

## BRYOPHYTE FLORA OF THE BOTANIC GARDEN OF THE UNIVERSITY OF SOPRON (W HUNGARY)

Péter SZÚCS

*Eszterházy Károly University, Institute of Biology, Department of Botany and Plant Physiology,  
H–3300 Eger, Leányka u. 6, Hungary; szucs.peter@uni-eszterhazy.hu*

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**Abstract:** In the course of the research conducted between 2004 and 2008 at the Botanic Garden of the University of Sopron, altogether 78 bryophyte taxa (4 liverworts and 74 mosses) were identified. Some Hungarian Red List taxa were detected from the territory: *Aphanorrhegma patens*, *Brachythecium glareosum*, *Campylium polygamum*, *Cirriphyllum piliferum*, *C. tommasinii*, *Climacium dendroides*, *Eurhynchium striatum*, *Orthotrichum obtusifolium*, *Pottia intermedia*, *Rhynchostegiella tenella*, *Rhynchostegium murale*, *Schistidium elegantulum*, and *Tortula papillosa*.

**Key words:** bryophyte diversity, Hungarian botanic gardens, red list status, semi-natural habitats

### INTRODUCTION

The first significant wave of bryological research conducted in Hungarian botanic gardens was between 1933 and 1968 involving renowned researchers such as László Vajda, Ádám Boros, and József Igmándy. Ádám Boros made visits to Hungarian botanic gardens including Budapest (1933, 1935, 1941, 1942, 1943, 1951), Szarvas (1948, 1960), Vácrátót (1953, 1954), Szeged (1960), and Debrecen (1960) but he also surveyed gardens in neighbouring countries (Kolozsvár, 1941; Pozsony, 1968; Kassa, 1962) and reported sporadic data on the bryoflora of these gardens in his travel diary (BOROS 1915–1971). Majority of these data has never been published, however.

The first description of the bryoflora of the botanic gardens of Vácrátót (VAJDA 1954) and Szigliget (VAJDA 1968) is linked with the name of László Vajda. Bryofloristical data of the botanic garden of Sopron have been published first by József Igmándy (IGMÁNDY 1949).

After a short intermission between 1968 and 1992, the bryofloristical research on Hungarian botanic gardens ran up again. István Galambos (GALAMBOS 1992) published results on the bryoflora of the botanic garden of Zirc.

Several new works were published in succession on already investigated but mostly unexplored botanic gardens, arboretums, and one castle garden: Agostyán

(Tata) (SZŰCS 2009), Zirc (SZŰCS 2013), Eger (SZŰCS and PÉNZESNÉ 2017), Martonvásár (NAGY *et al.* 2016), Soroksár (NÉMETH and PAPP 2016), Budapest (Buda Arboretum) (KOVÁCS and RIGÓ 2016).

The present research introduces the bryophyte flora of the Botanic Garden of the University of Sopron, basing on the investigations conducted between 2004 and 2008. Results were also compared with the bryoflora diversity of other Hungarian botanic gardens.

## MATERIAL AND METHODS

In order to characterise the conservation and indicator status of taxa the Hungarian Red List was used (PAPP *et al.* 2010). The nomenclature of bryophytes follows PAPP *et al.* (2010). In the case of *Hypnum cupressiforme* var. *lacunosum* HILL *et al.* (2006) was used.

Locality descriptions include data with the following order: habitat, GPS coordinates, date of collection. The identifiers of the quadrates, according to the Central European Flora Mapping System, were indicated in square brackets (KIRÁLY 2003).

Collected individuals are stored at the Cryptogamic Herbarium of the Department of Botany and Plant Physiology at the Eszterházy Károly University, Eger (EGR).

