

THE ASSOCIATION IN CLASS *FESTUCO-BROMETEA* Br.-Bl. et
R. Tx. IN Br.-Bl. 1949 FROM THE COVURLUI PLATEAU

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The authors describe 6 well spread associations from the Covurlui Plateau and Plain. Floristic and phytocoenologic composition, bioforms spectrum, phytogeographic elements and ecological indices are analysed for those associations. Also economical value is discussed.

Key words: phytocoenosis , bioforms, geoelements.

INTRODUCTION

Pastures from the Covurlui Plateau and Plain are well spread, most of the areas being covered by *Festuco-Brometea*.

Vegetal associations presented in this paper were identified in various location in Moldavia [3, 6] and the entire country (Romania) [8], and also in many locations we have investigated [1, 8–12].

Therefore, our research tries to complete previous studies with new data form locations never mentioned before.

RESULTS AND DISCUSSIONS

Identified vegetal associations are part of the following coenosystem [2, 3]:

Festuco – Brometea Br.-Bl. et R. Tx. in Br.-Bl. 1949

Festucetalia valesiaca Br.-Bl. et R. Tx. ex Br.-Bl. 1949

Festucion valesiaca Klika 1931

Jurineo arachnoideae – Euphorbinenion nicaensis Dobrescu et. Kovács
1971 corr. Sârbu, Coldea et Chifu 1993

Ass. *Taraxaco serotinae – Festucetum valesiaca* (Burduja *et al.* 1956) Sârbu,
Coldea et Chifu 1979

Ass. *Taraxaco serotinae – Bothriochloetum ischaemi* (Burduja *et al.* 1956) Sârbu,
Coldea, et Chifu 1979

Ass. *Artemisio austriaca – Poëtum bulbosae* I. Pop 1970

Ass. *Cynodonti – Poëtum angustifoliae* (Rapaics 1927) Soó 1957

Ass. *Bromo squarrosi – Xeranthemetum annui* Coroi 2001

Festucetalia vaginatae Soó 1957***Bromion tectorum*** Soó 1957Ass. *Brometum tectorum* Bojko 1934

We have to mention that bioforms and phytogeographic elements information was extracted from Ciocârlan, 2000 [4], ecological indices from Sanda *et al.* 2003 [5], and information about protected species, from Oltean *et al.* 1994 [7].

Ass. ***Taraxaco serotinae*** – ***Festucetum valesiaca*** (Burduja *et al.* 1956) Sârbu, Coldea et Chifu 1979 (Syn.: *Festucetum valesiaca* Burduja *et al.* 1956)

Chorology. The association is more prevalent in wide pastures and forest clearings. Relevant surveys are from Suceveni, Zărnești, Crăiești, Jorăști, Pupezeni, Rădești, Roșcani, Vlădești and Bursucani.

Stationary conditions. The phytocoenoses established by *Festuca valesiaca* are located on plateaus with a low or moderate inclination, rarely on higher slopes, with mostly north expositions with quasi degraded chernosem soil (Sârbu 1984).

The floristic and phytocoenological composition (Table 1). The association has an average floristic composition, 125 species, with an average of 47 species/survey.

Along with characteristically specie *Taraxacum serotinum* and the main specie *Festuca valesiaca*, coexist a large number of other species (75%) characteristic for the class *Festuco-Brometea*. One can remark high constancy species (IV and V), like: *Eryngium campestre*, *Artemisia austriaca*, *Astragalus onobrychis*, *Salvia pratensis*, *Filipendula vulgaris*, *Medicago falcata*, *Medicago minima*, *Thymus pannonicus*, *Achillea setacea*, *Salvia nemorosa*, *Euphorbia cyparissias*, *Potentilla argentea*, *Plantago lanceolata*, *Hieracium pilosella* etc.

Low participating in the floristic composition (6–10%) are the species from the class *Molinio* – *Arrhenatheretea*, *Artemisietea* and *Stellarietea mediae*, having an average to low constancy (III–I).

