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SAXICOLE BRYOPHYTES FROM VÂLSAN KEYS

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Abstract
The paper presents a review of the saxicole species in the Vâlsan Keys and considerations regarding the bryophytic saxicole cenoses from the protected area. To analyze the diversity of the saxicole bryophytes, we considered the number of species, as well as the phytogeografical element, the growth form and the "life strategy" of each species. From the systematic perspective, Vâlsan Keys are featured by a high specific diversity of the saxicole bryophytes.

Keywords: saxicolous bryophytes, Vâlsan Keys, bryophyte diversity variables.

1. INTRODUCTION

The Vâlsan Valley Protected Area was established in 1994, with a status of national reservation, in order to preserve the aspect, the valuable flora species, forest habitats and the landscape, and also to promote and encourage the ecological tourism, in order to make the public conscious and educate it to protect the nature and its values.

Considering the whole diversity of the biotypes in the Vâlsan Valley, the main objective of our research is to know the taxonomic diversity of the saxicole bryophytes in the Vâlsan Keys.

Saxicole bryophytes represent a group of organisms with specific, physiological and ecological adaptations, which make them successful in various habitats. Saxicole bryophytes appear on the islands of the habitat, such as rocks, scree, boulders, which can be considered local centers of diversity (Kubešová & Chytrý, 2005).

In Europe, most of the vegetation studies regarding the saxicole bryophytes focus on describing the differences of the local vegetation or on the vegetation-environment relations, and rarely on creating diversity models (Kubešová & Chytrý, 2005).

As the saxicole bryophytes groups usually possess specific relations with the environment (Frahm, 2001), they can provide perspectives on diversity, more than the ones provided only by the number of species.

2. MATERIALS AND METHODS

The studied biological material was collected from the Keys of Vâlsan River, as a result of many field visits. For the bryophytes collected from the rocks, we indicated, as much as possible, the rock (granite, basalt, limestone etc.), the exposition (the ratio with the sunlight, with the dominant winds etc.) if they are fixed directly on the rock, on a thin layer of dust or in the cracks.

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To analyze the diversity of the saxicole bryophytes, we considered the number of species, and also the phytogeographic element, the growth form and the "life strategy" of every species.
For each species, we verified the sozologic status: VR – very rare species, RS – rare species, SS – sporadic species (Dihoru, 1994).
The nomenclature of the species was actualized after Schumacker Váňa (2000, 2005) for the representative of the Marchantiophyta class and after Hill et al. (2006) for the representatives of the Musci (Bryophyta) class.

