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THE ANALYSIS OF THE VASCULAR FLORA FROM THE NATURAL PARK VÂNĂTORI – NEAMȚ

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Abstract: This article analyses the flora from The Natural Park Vânători – Neamț, in the aspect of the participation of different life - form categoriers, floristic elements and ecological indices.

Key words: vascular flora, life - forms, floristic elements, ecological indices.

Introduction

The results of the investigation developed between the years 2004-2005, as well as the existing literature data in the field, on the floristic diversity of the Park Vânători – Neamț, put into evidence the presence of **982** chormophyte species, belonging to 96 families and 311 genera [2, 3, 5, 6, 7, 8, 12, 13, 14, 15]

Material and method

The establishment of the life - forms and floristic elements was made on the basis of *Flora ilustrată a României. Pteridophyta et Spermatophyta*, by V. Ciocârlan (2000) [8], *Caracterizarea ecologică și fitocenologică a speciilor spontane din flora Românie*, by V. Sanda and colab. (1983) [15]. The ecological indices were noted by H. Ellenberg (1974) *Indicator values of vascular plants in Central Europe*. [10]

Results and discussions

a) The analysis of bioforms

Among the inventoried species from the Park Vânători – Neamț until now, 494 (53,29 %), belong to the hemicryptophytes (H), that are dominating in the life-form spectrum and contributes to the basic fund of the grassy vegetation from the studied area. (Tab. 1; Fig.1).

Statistical analysis of the life – forms indicates the dominance of the hemicryptophytes, a moderate climate and a high weight of grassy formations in the investigated area. The therophytes (T) are represented by 145 species (15,64 %) and are situated a great distance from H, in the life – form spectrum. The geophytes (G) represented by 117 species (12,62 %) represent mostly the prevernal and vernal grassy floristical carpet of the vegetal associations.

The participation of the phanerophytes (Ph) to the life – form spectrum is low 67 (7,23 %), because of the relative homogeneity of the forestry formations from the studied area.

The low percentage of the chamephytes (Ch) of 29 (3,13 %), may be considered normal, because this type of life – form characterizes the regions with frosty winters and

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abundant snow falls. Very low percentage also have the hydrophytes (Hd) 0,86 % and the hydrohelophytes (Hh) 0,32 % who occupied a small surface from the studied area. [1, 8, 9]

Tab. 1 – Statistical analysis of the life forms

Life form	No. of species	%
H.	494	53.29
T.	145	15.64
Ht.	63	6.80
G.	117	12.62
Ph.	67	7.23
Ep.	1	0.11
Ch.	29	3.13
Hd.	8	0.86
Hh.	3	0.32

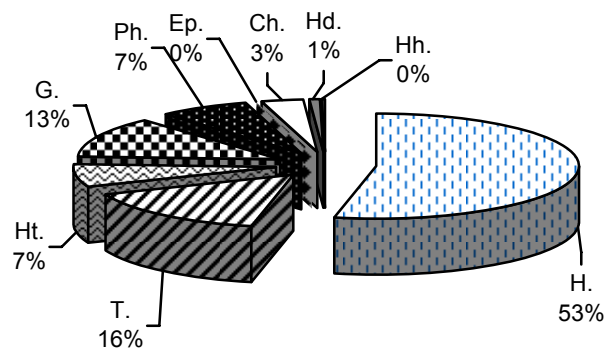


Fig. 1 – The life forms spectrum

b) The analysis of the floristic elements

The floristic elements from the Park Vânători – Neamț, indicate a large diversity :

