

CONTRIBUTIONS TO THE ASSESSMENT OF GRASSLAND HABITATS PRODUCTIVITY IN THE MUREȘ GORGE

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Abstract. *The permanent grasslands in the Mureș Gorge, between Toplița and Deda, located between 500 - 750 m altitude, in an area with a tradition of animal breeding, have a fairly high productivity. On average, the pastoral value (PV) is 50.6 and the green mass production (GMP) 9.33 t/ha, on which 0.87 LU/ha can be maintained during the 165 days of the grazing season. The normal Habitat 6520 with the *Phyteumo - Trisetion* and *Cynosurion* alliances has the highest productivity (68 PV and 12.9 t/ha GMP), 4-5 times higher than the degraded Habitat 6210 with the *Seslerio - Festucion pallentis* alliance (16 PV and 2.37 t/ha GMP). Data on grassland productivity further serve to assess potential forage and utilization with livestock.*

Keywords: permanent grasslands, pastoral value, green mass production, grazing capacity

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1. Introduction

Riverside permanent grasslands are generally more productive, usually having guaranteed soil moisture and a higher degree of trophicity (Marușca, Nicolin 2020; Marușca, Vințan 2022; Marușca et al. 2022; Oprea, Marușca 2022) [4, 5, 6, 7].

In addition to the geobotanical studies, the present work continues the evaluation of the productivity of the grasslands based on the floristic survey (Marușca 2019) [2], results that continue to serve for the preparation of improvement and exploitation projects.

2. Materials and Methods

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To evaluate the grasslands productivity of riverside and gorges grasslands, the work "Flora and vegetation of the Mureş Gorge between Topliţa and Deda", author Silvia Oroian, published in 1998 at the Mureş Publishing House, was studied [8].

The evaluation method is not discussed again because it was extensively presented in these annals (Maruşca et al. 2019) [3].

The following cenotaxonomic units were taken into study for the evaluation of grassland productivity:

Cl. MOLINIO-ARRHENATHERETEA R. Tx. 1937 em R.Tx.1970

Ord. *MOLINIETALIA* W.Koch 1926

Orchards and hayfields

Al. *Agrostion albae* Soó (1933) 1971

1. As. *Agrostietum stoloniferae* (Ujv. 1941) Burduja et al.1956

Ord. *Arrhenatheretalia* R.Tx 1931

Al. *Arrhenatherion* Koch 1926

2. As. *Ranunculo repentis - Alopecuretum pratensis* Ellmauer 1993

sub as. *geranietosum pratensis* (Zaliberová 1982) comb nova

Al. *Phyteumo - Trisetion* (Passarge 1969) Ellmauer et Mucina 1993

3. As. *Poo - Trisetetum* Knapp ex Oberd.1957

Al. *Cynosurion* R.Tx 1947

4. As. *Festuco rubrae - Agrostietum capillaris* Horv. 1951

5. As. *Festuco rubrae - Agrostietum capillaris* Horv. 1951 *nardetosum*

subass nova

Cl. FESTUCO - BROMETEA Br-BI et Tx. Ex Klika et Hadač 1944

Ord. *FESTUCETALIA VALESIACAE*, Br-BI et Tx. Et Br-

BI.1949

Al. *Seslerio - Festucion pallentis* Klika 1931

6. As. *Thymo comosi - Festucetum rupicolae* (Csűrös 1959), I. Pop et Hodişan 1985 1956

Al. *Festucion valesiaca* Klika 1931

7. As. *Agrostio - Festucetum valesiaca* Borislavjevič et al. 1956

For grazing capacity, depending on the altitude where the grasslands are met (500 - 750 m), 165 days of optimal grazing season were estimated.

Grassland cenotaxonomic units at the level of associations and alliances have been synthesized in the new Natura 2000 habitats (Gafta, Mountford, 2008) [1].

3. Results and Discussions

The permanent grasslands from the Mureş Gorge on the Topliţa - Deda section have on average 74 species of cormophytes, the richest being the associations

Agrostetum stoloniferae (109 species) and *Poo - Trisetetum* (87 species) and the poorer *Ranunculus repentis - Alopecuretum pratensis* (44 species) and *Festuco rubrae - Agrostietum capillaris - nardetosum* (58 species) (Table 1).

