
The liverwort flora of Vištytis Regional Park

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Investigation of liverwort flora of the Vištytis Regional Park revealed 40 species of liverwort (*Marchantiophyta*) growing in this park. They belong to 21 families and 26 genera. One hornwort (*Anthocerotophyta*) species was found as well. Thalloid liverworts are quite common in the park (12 species). Comparison of the composition of liverwort flora of Vištytis and Gražutė regional parks showed a great difference between them. Different climatic and microclimatic conditions in the parks are among the main determining factors.

Key words: liverworts, flora, regional parks, Lithuania

INTRODUCTION

Liverworts are among the least investigated plants of the world. Although lately studies of liverworts are being carried out constantly [1], there are still areas where liverworts are not investigated at all or very little. The Vištytis Regional Park (RP) situated in the south-western part of Lithuania is one of them. A very hilly morainic relief of the park, with steep sloped and stony hills, was formed by active ice flows of a branched off glacier shield in the ice-age [2]. Lakes and mires are present in abundant depressions. There are several large forests in the territory of the park. Oak forests, very often with spruce, hornbeam and lime tree admixture, are characteristic of the park. They grow on loamy soils. Pine forests are found on sandy soils [2].

MATERIALS AND METHODS

Investigations of liverwort flora in the Vištytis RP were carried out in July–August 2001. From different biotopes, 109 herbarial specimens were collected. The specimens are being stored in the WI. Data of the Scientific Herbarium (HS) of Marijampolė Nature Research and Ecological Education Station, mostly collected by V. Tumosienė in 1998, were used for compilation of the species list. Literature used for liverwort species identification is indicated in our previous publications. Plant names are given according to R. Schumacher & J. Vaná [3].

RESULTS AND DISCUSSION

Upon analysing all available material it was established that 40 species of liverworts, belonging to 21

families, 25 genera, and one hornwort (*Anthocerotophyta*) species grow in the Vištytis RP. Most of liverwort species belong to these orders: *Jungermanniales* – 29, *Metzgeriales* – 6, *Marchantiales* – 5 species. The family *Cephaloziaceae* is dominating (7 species). Four species belonging to *Geocalyceaceae*, 3 to *Aneuraceae*, *Ricciaceae*, *Calypogeiaceae*, two to *Lophoziaceae*, *Lepidoziaceae*, *Jungermanniaceae*, *Plagiochillaceae*, one to from the remaining families were recorded.

Most common species in the park are *Chiloscyphus profundus*, *Lepidozia reptans*, *Metzgeria furcata*, *Plagiochila asplenioides*, *P. porelloides*, *Ptilidium pulcherrimum*, *Radula complanata*. Two species new for Lithuania were found: *Cephalozia leucantha* (leg. et det. N. Kalinauskaitė) and *Frullania fragilifolia*. (leg. V. Tumosienė, det. N. Kalinauskaitė).

Most species were found in various swampy habitats: in boggy depressions among hills, on lake shores. Unfortunately, beavers' activity unfavourably transforms a lot of habitats suitable for liverworts.

A comparison of liverwort flora composition of Vištytis RP and Gražutė RP [4] was carried out. A table was compiled, where species growing in Vištytis (V) RP and Gražutė (G) RP were indicated. The data of the table show that the Vištytis liverwort flora differs distinctly from the Gražutė RP liverwort flora. Fourteen species were found only in Vištytis RP and 10 species only in Gražutė RP. The total number of species recorded in both parks is 25 (Table). The similarity coefficient (according to Sjörens) of the liverwort flora of these parks is $K_s = 32.05$.

