APPRECIATIONS CONCERNING THE EVOLUTION DYNAMICS OF THE GRASSLANDS FROM GOTTLOB AREA (TIMIŞ COUNTY)

APRECIERI PRIVIND DINAMICA DE EVOLUȚIE A PAJIŞTILOR DIN ZONA GOTTLOB (JUDEȚUL TIMIŞ)

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Abstract: *The study of the permanent grassland from Gottlob area during 2000-2006 is differentiated for these two permanent grassland identified plots (nearby Jimbolia and to Grabaț) through exploitation mode influence, first grassland plot being used more intense by village community animals, the second being less used (to Grabaț). The purpose of this work is to analyse the evolution of the botanical composition, pastoral value and biodiversity of permanent grasslands from Gottlob during 2000-2006 period. Biodiversity determination is achieved using quantifying methods of the spatial diversity (aggregative and theorizing) by theorizing the information as a tool of measuring the complexity of the ecosystems.*

Rezumat: *Studiul pajiştilor permanente din zona Gottlob în perioada 2000-2006, s-a diferențiat pentru cele două trupuri de pajiştii identificate (la ieşirea spre Jimbolia şi spre Grabaț), prin influența modului de exploatare, primul trup de pajişte servind drept islaz comunal, cel de-al doilea (spre Grabaț), fiind folosit de către un număr mai redus de gospodării. Scopul acestei lucrări este să analizeze evoluția compoziției floristice, valoarea pastorală şi biodiversitatea pajiştilor permanente de la Gottlob în perioada 2000-2006. Determinarea biodiversității s-a realizat prin utilizarea metodelor de cuantificare a diversității în spațiu (agregativă şi teoretizare) prin teoretizarea informației ca mijloc de măsurare a complexității ecosistemului.*

Key words**:** *permanent grasslands, pastoral value, botanical composition, biodiversity.*
Cuvinte cheie: *pajişti permanente, valoare pastorală, compoziție floristică, biodiversitate.*

INTRODUCTION

World's development cannot be separated from grassland use and animal breeding. Six of the seven ancient cultures were based on grazing. Worldwide, grasslands cover 23% of the land, i.e. over 3 billion hectares, about two times the arable land (MOISUC, 2002).

In nowadays Romania, permanent grassland area is of 4872 million ha, of which 3378 million ha are pasturages and 1494 million ha is hayfields. They represent 20.4% of the total area of the country, 21.2% of the land, and 32.9% of the agricultural land.

MATERIAL AND METHODS

Analysed material consists in two permanent grassland surfaces from the area of Gottlob locality, Timiş County. The purpose of this work is to analyse the evolution of the botanical composition, pastoral value and biodiversity of a permanent grassland from Gottlob during 2000-2006 period.

The determination of the biodiversity was achieved by using the methods of quantifying the spatial diversity (aggregative and theorizing) by theorizing the information as a tool of measuring the complexity of the ecosystems (ARSENE G.G. 2003).

The calculation of the Shanon – Weaver index includes the Boltzman's (GEORGESCU and ROENGEN, 1979) equation, taken over by the engineer Claude Shannon and applied to formalize the theory of communication.

RESULTS AND DISCUSSIONS

Aspects concerning the structure of grassland vegetation from Gottlob – Vizejdia

Vegetation analyses realised with the help of square meter method are realised during 2000-2006 and show that first grassland surface analysed in Gottlob presents a vegetation association *Bromus mollis – Lolium perenne – Trisetum flavescens* type.

On this surface pastoral value is decreasing from 1.95 (on 0-5 scale), or 51.2 (on 0-100 scale, in conformity with LOISSEAU, 1992) in 2000 to 30 in 2006.

Table 1

Botanical structure dynamics in Gottlob-Vizejdia grassland during 2000-2006 (%)

Year	Grasses %	Legumes %	Other botanical families %
2000	27.9	13.95	58
2005	25	5	70
2006	25	7.5	67.5

Grasses participation for the vegetation carpet formation is relatively constant during time, this being comprised between 25% and 27.9% (table 1). Legumes participation in the vegetation carpet is influenced by the exploitation system that is extensive in this case, this fact determining the decrease of these species, these being replaced gradually with other species less valuable from forager point of view. Graphical representation of the botanical structure dynamics from Gottlob-Vizejdia grassland is represented in figure 1.

