DIVERSITY OF PTERIDOPHYTES IN THE PROTECTED AREA OF VÂLSAN VALLEY

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Abstract
In the Vâlsan Valley there are two categories of regions that have been declared protected areas: The Natural Reserve Vâlsan Valley, code 2125 and The protected natural area of community interest Vâlsan Valley, code ROSCI0268. The aim of the research was to identify the species of pteridophytes in the protected areas, a necessary step for the conservation of their diversity. Within the area researched 26 species of pteridophytes were determined. Specific diversity across the genera identified ranges from 5 to 1, thus: *Equisetum* (5), *Asplenium* (4), *Dryopteris* (4), *Polystichum* (3) and *Huperzia, Lycopodium, Selaginella, Botrychium, Polypodium, Phegopteris, Athyrium, Cystopteris, Gymnocarpium, Matteuccia* with only one species. Concerning the abundance of the species identified, the pteridoflora in the area researched is made up of frequent (73%) and sporadic species (27%), such as *Huperzia selago, Lycopodium annotinum, Botrychium multifidum, Asplenium scolopendrium, Matteuccia struthiopteris, Dryopteris expansa, Polystichum braunii*.

Keywords: Vâlsan Valey, pteridophytes, frecvent species, sporadic species, Botrychium multifidum.

1. INTRODUCTION

In the Vâlsan Valley there are two categories of regions that have been declared protected areas. The Natural Reserve Vâlsan Valley (RNVV), code 2125, is a natural protected area of national interest, established by Decision no. 18/1994 of the Argeş County Council. It features as a protected region in Law no. 5/2000 concerning the approval of the Project of planning the national territory, Section 3 – protected areas, published in the Official Gazette, part I no. 152 of 12/04/2000. RNVV includes the basin of the Vâlsan river uphill of the village Brădet, up to the point Barieră (Barrier), to which is added the minor bed of the river Vâlsan up to its confluence with the river Argeş. The purpose of the mixed reserve is: to protect and preserve a number of habitats and natural species that are important in terms of flora, fauna, forests, hydrology, geology, speleology, palaeontology, paedology. The reserve corresponds to the IV IUCN category (International Union for Conservation of Nature), and is an area of managing the habitats/species: a protected area administered especially for conservation through management interventions.
The protected natural area of community interest Vâlsan Valley, code ROSCI0268, was declared, in 2007, through Ordinance no. 1964 of 13/12/2007 concerning the establishment of the protected natural area regime of the sites of community importance, as an integral part of the European ecological network Natura 2000 in România; the ordinance was published in the Offical Gazette, Part I no. 98 of 07/02/2008, on account of the presence of the following types of habitats and species of de community interest. The aim of the research was to identify the species of pteridophytes in the protected area, a necessary step for the conservation of their diversity.

2. MATERIAL AND METHODS

The researches were conducted in the Vâlsan Valley (Fig. 1) starting from the Brădet Chalet up to the area known as Poienile Vâlsanului (the Vâlsan Glades), except for the species *Botrychium multifidum*, identified uphill of Poienile Vâlsanului. To make the determination of the species, the following determiners were used: Andrei (2000), Ciocârlan (2009), Grințescu (1952), Tutin şi colab. (1993).

3. RESULTS ANS DISSCUSION

Within the area researched 26 species of pteridophytes were determined, systematically distributed in classes Lycopsida, Sphenopsida, Filicopsida, in nine families: Lycopodiaceae, Selaginellaceae, Equisetaceae, Ophioglossaceae, Polypodiaceae, Thelypteridaceae, Aspleniaceae, Woodsiaceae and Dryopteridaceae. Specific diversity across the genera identified ranges from 5 to 1, thus: *Equisetum* (5), *Asplenium* (4), *Dryopteris* (4), *Polystichum* (3) and *Huperzia*, *Lycopodium*, *Selaginella*, *Botrychium*, *Polypodium*, *Phegopteris*, *Athyrium*, *Cystopteris*, *Gymnocarpium*, *Matteuccia* with only one species.