### Study area

The Botanical Garden of the University of Sopron is located in Győr-Moson-Sopron County, in the territory of the local administrative unit of Sopron, in the eastern foothills of the Sopron Hills. The extension of the territory is 17 hectares (Fig. 1). From the phytogeographical point of view the Sopron Hills are situated in the border region of the Alpine (Alpicum) and the Pannonian (Pannonicum) floristic provinces. The mean annual temperature varies between 8–9 °C, and the annual precipitation is usually between 650–900 mm (KIRÁLY 2004, SZMORAD 2011). The soils of the botanical garden were developed on loess, marl, and marl-like sediments, and the soil texture is loam and clayey-loam. The average soil pH is slightly acidic in the territory (FOLCZ and BÖRCSÖK 2015).

The garden contains 2691 woody plant taxa, 3691 herbaceous taxa, and 171 mushroom species. Among the taxa there are 16 in situ and 135 ex situ protected plant species, as well as 2 protected mushroom species (KOCSÓ 2008, FOLCZ and BÖRCSÖK 2015).

## Site details

Collection of the specimens was carried out in Győr-Moson-Sopron County, in the territory of the local administrative unit of Sopron. Each collection point belongs to 8365.1 quadrant.

1. Rockery, stone wall, mown lawn, and roadside, bare soil surface, 47.680033° N, 16.572674° E (04.02.2004, 25.06.2004, 26.06.2004, 27.06.2004, 24.09.2005, 12.04.2006, 24.09.2008)
2. Stone building, mown lawn, and roadside, woody vegetation, bare soil surface, 47.679451° N, 16.573767° E (20.01.2004, 04.02.2004, 25.06.2004, 24.09.2005, 12.04.2006)
3. Mown lawn, roadside, woody vegetation, bare soil surface, embankment of road, 47.678624° N, 16.574742° E (20.01.2004, 04.02.2004, 27.06.2004, 24.09.2005, 12.04.2006)
4. Embankment of road, mown lawn, drainage ditch, 47.680744° N, 16.573269° E (04.02.2004, 25.06.2004, 26.06.2004, 12.04.2006)
5. Stone wall, embankment of road, drainage ditch, 47.679634° N, 16.575648° E (20.01.2004, 04.02.2004, 25.06.2004, 26.06.2004, 27.06.2004)

