THE FLORISTIC AND STATIONAL CHARACTERISATION OF THE GRASSLAND SUBTYPE *AGROSTIS CAPILLARIS + TRISETUM FLAVESCENS* FROM APUSENI MOUNTAINS, ROMANIA

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Abstract: *The floristic composition of the semi – natural grasslands from Apuseni Mountains area differ from one station to another, depending on some factors like: the natural ones, the performed management, by the area's social-economic situations. The objective of this paper is to characterise the grassland subtype Agrostis capillaris – Trisetum flavescens which is present in the grasslands from the Gheţari – Poiana Călineasa Plateau in Gârda de Sus commune, Apuseni Mountains. The identification and description of the respective subtype was elaborated after the analysis of 37 floristic relevèes performed using the Braun - Blanquet modified method and, then, by applying some statistic indexes. In our study area, this grassland subtype occures at an altitude comprised between 1070 and 1337 m, the most frequent altitude being 1099 m. The floristic composition of this subtype differs rather much depending on the stational conditions. Thus, the species from Poaceae family are present in average by 48,4 %, with a minimum of 23,5 % and a maximum of 81 %. The data dispersal is normal, positive and mesokurtic (Skewness = 0,48; Kurtosis = 0,44). The Cyperaceae and Juncaceae families have a low participation, in average 1,01 %, in most of the cases not being at all present. The species from the Fabaceae family are present with an average of 10,8 %, with a minimum of 0% and a maximum of 28 %. The data referring to their participation have a normal, positive and mesokurtic distribution – Skewness = 0,74 and Kurtosis = 0,36. The plants from other botanical families occur in average with 45,15 %, with a minimum of 16 % and a maximum of 75 %. The participation data dispersal is normal, negative (Skewness = - 0,08) and mesokurtic (Kurtosis = - 0,56). Regarding the agronomic value of the grassland, it frames within the sixth class (VI), the category of grassland is medium and it can support an animal load of 0,81 – 1,00 LSU / ha.*

Key words**:** *phytocenosis, data distribution, cover, constancy clases,*

INTRODUCTION

The floristic composition of the semi – natural grasslands from Apuseni Mountains area differ from one station to another, depending on some factors like: the natural ones, the performed management, the land's orography, by the area's social-economic situations. It is important to record data from an area's grasslands in order to quantify its potential for fodder and to evaluate the floristic composition in an area where traditional farming is being performed. The objective of this paper is to characterise the grassland subtype *Agrostis capillaris – Trisetum flavescens* which is present in the grasslands from the Gheţari – Poiana Călineasa Plateau in Gârda de Sus commune, Apuseni Mountains.

MATERIAL AND METHODS

The identification and description of the respective subtype was elaborated after the analysis of 37 floristic relevèes performed using the Braun - Blanquet modified method and, then, by applying some statistic indexes, like: average, average abundance – dominance (AAD) and constancy (K) (**CRISTEA ET AL.,** 2004), median, mode, data asymmetry indexes (skewness (Skew), kurtosis (Kurt)), minimum (MIN) and maximum (MAX). The assymmetry indexes

show the data dispersal: if they range within ± 1,96 the distribution is normal, if they overcome this values, the distribution is assymmetric (3).The forage value of the phytocenosis was calculated by using the specific quality index (SI) and the pastoral value (PV).

RESULTS AND DISCUSSIONS

From the type's framing point of view, this phytocenosis is not described as type or subtype neither in the nemoral floor nor in the boreal floor, after UCRA ET AL.(1979). However, we consider that this phytocenosis is in a succession stage evolving from the type *Agrostis capillaris – Festuca rubra* towards the subtype *Trisetum flavescens*. Considering that it has been identified in 37 (out of 426) sites representing 9 % out of the total studied area of grasslands, it will be assigned with the name of "the subtype *A. capillaris – T. flavescens"*.

In our study area, this grassland subtype occurs at an altitude comprised between 1070 and 1337 m ASL (Table 1). The grassland subtype is spread beginning from plane land towards skewd land up to 40 ^{o} inclination. The subtype was encountered on all kinds of slopes, but the most frequent (35 % of the sites) on Eastern and Southern slopes (95 - 180 ^{o}). This subtype is exploited only through mowing. The cover with wooden vegetation differs rather much between 0 and 25 %, in average 4,46 %, and the most frequent is 2 %. The general cover with herbaceous vegetation ranges between 80 and 100 %, the data distribution being assymmetrical, negative and leptokurtic (Skewness = - 2,24, Kurtosis = 6,33).

The floristic composition of this subtype differs rather much depending on the stations' conditions. Thus, the species from *Poaceae* family are present in average by 48,4 %, with a minimum of 23,5 % and a maximum of 81 %. The data dispersal is normal, positive and mesokurtic (Skewness = 0,48; Kurtosis = 0,44). In order to save space only the enlightening and frequent (constancy classes V and IV) will be presented in the table. The *A. capillaris* species occurs with an average abundance – dominance of 24,66 %, and *T. flavescens* with 16,32 %. The most frequent value of cover in the sward recorded by *A. capillaris* is 17,5 %, *T. flavescens* having the same frequency. Besides these two, among the grasses, *Festuca rubra* also occurs with a frequency of 5 %. Among the grasses, the enlightening species of this grassland subtype are: *A. capillaris, F. rubra* and *T. flavescens* (K = V).

The *Cyperaceae* and *Juncaceae* families have a low participation, in average 1,01 %, in most of the cases not being at all present.