The list of the families and species identified: Lycopodiaceae: *Huperzia selago* (L.) Bernh - Ch, spor., Cosm., *Lycopodium annotinum* L. - Ch, spor., Circ.; Selaginellaceae: *Selaginella helvetica* (L.) Spring - Ch, frecv., Circ.; Equisetaceae: *Equisetum arvense* L. - G, frecv., Cosm., *E. hyemale* L. - G, frecv., Circ., *E. palustre* L. - G, frecv., Circ., *E. sylvaticum* L. - G, frecv., Circ., *E. telmateia* Ehrh. - G, frecv., Circ.; Ophioglossaceae: *Botrychium multifidum* (Gmel.) Rupr. - G, spor., Circ.; Polypodiaceae: *Polypodium vulgare* L. - G, frecv., Circ; Thelypteridaceae: *Phegopteris connectilis* (Michaux) Watt - G, frecv., Circ; Aspleniaceae: Circ., *Asplenium ruta-muraria* L. - H, frecv., Euras., *A. scolopendrium* L. - G, spor., Circ., *A. trichomanes* L. - H, frecv., Cosm., *A. trichomanes-ramosum* L. - H, frecv., Circ.; Woodsiaceae: *Athyrium filix-femina* (L.) Roth - H, frecv., Cosm., *Cystopteris fragilis* (L.) Bernh. - H, frecv., Cosm., *Gymnocarpium dryopteris* L. - G, frecv., Circ., *Matteuccia struthiopteris* (L.) Tod. - H, spor., Circ; Dryopteridaceae: *Dryopteris affinis* (Lowe) Fraser-Jenkins - H, frecv., Euras., *D. carthusiana* (Vill.) H.P.Fuchs - H, frecv., Circ., *D. expansa* (C. Presl) Fraser-Jenk. & Jermy - H, spor., Circ., *D. filix-mas* (L.) Schott - H, frecv., Euras., *Polystichum aculeatum* (L.) Roth - H, frecv, Euras., *P. braunii* (Spenner) Fée - H, spor., Circ., *P. setiferum* (Forsk.) Woynar - H, frecv, Cosm.