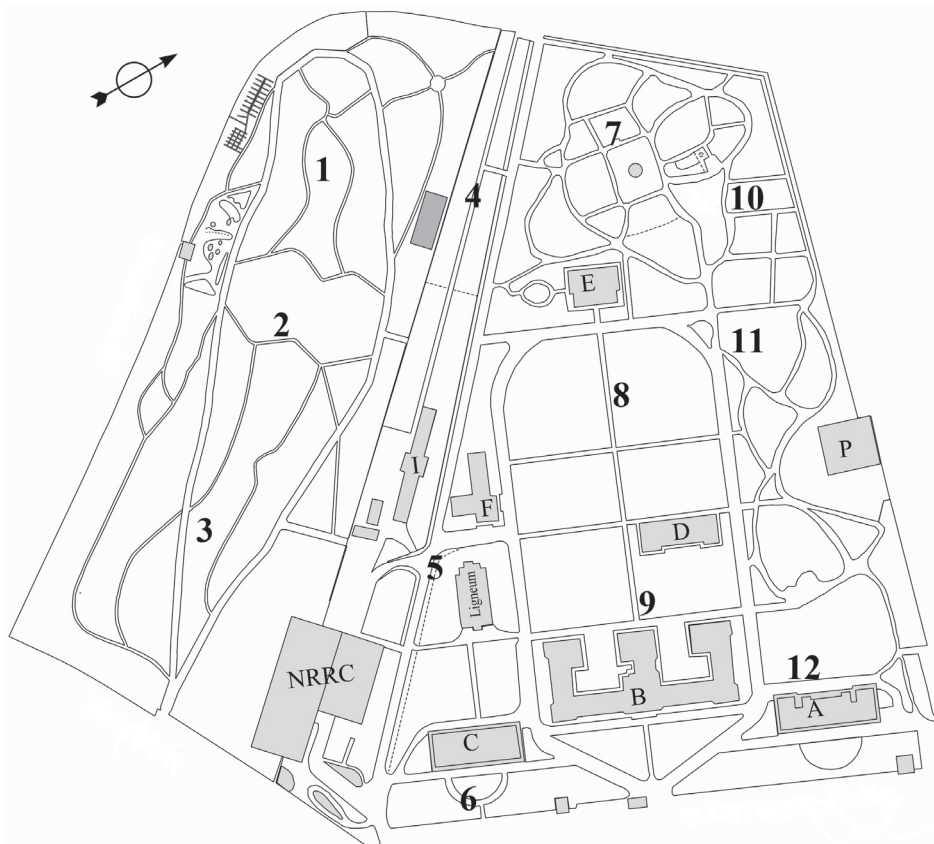


Fig. 1. Map of the botanical garden of the University of Sopron with the sampling sites (M 1 : 3000).

6. Rockery and mown lawn, 47.679232° N, 16.577297° E (04.02.2004, 25.06.2004, 26.06.2004, 27.06.2004, 24.09.2005, 12.04.2006)
7. Mown lawn, roadside, woody vegetation, 47.681264° N, 16.573834° E (04.02.2004, 25.06.2004, 26.06.2004, 27.06.2004, 12.04.2006)
8. Mown lawn, roadside, bare soil surface, 47.680681° N, 16.575495° E (20.01.2004, 04.02.2004, 25.06.2004, 24.09.2015, 12.04.2006)
9. Mown lawn, embankment of road, bare soil surface, concrete, 47.680388° N, 16.576685° E (20.01.2004, 04.02.2004, 25.06.2004, 26.06.2004, 27.06.2004)
10. Forest area, roadside, woody vegetation, 47.681751° N, 16.574057° E (04.02.2004, 25.06.2004, 26.06.2004)
11. Forest area, roadside, woody vegetation, 47.681578° N, 16.575339° E (04.02.2004, 26.06.2004, 27.06.2004)
12. Bare soil surface, anthropogenic habitat, 47.681097° N, 16.577539° E (20.01.2004, 04.02.2004, 25.06.2004, 26.06.2004, 27.06.2004, 24.09.2005, 12.04.2006)

## RESULTS

### Number of taxa, conservation status, indicator species

According to the present investigations 78 bryophytes were collected in the Botanic Garden of the University of Sopron, including 4 liverworts and 74 mosses. Besides the common and frequent taxa, mosses which are still not threatened, but need attention (LC-att) according to the Hungarian Bryophyte Red List, can be found (e.g. *Brachythecium albicans*, *Cirriphyllum tommasinii*, *Climacium dendroides*, *Lophocolea bidentata*, *Pottia intermedia*, *Rhynchostegium murale* and *Tortula papillosa*).

Near threatened species were as follows: *Aphanorrhagma patens*, *Brachythecium glareosum*, *Campylium polygamum*, *Cirriphyllum piliferum*, *Orthotrichum obtusifolium*, and *Rhynchostegiella tenella*.

Indicator species which by their mere presence denote the greater level of conservation value of the habitat, also occur in the garden like *Lophocolea bidentata*, *Campylium polygamum*, *Cirriphyllum piliferum*, *Cirriphyllum tommasinii*, *Orthotrichum cupulatum*, *Pottia intermedia*, and *Rhynchostegiella tenella*.

### List of species

Numbers refer to sites listed above. The substrates given after a semicolon refer to all listed sites.

