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Rare ferns of Hungary IV. Woodsia ilvensis in the Bükk National Park

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Abstract: Woodsia ilvensis (L.) R. Br. occurs on the north-western slope of the "Várhegy" in the vicinity of Szarvaskő in the Bükk National Park. The results of cenological investigations are presented.

Woodsia ilvensis is known from one locality in the Bükk National Park near the village Szarvaskő, on the slope of the "Várhegy" hill. Other localities in Hungary are in the Börzsöny Mountains (KÁRPÁTI 1935), the Mátra Mountains and in the Zemplén Mountains. All the localities are isolated in Hungary. Its occurrence is sporadic in the Carpathians as well. It has a vast range in North America, Greenland, Scandinavia and Asia (see map). The vegetation on silicate (gabbro) soil includes several rare plants besides Woodsia ilvensis, such as Sesleria heufleriana, Dictamnus albus, Carex brevicollis, Saxifraga paniculata, Minuartia frutescens, Asplenium septentrionale.

MATERIAL AND METHOD

The cenological investigations were carried out from May 1983 to June 1985. Thirty-nine 2 by 2 m sample plots were taken. The cover values according to the BRAUN-BLANQUET (1964) scale were assigned to the species (see Table). Exposition of the slope was north-west or north-north-west, with a gradient of 60-70°. The distributions of the floral elements, life-forms and cenological characters of the species list may be seen in Fig. 1 and the ecological indexes are depicted in Fig. 2. These are: R (soil requirement), T (temperature requirement), F (water requirement) and N (nitrogen requirement). We used these indexes as given by SOÓ (1964-80) and PRISZTER (1985).

RESULTS

Woodsia ilvensis is the characteristic member of these pioneer silicate rock grass communities. First ZÓLYOMI (1936) and SOÓ (1937) presented data on the silicate plant associations of Szarvaskő. In our sample plots 12 plant species occured from the 22 character species mentioned by SOÓ (1941) for the Asplenio-Festucion glaucae group. This rock cleft community belongs to the Asplenio septentrionali-Melicetum ciliatae association.

The floral elements are distributed as follows: mainly Mediterranean, sub-Mediterranean, Eurasian and Pannonian elements form the slope vegetation. The presence of the Carpathian elements is also noteworthy.

The life-form distribution is the following: hemicryptophytes, chamaephytes and geophytes