Vegetation coverage was 89% in which *Thymo comosi - Festucetum rupicolae* barely registers 40%, the rest of the associations have 84-100%

The average participation in the grass carpet of forage species is quite high (69%) and of harmful species is low (20%).

Indices of pastoral value (PV) are consistent with the participation of forage species in the grassy carpet, ranging from 16 PV in degraded habitat 6210 (*Seslerio - Festucion pallentis*) to 68 PV in normal habitat 6520 (*Phyteumo - Trisetion and Cynosurion*) (Table 2) .

Table 5. General data on the phytodiversity and forage structure of the grassy carpet of the Mureş Gorge grasslands

No.	Phytosociological association	Species no.	Vegetation cover	Participation %	
				Forager	Harmful
	<i>Agrostion albae</i>				
1	<i>Agrostietum stoloniferae</i>	109	100	74	26
	<i>Arrhenatherion</i>				
2	<i>Ranunculo repentis - Alopecuretum pratensis</i>	44	84	79	5
	<i>Phyteumo - Trisetion</i>				
3	<i>Poo - Trisetetum</i>	87	98	84	14
	<i>Cynosurion</i>				
4	<i>Festuco rubrae - Agrostietum capillaris</i>	73	100	86	14
5	<i>Festuco rubrae - Agrostietum capillaris - nardetosum</i>	58	100	71	29
	<i>Seslerio - Festucion pallentis</i>				
6	<i>Thymo comosi - Festucetum rupicolae</i>	71	40	10	30
	<i>Festucion valesiaca</i>				
7	<i>Agrostio - Festucetum valesiaca</i>	73	100	80	20
	AVERAGE	74	89	69	20

On average, the encountered habitats (6440, 6510, 8520, 6210 normal and degraded) reach almost 51 PV, being considered quite good.

Average green mass production (GMP) was assessed at 9.33 t/ha, which can support 0.87 LU/ha in 165-day grazing season.

Table 6. The productivity of the grassland associations in the Crişurilor Plain

Habitat*)	Phytosociological alliance	Pastoral value		Green mass production t/ha	Animal loading LU/ha (165 days)	% to the average
		ind.	%			
6440	<i>Agrostion albae</i>	53.7	106	11.04	1,03	118
6510	<i>Arrhenatherion</i>	43.9	87	8.97	0,84	97
6520 normal	<i>Phyteumo - Trisetion</i>	69.6	138	13.08	1,22	140
	<i>Cynosurion</i>	66.3	131	12.73	1,19	137
6520 degraded	<i>Cynosurion</i>	53.1	105	9.60	0,90	103
6210 normal	<i>Festucion valesiacaе</i>	51.7	102	7.54	0,70	80
6210 degraded	<i>Seslerio - Festucion pallentis</i>	16.0	32	2.37	0,22	25
Habitat AVERAGE		50,6	100	9.33	0.87	100

6440 – River valley alluvial grasslands of *Cnidion dubii*

6510 - Lowland hay grasslands (*Alopecurus pratensis*, *Sanguisorba officinalis*)

6520 - Mountain hay grasslands

6210 - Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco - Brometea*) (*important orchid sites)

The highest production of green mass is recorded in the same habitat 6520 normal (12.91 t/ha) with a grazing capacity of 1.21 LU/ha and the lowest in the degraded habitat 6210 (2.37 t/ha GMP and 0.22 LU/ha).

These data continue to serve for the economic evaluation of the grasslands potential necessary for the preparation of pastoral arrangements.

Conclusions

- (1). The permanent grasslands from the Mureş Gorge are rich in species (74/survey) with a participation of 69% forage species and 20% harmful species in the grass carpet.
- (2). The average pastoral value is 50.6, being considered quite good, for the local conditions in the area under study.
- (3). The average green mass production reaches 9.33 t/ha, which can ensure a load of 0.87 LU/ha in 165 days of grazing season.

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