

**THE DYNAMICS OF THE SPECIES FROM THE VEGETATION
CARPET OF SOME SANDY-LAND GRASSLAND FROM VALEA LUI MIHAI
– BIHOR COUNTY**

**DINAMICA SPECIILOR DIN COVORUL VEGETAL AL UNOR
PAJIȘTI PSAMOFILE DE LA VALEA LUI MIHAI – JUDEȚUL BIHOR**

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Abstract: In this work is presented the evolution of the vegetation carpet from some sandy land grassland under the influence of exploitation intensity. The purpose of these researches is to analyse the dynamics of the vegetation in the condition of the improper management, because this is the condition of most of the Romanian grasslands. Also, this research is concerned by the botanical composition of the vegetation carpet, the structure of the vegetation from the point of view of the main plant types (grasses, leguminous, Cyperaceae and Juncaceae, and species from other botanical families) species number, and aspects concerning the biodiversity. The data were collected from 4 grassland surfaces (Lenfin – hayfield, Fűrkö, Dihenes and Urkuta – pastures) from the land surface of Valea lui Mihai locality during 2007-2008. The research methods used in this work are the vegetation analysis with square meter method (DAGET et POISSONET, 1971) this type of data collecting offering data that can be used in the detailed calculus of biodiversity (Shannon-Weaver) and dominance (Simpson) indexes. The results obtained shows that the greatest biodiversity is found in the case of Lenfin hayfield, and in the case of the pastures the obtained indexes have similar values they showing a medium biodiversity index. For the improvement of the botanical composition of the grasslands from the area of Valea lui Mihai are needed some immediate measures as are: mowing the non-consumed plants to reduce the weed proliferation on the grazed land surfaces (Fűrkö, Dihenes and Urkuta); fertilization of the hayfield and of the pastures; the use of the grassland only for grazing (not for deposition of wastes); the elimination of water excess in the case of Urkuta pasture there being present in a great amount hydrophytes plants species.

Rezumat: În această lucrare este prezentată evoluția covorului vegetal de pe niște pajiști psamofile sub influența intensității exploatării. Scopul acestor cercetări este să analizeze dinamica vegetației în condițiile unui management defectuos, deoarece aceasta este condiția majorității pajiștilor din România. De asemenea, aceste cercetări se preocupă de compoziția floristică a covorului vegetal, structura vegetației din punct de vedere al principalelor tipuri de plante (graminee, leguminoase, Cyperaceae și Juncaceae și specii din alte familii botanice), numărului de specii și aspecte privind biodiversitatea. Datele au fost colectate de pe patru suprafețe de pajiște (Lenfin – fâneață, Fűrkö, Dihenes și Urkuta – pășuni) din perimetrul localității Valea lui Mihai în perioada 2007-2008. Metoda de studiu utilizată în această lucrare este analiza vegetației cu metoda dublului metru (DAGET et POISSONET, 1971) acest tip de colectare a datelor putând fi folosit la calculul detaliat al indicilor biodiversității (Shannon-Weaver) și dominanței (Simpson). Rezultatele obținute arată că cea mai mare biodiversitate a fost găsită în cazul fâneței Lenfin, iar în cazul pășunilor indicii obținuți au valori similare, aceștia fiind caracteristici pentru o biodiversitate medie. Pentru îmbunătățirea compoziției floristice a pajiștilor din zona Valea lui Mihai sunt necesare o serie de măsuri imediate cum sunt: cosirea plantelor neconsumate pentru a reduce proliferarea buruienilor pe pășuni (Fűrkö, Dihenes și Urkuta); fertilizarea fâneței (Lenfin) și a pășunilor; utilizarea pajiștilor doar pentru pășunat (nu pentru depunerea deșeurilor); eliminarea excesului de umiditate în cazul pășunii Urkuta acolo fiind prezente într-o măsură foarte mare specii de plante hidrofitice.

Key words: *sandy-land grassland, dynamics, hayfield, pasture, vegetation.*

Cuvinte cheie: *pajiște psamofilă, dinamică, fâneată, pășune, vegetație.*

INTRODUCTION

The vegetation of a territory means the totality of the plants' association that populates a certain surface. The natural grasslands have a vegetation with own characteristics as: comprise perennial herbaceous species, comprises a great number of plants species with different needs for the environmental factors; perennial grasses have the greatest frequency in grasslands they being followed by leguminous and then other species (MOISUC *et* DUKIC, 2002).

