

# BIODATA HUNGARICA

## SPECIES CHECKLIST FOR HUNGARY AND THE CARPATHIAN BASIN

## MAGYAR BIODIVERZITÁS-KUTATÓ TÁRSASÁG



## BRYOPHYTES AND FERNS ON STONE WALLS IN THE CUHA VALLEY, BAKONY MTS, WESTERN HUNGARY

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**Abstract:** In 2015 the bryophyte and pteridophyte floras were investigated in a short section of the Cuha valley (Bakony Mts, Western Hungary) on man-built stone walls supporting a more than 100 years old railway dyke. Altogether 43 bryophyte taxa (8 liverworts and 35 mosses) and 4 pteridophytes were recorded, including three protected species (two bryophytes and a fern).

**Keywords:** liverworts, mosses, ferns, old railway, limestone rock wall

### INTRODUCTION

Historical railways are having today their renaissance (REES *et al.* 2010). The ancient railways do not exclusively serve public transportation but are essential parts of the regions' touristic development.

The railway line between the Western Hungarian towns Győr and Veszprém was built in 1895–96 and crosses the Bakony Mountains. In its middle section the line crosses the Porva basin, a relatively old, Upper Triassic limestone formation (KISS *et al.* 2001) of the Bakony. Here the valley of the Cuha stream becomes narrower and so tunnels and dykes along the railway must have been constructed.

Since the line was opened for the public the supporting wall of the dykes are constantly undermined by the Cuha stream during floods. At the beginning of the 21<sup>st</sup> century the wall sunk dangerously and its reconstruction proved to be inevitable.

During the long decades passed a significant bryophyte flora has settled on the limestone rocks. Although the vascular plant vegetation was surveyed in detail earlier in the Cuha valley (SINIGLA 2014) the species composition of the bryophyte vegetation was still unrevealed. Our aim was to compile a checklist of the bryophytes and accompanying pteridophytes living in this habitat with

high attention to the protected species and evaluate the conservation merit of this assemblage.

### MATERIAL AND METHODS

Bryophytes and ferns were collected from artificial limestone rock walls at the railway. To obtain a complete list of protected plants additional collecting were made from single rocks and trees in the surrounding forest, which can also be affected by the construction works conducted along the railway.

The exact details of the collecting event is:

Veszprém County, Bakony Mts, Cuha valley, between 47°21'06.9" N, 17°43'49.3" E and 47°20'54.7" N, 17°50'00.7" E, 250 m a.s.l., 3.XII.2015, leg. and det. Papp B.

The specimens are deposited in the Bryophyte Collection of the Hungarian Natural History Museum, Budapest (BP). Nomenclature of bryophytes follows PAPP *et al.* (2010). For the analysis of the conservation value of the bryophyte flora the same paper was used. Nomenclature of pteridophytes follows SIMON (1992). Protected species in Hungary are given according to the Government Decree 66/2015. (X. 26.)

## RESULTS

Altogether 43 bryophyte taxa (8 liverworts and 35 mosses) and 4 pteridophytes were recorded. Thirty-four bryophyte taxa and two ferns were found on the man-built stone-walls. Further two fern species and seven bryophytes (three from limestone rocks in the stream, two from alder tree, four from limestone rocks nearby) were collected in the surroundings.

The list of the species found is given below. Numbers in brackets: 1 – first rock wall; 2 – second rock wall; 3 – surrounding. The following abbreviations were used: EN – endangered; VU – vulnerable, NT – near threatened; LC-att – least concern-attention, taxa, which are still not threatened, but need attention; indicator – species, which by their presence denote the greater level of conservation value of the habitat where they occur.

## DISCUSSION

In the investigated part of the Cuha valley the bryophyte diversity is quite high, the flora is rich in protected and red-listed species in Hungary.

On the man-built stone walls one species protected and vulnerable in Hungary (*Taxiphyllum densifolium*), one endangered (*Preissia quadrata*), two near-threatened (*Pedinophyllum interruptum*, *Plagiochila asplenoides*) and five species, which are still not threatened, but need attention (LC-att) (*Didymodon rigidulus*, *Eurhynchium striatulum*, *Mnium marginatum*, *M. stellare*, *Rhynchostegium murale*) were found. In the surrounding area further one protected (*Anomodon rostratus*), two near-threatened (*Cololejeunea rossettiana*, *Anomodon longifolius*), and one species which is still not threatened, but needs attention (*Cirriphyllum tommasinii*) were collected.

Twenty-three percent of the bryophyte species recorded are indicators, which by their presence denote the greater level of conservation value of the habitat where they occur.

Two pteridophytes occur on the artificial rock walls. Further two were found in the surrounding area, one of them (*Phyllitis scolopendrium*) is protected in Hungary. The first rock wall is extremely rich in bryophytes, almost 30 species occur there, hence it has high nature conservation value and it is also very attractive aesthetically.