Table 1

Ass. *Taraxaco serotinae* – *Festucetum valesiaca*
(Burduja *et al.*, 1956) Sârbu, Coldea et Chifu 1979

No. of survey	1	2	3	4	5	6	7	8	9	10	
Altitude (m.s.m.)	220	240	210	220	240	270	190	160	250	240	
Exposition	NE	NV	SE	SV	NV	NE	SE	SE	SV	NE	
Slope (degrees)	8	20	15	20	10	25	3	15	3	5	K
Coverage of the vegetation (%)	80	70	80	70	60	85	85	65	75	65	
Surface (sq.m.)	100	100	100	100	100	100	100	100	100	100	
Number of species	61	58	40	35	41	50	51	44	49	42	
Caract. of ass.											
<i>Taraxacum serotinum</i>	+				+	+	+				II

<i>Jurineo-Euphorbinenion</i>										
Ajuga laxmannii	+	+						+		II
Carduus hamulosus							+			I
Centaurea orientalis					+					I
Chamaecytisus austriacus	+	+						+		II
Cleistogenes bulgarica	+	+							+	II
Dianthus membranaceus	+	+		+			+	+	+	III
Echium maculatum	+						+			I
Eryngium campestre	+	+	+	+	+	+	+	+	+	V
Euphorbia glareosa	+	+	+	+	+	+	+	+	+	V
Galium humifusum	+		+				+	+		II
G. octonarium							+	+		I
Iris pumila							+			I
Jurinea arachnoidea							+		+	I
Linum hirsutum			+					+		I
Salvia austriaca	+						+	+		II
Stachys germanica	+	+	+					+	+	III
<i>Festucion valesiacae</i>										
Ajuga chamaeypytis	+				+			+		II
Allium rotundum									+	I
Artemisia austriaca	+	+	1	1	1	1	+	+	+	V
Asperula cynanchica			+						+	I
Aster linosyris								+		I
Astragalus onobrychis	+		+	+	+	+	+	+	+	IV
Chondrilla juncea	+	+				+			+	II
Dichanthium ischaemum	+	+	+	+	+	+	+	+	+	V
Elymus hispidus							+			I
Falcaria vulgaris							+	+		I
Filipendula vulgaris	+	+	+			+	+	+	+	IV
Fragaria viridis							+	+		I
Koeleria macrantha	+		+	+	+	+	+	+	+	V
Linaria genistifolia				+			+		+	II
Medicago falcata	+	+	+	+	+	+	+		+	V
M. minima		+	+	+			+	+	+	IV
Potentilla recta							+			I
Salvia pratensis		+							+	I
Sanguisorba minor	+	+						+	+	II
Senecio erucifolius	+				+					I
Stachys recta				+						I
Stipa capillata		+					+	1		II
Teucrium polium ssp. capitatum				+		+				I
<i>Festucetalia valesiacae</i>										
Achillea collina	+				+					I

A. setacea	+	+	+	+	+	+	+	+	+	+	V
Adonis vernalis		+			+						I
Campanula sibirica	+	+				+				+	II
Centaurea biebersteinii	+	+		+			+		+		III
Cerastium semidecandrum									+		I
Ceratocarpus arenarius						+	+				I
Echium vulgare	+	+			+	+	+			+	III
Euphorbia cyparissias	+	+		+		+	+	+	+	+	IV
Festuca valesiaca	4	4	4	4	3	4	4	3	3	3	V
Hieracium bauginii	+	+					+	+		+	III
Hypericum perforatum	+	+		+					+	+	III
Galium verum	+	+			+		+		+		III
Linum austriacum	+		+	+		+			+	+	III
Melica ciliata	+	+				+			+		II
Ornithogalum orthophyllum ssp. kochii								+			I
Phleum phleoides	+	+		+			+				II
Potentilla pedata		+			+						I
Salvia nemorosa	+		+	+	+	+	+	+	+	+	IV
Sideritis montana			+								I
Silene otites	+							+			I
Stachys recta	+						+				I
Teucrium chamaedrys	+	+				+	+		+	+	III
Thymus pannonicus	+	+	+	+	+	+		+	1	+	V
Trifolium campestre	+				+					+	II
Verbascum lychnitis								+			I
V. speciosum	+		+		+			+	+	+	III
Veronica orchidea		+					+				I
V. prostrata	+										I
Vinca herbacea		+					+				I
<i>Festucetalia vaginatae</i>											
Alyssum desertorum		+		+	+			+			II
Anthemis ruthenica								+	+	+	II
Bromus squarrosus		+					+				I
Erysimum diffusum	+	+						+	+	+	III
Helichrysum arenarium	+										I
Plantago argentea	+										I
P. scabra	+										I
Scabiosa argentea	+										I
S. ochroleuca	+					+			+		II
<i>Festuco – Brometea</i>											
Acinos arvensis							+				I
Asperula tenella	+	+							+		II

