

## **THE PASTORAL VALUE OF TĂRCĂIȚA VALLEY GRASSLAND (CODRU-MOMA MOUNTAINS, BIHOR COUNTY)**

**Pășcuț Călin Gheorghe\***

\*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048,  
Oradea, Romania, e-mail: [pascutcalin@yahoo.com](mailto:pascutcalin@yahoo.com)

### **Abstract**

*The work represents a floristic study in order to determine the pastoral value of the Tărcăița Valley pastures (Codru-Moma Mountains, Bihor County). In the present study phytocoenoses belonging to 2 vegetal associations were studied (*Festuco rubrae-Agrostetum capillaris* Horvat 1951 and *Botriochloetum (Andropogonetum) ischaemi* (Kristiansen 1937) Pop 1977).*

*The study was conducted in the year 2017, a number of 10 relevées having been completed, 6 belonging to the *Festuco rubrae-Agrostetum capillaris* association and 4 to the *Botriochloetum (Andropogonetum) ischaemi* association.*

**Key words:** pasture, vegetable association, pastoral value, forage quality

### **INTRODUCTION**

The study is located in the Tărcăița Valley, tributary of the Crișul Negru River, in the central part of Codru-Moma Mountains. Tărcăița Valley is the second longest in the Codru-Moma Mountains, having an area of collecting water of 44.7 km<sup>2</sup>. The network of streams flow is fan-shaped, with a high relief energy (up to 650 m to the Devii Summit), the most important streams being: Râposu Brook and Brandiului Brook.

The study was conducted in the year 2017, two types of meadows having been identified, the first represented by *Festuca rubra* and *Agrostis capillaris* and the second by *Dichanthium ischaemum*. Phytocoenological research in the Codru-Moma Mountains grasslands was made by Paucă (1941) and Pășcuț (2012).

### **MATERIAL AND METHOD**

The pastoral value is a synthetic index of quality characterization of pastures as determined by methods of assessment. Identification of the pastoral value is useful in determining the capacity of pastures concerning the number of grazing animals.

The floristic composition of the grasslands and the estimation of the participation of the component species was achieved through the phytocoenologic method developed by Braun-Blanquet.

This method calls for the appreciation of abundance and dominance (AD) of species found in the grassy area on 100 m<sup>2</sup> in key points, being

marked on a scale from 0 to 5, with correspondent values in percentages of participation: 5 (coverage average of 87.5%), 4 (coverage average of 62.5%), 3 (coverage average of 37.5%), 2 (coverage average of 17.5%), 1 (coverage average of 5%) 0 (coverage average of 0.5%) (Cristea, 1993; Cristea et al., 2004).

The pastoral value of the meadows is determined by using a pointer through the formula (Marușca et al., 2012, 2014):

$$V.P. = \frac{\sum P.C.(%) \times I.C.}{5}$$

where: V.P. - pastoral value indicator (0-100);  
P.C. - participation in the grassy area (%) (ADm-abundance-dominance average);  
I.C. - forage quality index.

After determining the pastoral value indicator by dividing to 5 the score obtained from multiplying ADm x I.C., this is rated as follows: 0-5 (degraded grassland); 5-15 (very weak); 15-25 (weak); 25-50 (middleweight); 50-75 (good); 75-100 (very good) (Marușca et al., 2012, 2014).

The scientific names of the species of plants identified on the Tărcăiței Valley are the ones presented in the work developed by Ciocârlan (2009) and Sârbu et al. (2013).

The forage quality index values used are in accordance with the work developed by Rotar et al., (2009) and Marușca et al., (2012, 2014).

## RESULTS AND DISCUSSION

Mesophyllic meadows of *Agrostis capillaris* and *Festuca rubra* develop on eutricambosol and districambosol soils, which are deep, rich in humus, meeting on the upper hill at altitudes of 390-740 m, on flat lands and with tilt up to 20°, with various exhibitions (Table 1).

In these pastures on soils with low nutritive values the *Festuca rubra* (45.42%) is dominant, while on good soils the *Agrostis capillaris* (24.17%) is dominant.