The term specific biodiversity was introduced by WILSON and PETER (1988). After BAUDRY and BUREL (1982) there are much more levels where the biodiversity can be analyzed, these being: the diversity of the ecosystems, the diversity of the species communities, specific diversity, and genetic diversity (intraspecific).

The structure of a biocenosis is given by the spatial and temporal relationships among the individuals. In the analysis of the structure of a biocenosis are used a series of quantitative factors that allow to appreciate exactly the contribution and the role of every species from biocenosis and in the realization of the biological production (MOHAN *et* ARDELEAN, 1993). Numerous authors are advancing the idea that the greatest species number is present in the communities where the biomass production has an intermediate level (GRIMME, 1997; PETERS *et al.*, 1996).

MATERIALS AND METHODS

The material studied in this work is represented by four grassland areas from Valea lui Mihai locality (Bihor County). The grasslands occupy there 420 hectares, this representing 22.5 % from the agricultural surface of the locality Valea lui Mihai. These are grouped in the next plots:

- Lenfin – hayfield – 33.07 ha;
- Fürkó – pasture – 114.45 ha;
- Dihenes – pasture – 105.75 ha;
- Urkuta – pasture – 28.36 ha.

The data were collected during 2007-2008 period from six plots of 5 square meters from every one of those four grasslands.

As methods of study there were used the square meter method, the calculus of the diversity index Shannon-Weaver, and the calculus of the dominance index Simpson.

RESULTS AND DISCUSSIONS

The vegetation of Lenfin hayfield is dominated by *Bromus hordeaceus* and *Agropyron repens*. In this hayfield in 2007 were determined 32 species from that 62 % are represented by species from other botanical families, grasses representing 22 %, and the legumes 16 %. In 2008 the situation is close similar with the one from the anterior year, the total number of species found there being 36 (figure 1).

The vegetation of Fürkó pasture is dominated by the species *Agropyron repens* and *Poa pratensis*. The general aspect of this pasture is the most balanced because it contains a small number of species from other botanical families in comparison with the others grassland surfaces from Valea lui Mihai. This fact is due also to the fact that pasture plot is situated to the greatest distance from the village hearth, this fact making that the human influence and the grazing pressure to be more reduced.

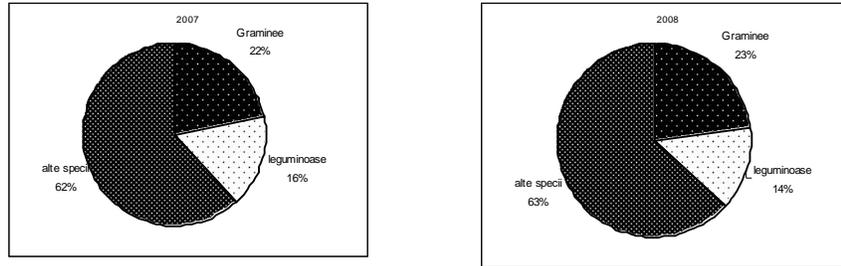


Figure 1. The situation of the species on technological groups of plants in Lenfin hayfield (2007-2008)

In this grassland were determined in 2007 15 species from that 53 % are represented by the species from other botanical families, grasses representing 27 %, and the legumes 20 %. In 2008 the situation of the species number is like the one from the previous year there being found the same species number (figure 2).

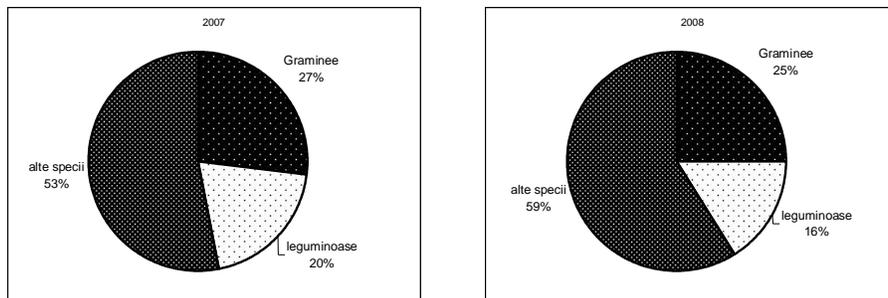


Figure 2. The situation of the species on technological groups of plants in Fürkó pasture (2007-2008)

The vegetation of the pasture Dihenes is dominated by the species *Cynodon dactylon* and *Poa pratensis*. The general aspect of this pasture is relatively balanced, but this one contains a greater number of species from other botanical families in comparison with the pasture presented before. This pasture plot is situated closer by the village heart, this fact making the anthropic influence to be more powerful, as is the grazing pressure.