<i>Thlaspi perfoliatum</i>						+	+	+	+		II
<i>Trifolium arvense</i>	+	+	+	+		+				+	III
<i>T. diffusum</i>	+								+		I
<i>Turritis glabra</i>									+		I

Place and date of the surveys: 1. Suceveni, 24.07.2004; 2. Zărnești, 26.07.2004; 3. Crăiești, 24.07.2004; 4. Jorăști, 24.07.2004; 5. Pupezeni, 21.05.2005; 6. Rădești, 21.05.05; 7. Roșcani, 21.05.05; 8. Vlădești, 22.05.05; 9, 10. Bursucani, 21.05.05

The bioforms spectrum (Fig. 1) mostly contains hemicryptophytes (47.4%), along with terophytes and hemiterophytes (36.2%).

The phytogeographic elements spectrum (Fig. 2) reveal a large number of Eurasiatics (40.5%) and Pontic elements (25.8%).

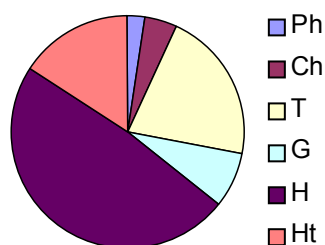


Fig. 1. The bioforms spectrum in the *Taraxaco serotinae* – *Festucetum valesiacaе* ass.

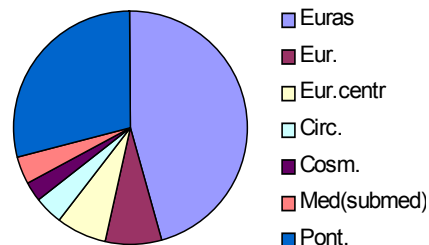


Fig. 2. The phytogeographic elements spectrum in the *Taraxaco serotinae* – *Festucetum valesiacaе* ass.

The ecological indices spectrum (Fig. 3) indicates the predominance of xeromesophile and xerophile species (83.5%), mesophile and moderate-termophile (77.5%), low acid-neutrophilic and euriionic (54.2%).

Economical significance. *Festuca valesiaca* phytocoenosis are exclusively used for depasturage, therefore the vegetation coverage is relatively low (72%). Only 22% of the species represents forage, and high quality plants are only form species: *Lolium perenne*, *Lotus corniculatus*, *Medicago falcata*, *Medicago lupulina*, *Trifolium repens*.

Around 70% are non- forage species, and 8% are toxic plants as: *Adonis vernalis*, *Euphorbia cyparissias*, *Euphorbia glareosa*, *Artemisia austriaca*, *Carduus acanthoides*, *Carduus hamulosus*, *Descurainia sophia*, *Eryngium campestre* and *Rumex acetosella*.

Ass. *Taraxaco serotinae* – *Bothriochloetum ischaemi* (Burduja *et al.* 1956) Sârbu, Coldea et Chifu 1999 (Syn.: *Bothriochloa ischemum* Burduja *et al.* 1956)

Number of species	34	39	26	28	31	28	37	51	47	36	
Caract. of ass.											
Taraxacum serotinum	+	+	+	+			+	+	+		IV
Jurineo-Euphorbinenion											
Ajuga laxmannii					+		+				I
Carduus hamulosus	+							+			I
Cleistogenes bulgarica			+	+							I
Dianthus membranaceus			+			+	+				II
Eryngium campestre	+	+	+	+	+	+	+	+	+	+	V
Euphorbia glareosa		+	+	+	+	1	+			+	IV
Jurinea arachnoidea	+			+				+	+		II
Echium maculatum							+			+	I
Galium humifusum	+	+			1	+		+	+		III
Salvia austriaca				+						+	I
Stachys germanica					+					+	I
Festucion valesiaca											
Ajuga chamaepytis								+	+		I
Allium rotundum	+					+					I
Artemisia austriaca		+	+			+	+	+	+		III
Astragalus onobrychis			+		+			+	+	+	III
Chondrilla juncea	+	+		+			+			+	III
Dichanthium ischaemum	5	4	5	5	4	3	4	3	4	4	V
Koeleria macrantha				+	+		1	1	+		III
Linaria genistifolia							+		+		I
Medicago falcata						+				+	I
M. minima								+	+		I
Potentilla recta			+						+	+	II
Sanguisorba minor	+	+	+		+		+	+	+	+	IV
Senecio erucifolius				+						+	I
Stipa capillata		+	+		+		+	+			III
Teucrium chamaedrys			+	+						+	II
Festucetalia valesiaca											
Achillea setacea	+	+	+	+	+	+	+	+	+	+	V
Adonis vernalis							+				I
Campanula sibirica		+						+			I
Centaurea biebersteinii			+	+				+	+		II
Festuca valesiaca	+	1	+	+	+	1	+	+	+	+	V
Euphorbia cyparissias	+	+			+			+	+	+	III
Hieracium bauhinii			+		+	+	+	+		+	III
Hypericum perforatum					+		+	+		+	II
Salvia nemorosa				+		+	+	+	+		III
Sideritis montana								+	+		I
Thymus pannonicus	+		+		+	+	1	1	1	+	V