3. RESULTS AND DISCUSSIONS

In the researched area, we analyzed and identified a number of 70 taxons, 7 from Marchantiophyta (Hepaticae class) and 63 from Bryophyta (Musci class), belonging to 56 types: 7 hepaticae and 49 musci.
The list of the identified species: *Conocephalum conicum* (L.) Dumort. (Figure 1), *Preissia quadrata* (Scop.) Nees., *Aneura pinguis* (L.) Dumort., *Metzgeria furcata* (L.) Dumort. (*Jungermannia furcata* L., *Metzgeria glabra* Raddi), *Plagiochila porelloides* (Torrey ex Nees) Lindenb., *Scapania nemorea* (L.) Grölle, *Lejeunea cavifolia* (Ehrh.) Lindb., *Sphagnum angustifolium* (C.E.O. Jensen ex Russow.) C.E.O. Jensen **SS**, *Sphagnum squarrosum* Crome, *Sphagnum capillifolium* (Ehrh.) Hedw., *Sphagnum girgensohnii* Russow, *Sphagnum quinquefarium* (Braithw.) Warnst., *Pogonatum urnigerum* (Hedw.) P. Beauv., *Polytrichastrum alpinum* (Hedw.) G.L.Sm., *Encalypta streptocarpa* Hedw., *Grimmia pulvinata* (Hedw.) Sm., *Grimmia trichophylla* Grev. **RS.** *Racomitrium sudeticum* (Funck.) Bruch & Schimp. **SS,** *Schistidium apocarpum* (Hedw.) Bruch & Schimp., *Blindia acuta* (Hedw.) Bruch & Schimp. **SS,** *Ditrichum flexicaule* (Schwägr.) Hampe, *Cynodontium polycarpon* (Hedw.) Schimp. **SS,** *Dicranoweisia crispula* (Hedw.) Milde **SS**, *Dicranella crispa* (Hedw.) Schimp. **VR,** *Dicranum scoparium* Hedw. (Figure 2), *Dicranum fuscescens* Sm. (Figure 3), *Paraleucobryum longifolium* (Hedw.) Loeske, *Barbula unguiculata* Hedw., *Bryoerythrophyllum recurvirostrum* (Hedw.) P.C.Chen, *Didymodon fallax* (Hedw.) R.H.Zander, *Didymodon insulanus* (De Not.) M.O. Hill, *Syntrichia ruralis* (Hedw.) F.Weber & D.Mohr, *Tortula muralis* Hedw., *Orthotrichum anomalum* Hedw., *Hedwigia ciliata* (Hedw.) P. Beauv., *Bartramia halleriana* Hedw., *Bartramia pomiformis* Hedw., *Plagiopus oederianus* (Sw.) H.A.Crum & L.E.Anderson, *Bryum argenteum* Hedw., *Bryum capillare* Hedw., *Bryum pseudotriquetrum* (Hedw.) P.Gaertn. et. al., *Plagiobryum zieri* (Hedw.) Lindb. (Bryum zieri Hedw.) **RS**, *Pohlia elongata* var. *greenii* (Brid.) A.J.Shaw, *Mnium marginatum* (Dicks) P. Beauv. var. marginatum, *Rhizomnium pseudopunctatum* (Bruch.et. Schimp.) T.J.Kop. **SS**, *Rhizomnium punctatum* (Hedw.) T.J.Kop., *Amblystegium serpens* (Hedw.) Schimp., *Campylium stellatum* (Hedw.) Lange & C.E.O., *Cratoneuron commutatum* (Hedw.) Roth, *Cratoneuron filicinum* (Hedw.) Spruce, *Hygrohypnum luridum* (Hedw.) Jenn., *Hygrohypnum duriusculum* (De Not.) D.W. Jamieson **RS**, *Sanionia uncinata* (Hedw.) Loescke, *Rhynchostegium murale* (Hedw.) Schimp., *Oxyrrhynchium schleicheri* (R. Hedw.) Röll, *Brachythecium mildeanum* (Schimp.) Schimp., *Brachythecium rutabulum* (Hedw.) Schimp., *Brachytheciastrum velutinum* (Hedw.) Ignatov & Huttunen, *Homalothecium sericeum* (Hedw.) Schimp., *Campylophyllum halleri* (Hedw.) M. Fleisch. **SS**, *Ctenidium molluscum* (Hedw.) Mitt., *Hypnum bambergeri* Schimp. **SS**, *Hypnum lindbergii* Mitt., *Ptilium crista - castrensis* (Hedw.) De Not. (Figure 4), *Pylaisia polyantha* (Hedw.) Schimp., *Hylocomium splendens* (Hedw.) Schimp., *Rhytidiadelphus triquetrus* (Hedw.) Warnst., *Plagiothecium laetum* Schimp., *Neckera complanata* (Hedw.) Huebener, *Isothecium alopecuroides* (Lam. ex Dubois) Isov..

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From the perspective of the substrate they were collected from, 48 species prefer a single substrate, 21 species prefer two categories of substrate in the following combinations teri-saxicole or corti-saxicole and one species (*Sanonia uncinata*) was found on three categories of substrate.

Figure 1. *Conocephalum conicum* (L.) Dumort.

Figure 2. *Dicranum scoparium* Hedw.

Figure 3. *Dicranum fuscescens* Sm.

Figure 4. *Ptilium crista - castrensis* De Not.