In this grassland were determined 16 species of plants from that 62 % are represented by the species from other botanical families, and grasses and leguminous have 19 % both (figure 3).

The vegetation of Urkuta pasture is dominated by *Cynodon dactylon* and *Poa pratensis* as in the case of Dihenes pasture. The general aspect of this pasture shows that this is containing a great number of species from other botanical families, similar with the pasture presented before. This pasture plot is situated close to the village heart, as is the previous pasture that determinate a powerful anthropical influence and a great pressure of grazing.

This grassland is distinct by the other three analyzed before because these is characterised by humidity excess. This fact is evidenced by the participation in the vegetation carpet of a series of species with great needs for water as are *Juncus effusus* and *Luzula campestris*.

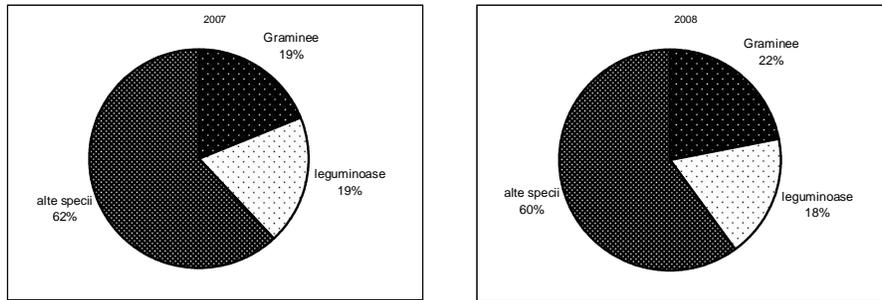


Figure 3. The situation of the species on technological groups of plants in Dihenes pasture (2007-2008)

In 2007 in this grassland were determined 18 species of plants from that 59 % are represented by the species from the other botanical families, the grasses represent 22% and the legumes 19 % (figure 4). The data from 2008 are similar like those collected in 2007.

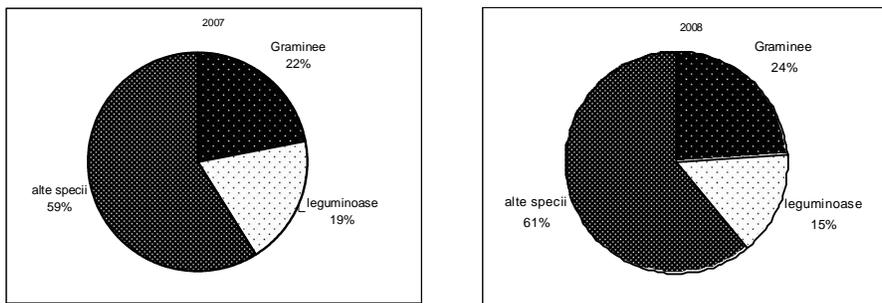


Figure 4. The situation of the species on technological groups of plants in Urkuta pasture (2007-2008)

In table 1 is presented the situation of the biodiversity indexes (Shannon-Weaver) and dominance indexes (Simpson) determined in the grasslands studied at Valea lui Mihai.

Table 1

The biodiversity and dominance indexes of the grasslands from Valea lui Mihai (2007-2008)

Grassland	Index Shannon-Weaver		Index Simpson	
	2007	2008	2007	2008
Lenfin	4.3	4.1	0.11	0.09
Fürkó	2.8	2.5	0.06	0.06
Dihenes	3.1	3.2	0.07	0.07
Urkuta	3.5	3.2	0.08	0.07

Analyzing the data from table 1 the Lenfin hayfield has an increased biodiversity and all the three pastures have an average biodiversity. The evolution of this index is relatively constant during the two years of study.

The Simpson index calculated shows for all the grassland during the two years of study when were made the observations that in the vegetation carpet are present many species with similar number of individuals.

CONCLUSIONS

After the processing of the vegetation data registered for the grasslands from Valea lui

Mihai during 2007-2008 we can conclude the following:

- In all the grasslands are dominant the species from other botanical families from the point of view of the species number;
- The evolution of the botanical composition of the grassland is relatively constant from the point of view of the biodiversity during the two years of study;
- The greatest biodiversity was determined in Lenfin hayfield.

For the improvement of the botanical composition of the grasslands and respectively of their yield is recommended the realization of some minimal maintenance works as are:

- The mowing of the non-consumed plants after grazing for the diminishing of the weed proliferation on those pasture surfaces;
- Fertilization of the hayfield and of the pastures;
- The use of the pasture only for grazing (not the deposition of wastes);
- Elimination of the humidity excess from Urkuta pasture.

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