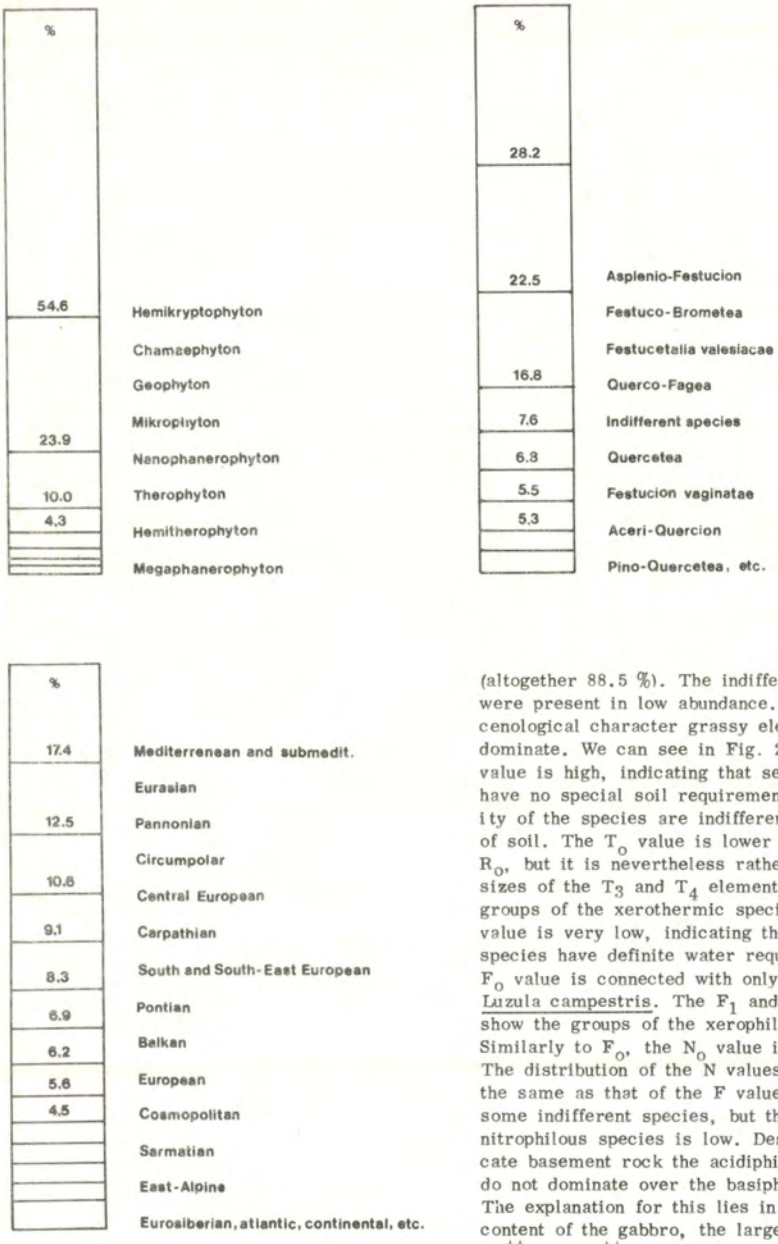


Fig. 1. Distribution of life-forms, cenological characters and phytogeographical spectrum

(altogether 88.5 %). The indifferent species were present in low abundance. According to cenological character grassy elements predominate. We can see in Fig. 2 that the R_0 value is high, indicating that several species have no special soil requirements. The majority of the species are indifferent to the type of soil. The T_0 value is lower than that of R_0, but it is nevertheless rather high. The sizes of the T_3 and T_4 elements show the groups of the xerothermic species. The F_0 value is very low, indicating that most of the species have definite water requirements. The F_0 value is connected with only one species: Luzula campestris. The F_1 and F_2 values show the groups of the xerophilous species. Similarly to F_0, the N_0 value is very low. The distribution of the N values is almost the same as that of the F values. There are some indifferent species, but the number of nitrophilous species is low. Despite the silicate basement rock the acidiphilous species do not dominate over the basiphilous species. The explanation for this lies in the basic content of the gabbro, the large quantity of Ca^{++} and Mg^{++}.

Besides the moss and lichen synusia, the most important pioneer species in the

silicate grass vegetation are the xerophilous ferns (Woodsia ilvensis and Asplenium septentrionale). The microhabitat of Woodsia ilvensis lies in between the little rock clefts and the unbroken rock grass layer. The clefts are occupied by Asplenium septentrionale everywhere. The large, cavernous fissures are taken up mainly by Minuartia frutescens, Sempervivum hirtum, Seseli osseum, Koeleria cristata, Festuca pallens and Potentilla arenaria. Woodsia is unable to work its way into the mat made up of grass-forming species, e.g. the fern is not competitive with the Thymus spots. Woodsia ilvensis is at competitive advantage in fissure of exposition and size larger than needed by Asplenium septentrionale, but smaller than needed by the grass-forming species. If the fissure is too large and/or the gradient of the slope is about 90-100°, the less xerophilous Asplenium trichomanes or Cystopteris fragilis occupy the space. From the point of view of drought resistance, a decreasing order of Asplenium septentrionale - Woodsia ilvensis - Cystopteris fragilis - Asplenium trichomanes may be established. The other Hungarian habitats of Woodsia ilvensis are probably different from this plant community.