The species from the *Fabaceae* family are present with an average of 10,8 %, with a minimum of 0% and a maximum of 28 %. The data referring to their participation have a normal, positive and mesokurtic distribution – Skewness = 0,74 and Kurtosis = 0,36. The the enlightening species from the leguminous group having the constancy V are *Trifolium pratense* and *Lotus corniculatus*.

The plants from other botanical families occur in average with 45,15 %, with a minimum of 16 % and a maximum of 75 %. The participation data dispersal is normal, negative (skewness = - 0,08) and mesokurtic (kurtosis = - 0,56). The herbaceous species with a more important presence are *Alchemilla vulgaris* (10,47 %), *Centaurea phrygia agg.* (4,05 %), *Colchicum autumnale* (7,89 %). The enlightening species for the subtype *A. capillaris – T. flavescens* from this group are *A. vulgaris* şi *C. phrygia agg.* (Constancy = V), followed by the frequent ones (Constancy = IV) *C. autumnale, Crepis biennis, Hypericum maculatum, Leucanthemum vulgare, Pimpinella major, Rhinantus minor, Rumex acetosa* and *Taraxacumm officinale*.

Regarding the agronomic value of the grassland, it frames within the sixth class (VI), the category of grassland is medium and it can support an animal load of 0,81 – 1,00 LSU / ha.

Table 1

Statistic precessing of data regarding station conditions and floristic composition of the subtype *Agrostis capillaris - Trisetum flavescens* and the frequency's constancy of species in relevees

Stational conditions	**Average**	**Median**	**Mode**	**Skew**	**Kurt**	**MIN**	**MAX**	**SI*%**	**K**
Altitude (m ASL)	1187.03	1170.00	1099.00	0.45	-0.92	1070.00	1337.00	-	-
Inclination (°)	10.22	8.00	10.00	1.79	4.23	0.00	40.00	-	-
Slope (°)	190.19	180.00	180.00	-0.22	-0.87	0.00	347.00	-	-
Land use	1.00	1.00	1.00	-	-	1.00	1.00	-	-
Wooden vegetation cover (%)	4.46	2.00	2.00	2.21	5.29	0.00	25.00	-	-
Fallow anthills (%)	1.95	1.00	0.00	0.70	-0.82	0.00	6.00	-	-
Moss (%)	1.08	0.00	0.00	4.11	15.77	0.00	20.00	-	-
General cover (%)	95.92	97.00	97.00	-2.24	6.33	80.00	100.00	-	-
Species (%)	**AAD**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Poaceae	**48.04**	**46.00**	**60.50**	**0.48**	**0.44**	**23.50**	**81.00**	**-**	**-**
Agrostis capillaris	24.66	17.50	17.50	1.48	2.15	17.50	62.50	73.99	V
Festuca rubra	4.97	5.00	5.00	1.34	1.59	0.00	17.50	14.90	V
Trisetum flavescens	16.32	17.50	17.50	-2.88	6.95	5.00	17.50	65.27	V
Fabaceae	**10.08**	**7.00**	**6.50**	**0.74**	**-0.36**	**0.00**	**28.00**	**-**	**-**
Lotus corniculatus	2.14	0.50	0.50	2.96	11.88	0.00	17.50	8.57	V
Trifolium pratense	2.38	0.50	0.50	2.75	10.72	0.00	17.50	9.51	V
Trifolium repens	4.30	2.75	5.00	1.65	1.99	0.00	17.50	17.19	IV
Vicia cracca	0.98	0.50	0.50	3.58	14.07	0.00	11.25	1.96	IV
Plants from Other Botanical Families	**45.15**	**46.50**	**34.50**	**-0.08**	**-0.56**	**16.00**	**75.00**	**-**	**-**
Alchemilla vulgaris	10.47	5.00	5.00	1.28	1.55	0.00	37.50	20.93	V
Centaurea phrygia agg.	4.05	5.00	5.00	2.12	6.36	0.00	17.50	0.00	V
Colchicum autumnale	7.89	5.00	0.00	1.55	2.37	0.00	37.50	0.00	IV
Crepis biennis	0.95	0.50	0.50	2.09	3.02	0.00	5.00	0.00	IV
Hypericum maculatum	1.36	0.50	0.50	1.38	0.12	0.00	5.00	0.00	IV
Leucanthemum vulgare	0.82	0.50	0.50	2.74	6.43	0.00	5.00	0.82	IV
Pimpinella major	1.16	0.50	0.50	1.57	0.77	0.00	5.00	1.16	IV
Rhinanthus minor	1.49	0.50	0.50	2.32	6.11	0.00	11.25	0.00	IV
Rumex acetosa	1.78	0.50	0.50	4.57	21.62	0.00	32.50	0.00	IV
Taraxacum officinale	1.74	0.50	0.50	3.27	13.63	0.00	17.50	3.49	IV
∑	-	-	-	-	-	-	-	229.63	-
PV								2,29	

Land use marked with 1 – mowing, 2 – grazing, 3 – abandoned
ASL –above sea level

CONCLUSIONS

In general the subtype *Agrostis capillaris – Trisetum flavescens* is encountered on Eastern and Southern slopes. There are only 18 species that are characteristic for the studied subtype, which occur with high constancy (in over 60 % of the relevees). The most frequent

value of cover in the sward recorded by *A. capillaris* and *T. flavescens* is 17,5 %. From the agronomic value point of view, it frames within the sixth class (VI), the category of grassland is medium and it can support an animal load of 0,81 – 1,00 LSU / ha, which is an indicated value for sustainable farming.

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