GENERAL CHARACTERIZATION OF GRASSLAND PLANTS IN THE UPPER BASIN OF THE SUCEAVA RIVER: BIOLOGICAL, ECOLOGICAL AND PRATOLOGICAL ASPECTS

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Abstract

The aim of this study is to perform an analysis on the flora of natural pastures in the upper basin of the River Suceava, elements that would form the basis for determining the pastoral value of grasslands and identify necessary measures for their sustainable management.

The study of natural grassland flora was made by several field trips between 2008-2009, most of the grassland surfaces in the region being crossed, noting and collecting for herborizing all plant species encountered in the field. Floristic data collected from the field were processed in the laboratory to highlight the main aspects of biology, ecology and forage value of the analyzed grasslands flora.

We found on studied area, a remarkable floristic richness, representing approx. 10.5% of the entire vascular flora of Moldova.

Among the species with very high and high forage value in these grasslands, the following ones should be noted: Dactylis glomerata, Festuca pratensis, Lolium perenne, Phleum pratense, Alopecurus pratensis, Arrhenatherum elatius, Lotus corniculatus, Medicago falcata, Trifolium hybridum, T. pratense, T. repens etc [7].

Key words: grassland flora, Suceava River, forage value

INTRODUCTION

In carrying out research on the flora and natural grasslands in the upper basin of the Suceava River, we assumed that an effective exploiting of natural grasslands, without disturbing the structural and functional equilibrum of grassland ecosystems, a detailed knowledge is required, both about the structure of plant species of these grasslands, and about how these species are associated in the structure of plant comunities.

In this context, our research included the following aspects:

- preparing a complete list of vascular plants within natural grasslands investigated;
- analysis of the grassland flora, both biologically (concerning the structure of biological forms, phytogeographic elements, genetic categories) and ecologically (concerning the species preferences to light, temperature, moisture, soil reaction and nitrogen content).

MATERIAL AND METHODS

Study of natural grassland flora in the upper basin of the River Suceava, was made by several field trips between 2008-2009, in several months during the growing season (April-September) on these occasions most of the grassland surfaces in the region being crossed. During these movements were noted and collected for herborizing all plant species encountered in the field. To determine the herborized material we used the classical floristic works [1][2][3][4].

Floristic data collected from the field were processed in the laboratory to highlight the main aspects of biology, ecology and forage value of the analyzed grasslands flora.

RESULTS AND DISCUSSION

Our research revealed that the vascular flora of the natural grasslands in the upper basin of the River Suceava, comprises 259 vascular plant species belonging to 149 genus, 38 families, 33 orders, 4 classes and 2 divisions from *Plantae* kingdom.

The vast majority of taxa identified in the studied area belong to phylum *Magnoliophyta* (253 species), and six species to the *Polypodiophyta* phylum (Table 1).

Table1 Taxonomic structure of grassland flora

Taxa	Polypodiophyta	Magnoliophyta	Total
Species	6	253	259
Subspecies	0	10	10
Genus	3	146	149
Families	3	35	38
Orders	3	30	33
Classes	2	2	4

Among the plant families present in natural grasslands in the upper basin of Suceava, the next ones are richest in species : *Asteraceae* (40 species), *Poaceae* (30 species), *Fabaceae* (21 species), *Cyperaceae* (17 species), *Scrophulariaceae* (14 species), *Apiaceae* (14 species), *Lamiaceae* (13 species), *Rosaceae* (9 species), *Juncaceae* (9 species), etc. Overall, these families form the basic background flora of the territory studied, together totaling 167 species, representing approx. 65% of the vascular flora of these meadows. Outlining the distribution of biological forms (Fig. 1) we found a clear predominance of hemicryptophytes (64.9%), which are followed by therophytes + hemitherophytes (17.4%), geophytes (10%), camephytes (3.9%) and helohidatophytes (3.9%). Hemicryptophytes dominance is natural, given the fact that, in general, natural grasslands are characterized by a high proportion of these bioforms [5]. Hemiterophytes and terofitephytes have a very high percentage, but their presence is a measure of the degree of disturbance of habitats, either naturally (primarily by the boar) or artificial (generally by excessive grazing).

