum - 2L/2
**Tortella tortuosa* - 1K/1; 2K/2
Tortula muralis - 1K/1; 2K/2
**Ulota bruchii* - 1S/1
**Ulota crispa* - 1S/2

Discussion

In the study area, totally 138 bryophytes (34 liverworts and 104 moss species) were recorded in 2019. Ten species belong to some of categories of the Red List (Kučera *et al.* 2012). Specifically, there are five liverworts: *Chiloscyphus pallescens*, *Liochlaena lanceolata*,

Nowellia curvifolia, *Riccardia latifrons* and *Trichocolea tomentella*, and five moss species: *Brachydontium trichodes*, *Campylostelium saxicola*, *Fissidens pusillus*, *Lewinskya striata*, and *Oxystegus tenuirostris*.

Travný Nature Reserve hosts a high species diversity of bryophytes, despite the fact that beech forests generally do not belong to vegetation types with a rich moss layer (which is often caused by a high layer of leaf litter). However, the beech forests in the locality intertwine in a mosaic with spruce stands and often also with an admixture of some deciduous trees. It significantly increases mainly the diversity of species growing at the bark of trees (epiphytic species) and subsequently on the rotten wood (epixylous species). The diversity of bryophytes is also increasing thanks to the cut valleys of streams which host a number of interesting epilithic species growing on water-sprinkled stones and shaded rock outcrops.

A detailed bryological survey was carried out for the first time here in 2019 and the total number of recorded representatives of bryophytes is high. It, among other things, also testifies to the high diversity of substrates. At the same time, it indicates the long-term continuity of the development of the forests in the protected area.

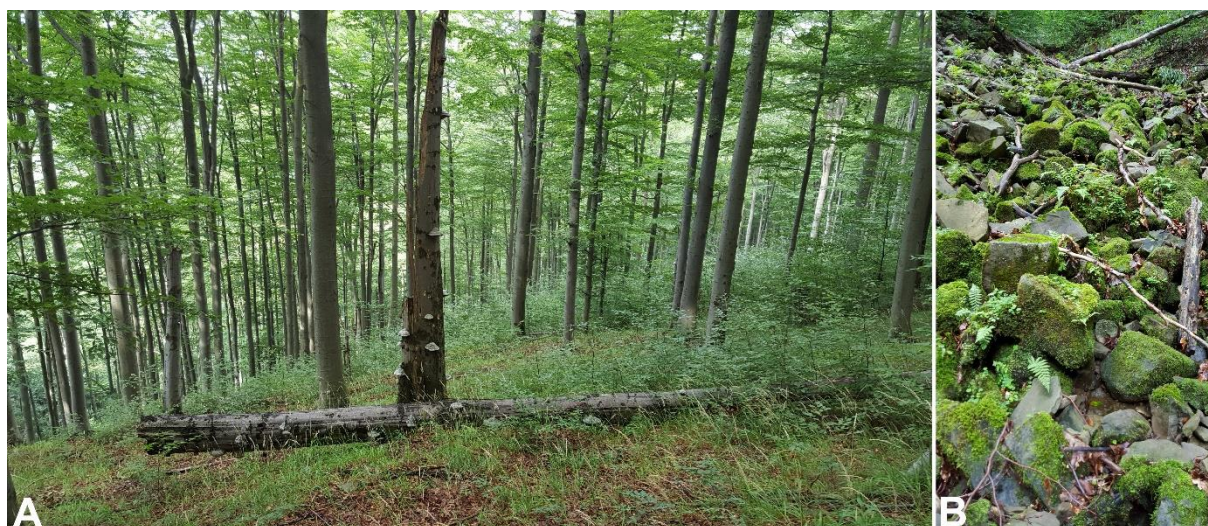


Fig 2: View of Travný Nature Reserve: **A** - vegetation in the forest type 1 (beech forest), **B** - boulders overgrown with epilithic bryophytes in the Polenitý stream bed.

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