### Hepaticae

*Lophocolea bidentata* (L.) Dumort. – 4; on shady soil  
*Marchantia polymorpha* L. – 12; on artificial stone

*Pellia endiviifolia* (Dicks.) Dumort. – 5; on shady, wet soil

*Radula complanata* (L.) Dumort. – 8; bark of *Populus ×euramericana*

### Musci

*Amblystegium serpens* (Hedw.) Schimp. – 1, 2: on bark of *Acer platanoides*, 3, 7: on bark of *Aesculus hippocastanum*, 8: on bark of *Aesculus hippocastanum*; on soil

*Amblystegium tenax* (Hedw.) C. E. O. Jensen – 5; on shaded, wet stone

*Aphanorrhagma patens* (Hedw.) Lindb. – 6; on shady, wet, clayey soil

*Atrichum undulatum* (Hedw.) P. Beauv. – 3; on soil

*Barbula convoluta* Hedw. – 1, 5, 6; on exposed soil

*Barbula unguiculata* Hedw. – 1, 2, 3, 5, 6, 8, 12; on exposed soil

*Brachythecium albicans* (Hedw.) Schimp. 1, 5, 6; on exposed soil

*Brachythecium glareosum* (Spruce) Schimp. – 5; on concrete and stone

*Brachythecium rutabulum* (Hedw.) Schimp. – 2, 3, 6, 7, 8, 9; on soil

*Brachythecium salebrosum* (F. Weber et D. Mohr) Schimp. – 1: on bark of *Betula pendula*, 8; on bark of *Aesculus hippocastanum*

*Brachythecium velutinum* (Hedw.) Schimp. – 1, 3, 7; on shady soil

*Bryum argenteum* Hedw. – 1, 5, 6, 12; on exposed soil

*Bryum bicolor* Dicks. – 1; on soil

*Bryum caespiticium* Hedw. – 1, 5, 12; on exposed soil

*Bryum capillare* Hedw. – 6, 7; on soil

*Bryum moravicum* Podp. – 5; on bark of *Robinia pseudoacacia*; 6; on bark of *Tilia tomentosa*

*Calliargonella cuspidata* (Hedw.) Loeske – 7, 8; on wet soil

*Campylium calcareum* Crundw. et Nyholm – 6; on shady limestone

*Campylium chrysophyllum* (Brid.) Lange – 9; on soil

*Campylium polygamum* (Schimp.) C. E. O. Jensen – 8; on wet soil

*Ceratodon purpureus* (Hedw.) Brid. – 1: on stone and exposed soil; 4, 5: on stone and concrete, 12; on artificial stone