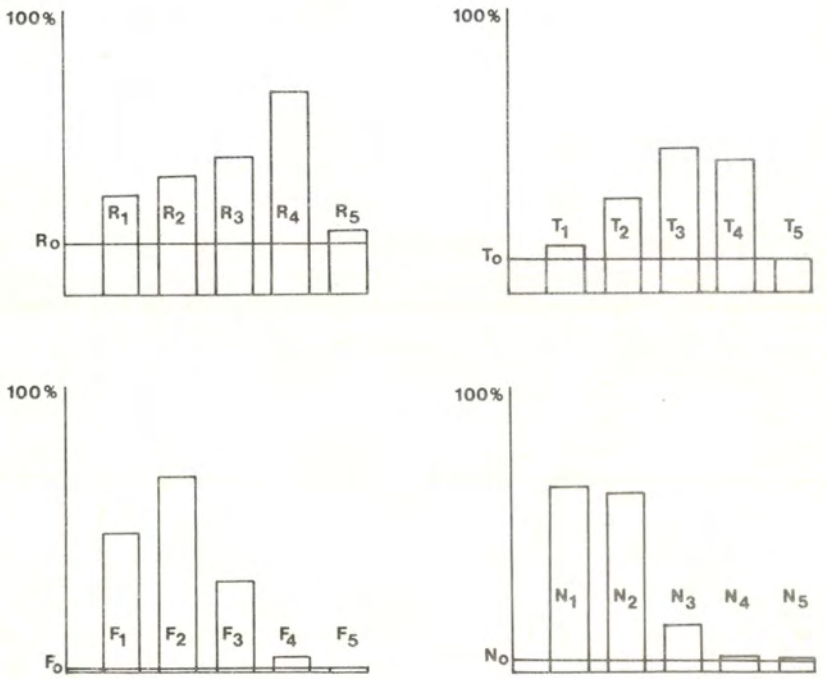


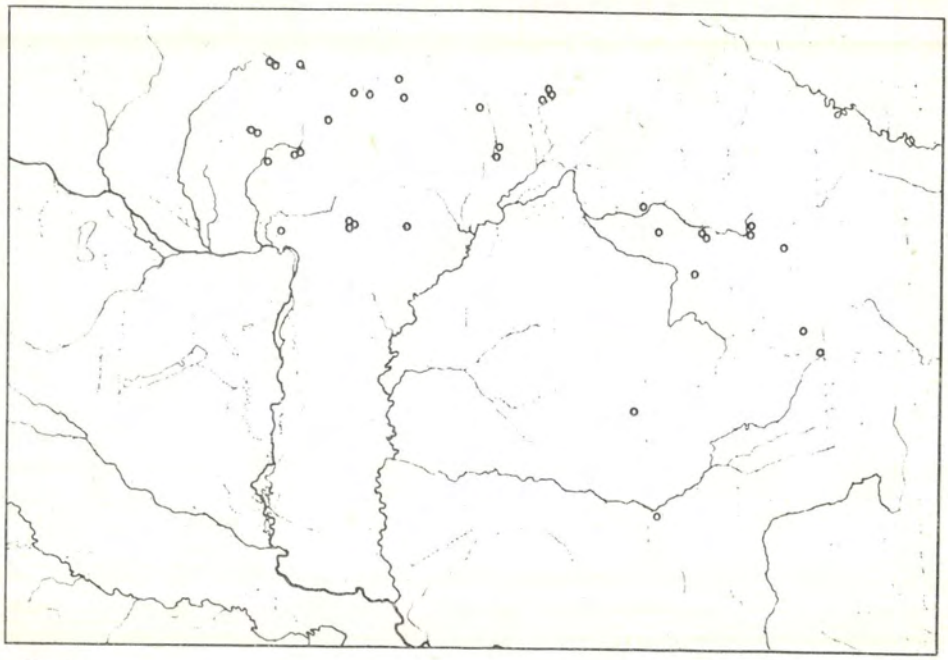
Fig. 2. Distribution of the R, T, F, N values

Table 1.