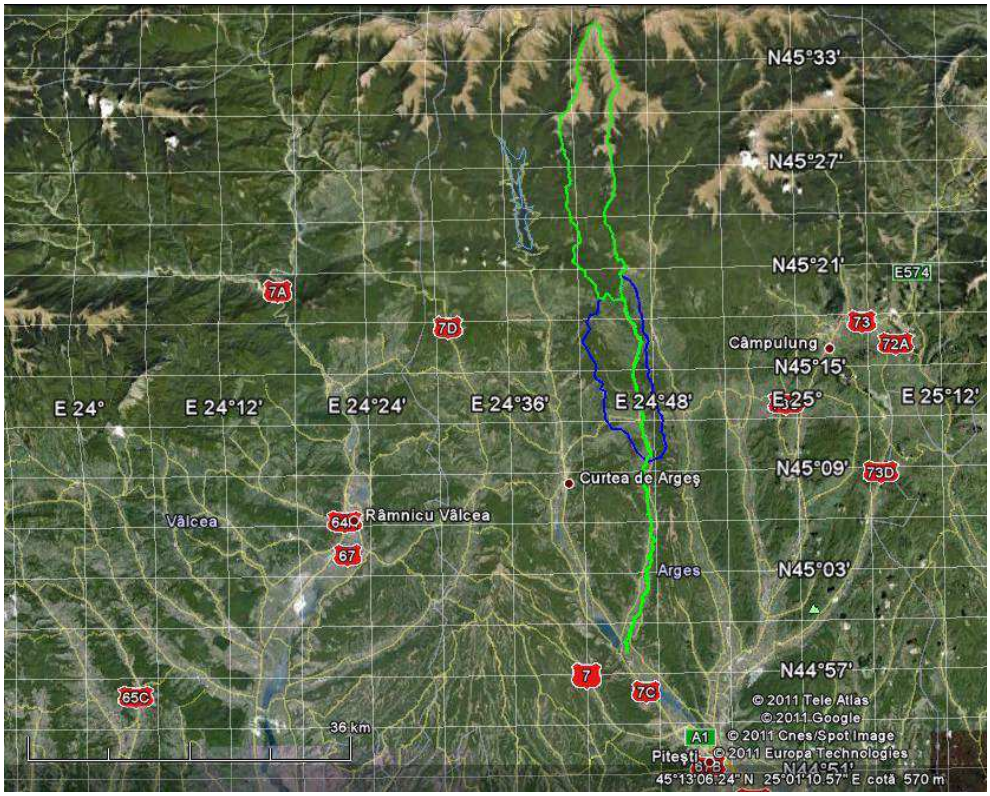

Figure 1. The Natural Reserve Vâlsan Valley (RNVV), code 2125 (green border) and The protected natural area of community interest Vâlsan Valley, code ROSCI026 (blue border)
Sursa: http://www.valeavalsanului.ro/docs/Raport-privind-starea-actuala-valea-valsanului-final.pdf

In the pteridoflora identified there is a prevalence of the hemicryptophytes (50%), followed by geophytes (38.46%), and chamaephytes (11.54%) (Fig. 2). As far as the geoelements are concerned, a prevalence can be found of the circumpolar species (61.54%), followed by the cosmopolitan elements (23.08%), and the Eurasian elements (15.38%) (Fig. 3).

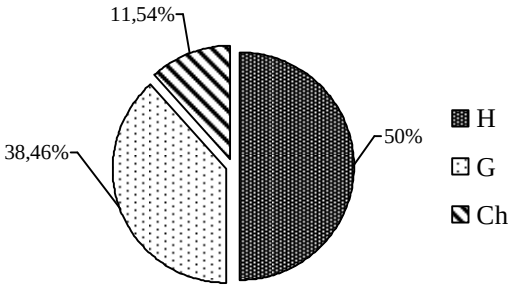

Figure 2. The spectrum of the bioforms for the pteridophytes in the Vâlsan Valley

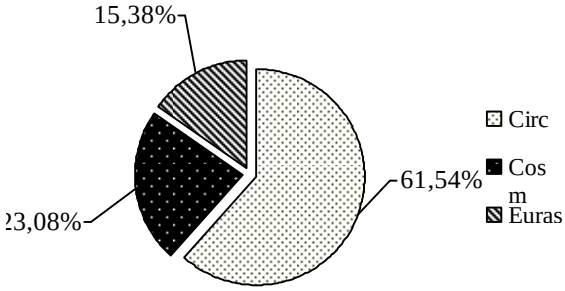

Figure 3. The spectrum of the geoelements for the pteridophytes in the Vâlsan Valley

The species *Botrychium multifidum*, mentioned in the Bern Convention, Annex I, Appendix I, 1998, in the category strictly protected species (Sârbu and collab. 2007; Sârbu and collab. 2003), was identified in the area researched in only one site, with fewer than 20 individuals.

Figure 4. Botrychium multifidum in the Vâlsan Valley

Concerning the abundance of the species identified, the pteridoflora in the area researched is made up of frequent (73%) and sporadic species (27%), such as *Huperzia selago*, *Lycopodium annotinum*, *Botrychium multifidum*, *Asplenium scolopendrium*, *Matteuccia struthiopteris*, *Dryopteris expansa*, *Polystichum braunii*.

Asplenium scolopendrium, a sporadic species in Romania, forms, in the territory under research, populations that sometimes exceed 250 individuals, because in some cases, the rare species can be abundant at a local level, and the abundant species can be found infrequently in some parts of the area (Hanski and collab., 1993).
In Romania, the species *Dryopteris expansa* (Fig. 5) is cited only from 6 localities (Oprea, 2005), and over the area researched, the species was found in only two populations including a number of individuals ranging between 1 and 5.

Figure 5. Dryopteris expansa in the Vâlsan Valley

4. CONCLUSIONS

The territory researched is characterised by a high specific diversity of pteridophytes. Thus, out of all the species that vegetates in Romania's territory, 26 species were identified in the area under research during the present study. The pteridoflora in the area researched is made up of frequent and sporadic species.

5. ACKNOWLEDGEMENTS

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