<i>Festucetalia vaginatae</i>												
Alyssum desertorum								+	+	+	II	
Anthemis ruthenica								+		+	I	
Bromus squarrosus	+	+		+							+	II
B. tectorum								+		+		I
Cynanchum acutum			+		+							I
Erysimum diffusum	+	+						+		+		II
Onobrychis arenaria					+						+	I
Plantago scabra	+	+										I
Potentilla arenaria				+	+				+			II
Scabiosa ochroleuca	+	+	+				+		+	+		III
<i>Festuco – Brometea</i>												
Acinos arvensis								+		+		I
Asperula tenella	+	+						+	+	+		III
Carex caryophylla					+				+			I
Centaurea diffusa	+	+						+	+	+		III
Crepis foetida ssp.rhoeadifolia	+	+	+	+	+	+	+	+	+	+	+	V
Cynodon dactylon	+	+	+				+		+		+	III
Daucus carota			+		+	+			+		+	III
Hieracium pilosella								+	+	+		II
Plantago lanceolata	+	+	+		+	+	+	+	+	+	+	V
Poa angustifolia	+	+	+	+	+	+	+	+	+	+	1	V
Potentilla argentea	+	+	+	+	+	+	+	+	+	+	+	V
Xeranthemum annuum	+	+	+	+			+		+	+	+	IV
<i>Molinio-Arrhenatheretea s.l.</i>												
Cichorium intybus	+	+		+	+	+			+	+		IV
Equisetum arvense	+		+					+				II
Eryngium planum								+	+			I
Lotus corniculatus	+	+		+			+			+	+	III
Vicia cracca			+									I
<i>Artemisietea et Stellarietea mediae s.l.</i>												
Anagallis arvensis					+							I
Artemisia absinthium			+						+	+		II
Berteroa incana	+	+		+	+	+	+			+		IV
Carthamus lanatus						+						I
Erodium cicutarium	+	+							+	+		II
Lappula squarrosa									+	+		II
Melilotus officinalis			+								+	I
Nigella arvensis	+	+			+	+			+		+	III
Reseda lutea									+	+		I
Senecio vernalis								+	+	+		II
Sisymbrium loeselii	+								+			I
Verbascum phlomoides			+						+		+	II

Vicia tetrasperma				+	+			I	
Variae syntaxa									
Agrimonia eupatoria	+	+			+		+	+	III
Arenaria serpyllifolia					+		+	+	II
Coronilla varia				+	+			+	II
Crataegus monogyna							+		I
Filago arvensis	+	+			+		+	+	III
Rosa canina							+		I
Thlaspi perfoliata							+		I
Trifolium arvense			+	+				+	II

Place and date of the surveys: 1. Suceveni, 24.07.2004; 2. Rogojeni, 24.07.2004, 3. Crețești, 24.07.2004; 4. Roșcani, 24.07.2004; 5. Jorăști, 25.07.2004; 6–9. Ghinghești, 18.07.2005; 10. Zărnești, 25.07.2004

The bioforms spectrum (Fig. 4) is dominated by hemicryptophytes (48.1%) but also a significant percentage is represented by terophytes (29.8%).

The phytogeographic elements spectrum (Fig. 5) is defined by a high percentage of Eurasian elements (57.1%) and also a significant percentage of Pontic elements (19.5%).

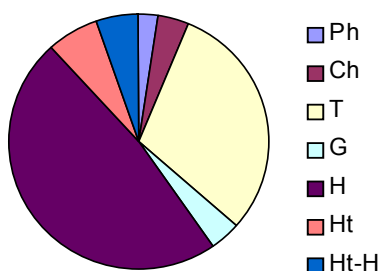


Fig. 4. The bioforms spectrum in the *Taraxaco – Bothriochloetum ischaemi* ass.

