STUDY REGARDING THE PASTORAL VALUE OF THE MEADOWS FROM BIHARIEI PLAIN (BIHOR COUNTY)

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RESEARCH ARTICLE

Abstract

Meadows are rich in biodiversity, supporting a wide range of flora and fauna. They are important habitats for various plant species, insects, birds, and mammals, contributing to the overall health of ecosystems. Overall, meadows play a crucial role in supporting biodiversity, regulating the climate, conserving water, providing recreational opportunities, and sustaining agricultural livelihoods. Their pastoral value extends far beyond their appearance, making them essential components of healthy and resilient ecosystems. This study aims to analyze the floristic composition and the pastoral value of a permanent meadow, dominated by phytocoenosis Agrostetum stoloniferae, located in the Bihariei Plain (Bihor County), trying to identify measures to improve. 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: meadow, pastoral value indicator, species inventory, meadows, fodder quality index.
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INTRODUCTION

Meadows have traditionally been used for agriculture and livestock grazing. They provide valuable forage for livestock and support sustainable farming practices. Meadows also contribute to the local economy through the production of hay, pasture, and other agricultural products.

Keeping the grassy lawn of the grasslands in balance is an art that the manager of the pastoral fund must master thoroughly, starting with the knowledge of the plants, the needs of fertilizers and their humidity, appropriate methods of use by grazing or mowing and other measures (Maruşca, 2006).

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).

In the studied area, the floristic composition of the *Agrostetum stoloniferae* phytocoenosis is rich and varied, in which the edifying species *Agrostis stolonifera* it is stated quantitatively, together with *Lolium perenne* and *Trifolium repens*. It develops in meadows with the water table close to the soil surface, and adapts very well to the seasonal fluctuation of the stagnant water level, regenerating quickly after being trampled by animals during grazing and after mowing, fitting into the habitat R3715 Danubian-Pannonian meadows of *Agrostis stolonifera* (Doniţă et al., 2005).

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, Doniță, 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):

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

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 meadows dominated by the Agrostetum stoloniferae phytocoenosis are appreciated from the point of view of pastoral value, having a good productivity, the fodder obtained having a high palatability.

Grasslands dominated by *Agrostetum stoloniferae* usually have a rich composition of grass species, with *Agrostis stolonifera* (creeping grass) being the dominant species. This type of meadow often features a dense, low-growing clump with creeping stems that help the grass spread horizontally. Along with *Agrostis stolonifera*, there are other grass species such as *Lolium perene* and *Agrostis capillaris*, which contribute to the diversity and overall structure of the meadow, being known for their lush appearance.

Among the species of grasses (*Poaceae*), which accompany *Agrostis stolonifera*, with good nutritional value, we mention species that have excellent nutritional value, like: *Lolium perenne*, *Festuca pratensis*, *Dactylis glomerata*, they being accompanied by leguminous species (*Fabaceae*), such as *Trifolium repens*, *Lotus corniculatus, Lathyrus pratensis,* with very good nutritional value.

These meadows 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 (44%), where dominant is *Agrostis stolonifera* (15%), together with *Lolium perenne* (15%), followed by *Agrostis capillaris* and *Agrostis canina* (4%). The *Fabaceae* family (21%) is well represented by *Trifolium repens* (10%) and *Melilotus officinalis* (5%). Among the species from other botanical families, a higher share has *Juncus effusus* (5%) - (Table 1).

Species from other botanical families, which are of interest from a nutritional value point of view, are relatively few in number. Among them we mention: *Achillea millefolium*, *Daucus carota* ssp. *carota*, *Plantago major*, *P. media*, all with average nutritional value.

Also, in these meadows, there are plant species not consumed by animals or with a low degree of consumption, like *Lysimachia nummularia*, *Verbena officinalis*, respectively species harmful to the grassy carpet of the meadows, and here we mention *Juncus conglomeratus*, *Juncus effusus*, *Ononis spinosa* and *Crataegus monogyna*.

Table 1

Species Inventory and Pastoral Value Indicator

Species	% P.C.	I.C.	P.C. x I.C.
Poaceae	**(44)**		
Agrostis stolonifera	15	3	45
Agrostis capillaris	4	3	12
Lolium perenne	15	5	75
Agrostis canina	4	2	8
Dactylis glomerata	2	5	10
Festuca pratensis	2	5	10
Poa pratensis	2	3	6
Fabaceae	**(21)**		
Lathyrus pratensis	2	4	8
Lotus corniculatus	+	4	0
Medicago lupulina	2	4	8
Melilotus officinalis	5	2	10
Trifolium fragiferum	1	3	3
Trifolium pratense	1	4	4
Trifolium repens	10	4	40
Vicia cracca	+	3	0
Species from other botanical families	**(35)**		
Achillea millefolium	+	2	0
Cichorium intybus	2	1	2
Daucus carota ssp. *carota*	+	2	0
Leontodon autumnalis	+	1	0
Plantago major	1	2	2
Plantago media	1	2	2
Verbena officinalis	3	0	0
Bellis perennis	3	0	0
Capsella bursa-pastoris	+	0	0
Centaurea jacea	2	0	0
Crepis biennis	3	0	0
Crataegus monogyna	1	0	0
Erigeron annuus	1	0	0
Euphorbia cyparissias	3	0	0
Juncus conglomeratus	+	0	0
Juncus effusus	5	0	0
Lysimachia nummularia	4	0	0
Ononis spinosa	3	0	0
Rumex obtusifolius	+	0	0
Tanacetum vulgare	3	0	0
TOTAL	**100**	–	**245**
Pastoral Value	–	–	**49**
Appreciation P. V.	**Medium**		

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

CONCLUSIONS

The pastoral value of the permanent *Agrostetum stoloniferae* meadow is 49, which indicates a medium value.

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.

Long-term pastoral management refers to the planning and sustainable management of grazing lands over an extended period of time. This involves strategies such as grazing rotation, efficient management of livestock stocks, conservation of water and soil resources, as well as maintaining biodiversity.

Adopting such measures can ensure the maintenance of the health of grassland ecosystems and the sustainability of pastoral activities in the long term.

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