The composition of liverwort flora is apparently strongly influenced not only by substrate, but by ecological conditions as well. The substrate is the same

Table. The distribution species of liverworts in Vištytis and Gražutė regional parks

Taxa	V	G
<i>Aneura pinguis</i> (L.) Dumort.	+	+
<i>Anthoceros punctatus</i> L.	+	-
<i>Barbilophozia attenuata</i> (Mart.) Loeske	-	+
<i>Blasia pusilla</i> L.	+	-
<i>Blepharostoma trichophyllum</i> (L.) Dumort. var. <i>trichophyllum</i>	+	+
<i>Calypogeia integristipula</i> Steph.	+	+
<i>C. muelleriana</i> (Schiffn.) Mull. Frib.	+	+
<i>C. neesiana</i> (C. Massal. et Carestia) Mull. Frib.	+	-
<i>C. sphagnicola</i> (Arnell et J. Perss.) Warnst et Loeske	-	+
<i>Cephalozia pleniceps</i> (Austin) Lindb.	+	+
<i>C. bicuspidata</i> (L.) Dumort.	+	+
<i>C. catenulata</i> (Huebener) Lindb.	+	-
<i>C. connivens</i> (Dicks.) Lindb.	+	+
<i>C. leucantha</i> Spruce	+	-
<i>C. macrostachya</i> Kaal.	+	+
<i>Cephaloziella divaricata</i> (Sm.) Schiffn.	+	+
<i>C. elachista</i> (J. B. Jack ex Gottsche et Rabenh.) Schiffn.	-	+
<i>C. hampeana</i> (Nees) Schiffn.	-	+
<i>C. rubella</i> (Nees) Warnst.	-	+
<i>Chiloscyphus coadunatus</i> (Sw.) J. J. Engel et R. M. Schust.	+	+
<i>Ch. polyanthos</i> (L.) Corda	+	+
<i>Ch. profundus</i> (Nees) J. J. Engel et R. M. Schust.	+	+
<i>Ch. minor</i> (Nees) J. J. Engel et R. M. Schust.	-	+
<i>Cladopodiella fluitans</i> (Nees) H. Buch	+	+
<i>Conocephalum conicum</i> (L.) Dumort	+	-
<i>Frullania fragilifolia</i> (Taylor) Gottsche et al.	+	-
<i>Geocalyx graveolens</i> (Schrud) Nees	+	-
<i>Jamesionella autumnalis</i> (DC.) Steph.	+	+
<i>Jungermannia leiantha</i> Grolle	+	-
<i>Kurzia pauciflora</i> (Dicks.) Grolle	+	-
<i>Lepidozia pearsonii</i> Steph.	-	+
<i>L. reptans</i> (L.) Dumort.	+	+
<i>Lophozia bicrenata</i> (Schmidel ex Hoffm.) Dumort.	-	+
<i>L. excisa</i> (Dicks) Dumort.	-	+
<i>L. incisa</i> (Schrud) Dumort. subsp. <i>incisa</i>	+	-
<i>L. ventricosa</i> (Dicks) Dumort.	-	+
<i>Marchantia polymorpha</i> L.	+	+
<i>Metzgeria furcata</i> (L.) Dumort.	+	-
<i>Mylia anomala</i> (Hook.) Gray	+	+
<i>Nowellia curvifolia</i> (Dicks.) Mitt.	+	-
<i>Pelia neesiana</i> (Gottsche) Limpr.	+	+
<i>Plagiochila asplenoides</i> (Lemend. Taylor) Dumort.	+	+
<i>P. porelloides</i> (Torrey ex Nees) Lindenb.	+	+
<i>Ptilidium pulcherrimum</i> (G. Weber) Vanio	+	+
<i>Radula complanata</i> (L.) Dumort.	+	+
<i>Riccardia incurvata</i> Lindb.	+	+
<i>R. latifrons</i> (Lindb.) Lindb.	+	+
<i>R. palmata</i> (Hedw.) Carruth.	-	+
<i>Riccia fluitans</i> L.	+	-
<i>R. sorocarpa</i> Bisch.	+	+
<i>Ricciocarpos natans</i> (L.) Corda	+	-
<i>Scapania irrigua</i> (Nees) Nees	-	+
<i>Trichocolea tomentella</i> (Ehrh.) Dumort.	+	-
<i>Tritomaria exsectiformis</i> (Breidl.) Schiffn. ex Loeske	-	+
Total:	41	38

[2], but climate is quite different in both parks [5]. Vištytis RP and Gražutė RP belong to the same

district of south-eastern highlands [2], but Vištytis RP is situated in the south-easternmost part and Gražutė RP in the north-easternmost part. The climate of Vištytis RP is milder, but in Gražutė RP it is more continental. Most of tree and flowering plant species characteristic of Central Europe grow in Vištytis RP, as well as the newly found *Frullana fragilifolia* and rich in species tufted liverworts (12 species) more common in Central Europe. One of them is *Metzgeria furcata*, which is not only very common, but very often is found with reproduction organs. This indicates suitable conditions of for its existence.