*Cirriphyllum piliferum* (Hedw.) Grout – 3, 7, 8; on soil

*Cirriphyllum tommasinii* (Boulay) Grout – 5; on shaded stone

*Climacium dendroides* (Hedw.) F. Weber et D. Mohr – 7, 8; on shaded soil

*Cratoneuron filicinum* (Hedw.) Spruce – 6; on soil

*Dicranella heteromalla* (Hedw.) Schimp. – 11; on soil

*Dicranella varia* (Hedw.) Schimp. – 8; on soil

*Didymodon vinealis* (Brid.) R. H. Zander – 9; on soil

*Eurhynchium angustirete* (Broth.) T. J. Kop. – 3; on soil

*Eurhynchium hians* (Hedw.) Sande Lac. – 2, 3, 4, 6, 7, 8, 9, 11; on soil

- Eurhynchium striatum* (Hedw.) Schimp. – 3; on soil  
*Fissidens bryoides* Hedw. – 7; on soil  
*Fissidens taxifolius* Hedw. – 7, 8, 9; on bare soil  
*Funaria hygrometrica* Hedw. – 2, 12; on soil  
*Grimmia pulvinata* (Hedw.) Sm. – 1: on stone, 5; on stone and concrete  
*Homalothecium lutescens* (Hedw.) H. Rob. – 1, 9; on exposed soil  
*Homalothecium philippeanum* (Spruce) Schimp. – 1; on limestone  
*Hylocomium splendens* (Hedw.) Schimp. – 7; on shaded soil  
*Hypnum cupressiforme* Hedw. – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12; soil, stone, concrete, bark of trees  
*Hypnum cupressiforme* var. *lacunosum* Brid. – 5; on exposed stone  
*Leskea polycarpa* Ehrh. ex Hedw. – 4, 5, 8; on bark of *Populus*  
*Orthotrichum affine* Schrad. ex Brid. – 5, 8; on bark of *Populus*  
*Orthotrichum anomalum* Hedw. – 1; on exposed limestone  
*Orthotrichum cupulatum* Brid. – 5; on exposed stone  
*Orthotrichum diaphanum* Schrad. ex Brid. – 6: on bark of *Tilia tomentosa*, stone; 8; on bark of *Populus*  
*Orthotrichum obtusifolium* Brid. – 5; on bark of *Fraxinus angustifolia*  
*Orthotrichum stramineum* Hornsch. ex Brid. – 5: on bark of *Fraxinus*; 10; on bark of *Acer pseudoplatanus*  
*Phascum cuspidatum* Hedw. – 1, 2, 5; on bare soil  
*Physcomitrium pyriforme* (Hedw.) Brid. – 5; on wet, shaded soil  
*Plagiomnium affine* (Blandow) T. J. Kop. – 7, 8; on soil  
*Plagiomnium cuspidatum* (Hedw.) T. J. Kop. – 3, 5, 8; on soil  
*Plagiomnium rostratum* T. J. Kop. – 2, 4, 5, 8; on soil  
*Plagiomnium undulatum* (Hedw.) T. J. Kop. – 3, 4, 5, 8, 9; on soil  
*Plagiothecium cavifolium* (Brid.) Z. Iwats. – 5; on soil  
*Platygyrium repens* (Brid.) Schimp. – 2, 7; on bark of *Quercus*  
*Pohlia melanodon* (Brid.) A. J. Shaw – 8; on soil  
*Pottia intermedia* (Turner) Fürnr. – 1; on soil  
*Pottia lanceolata* (Hedw.) Müll. Hal. – 1; on wet, shady soil  
*Pseudocrossidium hornschuchianum* (Schultz) R. H. Zander – 1; on limestone  
*Pylaisia polyantha* (Hedw.) Schimp. – 5: on bark of *Fraxinus*, 6; on bark of *Tilia tomentosa*  
*Rhynchostegiella tenella* (Dicks.) Limpr. – 5; on shaded, wet stone  
*Rhynchostegium murale* (Hedw.) Schimp. – 5; on concrete  
*Rhytidiadelphus squarrosus* (Hedw.) Warnst. – 7; on soil  
*Rhytidiadelphus triquetrus* (Hedw.) Warnst. – 7, 8; on soil  
*Schistidium crassipilum* H. H. Blom – 6; on muscovite stone (ERZBERGER and SCHRÖDER 2008)



- Schistidium elegantulum* H. H. Blom – 9; on concrete (ERZBERGER and SCHRÖDER 2008)
- Scleropodium purum* (Hedw.) Limpr. – 3, 4, 7, 8; on soil
- Thuidium abietinum* (Hedw.) Schimp. – 8, 9; on soil
- Thuidium delicatulum* (Hedw.) Schimp. – 7, 8; on soil
- Thuidium philibertii* Limpr. – 7, 8; on soil
- Thuidium tamariscinum* (Hedw.) Schimp. – 7; on soil
- Tortula muralis* L. ex Hedw. – 1, 5, 6; on stone, 2, 3; on bitumen
- Tortula papillosa* Wilson – 5; on bark of *Fraxinus*
- Tortula ruralis* (Hedw.) P. Gaertn., B. Mey. et Scherb. – 1: on soil and stone; 5; on stone

## DISCUSSION

Some common bryophytes of the botanic garden of Sopron, including *Amblystegium serpens*, *Barbula unguiculata*, *Brachythecium rutabulum*, *B. salebrosum*, *Eurhynchium hians*, *Bryum argenteum*, *Ceratodon purpureus*, *Hypnum cupressiforme*, *Leskea polycarpa*, *Orthotrichum anomalum*, *O. diaphanum*, *Radula complanata*, *Tortula muralis*, and *Tortula ruralis* occur also in almost all investigated Hungarian botanic gardens and arboretums (Table 1). 62.8% of the species identified in the Botanic Garden of the University of Sopron can also be found in the Botanic Garden of Vácrátót. The results for other gardens and arboretums are as follows: Agostyán 40.0%, Eger 34.6%, Budapest 39.7%, Martonvásár 48.7%, Soroksár 50.5%, Szigliget 37.2%, and Zirc 52.6%.

