STUDY ON THE PASTORAL VALUE OF THE GRASSLANDS LOCATED IN THE SALONTEI PLAIN (BIHOR COUNTY)

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RESEARCH ARTICLE

Abstract

Grasslands are one of the most valuable forms of natural landscapes, being essential for the healthy functioning of terrestrial ecosystems. They are ecosystems characterized by herbaceous vegetation, such as grasses and perennial flowers, covering vast areas of land. Grasslands occur in various areas and are influenced by climatic, soil and human use factors.

Ecologically, meadows provide vital habitats for a diverse range of flora and fauna, contributing to biodiversity conservation and the resilience of ecosystems. They serve as key areas for pollination, water filtration, and soil stabilization, making them essential in sustaining both natural and agricultural systems.

The grassland vegetation of the Salontei Plain, a subunit of the Western Plain, is influenced by the water regime, soil typology and human activities in the area. The Salontei Plain is a largely agricultural area, but still preserves a wide variety of grasslands that shelter a diverse flora.

This paper analyzes the floristic composition and pastoral value of a permanent grassland, dominated by the Achilleo-Festucetum pseudovinae phytocenosis, located in the Salontei Plain (Bihor County), trying to identify improvement measures. The assessment of the participation of the component species and the floristic composition was based on the floristic surveys, after which the pastoral value was evaluated.

Keywords: species inventory, nutritional value, pastoral value indicator, meadows, fodder quality index.
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INTRODUCTION

The Salontei Plain is characterized by its relatively flat topography, with floodplain meadows, wet meadows, steppes and dry meadows, also marked by agricultural fields, and is a typical example of the Pannonian Plain ecosystems.

The meadows, especially the wetland ones, support a high diversity of plant and animal species, contributing to the overall ecological health of the plain. Some of these meadows are considered valuable for conservation, particularly as they are increasingly rare in the region due to agricultural expansion and urban development.

The process of photosynthesis in the ecosystems of the grasslands is intensified by the fodder plants and a greater amount of organic matter is introduced into the soil, maintaining an active biological life in the soil. Through the roots of meadow fodder plants, which act as a binder in the presence of organic matter, the process of destroying the granular structure of the soils is stopped, in most cases leading to their improvement (Mocanu, Hermenean, 2013; Simtea et al., 1990).

The soil in the Salontei Plain is generally chernozem (a rich, dark soil high in organic matter) and clay-loam, making it suitable for agriculture. However, the wet meadows often have more gleied soils, which are influenced by waterlogging

In the studied area, the association grows on slightly saline gleisoil's and solonets in the meadows from the Salontei Plain, where it occupies areas of 40–100 m^2. The floristic inventory of *Achilleo-Festucetum pseudovinae* association groups a number of 41 halophilic and non-halophilous species, of which *Festuca pseudovina*, *Achillea setacea*, *Achillea collina* are the characteristic and edifying species.

Regarding the type of habitat, it falls into the category of Natural Habitat of Community Interest, whose conservation requires the designation of Special Areas of Conservation (SAC), Natura 2000: 1530* Pannonian salt steppes and salt marshes.

Code R1531 Ponto-Pannonic grasslands of *Festuca pseudovina* and *Achillea collina* (Doniţă et al., 2005, Gafta, Mountford (coord.) et al., 2008).

MATERIAL AND METHODS

The pastoral value (V. P.) is a synthetic index of characterization for the quality of a meadow that includes the main elements related to the floristic composition, the percentage of coverage for each species, as well as the nutritional value of the component species.

The floristic composition of a grassland and the appreciation of the participation of the component species is done by one of the classical methods named after the initiators:

- ✓ phytosociological method, Braun-Blanquet
- ✓ pratological method, Klapp-Ellenberg
- ✓ double meter method, Daget-Poissonet
- ✓ gravimetric method

The evaluation of the participation of the species and the floristic composition was made by combining the phytosociological method with the pratological method.

The phytosociological method appeals to the appreciation of the abundance and dominance (ADm) of the species in the grassy area on 25-100 m², in representative key points, being noted on a 6-step scale (Ivan, Doniţă, 1975; Cristea et al., 2004), which correspond to the participation percentages:

- 5 - with a coverage average of 87.5%
- 4 - with a coverage average of 62.5%
- 3 - with a coverage average of 37.5%
- 2 - with a coverage average of 17.5%
- 1 - with a coverage average of 5%
- + - with a coverage average of 0.5%

The taxa identified in the field have been recognized by specialty catalogues "Romania's Illustrated Flora" (Ciocârlan, 2009), in conjunction with the information provided by the "International Code of Botanical Nomenclature" (Code de Tokyo, 1993).

The pratological method emphasizes the assessment of the percentage share in biomass of botanical components by economic groups: *Poaceae*, *Fabaceae* and species from other botanical families.