1 – 4 (Photo C. Dobrescu)

Of the saxicole muscle groups, we frequently meet:

1. *Syntrichia ruralis, Schistidium apocarpum, Grimmia pulvinata, Pohlia elongata var. greenii, Bryum argenteum;*
2. *Bartramia halleriana, Dicranum scoparium, Ceratodon purpureus;*
3. *Hypnum cupressiforme, Plagiothecium cavifolium, Plagiothecium laetum, Brachythecium rivulare, Hylocomium splendens;*

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4. *Rhytidiadelphus triquetrus, Plagiochila porelloides, Metzgeria furcata, Lejeunea cavifolia, Scapania nemorea;*
5. *Bryum pseudotriquetrum, Cratoneuron filicinum, Aneura pinguis, Tortula muralis, Brachythecium rutabulum, Amblystegium serpens, Schistidium apocarpum, Didymodon fallax;*
6. *Hypnum cupressiforme, Grimmia trichophylla, Hygrohypnum sp.;*
7. *Hygrohypnum sp., Bryum pseudotriquetrum, Barbula unguiculata, Bryum argenteum, Pohlia elongata var. greenii;*
8. *Bryum capillare, Ceratodon purpureus, Grimmia pulvinata, Grimmia trichophylla, Schistidium apocarpum, Leucodon sciuroides;*
9. *Hypnum cupressiforme, Hypnum bambergeri, Hedwigia ciliata, Dicranum scoparium.*

As for the growth forms, small size saxicole acrocarp bryophytes were frequently met on basic rocks (Figure 5), high acrocarp bryophytes were frequent of small, shadowed rocks, while the pleurocarpous mosses occupy large areas on bigger stones (Figure 6).

Figure 5: ***Saxicolous mosses communities with small acrocarpous bryophytes*** **(Photo C. Dobrescu)**

Figure 6*: Saxicolous mosses communities with tall acrocarpous and pleurocarpous bryophytes*
(Photo C. Dobrescu)

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4. CONCLUSIONS

From the systematic perspective, Vâlsan Keys are featured by a high specific diversity of the saxicole bryophytes. From the Marchantiophyta species, 8 are cited for the first time in the area.

Of the highly importance species regarding the chorology, we identified in our country: 1 very rare species (VR) *Dicranella crispa*, 3 rare species (RS) *Grimmia trichophylla*, *Plagiobryum zieri*, *Hygrohypnum duriusculum*; 8 sporadic species (SS) *Sphagnum angustifolium*, *Racomitrium sudeticum*, *Blindia acuta*, *Cynodontium polycarpon*, *Dicranoweisia crispula*, *Rhizomnium pseudopunctatum*, *Campylophyllum halleri*, *Hypnum bambergeri.*

Small acrocarp saxicole bryophytes are positively related to well enlighten sites, while the large sized pleurocarpous mosses are related to sites in shadowed areas. Perennial bryophytes have been more frequently noticed in shadowed sites, on larger rocks and on the slopes on the river banks, while the colonizing species have been better represented on acid isolated rocks and boulders.

5. REFERENCES

Dihoru, G. (1994). Bryophyta - Musci in the Romanian Flora, *Revue Roumaine de Biologie, Biologie Vegetale*, 39 (2): 91-107

Frahm, J-P. (2001). Biologie der Moose. Berlin, Heidelberg: Spektrum Akademischer Verlag.

Hill, M. O., Bell N., Bruggeman-Nannenga M. A., Brugués M., Cano M. J., Enroth J., Flatberg K. I., Frahm J.-P., Gallego M. T., Garilleti R., Guerra J., Hedenäs L., Holyoak D. T., Hyvönen J., Ignatov M. S., Lara F., Mazimpaka V., Muñoy J., Söderström L. (2006). Bryological Monograph. An annotated checklist of the mosses of Europe and Macaronesia, *Journal of Bryology*, 28:198 – 267.

Kubešová, Svatava, Chytrý, M. (2005). Diversity of bryophytes on treeless cliffs and talus slopes in a forested central European landscape, *Journal of Bryology*, 27:35–46.

Schumacker, R., Váňa, J. (2000). Identification keys to the liverworts and hornworts of Europe and Macaronesia (Distribution & Status), *Documents de la station scientifique des Hautes/Fagnes*, 31:1-160.

Schumacker, R., Váňa, J. (2005). Identification keys to the Liverworts and Hornworts of Europe and Macaronesia (Distribution & Status), 2nd revised edition, Sorus, Poznań, 211p.