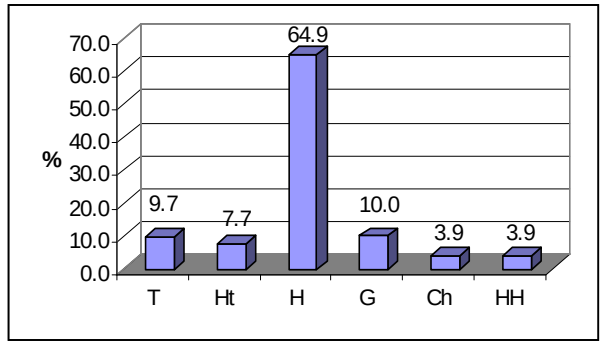

Fig. 1. Distribution of biological forms (T-therophytes, Ht-hemitherophytes, H- hemicryptophytes , G-geophytes, Ch-camephytes, HH-helohidatophytes)

Analyzing the genetic groups, we found that diploid species (D) hold first place in the structure of the investigated grassland flora (46.3%), followed by polyploid species (P), 40.2%, plus the 13.4 % of taxa that have both diploid and polyploid populations (for a total of 13 taxa we had no reliable cariological data) (Fig. 2).

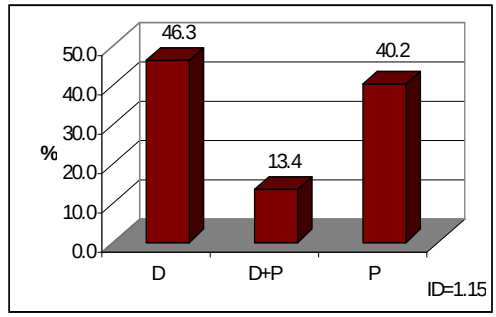

Fig. 2. The spectrum of genetic categories (D-diploid species, P-polyploid species, D + P-species populations showing both diploid and polyploid; ID = diploidy index)

Analysis of floristic elements (Table 2) reveals that the prinipal background of species is represented by the Eurasian (47,9%), European (35,1%) and Circumpolar (13,1%) taxa. Cosmopolitan (6,9%), Pontic (4,7%) or other elements have smaller proportions in the flora.

Tabel 2 Distribution of floristic elements from the natural grassland the upper basin of Suceava

Floristic element	Number of species	%
Carp.-Balc.	3	1,2
Alp.-Carp.	4	1,5
Dacic (incl. subend.)	1	0,4
Circ.	34	13,1
Eur.	33	12,7
Centr. Eur.	24	9,3
total Eur.	91	35,1
Atl.-Eur.	1	0,4
Pont.	1	0,4
Pont.-Medit.	5	1,9
Pont.-Balc.	3	1,2
Pont.-Pan.	3	1,2
total Pont.	12	4,7
Medit. (incl. submedit.)	1	0.4
Euras	115	44,4
Euras cont.	9	3.5
total Euras.	124	47,9
Cosm	18	6,9
Adv.	4	1,5

Carp.-Balc.- Carpatho-Balkan ; Alp.-Carp.- Alpine-Carpathian; Dacic – Dacian; Circ.-circumpolar ; Eur.- European ; Centr. Eur. – Central European ; Atl.-Eur. –Atlantic-European; Pont.-Pontic; Pont.-Medit.- Pontic-Mediterranean; Pont.-Balc.- Pontic-Balkan; Pont.-Pan.- Pontic-Pannonian; Medit.- Mediterranean; Euras- Eurasian; Euras cont.- Eurasian continental ; Cosm-cosmopolitan; Adv.- adventive

Studying the ecological spectrum and values of the ecological indices, we found a general (sub) heliophilous (Lm = 7), mezo-thermophilous (Tm = 5.2), mesophilous (Um= 5.6), weak acidophilous (Rm = 6.2) and moderate nitrophylous (Nm = 4.4) caracter of the vascular flora from the investigated grasslands (Fig. 3).