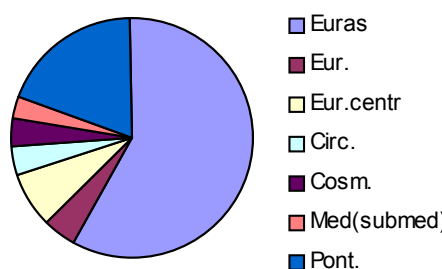


Fig. 5. The phyogeographic elements spectrum in the *Taraxaco – Bothriochloetum ischaemi* ass.

Most of the species in **the ecological indices spectrum** (Fig. 6) are xeromesophile (64.9%) and xerophile (23.3%), micro-mesophile (57.1%) and moderate-termophile (32.4%), low acid-neutrophilic (51.9%) and euriionic (25.9%).

Economical significance. Pastures of *Dichantium ischaemum* have low economical value, only 23% of the species representing forage, and the main species is useful only in early stages. Moreover, around 12% of the species are toxic like: *Euphorbia glareosa*, *Equisetum arvense*, *Eryngium campestre*, *Eryngium planum* etc.

Number of species	28	21	21	21	21	29	27	
Caract. of ass.								
Artemisia austriaca	2	3	3	4	3	4	3	V
Poa bulbosa	1	+	1	1	1	+	1	V
Jurineo-Euphorbinenion								
Ajuga laxmannii	+			+				II
Eryngium campestre	1	+	+	+	+	+	+	V
Euphorbia glareosa			+		+		+	II
Galium humifusum				+		+		II
Jurinea arachnoidea		+				+		II
Festucion valesiaca								
Asperula cynanchica			+					I
Astragalus onobrychis					+		+	II
Chondrilla juncea	+	+		+		+		III
Dichanthium ischaemum	+	+	+	+		+		IV
Festucetalia valesiaca								
Achillea setacea	+	1	+	+	+	+	+	V
Centaurea biebersteinii		+		+				I
Linum austriacum	+						+	II
Echium vulgare	+			+	+			II
Festuca valesiaca	+	+	1	+	1	+	+	V
Salvia nemorosa					+		+	I
Sanguisorba minor							+	I
Sideritis montana			+					I
Thymus pannonicus	+	1			+		+	III
Verbascum speciosum						+		I
Veronica prostrata							+	I
Festucetalia vaginatae								
Alyssum desertorum						+	+	II
Anthemis ruthenica	+		+		+	+		III
Bromus squarrosus	+				+			II
B. tectorum	+		+		+	1	+	IV
Cynanchum acutum	+							I
Erysimum diffusum						+	+	II
Plantago scabra	+	+		+				II
Potentilla arenaria	+	+	+		+	+		IV
Scabiosa argentea			+	+		+		II
S. ochroleuca				+				I
Tragus racemosus	+	+			+	+		III
Festuco – Brometea								
Centaurea diffusa	+	+				+	+	III
Cynodon dactylon	+	+						II
Herniaria glabra	+		+					II

<i>Plantago lanceolata</i>		+		+	+			II
<i>Poa angustifolia</i>							+	II
<i>P. bulbosa</i>	2	1	2	1	2	1	2	V
<i>Potentilla argentea</i>				+		+	+	II
<i>Xeranthemum annuum</i>	+	+	+	+			1	IV
<i>Artemisitea et Stellarietea mediae s.l.</i>								
<i>Alyssum alyssoides</i>							+	I
<i>Berteroa incana</i>	+		+		+	+		III
<i>Carduus nutans</i>		+		+	+			II
<i>Centaurea solstitialis</i>							+	I
<i>Cichorium intybus</i>			+		+	+	+	III
<i>Consolida regalis</i>	+							I
<i>Conyza canadensis</i>	+							I
<i>Descurainia sophia</i>	+		+			+		II
<i>Diplotaxis muralis</i>		+						I
<i>Erodium cicutarium</i>		+		+		+	+	III
<i>Lappula squarrosa</i>							+	I
<i>Lepidium campestre</i>						+		I
<i>Marrubium peregrinum</i>			+					I
<i>Medicago lupulina</i>						+	+	II
<i>Onopordon acanthium</i>						+		I
<i>Senecio vernalis</i>						+	+	II
<i>Sisymbrium loeselii</i>	+					+		II
<i>Variae syntaxa</i>								
<i>Arenaria serpyllifolia</i>			+		+	+		II
<i>Filago arvensis</i>		+			+			II
<i>Trifolium arvense</i>	+			+				II
<i>Veronica arvensis</i>			+				+	II

Place and date of the surveys: 1. Suceveni, 25.07.2004; 2. Jorăști, 25.07.2004; 3–4. Vlădești, 24.07.2004; 5. Roșcani, 24.07.2004; 6. Foltești, 20.05.2005; 7. Crăiești, 21.05.05

The bioforms spectrum (Fig. 7) is dominated by terophytes (42.5%) and hemicryptophytes (33.3%).