Some less common mosses (*Amblystegium tenax*, *Fissidens bryoides*, *Rhynchostegiella tenella*) were detected only in Sopron. The values show that the bryophyte flora of the Botanic Garden of the University of Sopron closely resembles the flora of some other investigated gardens (Zirc, Martonvásár, Soroksár) and the arboretum of Vácrátót, despite the long distance of the latter from Sopron. The high similarity can primarily be explained by the high number of species and the presence of common and frequent bryophytes.

The differences of the bryophyte flora of various gardens can mainly be explained by different habitats and natural conditions, various dimensions, different ages and level of bryophyte investigations (Fig. 2, Table 1).

The low proportion of liverworts (Fig. 2) in the investigated area is similar to the majority of other Hungarian botanic gardens and arboretums. However, this phenomenon is also very characteristic for many European cities and settlements (SZŰCS *et al.* 2017).

**Table 1.** Occurrence of species in the Sopron Botanic Garden, in other Hungarian botanic gardens, arboretums and manor parks and percentage of similarity of bryophyte flora with that of Sopron Botanic Garden. Comparative data were obtained from the following sources: Agostyán (SZÜCS 2009), Eger (SZÜCS and PÉNZESNÉ-KÓNYA 2017), Budapest (KOVÁCS and RIGÓ 2016), Martonvásár (NAGY *et al.* 2016), Soroksár (NÉMETH and PAPP 2016), Szigliget (VAJDA 1968), Vácrtót (VAJDA 1954), Zirc (GALAMBOS 1992, SZÜCS 2013).

Taxon name	Botanic gardens							
	Agostyán	Eger	Budapest	Martonvásár	Soroksár	Szigliget	Vácrtót	Zirc
<b>Hepaticae</b>								
<i>Lophocolea bidentata</i>	-	-	-	-	-	-	+	+
<i>Marchantia polymorpha</i>	-	-	+	+	+	-	+	+
<i>Pellia endiviifolia</i>	+	-	+	-	-	-	-	-
<i>Radula complanata</i>	+	-	+	+	+	+	+	+
<b>Musci</b>								
<i>Amblystegium serpens</i>	+	+	+	+	+	+	+	+
<i>Amblystegium tenax</i>	-	-	-	-	-	-	-	-
<i>Aphanorrhagma patens</i>	-	-	-	+	-	-	-	-
<i>Atrichum undulatum</i>	+	-	-	-	-	+	-	+
<i>Barbula convoluta</i>	-	-	+	+	-	-	-	+
<i>Barbula unguiculata</i>	+	+	+	+	+	+	+	+
<i>Brachythecium albicans</i>	+	-	-	-	+	-	+	-
<i>Brachythecium glareosum</i>	-	-	-	-	-	-	+	+
<i>Brachythecium rutabulum</i>	+	+	+	+	+	+	+	+
<i>Brachythecium salebrosum</i>	+	+	+	+	+	+	+	-
<i>Brachythecium velutinum</i>	+	-	-	-	+	-	+	+
<i>Bryum argenteum</i>	+	+	+	+	+	+	+	-
<i>Bryum bicolor</i>	-	-	-	-	+	-	-	-
<i>Bryum caespiticium</i>	-	+	-	+	+	-	+	-
<i>Bryum capillare</i>	-	-	+	+	+	-	+	+
<i>Bryum moravicum</i>	-	-	+	+	+	-	-	+
<i>Calliergonella cuspidata</i>	-	+	+	+	+	+	+	-
<i>Campylium calcareum</i>	-	-	-	-	+	-	-	-

