CHARACTERISATION OF SOME GRASSLAND AFFECTED BY FLOODING

CARACTERIZAREA UNOR PAJIŞTI AFECTATE DE INUNDAŢII

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Abstract: Water is generally a limitative factor for crops. The last years are characterized by severe drought phenomena or by powerful floods that affect arable land and in this way grassland too. This study is realised during 2005-2006 period and provides new data concerning the vegetation carpet on a surface formerly flooded.

Rezumat:Apa este un factor limitativ pentru cultură. Ultimii ani sunt caracterizaţi ori de fenomene puternice de secetă ori de inundaţii puternice care afectează terenul arabil, dar şi pajiştile în aceeaşi măsură. Acest studiu este realizat în perioada 2005-2006 şi aduce noi date privind covorul vegetal de pe o suprafaţă anterior inundată.

*Key words***:** *solid industrial residues, furnace slag, steel slag, fertilizing resources, environmental protection*
Cuvinte cheie: *deşeuri industriale solide, zgura de furnal, zgura de cuptor, resurse fertilizante, protejarea mediului*

INTRODUCTION

Through the exploitation of these ecosystems by humans appear a biotope standardisation trend and a simplification of the floristic composition, being promoted some species considered more important. Exploitation mode affects also the trophic chains, especially specific primary consumers, which are eliminated in a very high proportion.

In the absence of mowing, human intervention, the hayfield is degrading being replaced by another phytocoenosis, in correspondence with the natural series of the succession.

MATERIAL AND METHOD

This study is realised on three grassland surfaces from Grăniceri (Timiş County).
The research methods used in this work are:
- square meter method, which facilitate the determination of some vegetation indexes;
- Shannon-Weaver (biodiversity index) and Simpson (dominance index) diversity indexes calculus.

Shannon-Weaver diversity index (H) represents calculated entropy for a sample randomly extracted from a coenosis.

$$H' = -\sum_{i=1}^{S} fi \times \log_2 fi = -\sum_{i=1}^{S}\left(\frac{N_i}{N}\log_2\frac{N_i}{N}\right)$$

where:
fi - among 0 and 1;
Ni - among 0 and N;
Ni – species number of individuals i in sample;
N - total number of individuals ($\Sigma N_i = N$).

When they use natural logarithms the appreciation scale is next:

0,1 ... 1 –very low diversity;

l ... 2,5 –low diversity;

2,5 ... 4 –average diversity;

4 ... 7 –high diversity;

~ 7 –very high diversity.

Simpson index (D) estimates the probability that two individuals randomly extracted from a biocoenosis to belong to the same species, and is calculated with the next formula:

$$D= 1- \sum_{i=1}^{S} pi^2$$

where:

Pi – individuals proportion that represents i species in biocoenosis;

$$pi = Ni/N$$

N – total number of individuals from biocoenosis (or sample);

Ni – individuals total number from biocoenosis/sample from i species;

pi^2 – also is named informative energy (E).

RESULTS AND DISCUSSIONS

Grăniceri no. 1 grassland

Grăniceri no. 1 grassland is placed on one of the land surfaces affected because of flooding this being covered with a water layer for about a week. In present vegetation is dominated by *Lolium perenne, Hordeum histrix* and *Achillea millefolium.*

The vegetation covers 100% the soil surface. The vegetation covers of this grassland is containing 17 plant species and from these 18.75% are grasses, 23.53% are legumes, and the other 57.72% are represented by plant species from other botanical families (figure 1).
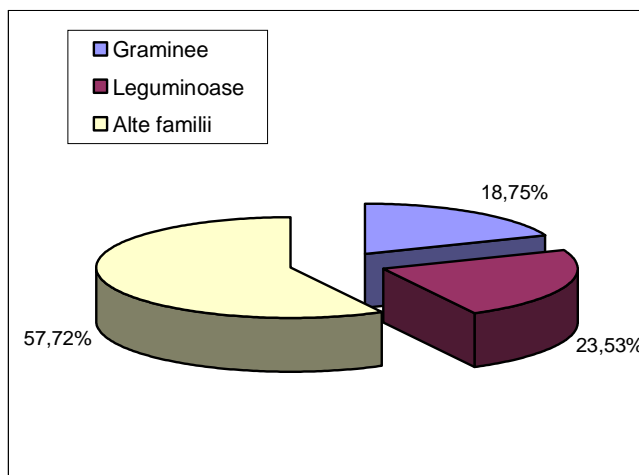

Figure 1 Grăniceri no.1 grassland vegetation structure

In this grassland legumes are represented by five species (*Medicago lupulina, Lotus corniculatus, Trifolium hybridum, Trifolium repens, Ononis spinosa*) because soil capacity for air isn't affected only for a very short time period, without any influence on these species.