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## LIST OF THE SPECIES

### Marchantiophyta

- Cololejeunea rossettiana* (C. Massal.) Schiffn. – (3); NT, indicator (shaded rock).  
*Metzgeria furcata* (L.) Dumort. – (3); widespread, common species.  
*Pedinophyllum interruptum* (Nees) Kaal. – (1); NT, indicator (shaded rock).  
*Plagiochila asplenoides* (L.) Dumort. – (1); NT, indicator (shaded rock, closed grassland).  
*Plagiochila porelloides* (Torrey ex Nees) Lindenb. – (1, 2); widespread, common species.  
*Porella platyphylla* (L.) Pfeiff. – (1, 2); widespread, common species.  
*Preissia quadrata* (Scop.) Nees – (1); EN.  
*Radula complanata* (L.) Dumort. – (1); widespread, common species.

### Bryophyta

- Amblystegium serpens* (Hedw.) Schimp. – (1); common species, widespread.  
*Amblystegium tenax* (Hedw.) C.E.O. Jensen – (3); widespread.  
*Anomodon attenuatus* (Hedw.) Huebener – (1, 2); widespread, common species.  
*Anomodon longifolius* (Brid.) Hartm. – (3); NT, indicator (shaded limestone rock, tree bark).  
*Anomodon rostratus* (Hedw.) Schimp. – (3); protected in Hungary, red-listed in Europe (ECCB 1995), in Hungary red-listed as NT, indicator (shaded limestone rock).  
*Anomodon viticulosus* (Hedw.) Hook. et Taylor – (2); widespread, common species.  
*Brachythecium rutabulum* (Hedw.) Schimp. – (1); widespread, common species.  
*Campylium calcareum* Crundw. et Nyholm – (1); widespread.  
*Cirriphyllum tommasinii* (Boulay) Grout – (3); LC-att, indicator (shaded limestone rock).  
*Didymodon rigidulus* Hedw. – (1, 2); LC-att, indicator (limestone rock, loess wall).  
*Encalypta streptocarpa* Hedw. – (2); widespread, common species.  
*Eurhynchium crassinervium* (Wilson) Schimp. – (1, 2); wide-spread.  
*Eurhynchium striatulum* (Spruce) Schimp. – (1, 2); LC-att, indicator (shaded rock).  
*Fissidens crassipes* Wilson ex Bruch et Schimp. –

- (3); widespread.  
*Fissidens dubius* P. Beauv. – (1); widespread.  
*Homalia bessereri* Lobarz. – (1, 2); widespread.  
*Homalothecium philippeanum* (Spruce) Schimp. – (1, 2); widespread.  
*Homalothecium sericeum* (Hedw.) Schimp. – (1, 2); widespread, common species.  
*Homomallium incurvatum* (Brid.) Loeske – (1); widespread.  
*Hypnum cupressiforme* Hedw. – (2); widespread, common species.  
*Leskea polycarpa* Ehrh. ex Hedw. – (3); widespread.  
*Mnium marginatum* (Dicks.) P. Beauv. – (1); LC-att, indicator (shaded rock).  
*Mnium stellare* (Hook. et Taylor) A.J.E. Sm – (1); LC-att, indicator (shaded rock).  
*Neckera complanata* (Hedw.) Huebener – (1, 2); widespread.  
*Plagiomnium rostratum* (anon.) T.J. Kop. – (1); widespread.  
*Platyhypnidium riparioides* (Hedw.) Dixon – (3); widespread.  
*Pseudoleskeella catenulata* (Brid. ex Schrad.) Kindb. – (1); widespread.  
*Pseudoleskeella nervosa* (Brid.) Nyholm – (1); wide-spread.  
*Rhynchostegium murale* (Hedw.) Schimp. – (1, 2); LC-att, indicator (shaded and wet rock).  
*Schistidium crassipilum* H.H. Blom – (1, 2); widespread, common species.  
*Taxiphyllum densifolium* (Broth.) Reimers – (1); protected in Hungary, red-listed in Europe (ECCB 1995), in Hungary red-listed as VU.  
*Taxiphyllum wissgrillii* (Garov.) Wijk et Margad. – (1, 2); widespread.  
*Tortella tortuosa* (Hedw.) Limpr. – (1, 2); widespread, common species.  
*Tortula muralis* L. ex Hedw. – (2); widespread, common species.  
*Tortula ruralis* (Hedw.) P. Gaertn., B. Mey. et Scherb. – (2); widespread, common species.

#### Pteridophyta

- Asplenium trichomanes* L. – (1).  
*Dryopteris filix-mas* (L.) Rich. – (3).  
*Phyllitis scolopendrium* (L.) Newm. – (3); protected in Hungary.  
*Polypodium vulgare* L. – (1).

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