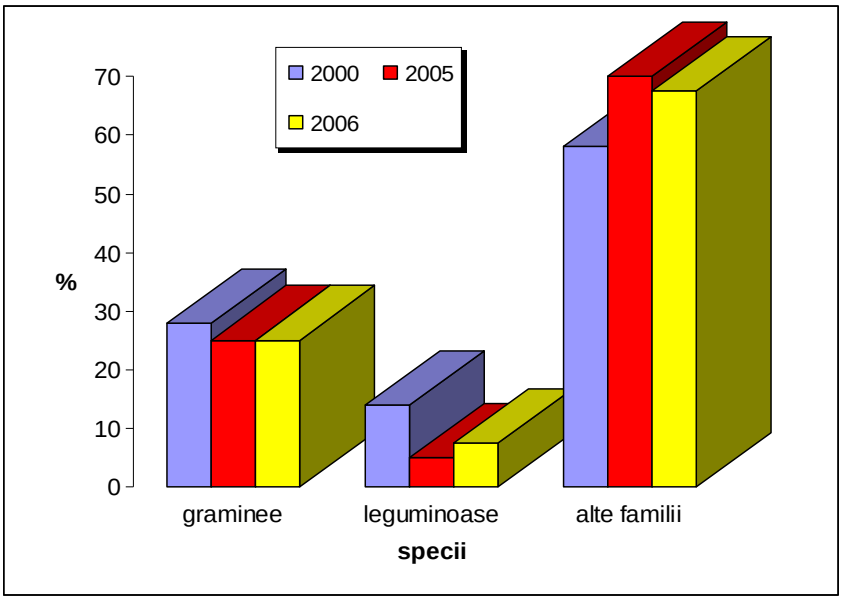


Figure 1. Graphical representation of the botanical structure dynamics from Gottlob-Vizejdia grassland (2000-2006)

Aspects concerning pastoral value and interspecific diversity in Gottlob-Vizejdia grassland

For the appreciation of pastoral value we have used the data collected in 2000 for Gottlob-Vizejdia grassland. Pastoral value obtained in 2000 on this surface is 1.95 (on 0-5 scale), or 51.2 (on 0-100 scale, in conformity with LOISSEAU, 1992) and in 2006 this is only 30.

There we have noticed that the greatest participation of *Bromus mollis* and an increased percentage of *Achillea millefolium* and *Agropyron repens*.

Literature (MOISUC *et al*., 2002, 2004; SAMFIRA *et al*., 2004, 2005) shows that the decrease of the vegetation carpet quality is determined by the decrease of the participation of the good forager species and the occupation of the habitat with species from other botanical families. In this way there is realised an increase of the species number from a certain grassland, this fact being directly associated with the decrease of grassland quality.

Aspects concerning the vegetation structure of Gottlob-Grabaț grassland

Vegetation analyses realised during 2000-2006 in the second grassland surface in Gottlob (Gottlob – Grabaț) show that the vegetation association is suffering changes, in this way *Bromus tectorum* became dominant replacing *Achillea millefolium* as participation in vegetation carpet, and *Festuca arundinacea* became codominant species.

On this surface pastoral value is decreasing from 1.95 (on 0-5 scale), or 51.2 (on 0-100 scale, in conformity with LOISSEAU, 1992) in 2000 to 30 in 2006.

Thus dominant vegetation association is *Bromus tectorum – Festuca arundinacea* and pastoral value is 2.25 (on 0-5 scale) or 51.8 (on 0-100 scale).

Grasses participation in vegetation carpet is relatively constant this being 25% and 27.9%. Legumes participation is maintaining constant during our study (2000-2006) these being comprised between 9% and 15.21% (table 1). Also, the evolution of the species from other botanical families percentage is showing an increase of their participation from 58% (2000) to 68% (in 2006).

Graphical representation of the botanical structure dynamics from Gottlob-Grabaț grassland is represented in figure 2.