For the determination of the pastoral value the following formula was used (Maruşca et al., 2014):

$$P.\ V. = \Sigma PC\ (\%)\ x\ \frac{IC}{5}$$

where:

P. V. – pastoral value indicator (0-100);
P. C. – participation in the grassy area (%),
I. C. – fodder quality index.

Having at disposal the floristic surveys from the field, with the percentage participation of species, the fodder quality index (I. C.) is passed next to each one (Maruşca et al., 2012; Rotar et al., 2009), namely:

- 5 - excellent nutritional value
- 4 - very good nutritional value
- 3 - good nutritional value
- 2 - average nutritional value
- 1 - poor nutritional value

After determining the pastoral value indicator, by dividing by 5 the score obtained from the multiplication of P.C. x I.C., it is assessed as follows (Maruşca et al., 2014):

- 0-5 - degraded meadow
- 5-15 - very weak
- 15-25 - weak
- 25-50 - medium
- 50- 75 - good
- 75-100 - very good

RESULTS AND DISCUSSIONS

The analyzed grassland is appreciated from the point of view of pastoral value, having a good productivity, the fodder obtained having a high palatability.

Following the floral inventory, from the *Poaceae* family were identified four species with excellent nutritional value (*Lolium perenne*, *Dactylis glomerata*, *Festuca pratensis*, *Phleum pratense*) and four species with very good and good nutritional value (*Agrostis capillaris*, *Agrostis stolonifera*, Alopecurus pratensis, *Puccinellia distans*). Regarding the inventory of the *Fabaceae* family, three species have very good nutritional value (*Lotus tenuis*, *Trifolium hybridum*, *Trifolium repens*).

These grasslands have a diversified vegetation, the floristic composition being rich and varied. The species belonging to the *Poaceae* family occupy the highest percentage of the floristic composition (40%), where dominant is *Agrostis capillaris* (12%), together with *Lolium perenne* (6%), followed by *Agrostis stolonifera* (5%) and *Festuca pseudovina* (4%). The *Fabaceae* family (24%) is well represented by *Trifolium campestre* (12%) and *Trifolium repens* (6%). Among the species from other botanical families, a higher share has *Taraxacum officinale* (4%), *Juncus inflexus* (5%), *Juncus trifidus* (4%) and - (Table 1).

Species from other botanical families, which are of interest from a nutritional value, are relatively few in number. Among them we mention: *Achillea setacea*, *Achillea collina*, etc.

Table 1

Species Inventory and Pastoral Value Indicator

Species	% P.C.	I.C.	P.C. x I.C.
Poaceae	**(40)**		
Festuca pseudovina	4	1	4
Alopecurus pratensis	3	4	12
Agrostis stolonifera	5	3	15
Agrostis capillaris	12	3	36
Lolium perenne	6	5	30
Dactylis glomerata	2	5	10
Festuca pratensis	2	5	10
Phleum pratense	2	5	10
Anthoxanthum odoratum	+	1	0
Cynodon dactylon	3	1	3
Puccinellia distans	+	3	0
Hordeum bulbosum	1	1	1
Fabaceae	**(24)**		
Lotus tenuis	+	4	0
Potentilla erecta	2	1	2
Trifolium fragiferum	3	3	9
Trifolium campestre	12	2	24
Trifolium hybridum	1	4	4
Trifolium repens	6	4	24
Vicia cracca	+	3	0
Species from other botanical families	**(36)**		
Achillea setacea	2	2	4
Achillea collina	3	2	6
Taraxacum officinale	4	2	8
Cichorium intybus	+	1	0
Daucus carota ssp. *carota*	+	2	0
Leontodon autumnalis	+	1	0
Leontodon hispidus	1	1	1
Galium verum	2	1	2
Matricaria perforata	+	0	0
Plantago lanceolata	2	2	4
Carex pilosa	+	0	0
Centaurea jacea	2	0	0
Crepis biennis	3	0	0
Euphorbia amygdaloides	+	0	0
Juncus trifidus	4	0	0
Juncus inflexus	5	0	0
Filipendula ulmaria	1	0	0
Ononis spinosa	3	0	0
Symphytum officinale	1	1	1
Rumex obtusifolius	2	0	0
Cirsium oleraceum	+	2	0
Cirsium arvense	1	0	0
TOTAL	**100**	–	**220**
Pastoral Value	–	–	**44**
Appreciation P. V.	**Medium**		

where: **P. C. – participation in the grassy area, I. C. – fodder quality index, P. V. – pastoral value indicator.**

CONCLUSIONS

The meadows of the Salontei Plain have significant pastoral value, both economically, ecologically and culturally. The meadows in this region are used mainly for grazing, but also for hay production, being of major importance in supporting agricultural activities and local biodiversity.

A pastoral value of 44 for *Achilleo-Festucetum pseudovinae* association indicates that the grassland is of average productivity for grazing purposes. It provides a reasonable amount of forage for livestock but may not be as high-yielding or nutritious as more productive grassland associations. The value reflects the potential for sustainable grazing with proper management, though supplementation may be needed depending on climatic and soil conditions.

The expansion of agricultural land for intensive crops can reduce grassland areas and affect biodiversity. Draining land to increase agricultural yields can lead to the loss of wet grasslands and valuable habitats. Uncontrolled or excessive grazing can lead to soil degradation and the loss of perennial vegetation. Climate change can affect the precipitation regime and, consequently, the vegetation of grasslands, which could reduce their quality and quantity.

The most important action that should be taken is the development of a long-term pastoral arrangement, thus leading to the restoration of the habitats that form the pastures, planting native grassland plant species to improve forage quality and support wildlife habitat is a common practice in long-term pastoral management.

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