The pastoral value of *Festuca rubra* with *Agrostis capillaris* pastures in Tărcăița Valley is medium, the pastoral value indicator is 47.28.

Table 1

The pastoral value (VP) of meadows belonging to the *Festuca rubrae-Agrostetum capillaris* Horvat 1951

No. relevées	1	2	3	4	5	6	ADm	IC	ADm x IC
Altitude (m)	655	685	640	740	460	390			
GPS									
Lat. N	46.52260	46.52902	46.52966	46.54625	46.56112	46.58667			
coordonates									
Long. E	22.23692	22.23416	22.24176	22.24716	22.27621	22.32227			
Herbaceous layer coverage (%)	100	100	100	100	100	100			
Shrubbery layer (%)	3	3	2	2	1	2			
Exposition	NV	S	N	NE	-	NE			
Slope (degree) (°)	15	10	20	10	-	15			
Area (m <sup>2</sup> )	100	100	100	100	100	100			
	0	1	2	3	4	5	6	7	8
	9								
<b>Poaceae</b>									
<i>Agrostis capillaris</i>	4	1	2	1	2	3	24.17	3	72.51
<i>Festuca rubra</i>	2	4	4	4	4	1	45.42	3	136.26
<i>Nardus stricta</i>	.	+	+	+	.	+	0.33	0	0
<i>Phleum montanum</i>	+	+	.	.	.	.	0.17	2	0.34
<i>Poa pratensis</i>	+	+	.	.	.	+	0.25	4	1
<i>Anthoxanthum odoratum</i>	.	+	+	+	+	1	1.17	1	1.17
<i>Danthonia decumbens</i>	.	+	+	.	+	+	0.33	0	0
<i>Festuca pratensis</i>	1	+	1	.	.	.	1.75	5	8.75
<i>Calamagrostis epigejos</i>	.	+	.	.	.	.	0.08	0	0
<i>Cynosurus cristatus</i>	+	+	+	+	+	+	0.5	3	1.5
<i>Molinia caerulea</i>	.	+	.	.	.	.	0.08	0	0
<i>Briza media</i>	.	.	.	+	.	.	0.08	1	0.08
<i>Lolium perenne</i>	+	+	+	.	+	.	0.33	5	1.67
<i>Holcus lanatus</i>	.	.	.	+	+	+	0.25	2	0.5
<b>Fabaceae</b>									
<i>Trifolium repens</i>	+	+	.	+	+	+	0.42	5	2.1
<i>Trifolium pratense</i>	+	+	+	+	+	+	0.5	5	2.5
<i>Lotus corniculatus</i>	+	+	+	+	+	+	0.5	4	2
<i>Genistella sagittalis</i>	.	+	.	+	.	+	0.25	0	0
<i>Medicago lupulina</i>	.	+	.	.	+	.	0.17	4	0.68
<i>Trifolium hybridum</i>	.	.	.	.	.	+	0.08	4	0.33
<b>Other families</b>									
<i>Plantago lanceolata</i>	+	+	+	+	+	+	0.5	2	1
<i>Achillea millefolium</i>	+	+	+	+	+	+	0.5	2	1
<i>Thymus glabrescens</i>	+	+	+	.	+	+	0.42	0	0
<i>Carex hirta</i>	+	.	.	.	+	.	0.17	0	0
<i>Alchemilla vulgaris</i>	+	+	.	.	.	.	0.17	2	0.34
<i>Bellis perennis</i>	+	+	.	.	.	.	0.17	0	0
<i>Cruciata laevipes</i>	.	.	.	.	+	.	0.08	0	0
<i>Potentilla argentea</i>	.	.	.	.	+	.	0.08	0	0
<i>Filipendula vulgaris</i>	.	+	.	.	.	.	0.08	1	0.08
<i>Campanula patula</i>	.	.	+	+	+	.	0.25	0	0
<i>Juncus effusus</i>	.	.	+	.	+	.	0.17	0	0
<i>Stachys germanica</i>	.	.	.	.	+	.	0.08	0	0
<i>Cichorium intybus</i>	.	.	.	.	+	.	0.08	1	0.08
<i>Gypsophila muralis</i>	.	.	.	.	.	+	0.08	0	0
<i>Galium verum</i>	.	.	.	+	+	.	0.17	1	0.17
<i>Cerastium holosteoides</i>	+	+	.	+	+	+	0.42	0	0
<i>Hieracium pilosella</i>	.	+	+	+	+	+	0.42	0	0