Table 1

Botanical structure dynamics in Gottlob-Vizejdia grassland during 2000-2006 (%)

Year	Grasses %	Legumes %	Other botanical families %
2000	28	14	58
2005	22.7	9.09	68.21
2006	21.73	15.21	63.04

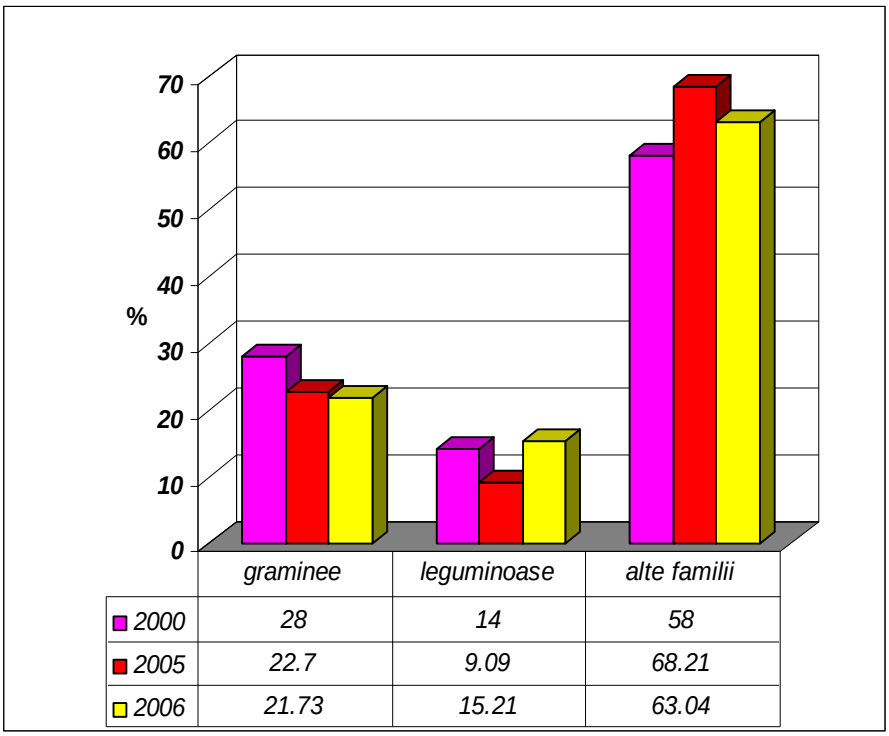
Aspects concerning pastoral value and interspecific diversity in Gottlob-Grabaț grassland

After the analysis of the vegetation quality concerning pastoral value index of Gottlob-Grabaț grassland we have noticed a increase of the vegetation quality in comparison with Gottlob-Vizejdia grassland.

There we have noticed that the greatest participation of *Bromus mollis* and *Lolium perenne,* and an increased percentage of *Achillea millefolium.*

We have noticed that Gottlob-Grabaț grassland has a medium quality this being appreciated with 59.99 value. It can be appreciated that the interspecific biodiversity for this

grassland surface is corresponding to a Shannon-Weaver index of 10.67, this value showing a great vegetation biodiversity.



	graminee	leguminoase	alte familii
2000	28	14	58
2005	22.7	9.09	68.21
2006	21.73	15.21	63.04

Figure 2. Graphical representation of the botanical structure dynamics from Gottlob-Grabaț grassland (2000-2006)

CONCLUSIONS

The study of the permanent grassland from Gottlob area during 2000-2006 is differentiated for these two permanent grassland identified plots (nearby Jimbolia and to Grabaț) through exploitation mode influence, first grassland plot being used more intense by village community animals, the second being less used (near to Grabaț).

Analyzing the first permanent grassland plot from Gottlob we have noticed as it's following:

- in *Bromus mollis-Hordeum murinum-Trisetum flavescens* vegetation association the codominant species is replaced the association becoming *Bromus mollis-Lolium perenne;*
- pastoral value has decreased during studied interval from 51.2 (on 0-100 scale) in 2000 to 30 in 2006;
- vegetation structure analysis shows that grasses are participating relatively constant as percentage (25-27%), legumes participation are decreasing as participation with about a half there being established very low values (5-

7%) and the percentage of the species from other botanical families are increasing from 50% to 70%;

- there are noticed great biodiversity values (appreciated with values greater then 9).

Analyzing the second permanent grassland plot from Gottlob we have noticed as it's following:

- in *Achillea millefolium – Bromus tectorum* vegetation association is replaced with *Bromus tectorum – Festuca arundinacea* association;
- pastoral value is maintaining in the same limits during studied interval being 51.8 (on 0-100 scale) in 2000 and 59.99 in 2006;
- vegetation structure analysis during 2000-2006 shows that grasses are participating relatively constant as percentage (25-27%), legumes participation is also constant as participation (9-15.21%) and the percentage of the species from other botanical families is increasing from 58% (2000) to 68% (2006);
- there are noticed great biodiversity values (appreciated with values greater then 10).

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