- ◆ **The category of northern and western elements** represents 80,06 % such as : the Eurasiatic elements (Euras.) 31,30 %, the central European elements (Eur. Centr.) 14,58 %, the European elements (Eur.) 14,36 %. These elements are mostly majority and confirme that the Natural Park Vânători – Neamț belongs to central European region, the central European province. The circumpolar elements (Circ.) occur in ratio of 12,11 % and indicates the northern influence of these climatic conditions.
- ◆ **The category of oriental and steppe conditional elements** is represented by 4,61 % predominant by the Pontico – Panonic – Balcanic elements (1,18 %), followed by the Pontic elements (3,43 %).
- ◆ **The category of southern and endemic elements** is represented by 8,03 %, has the following composition: the Mediterranean and Submediterranean elements 1,71 %, the Panonic elements 0,32 %, the Atlantic elements 2,25 %, the Dacian elements 0,64 %, the Dacian – Balcanic elements 1,82%. The endemic elements (*Aconitum moldavicum*, *Hepatica transsilvanica*, *Symphytum cordatum* etc.) are represented by 1,29 %, a good procentage for the studied area.
- ◆ **The polycore elements** include the cosmopolite species (Cosm.) 5,79 %, also, the adventive elements (Adv.) 1,50 % indicates a low anthropic influence. (Tab. 2; Fig. 2) [1, 8, 9]

Tab. 2 – Statistical analysis of the floristic elements

The floristic element	No. of species or subspecies	%
<i>The northern and western elements</i>		
Euras.	292	31.30
Eur.	134	14.36
Eur.cent.	136	14.58
Cont.	56	6.00
Alpino-carpatic	16	1.71
Circ.	113	12.11
<i>The oriental and endemic elements</i>		
Pont.	32	3.43
Pont.-Balc. + Pont.-pan.-balc.	11	1.18
<i>The southern and endemic elements</i>		
Medit. + Submedit.	16	1.71
Atlantice	21	2.25
Pan.	3	0.32
Carp.-Balc.	17	1.82
Dacice	6	0.64
End.	12	1.29
<i>Polycore elements</i>		
Cosm.	54	5.79
Adv.	14	1.50