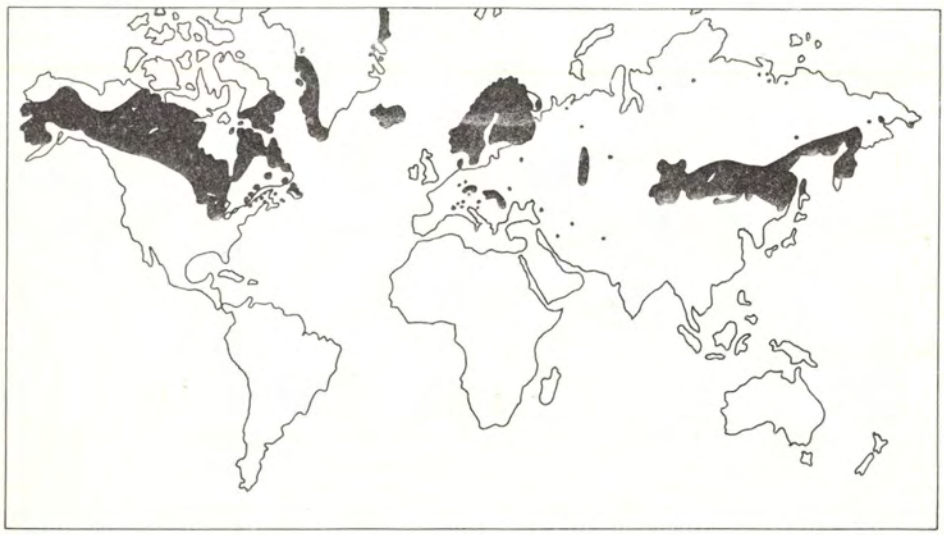
Species	Samples			
	1 - 10	11 - 20	21 - 30	31 - 39
Ajuga genevensis		+		
Allium flavum	+ + + +	+	+	+
Asplenium septentrionale	1 1 + + + + + + + + + 1 +		+ + + + + + + + +	+ + +
Asplenium trichomanes	+ + + + + + + +	+ + + +	+ + + + +	+ + + + + +
Artemisia campestris	1	+ +		

Table 1 (continued)

Species	Samples 1 - 10	11 - 20	21 - 30	31 - 39
Arenaria serpyllifolia		++ +	+	1 ++
Cardaminopsis arenosa	+			
Centaurea rhenana			+	+
Centaurea micranthos	+		+	
Cerasus mahaleb	+			
Cornus mas	5 2			
Cotoneaster nigra	1 + 2	+ +	1	2
Cystopteris fragilis	+ + 1	1 + + +		++
Cynanchum vincetoxicum	+	+ + +		+ +
Dictamnus albus	+ 1	+ +		
Euonymus verrucosus	+			
Erysimum odoratum		++		
Euphorbia cyparissias		+		+
Festuca pallens	+2 4 2 1 2 2 1 1 1 3 1 3 2 3 4 3 3 2 2 1 + 1 1 1 1 1 1 + 3 3 3 4 1 3 2 3 3 3			
Poa pannonica		+		
Filipendula vulgaris		++	+	+ 1 + + +
Fragaria vesca	1 + 1 2 +	+ 1	+	
Genista pilosa	+ 1	+ 1	++ ++	++ + 2
Hieracium umbellatum		+++ +	+ ++	++
Hypericum perforatum	+ +			
Inula ensifolia	+ +			
Inula hirta				++ +
Iris variegata	+	1 ++	+ 1 ++	+
Isatis tinctoria		+		
Koeleria cristata	+ +	+	+	+ +
Lactuca perennis		++	++	
Lathyrus vernus				+
Linaria genistifolia		+	+	+
Luzula campestris		+	+	+
Medicago falcata			2	
Minuartia frutescens	1 + 1 + + + + + + + 1 + + + + + + + + + + + + + + 1 + + + + +			
Myosotis arvensis				++ +
Poa nemoralis	+ 1 + + +	1	2 +	+
Polypodium vulgare		+		++ +
Potentilla arenaria	1 1 2 + + + + + + + 2 3 1 1 2 1 1 1 1 2 1 + + 1 1 + + 1 1 1 1 1 + 2 2 2 2			
Primula veris		+		
Pyrus achras		+		
Rosa sp.	2 2 + + 3 2 1 2			
Scabiosa ochroleuca				+ +
Saxifraga paniculata	1 1 + 1	+ +	+ + +	+ 1
Sedum acre	+ + + + + + + + + +	+	+ + +	+ + 2 +
Sedum hispanicum	+	+		+
Sedum maximum	+ + + +	+	+	
Sempervivum hirtum	1 + + + + + + + + + + + 1 + 1 + 1 + + 2 + + + 1 + + + + + + + + + + + + + + +			
Seseli osseum	2 1 + 1 + + + + + 2 1 + 1 + + + 2 + + + + + 1 + + + 1 1 1 + + 1 2 + 2 +			
Sesleria heufleriana	2 3	+	4 3	
Silene otites				+
Spiraea media	2 2	+ + + + 2	1 1	+
Stachys recta	+			
Teucrium chamaedrys			+ 1 +	
Trifolium alpestre		+	+ + 1	
Thymus glabrescens	1 1 + + 1 1 2 1 1 1 1 1 + + 1 1 1 + + + + + 2 1 2 1 2 2 + 2 3			
Valeriana officinalis	+ + + + + + + + 1 + + +			