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Another analyzed aspect is represented by the species dominance and biodiversity. Thus Shannon-Weaver index of this grassland is 2.35 this value being characteristic for a low vegetation biodiversity.

Concerning the species dominance Simpson index is 0.9 showing that the species from coenosis are numerous and have near populations.

Grăniceri no. 2 grassland

Grăniceri no. 2 grassland is placed on one of the land surfaces affected because of flooding this being covered with a water layer for about two weeks. In present vegetation is dominated by *Medicago lupulina, Lolium perenne, Bromus erectus and Achillea setacea.*

The vegetation covers 80% from the soil surface. The vegetation covers of this grassland is containing 17 plant species and from these 23.53% are grasses, 23.53% are legumes, and the other 52.94% are represented by plant species from other botanical families (figure 2).
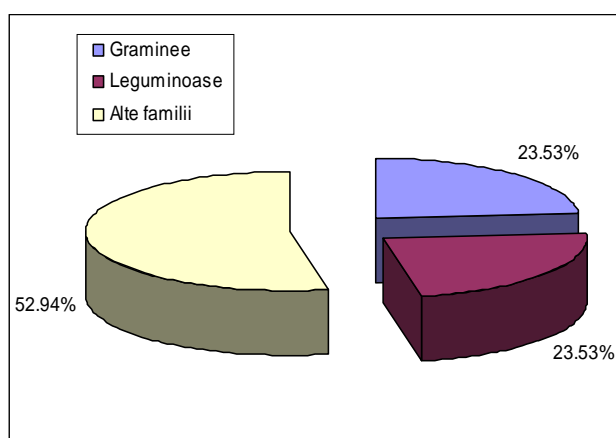

Figure 2 Grăniceri no.2 grassland vegetation structure

In this grassland legumes are represented by four species (*Medicago lupulina, Lotus corniculatus, Trifolium hybridum, Trifolium repens*) because soil capacity for air isn't affected only for a very short time period, without any influence on these species.

Another analyzed aspect is represented by the species dominance and biodiversity. Thus Shannon-Weaver index of this grassland is 2.42 this value being characteristic for a low vegetation biodiversity.

Concerning the species dominance Simpson index is 0.7 showing that the species from coenosis are numerous and have near populations.

Grăniceri no. 3 grassland

Grăniceri no. 3 grassland is placed on one of the land surfaces affected because of flooding this being covered with a water layer for about two weeks. In present vegetation is dominated by *Alopecurus pratensis.*

The vegetation covers 70% from the soil surface. The vegetation covers of this grassland is containing 8 plant species and from these 37.5% are grasses and plant species from

other botanical families, 12.5% are *Cyperaceae* and *Juncaceae* (figure 3). In this grassland legumes are represented by one species, respectively *Trifolium subteraneum*.
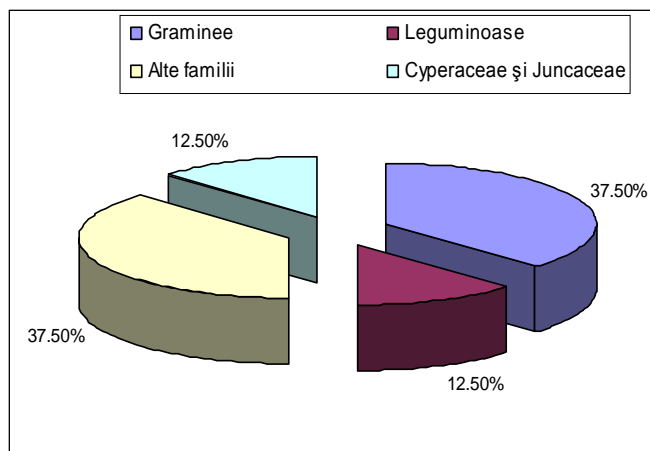

Figure 3 Grăniceri no.3 grassland vegetation structure

Another analyzed aspect is represented by the species dominance and biodiversity. Thus Shannon-Weaver index of this grassland is 2.16 this value being characteristic for a low vegetation biodiversity. Concerning the species dominance Simpson index is 0.11 showing that the species from coenosis are numerous and have near populations.

CONCLUSIONS

After the analysis of the data collected from Grăniceri grasslands we can formulate the next conclusions:

- Vegetation carpet of Grăniceri grasslands shows an average biodiversity with numerous species and near populations;
- Grassland vegetation is comprised between 70% and 100%, water stagnation duration being relatively
- In Grăniceri grasslands grasses percentage is comprised between 18.7%-37.5%, the legumes are participating with 12.5%-23.53%, and the species from other botanical families are 12.5%-57.7%.

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