Seven species of tufted liverworts were found in Gražutė RP. Snow cover remains longer in the depressions of this park. The temperature on the surface of soil keeps lower for a longer time and there are no broad-leaved trees, which could protect the soil surface from the direct sun in summer time in this park. Therefore growing conditions are not so favourable for liverworts here. In Gražutė RP conditions are more favourable for continental species and species more widely spread in Northern Europe, such as *Barbilophozia attenuata*, *Lepidozia pearsonii*, *Lophozia bicrenata*, which are not found in Vištytis RP.

ACKNOWLEDGEMENTS

I would like thank Director of the Vištytis RP Mr. R. Belevičius for providing an opportunity to carry out investigations and Director of the Marijampolė Nature Research and Ecological Education Station for permissioning to use the liverwort collection compiled in the Vištytis RP.

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VIŠTYČIO REGIONINIO PARKO KERPSAMANIŲ FLORA

S a n t r a u k a

Vištyčio RP kerpsamanių tyrimai atlikti 2001 m. liepos – rugpjūčio mėn. Buvo ištirta 13 augimviečių ir jose surinkti 109 herbariuminiai pavyzdžiai. Jie saugomi WI. Tyrimams papildyti taip pat panaudota Marijampolės Gamtos tyrimo ir ekologinio švietimo stoties herbaro (HS) duomenys. Išanalizavus surinktą medžiagą nustatyta, kad Vištyčio RP auga 40 kerpsamanių (*Marchantiophyta*) rūšių, priklausančių 21 šeimai ir 25 gentims ir 1 ylvaisūnų (*Anthocerotophyta*) rūšis. Dauguma kerpsamanių rūšių telkiasi šiose eilėse: *Jungermaniales* – 29 rūšys, *Metzgeriales* – 6, *Marchantiales* – 5. Tarp šeimų vyrauja *Cephaloziaceae* – 7 rūšys. *Geocalyceae*

ae šeimos aptiktos 4 rūšys, *Aneuraceae*, *Ricciaceae* ir *Calyptogeiaceae* – po 3 rūšis, *Lophoziaceae*, *Lepidoziaceae*, *Jungermanniaceae*, *Plagiochillaceae* – po 2 rūšis. Visose kitose šeimose – po 1 rūšį. Dažniausiai pasitaikančios rūšys: *Chiloscyphus profundus*, *Lepidozia reptans*, *Metzgeria furcata*, *Plagiochila asplenoides*, *P. porelloides*, *Ptilidium pulcherrimum*, *Radula complanata*. Rastos dvi naujos Lietuvoje rūšys: *Cephalozia leucantha* ir *Frullania fragilifolia*. Daugiausia rūšių rasta įvairaus tipo pelkėse, užpelkėjusiose tarpukalnių daubose, ežerų pakrantėse.

Buvo atliktas Vištyčio RP ir Gražutės RP kerpsamanių floros sudėties palyginimas. Nustatyta, kad šių parkų kerpsamanių floros sudėtis labai skiriasi, panašumo koeficientas $K_s = 32,05$. Matyt, didelę įtaką kerpsamanių floros sudėčiai turi ne tik substratas, bet ir ekologinės sąlygos. Vištyčio RP klimatas švelnesnis, Gražutės – daugiau žemyninis [2]. Vištyčio RP gana gausu gniužulinių kerpsamanių rūšių – 12, labiau paplitusius Vidurio Europoje, o Gražutės RP palankesnės sąlygos kontinentinėms ar rūšims, labiau paplitusioms Šiaurės Europoje.