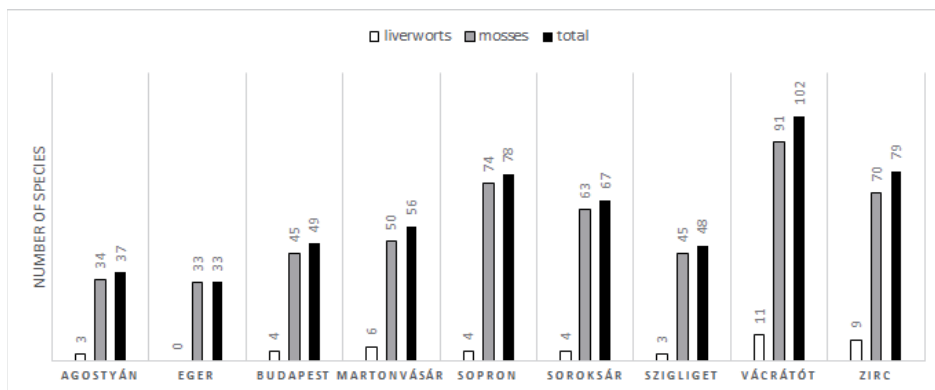


Table 1. (continued).

Taxon name	Botanic gardens							
	Agostyán	Eger	Budapest	Martonvásár	Soroksár	Szigliget	Vácrátót	Zirc
<i>Campylium chrysophyllum</i>	-	-	-	-	-	-	+	+
<i>Campylium polygamum</i>	+	-	-	-	-	-	-	-
<i>Ceratodon purpureus</i>	+	+	+	+	+	+	+	-
<i>Cirriphyllum piliferum</i>	-	-	-	-	-	+	-	+
<i>Cirriphyllum tommasinii</i>	+	-	-	-	-	-	+	+
<i>Climacium dendroides</i>	-	+	-	-	-	-	-	-
<i>Cratoneuron filicinum</i>	+	-	-	-	-	-	+	+
<i>Dicranella heteromalla</i>	+	-	-	-	-	-	-	-
<i>Dicranella varia</i>	-	-	+	-	-	-	-	+
<i>Didymodon vinealis</i>	-	-	-	-	-	+	-	-
<i>Eurhynchium angustirete</i>	+	-	-	-	-	-	+	-
<i>Eurhynchium hians</i>	+	+	+	+	+	+	+	+
<i>Eurhynchium striatum</i>	+	-	-	-	-	-	-	-
<i>Fissidens bryoides</i>	-	-	-	-	-	-	-	-
<i>Fissidens taxifolius</i>	+	+	+	+	-	-	+	+
<i>Funaria hygrometrica</i>	-	-	-	+	+	+	+	+
<i>Grimmia pulvinata</i>	+	-	+	+	+	+	+	-
<i>Homalothecium lutescens</i>	+	+	-	+	+	-	+	+
<i>Homalothecium philippeanum</i>	-	+	-	-	-	-	+	+
<i>Hylocomium splendens</i>	-	+	-	-	-	-	+	-
<i>Hypnum cupressiforme</i>	+	+	+	+	+	+	+	+
<i>Hypnum cupressiforme</i> var. <i>lacunosum</i>	+	-	-	-	-	-	-	-
<i>Leskea polycarpa</i>	+	-	+	+	+	+	+	+
<i>Orthotrichum affine</i>	-	-	+	+	+	-	+	+
<i>Orthotrichum anomalum</i>	-	+	+	+	+	+	+	+
<i>Orthotrichum cupulatum</i>	-	+	+	+	+	-	-	-
<i>Orthotrichum diaphanum</i>	-	+	+	+	+	+	+	+
<i>Orthotrichum obtusifolium</i>	-	-	+	+	+	-	+	+
<i>Orthotrichum stramineum</i>	-	-	-	-	+	-	-	-

Table 1. (continued).