Map. 1.
Herbarium data of the Woodsia ilvensis (BP)



Map. 2.
Distribution of Woodsia ilvensis (Foerster, 1979)

Table 1 (continued)

Species	1 - 10										11 - 20										21 - 30										31 - 39								
Verbascum sp.																													+										
Veronica orchidea																																			2	1	+	1	2
Veronica spicatum		+	+	+		+	+	+		+		+	+		2	1	+	+	+	2	1	+	1			+	+	+	+	1	1	1	1	+	2	1	1	1	2
Viscaria vulgaris																+	+	+					+						+	+		+	+						
Woodsia ilvensis	+	+	+	1	+	+	+	+	+	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moss synusium				1	+	3	1		+	2	1	+	2		2	+	+		1				+	+			+			1		1	1	2	+	+	1		2

The following species were found outside the sample plots: Achillea nobilis ssp. neilrechii, Acer campestre, Acer tataricum, Anemone ranunculoides, Betonica officinalis, Calamintha acinos, Campanula persicifolia, Campanula sibirica, Carex brevicollis, Carpinus betulus, Corydalis solida, Crataegus monogyna, Dactylis glomerata, Dianthus giganteiformis ssp. pontederae, Digitalis grandiflora, Equisetum arvense, Gagea pusilla, Glechoma hederacea, Lathraea squamaria, Ligustrum vulgare, Lilium martagon, Lonicera xylosteum, Muscari comosum, Ranunculus polyanthemos, Quercus cerris x Q. pubescens, Quercus cerris, Quercus petraea, Scutellaria columnae, Silene conica, Silene vulgaris, Tilia cordata, Ulmus minor, Ulmus scabra, Veronica verna and Viola odorata.

REFERENCES

BRAUN-BLANQUET, J. (1964): Pflanzensoziologie. - Wien-New-York, 865 pp.

FOERSTER, K. (1979): Einzug der Gräser und Farne in die Garten. - Leipzig, 256 pp.

KÁRPÁTI, Z. (1935): Beitrage zur Flora von Ungarn. - Bot. Közlem. 32: 199.

PRISZTER, SZ. (1985): Synopsis systematico-geobotanica florae vegetationisque Hungariae VII. - Akadémiai Kiadó, Budapest, 683 pp.

SOÓ, R. (1937): Flora regionis montium Mátra. - Editio Instituti Botanici Universitatis Debreceniensis, Debrecen, 89 pp.

SOÓ, R. (1941): A magyar (pannóniai) flóratartomány növényszövetkezeteinek áttekintése. (Übersicht der Pannonischen Vegetationstypen). - Magyar Biol. Kut. Munk. Tihany, 13: 498-511.

SOÓ, R. (1964-80): Synopsis systematico-geobotanica florae vegetationisque Hungariae I-VI. - Akadémiai Kiadó, Budapest, (1964): 519 pp., (1966): 655 pp., (1968): 506 pp., (1970): 614 pp., (1973): 723 pp., (1980): 556 pp.

ZÓLYOMI, B. (1936): Übersicht der Felsenvegetation in der Pannonischen Florenprovinz und dem Nordwestlich Angrenzenden Gebiete. - Annls hist.-nat.Mus.natn.hung. 30: 136-174.

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