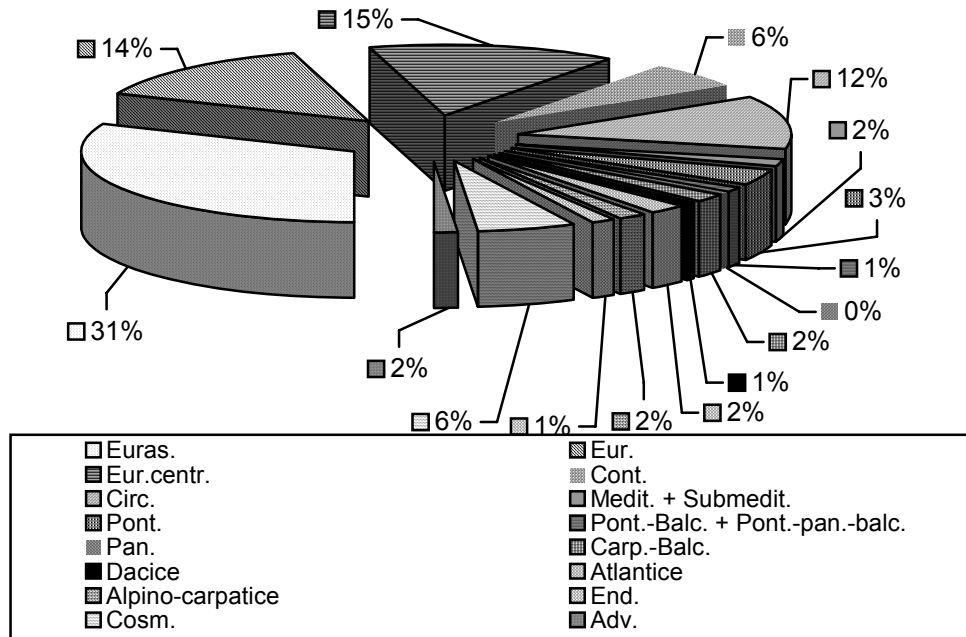


Fig. 2 – The spectrum of the floristic elements

c) The analysis of the ecological indexes

- ◆ Speaking of **the light (L)**, the highest percentage is represented by the plants who don't tolerate shading (33,72 %). The next category's predominance is 20,66 %, represented by plants who prefer the light and at a great distance are situated the plants who prefer the shading (0,14 %). The amphotolerant species represent 1,87 %, with no preferences for lightening.
- ◆ If considering **the temperature (T)** the highest part (32,85%) is attributed to the amphiplants, that manifest no special preferences for temperature. The species that characterise a temperate climate are good represented by 31,82 %.
- ◆ The **continentality index (Ct)** indicates the dominance of species with the main spreading in the entire central Europe (30,29%).
- ◆ As a function of **humidity (U)** best represented are the hygrophyllic species 21,29 % followed by the higo-hidrophyllic species 12,86 % and the mesohygrophyllic species. The amphotolerant species represent 9,14 %, with no preferences for humidity.
- ◆ Taking into consideration the **soil reaction (R)**, many species are amphotolerant 31,89 %, followed by the species which prefer neutral soil and neutral–basic soil 21,50 %. On the other hand the species that prefer an acid soil represent 0,14 %.

- ◆ **The soil's nitrogen content (N)** is well represented by the amphotolerant species 15,07 %, followed by the species that prefer soils poor in nitrogen 13,19 %. Also, a good percentage has the species that indicate the nitrogen presence 9,57 %. (Tab. 3; Fig. 3) [9, 10]

Tab. 3 – The statistical analyses of the ecological indexes

	The ecological indexes											
	L		T		C		U		R		N	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0	13	1.87	225	32.85	78	11.30	64	9.14	221	31.89	104	15.07
1	1	0.14			1	0.14	1	0.14	1	0.14	15	2.17
2	13	1.87	3	0.44	62	8.99	17	2.43	13	1.88	91	13.19
3	27	3.87	14	2.04	209	30.29	81	11.57	31	4.47	82	11.88
4	59	8.46	35	5.11	135	19.57	139	19.86	31	4.47	57	8.26
5	61	8.75	218	31.82	139	20.14	149	21.29	44	6.35	82	11.88
6	107	15.35	127	18.54	31	4.49	90	12.86	30	4.33	62	8.99
7	523	33.72	50	7.30	32	4.64	61	8.71	154	22.22	80	11.59
8	144	20.66	9	1.31	3	0.44	56	8.00	149	21.50	66	9.57
9	37	5.31	2	0.29			27	3.86	18	2.60	21	3.04
10							10	1.43				
11							1	0.14				
12							3	0.43				
?			2	0.29	2	0.29	1	0.14	1	0.14	30	4.35

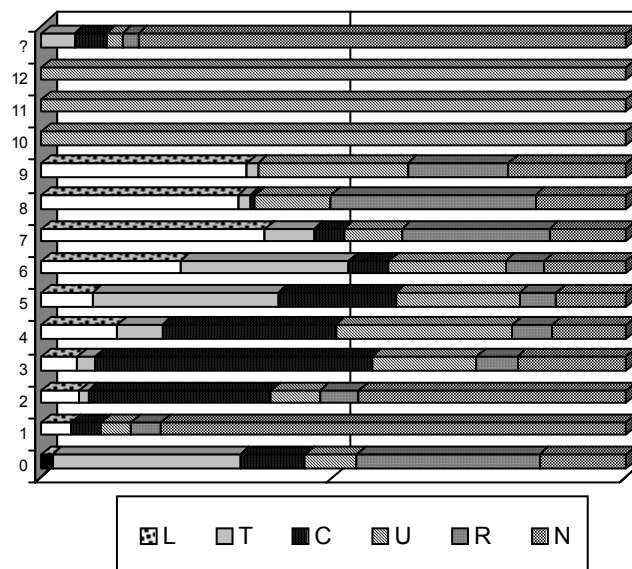


Fig. 3 – Ecological indexes spectrum

CONCLUZII

1. Most of life – forms are represented by hemicryptophytes (H).
2. The Eurasiatic elements are majoritary among floristic elements.
3. If we take a straight look of ecological indexes, we can easily notice that the most of plants prefer light, characterise a temperate climate with the main spreading in the entire central Europe. Taking into consideration humidity, best represented are the hygrophyllic species. Speaking of soil reaction and soil's nitrogen content most of plants are amphotolerants.

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