Taxon name	Botanic gardens							
	Agostyán	Eger	Budapest	Martonvásár	Soroksár	Szigliget	Vácraót	Zirc
<i>Phascum cuspidatum</i>	-	-	-	+	-	+	+	+
<i>Physcomitrium pyriforme</i>	-	-	-	+	+	-	+	+
<i>Plagiomnium affine</i>	+	-	-	+	-	+	-	-
<i>Plagiomnium cuspidatum</i>	-	+	+	+	+	-	+	+
<i>Plagiomnium rostratum</i>	-	-	-	-	-	-	-	+
<i>Plagiomnium undulatum</i>	+	+	-	+	-	+	+	+
<i>Plagiothecium cavifolium</i>	+	-	-	-	-	-	-	-
<i>Platygyrium repens</i>	-	+	-	+	-	-	-	+
<i>Pohlia melanodon</i>	-	-	-	+	-	-	-	-
<i>Pottia intermedia</i>	-	-	-	-	-	-	+	-
<i>Pottia lanceolata</i>	-	+	-	-	+	-	+	-
<i>Pseudocrossidium hornschurchianum</i>	-	-	+	-	+	-	+	-
<i>Pylaisia polyantha</i>	-	-	+	-	+	+	+	+
<i>Rhynchostegiella tenella</i>	-	-	-	-	-	-	-	-
<i>Rhynchostegium murale</i>	-	-	-	-	-	+	-	+
<i>Rhytidiadelphus squarrosus</i>	-	+	-	-	-	+	-	-
<i>Rhytidiadelphus triquetrus</i>	-	-	-	-	-	-	+	+
<i>Schistidium crassipilum</i>	+	+	+	+	+	-	-	+
<i>Schistidium elegantulum</i>	-	-	-	-	-	-	-	-
<i>Scleropodium purum</i>	+	+	-	-	+	+	+	+
<i>Thuidium abietinum</i>	-	-	-	-	+	-	+	-
<i>Thuidium delicatulum</i>	-	-	-	-	-	-	+	-
<i>Thuidium philibertii</i>	+	+	-	+	-	+	+	-
<i>Thuidium tamariscinum</i>	-	-	-	-	-	-	+	-
<i>Tortula muralis</i>	-	+	+	+	+	+	+	+
<i>Tortula papillosa</i>	-	-	+	+	+	+	+	-
<i>Tortula ruralis</i>	+	-	+	+	+	+	+	+
<b>Percentage of similitude with Botanic Garden of Sopron (%)</b>	40.0	34.6	39.7	48.7	50.5	37.2	62.8	52.6



**Fig. 2.** The number of species of Hungarian botanic gardens, arboretums, and manor parks. Comparative data were obtained from the following sources: Agostyán (Szűcs 2009), Eger (Szűcs and PÉNZESNÉ-KÓNYA 2017), Budapest (KOVÁCS and RIGÓ 2016), Martonvásár (NAGY *et al.* 2016), Sopron (this work), Soroksár (NÉMETH and PAPP 2016), Szigliget (VAJDA 1968), Vácrátót (VAJDA 1954), Zirc (GALAMBOS 1992, Szűcs 2013).

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**Összefoglaló:** A 2004. és 2008. között végzett kutatás alapján a Sopron Egyetem Botanikus Kertjének területéről összesen 78 mohafaj ismert, melyből 4 a májmohákhoz 74 pedig a lombosmohákhoz tartozik. Figyelemre méltó mohafajok a hazai vörös lista alapján: *Aphanorrhagma patens*, *Brachythecium glareosum*, *Campylium polygamum*, *Cirriphyllum piliferum*, *Cirriphyllum tommasinii*, *Climacium dendroides*, *Eurhynchium striatum*, *Orthotrichum obtusifolium*, *Pottia intermedia*, *Rhynchostegiella tenella*, *Rhynchostegium murale*, *Schistidium elegantulum* és *Tortula papillosa*.

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