	0	1	2	3	4	5	6	7	8	9
<i>Fragaria vesca</i>	.	.	.	.	+	.	.	0.08	1	0.08
<i>Prunella vulgaris</i>	+	+	+	+	+	+	+	0.5	1	0.5
<i>Dianthus carthusianorum</i>	.	.	.	+	+	.	.	0.17	0	0
<i>Veronica chamaedrys</i>	.	+	+	+	+	.	.	0.33	0	0
<i>Pimpinella saxifraga</i>	.	+	+	+	+	+	+	0.42	1	0.42
<i>Polygala vulgaris</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Rumex acetosa</i>	.	.	+	.	+	.	.	0.17	1	0.17
<i>Rhinanthus minor</i>	.	+	.	+	.	.	.	0.17	0	0
<i>Juncus tenuis</i>	.	.	.	.	.	.	+	0.08	0	0
<i>Leontodon autumnalis</i>	+	+	+	+	+	+	.	0.42	1	0.42
<i>Veronica officinalis</i>	+	.	+	+	+	+	+	0.42	0	0
<i>Mentha longifolia</i>	+	.	.	.	+	.	.	0.17	0	0
<i>Viola tricolor</i>	.	.	+	+	+	.	.	0.25	0	0
<i>Leucanthemum vulgare</i>	.	.	.	.	+	.	.	0.08	0	0
<i>Centaureum erythraea</i>	.	+	+	.	+	+	+	0.33	0	0
<i>Fragaria viridis</i>	.	+	+	.	.	.	.	0.08	0	0
<i>Potentilla erecta</i>	.	+	+	+	+	+	+	0.42	1	0.42
<i>Hypochaeris radicata</i>	.	.	.	+	.	.	.	0.08	0	0
<i>Cruciata glabra</i>	.	.	.	+	.	+	.	0.17	0	0
<i>Leontodon hispidus</i>	.	.	.	.	+	+	+	0.17	1	0.17
<i>Thymus pulegioides</i>	.	.	.	+	.	.	.	0.08	0	0
<i>Verbena officinalis</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Lysimachia vulgaris</i>	.	.	.	+	.	.	.	0.08	0	0
<i>Carlina vulgaris</i>	.	+	+	+	.	+	+	0.33	0	0
<i>Stachys officinalis</i>	.	.	.	+	.	.	.	0.08	0	0
<i>Carlina acaulis</i>	.	+	.	+	.	.	.	0.17	0	0
<i>Centaurea phrygia</i>	.	.	.	+	+	+	+	0.25	0	0
<i>Agrimonia eupatoria</i>	.	.	.	.	+	.	.	0.08	0	0
<i>Carex caryophylla</i>	.	+	+	.	.	+	+	0.25	0	0
<i>Potentilla reptans</i>	+	.	.	.	.	.	.	0.08	0	0
<i>Galium mollugo</i>	.	+	+	.	+	.	.	0.25	0	0
<i>Clinopodium vulgare</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Viola arvensis</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Euphrasia stricta</i>	.	+	+	+	.	+	+	0.33	0	0
<i>Daucus carota</i>	.	.	.	.	+	.	.	0.08	2	0.16
<i>Lycopodium clavatum</i>	.	.	+	.	.	.	.	0.08	0	0
<i>Pteridium aquilinum</i>	1	1	.	2	.	3	10.83	0	0	0
<i>Carduus acanthoides</i>	+	+	+	.	+	.	.	0.33	0	0
<i>Carduus nutans</i>	.	+	+	.	+	.	.	0.25	0	0
<i>Verbascum phlomoides</i>	.	.	.	.	+	.	.	0.08	0	0
<i>Hypericum perforatum</i>	.	+	.	+	+	.	.	0.25	0	0
<i>Eryngium campestre</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Euphorbia cyparissias</i>	+	+	+	+	.	+	+	0.42	0	0
<i>Ranunculus polyanthemus</i>	.	.	.	+	.	+	.	0.17	0	0
<i>Ranunculus repens</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Urtica dioica</i>	.	.	.	.	+	.	.	0.08	0	0
<i>Rumex conglomeratus</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Rumex crispus</i>	+	.	.	.	.	.	.	0.08	0	0
<i>Stellaria graminea</i>	.	+	.	+	+	.	.	0.25	0	0
<i>Rosa canina</i>	+	+	+	+	.	+	+	0.42	0	0