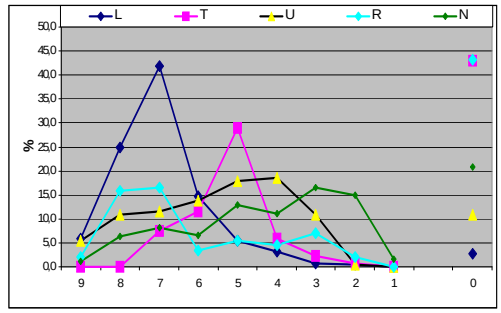

Fig. 3. The ecological spectrum of grassland flora in the upper basin of Suceava.
On the x-axis are represented, in descending order, graduations of analyzed ecological factors (L-light, T-temperature, U-soil moisture, R-soil reaction, N-nitrogen content of the soil)

Analysing forage value of species from the flora of studied grasslands (Table 3) using specific quality indices (SI) according to by Kovacs At. [6], it appears that most species (75%) fall into the category 0, ie species with no forage value, while categories 4 and 5, with high and very high forage value, respectively, are poorly reprezented, the percentage being 4% and 2% respectively.

Table 3 Distribution of plant species, according to their forage importance

Specifications	Category					
	0	1	2	3	4	5
Relative values %	75	8	7	4	4	2

0-no forage value, a very low-value, 2- small-value, 3-medium-value, 4- high-value, 5-very high forage value

Very high forage value species have *Dactylis glomerata, Festuca pratensis, Lolium perenne and Phleum pratense*. The main species with high forage value are *Alopecurus pratensis, Arrhenatherum elatius, Lotus corniculatus, Medicago falcata, M. lupulina, Onobrychis viciifolia, Poa pratensis, Trifolium hybridum, T.pratense, T. repens, Trisetum flavescens*.

CONCLUSIONS

Vascular flora of natural grasslands in the upper basin of the River Suceava, comprises 259 species belonging to 149 genera, 38 families, 33 orders, 4 classes and 2 phylums belongs to the *Plantae* kingdom;

See constant, that on a quite limited territory, there is a remarkable floristic richness, representing approx. 10.5% of the entire vascular flora of Moldova;

The vast majority of identified taxa in the studied area belongs to *Magnoliophyta* phylum (253 species), and only six species are from *Polypodiophyta* phylum;

The main botanical families represented in the flora of grasslands in the upper basin of Suceava are: *Asteraceae, Poaceae, Fabaceae, Cyperaceae, Scrophulariaceae, Apiaceae, Lamiaceae, Rosaceae, Juncaceae* ;

Regarding the distribution of biological forms, there is a clear predominance of hemicryptophytes, which are followed by therophytes, hemitherophytes, geophytes, and helohidatophytes camephytes;

Diploid species hold first place in the structure of grassland flora of the investigated territory, followed by polyploid speciess. Anyway, polyploid share is important in the flora structure, which may reflect a degree of zoo-anthropogenic disturbance of grassland phytocoenoses in the region;

The main species in the flora of the investigated meadows is represented by Eurasian, European and Circumpolar elements;

From ecological perspective, vascular flora of the meadows of the investigated territory are (sub) heliophilous, mesotermophilous, mesophilous, low acidophilous and moderately nitrophilous;

Among the important species because of their forage value, the folowing ones should be noted : *Dactylis glomerata, Festuca pratensis, Lolium perenne, Phleum pratense, Alopecurus pratensis, Arrhenatherum elatius, Lotus corniculatus, Medicago falcata, Trifolium hybridum, T. pratense, T. repens* etc.

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