	0	1	2	3	4	5	6	7	8	9
<i>Salix capraea</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Vaccinium myrtillus</i>	.	.	.	.	+	.	.	0.08	0	0
<i>Juniperus communis</i>	+	+	+	+	.	.	.	.	0	0
<i>Ligustrum vulgare</i>	.	+	.	.	.	.	.	0.08	0	0
<i>Rubus sulcatus</i>	+	+	+	+	.	.	+	0.42	0	0
<i>Prunus spinosa</i>	+	+	+	.	.	+	+	0.42	0	0
<i>Crataegus monogyna</i>	+	.	.	.	.	+	+	0.25	0	0
<b>TOTAL</b>						-				<b>236.4</b>
<b>Pastoral value (V.P.)</b>						-				<b>47.28</b>
<b>Appreciation VP</b>							<b>Medium</b>			

*Dichanthium ischaemum* pastures from Tărcăița Valley live on sunny slopes (S exhibition), with big inclination (25-35°), affected by erosion of superficial soils, at altitudes of 335-395 m (Table 2).

These pastures are poorly fed, *Dichanthium ischaemum* is the edifying species with a coverage of 50%. Along with the following species appear in small proportions: *Festuca rupicola* (7%), *Teucrium chamaedrys* (7%), *Brachypodium pinnatum* (2.75%), *Festuca pratensis* (1.63%), *Calamagrostis epigejos* (1.38%), *Agrostis capillaris* (1.38%).

The pastoral value of *Dichanthium ischaemum* pastures in Tărcăița Valley is very poor, the pastoral value indicator is 8.54.

Table 2

The pastoral value (VP) of meadows belonging to the *Botriochloetum (Andropogonetum) ischaemi* association (Kristiansen 1937) Pop 1977

No. relevées		1	2	3	4	ADm	IC	ADm x IC	
GPS	Altitude (m)	395	370	335	345				
coordinates	Lat. N	46.56943	46.57649	46.58013	46.58224				
	Long. E	22.30843	22.31486	22.31875	22.32036				
Herbaceous layer coverage (%)		85	95	80	90				
Shrubbery layer (%)		8	3	3	2				
Exposition		S	S	S	S				
Slope (degree) (°)		35	30	25	35				
Area (m <sup>2</sup> )		100	100	100	100				
		0	1	2	3	4	5	6	7
<b>Poaceae</b>									
	<i>Dichanthium ischaemum</i>	3	4	4	3	50	0	0	
	<i>Agrostis capillaris</i>	1	.	+	.	1.38	3	4.14	
	<i>Festuca rupicola</i>	1	1	+	2	7	2	14	
	<i>Arrhenatherum elatius</i>	+	+	+	+	0.5	4	2	
	<i>Poa pratensis</i>	+	+	.	+	0.38	4	1.52	
	<i>Anthoxanthum odoratum</i>	+	.	+	.	0.25	1	0.25	
	<i>Danthonia decumbens</i>	.	+	+	.	0.25	0	0	
	<i>Festuca pratensis</i>	1	+	+	+	1.63	5	8.15	
	<i>Calamagrostis epigejos</i>	1	+	.	.	1.38	0	0	
	<i>Brachypodium pinnatum</i>	1	1	+	+	2.75	1	2.75	

	0	1	2	3	4	5	6	7
<i>Cynosurus cristatus</i>	+	.	.	.	.	0.13	3	0.39
<b>Fabaceae</b>								
<i>Trifolium pratense</i>	.	.	.	.	+	0.13	5	0.65
<i>Lotus corniculatus</i>	+	+	.	.	+	0.38	4	1.52
<i>Medicago lupulina</i>	+	+	.	.	+	0.38	4	1.52
<i>Dorycnium pentaphyllum</i>	+	+	+	.	.	0.38	0	0
<i>Trifolium alpestre</i>	+	+	+	+	+	0.5	2	1
<b>Other families</b>								
<i>Plantago lanceolata</i>	+	+	+	.	.	0.38	2	0.76
<i>Achillea millefolium</i>	+	+	+	+	+	0.5	2	1
<i>Thymus glabrescens</i>	.	+	.	.	.	0.13	0	0
<i>Filipendula hexapetala</i>	+	+	+	+	+	0.5	1	0.5
<i>Echium vulgare</i>	+	+	+	.	.	0.38	0	0
<i>Thymus comosus</i>	.	+	.	.	+	0.25	0	0
<i>Stachys germanica</i>	+	.	+	.	.	0.25	0	0
<i>Potentilla cinerea</i>	+	+	+	.	.	0.38	0	0
<i>Cichorium intybus</i>	.	+	.	.	+	0.25	1	0.25
<i>Gypsophila muralis</i>	+	.	+	.	.	0.25	0	0
<i>Galium verum</i>	+	.	.	.	.	0.13	1	0.13
<i>Hieracium pilosella</i>	+	+	+	.	.	0.38	0	0
<i>Sedum acre</i>	+	+	+	.	.	0.38	0	0
<i>Prunella vulgaris</i>	.	+	.	.	.	0.13	1	0.13
<i>Silene dioica</i>	.	+	.	.	.	0.13	0	0
<i>Pimpinella saxifraga</i>	+	+	+	.	.	0.38	1	0.38
<i>Knautia arvensis</i>	.	+	+	.	.	0.25	0	0
<i>Centaureum erythraea</i>	+	.	.	.	.	0.13	0	0
<i>Fragaria viridis</i>	+	+	+	+	+	0.5	0	0
<i>Salvia nutans</i>	+	+	.	.	+	0.38	0	0
<i>Scabiosa ochroleuca</i>	+	+	+	+	+	0.5	0	0
<i>Hypochaeris radicata</i>	.	+	.	.	+	0.25	0	0
<i>Sanguisorba minor</i>	+	+	+	+	+	0.5	2	1
<i>Leontodon hispidus</i>	+	.	.	.	.	0.13	1	0.13
<i>Teucrium chamaedrys</i>	1	1	+	+	2	7	0	0
<i>Carlina vulgaris</i>	+	+	.	.	+	0.38	0	0
<i>Peucedanum oreoselinum</i>	+	.	.	.	.	0.13	0	0
<i>Carex caryophylla</i>	.	+	.	.	.	0.13	0	0
<i>Galium mollugo</i>	+	.	.	.	.	0.13	0	0
<i>Clinopodium vulgare</i>	+	.	+	.	.	0.25	0	0
<i>Erigeron annuus</i>	.	+	+	.	.	0.25	0	0
<i>Convolvulus arvensis</i>	+	.	.	.	.	0.13	2	0.26
<i>Veronica spicata</i>	+	.	.	.	.	0.13	0	0
<i>Daucus carota</i>	.	+	.	.	.	0.13	2	0.26
<i>Pteridium aquilinum</i>	.	.	+	+	1	1.38	0	0
<i>Carduus acanthoides</i>	.	+	+	+	+	0.38	0	0
<i>Carduus nutans</i>	+	+	.	.	.	0.25	0	0
<i>Verbascum phlomoides</i>	.	.	+	.	.	0.13	0	0
<i>Hypericum perforatum</i>	+	.	+	.	.	0.25	0	0
<i>Eryngium campestre</i>	+	+	+	+	+	0.5	0	0
<i>Euphorbia cyparissias</i>	+	.	+	.	.	0.25	0	0
<i>Corylus avellana</i>	+	.	.	.	.	0.13	0	0
<i>Rosa canina</i>	+	+	+	+	+	0.5	0	0
<i>Cornus mas</i>	+	.	+	.	.	0.25	0	0

0	1	2	3	4	5	6	7
<i>Juniperus communis</i>	+	+	+	+	0.5	0	0
<i>Ligustrum vulgare</i>	.	+	.	.	0.13	0	0
<i>Prunus spinosa</i>	1	+	+	+	1.63	0	0
<i>Crataegus monogyna</i>	+	+	+	+	0.5	0	0
<b>TOTAL</b>				-			<b>42.69</b>
<b>Pastoral value (V.P.)</b>				-			<b>8.54</b>
<b>Appreciation VP</b>					<b>Very poor</b>		

## CONCLUSIONS

The representative pastures in the Tărcăița Valley are *Festuca rubra* and *Agrostis capillaris* (*Festuco rubrae-Agrostetum capillaris* association Habib 1951), as well as *Dichanthium ischaemum* (*Botriochloetum* (*Andropogonetum*) *ischaemi* association (Kristiansen 1937) Pop 1977).

The pastoral value of *Agrostis capillaris* with *Festuca rubra* is medium (V.P. = 47.28), they are generally used for shepherding animals (sheep, cows, horses, goats). A tendency of extension of the toxic and harmful species can be observed in these pastures, in particular *Pteridium aquilinum* (ADm=10.83%), and in smaller proportions *Euphorbia cyparissias*, *Eryngium campestre*, *Carduus acanthoides*, *Carduus nutans*, *Hypericum perforatum*. To increase the value of these pastoral meadows in future works will be conducted to combat harmful and toxic plants, maintaining the proportion of low shrub vegetation within limits.

*Dichanthium ischaemum* pastures are those with very poor pastoral value (V.P.=8.54), occupying the slopes affected by erosion, with big inclination. They are currently not grazed, although in the future overseeding with valuable forage species will be carried out.

## REFERENCES

1. Ciocârlan V., 2009, Flora ilustrată a României. *Pteridophyta* et *Spermatophyta*. Ed. Ceres, București, pp.1141
2. Cristea V., 1993, Fitocenologie și vegetația României, Îndrumător de lucrări practice. Univ. Babeș-Bolyai, Cluj-Napoca, pp.149
3. Cristea V., Gafta D., Pedrotti F., 2004, Fitosociologie. Ed. Presa Universitară Clujeană, Cluj-Napoca, pp.233
4. Marușca T., Blaj A., V., Rusa M., 2012, Tehnologiile de creștere a valorii pastorale pentru pajiștile montane. Academia de Științe Agricole și Silvicultură Gheorghe Ionescu Șișești, pp.50
5. Marușca T., Mocanu V., Haș C.E., Tod A.M., Andreoiu C.A., Dragoș M.M., Blaj A.V., Ene A.T., Silistru D., Ichim E., Zevedei M.P., Constantinescu S.C., Tod V.S., 2014, Ghid de întocmire a amenajamentelor pastorale. Ed. Capolavoro, Brașov, pp.248

6. Paucă A.,1941, Recherches géologiques dans le Monts du Codru et de Moma. Anuarul Inst. Geol. Al României, vol. XXI, București
7. Paucă A.,1941, Studiu fitosociologic în Munții Codru și Muma. Teză de doctorat M.O., Imprimeria Națională, București, pp.119
8. Pășcuț C.G., 2012, Flora și vegetația Munților Codru-Moma. Rezumatul tezei de doctorat, Oradea, pp.527
9. Rotar I., Vidican R., Sima N., 2009, Cultura pajiștilor și a plantelor furajere. Ed. Risoprint, Cluj-Napoca, pp.252
10. Sârbu I., Ștefan N., Oprea A., 2013, Plante vasculare din România. Determinator ilustrat de teren. Ed. Victor B Victor, București, pp.1320