The phytogeographic elements spectrum (Fig. 8) is defined by a high percentage of Eurasiatic elements (57.4%) and also a significant percentage of Pontic elements (20.3%).

The ecological indices spectrum (Fig. 9) is similar to associations above, dominated by xeromesophile and xerophile species (92.5%), mesophile and moderate-termophile (81.4%), low acid-neutrophilic (55.5%) and euriionic (25.9%).

From the **economical** point of view association is insignificant, since *Poa bulbosa* has low forager importance and *Artemisia austriaca* is considered to have a bad influence on the quality of milk.

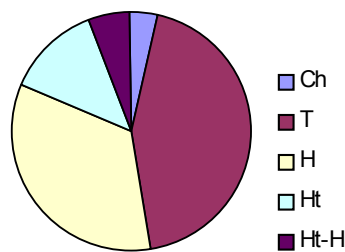


Fig. 7. The bioforms spectrum in the *Artemisia austriacae* – *Poëtum bulbosae* ass.

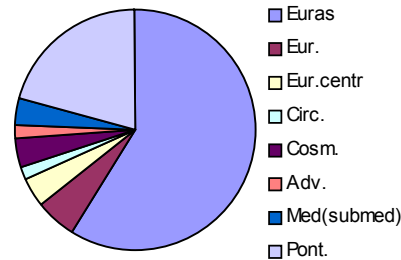


Fig. 8. The phytogeographic elements spectrum in the *Artemisia austriacae* – *Poëtum bulbosae* ass.

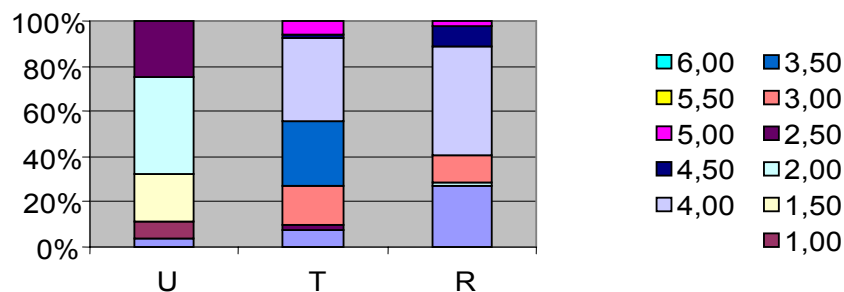


Fig. 9. The ecological indices spectrum of the *Artemisia austriacae* – *Poëtum bulbosae* ass. (U = humidity, T = temperature, R = soil reaction).

Ass. *Cynodonti-Poëtum angustifoliae* (Rapaics 1927) Soó 1957

Chorology. The association is not very spread and was identified around localities Rogojeni and Costache Negri.

Stationary conditions. Phytocoenosis in this associations lives on planes and fertile meadow and sometimes salted, with variable humidity, sometimes flooded or drained during summer.

The floristic and phytocoenological composition (Table 4). Phytocoenosis consisting of *Cynodon dactylon* and *Poa angustifolia*, have a heterogeneous floristic composition due the variable stationary condition. Therefore, along with xerophile xeromesophile species from class *Festuco – Brometea*, most frequent are *Galium humifusum*, *Eryngium campestre*, *Potentilla argentea*, *Centaurea diffusa* etc., vegetates mesophile species from the class *Molinio – Arrhenatheretea*, and also plants form the claselore *Artemisietea* and *Stellarietea mediae*.

The main two species, *Cynodon dactylon* and mainly *Poa angustifolia*, covers around 40–60%, but, in some cases, species like *Artemisia austriaca*,

Achillea setacea, *Trifolium campestre*, *Elymus repens* and *Lolium perenne* are significant, covering from 5% to 20%.

Table 4

Ass. *Cynodonti-Poëtum angustifoliae* (Rapaics 1927) Soó 1957

No. of survey	1	2	3	4	5	
Altitude (m.s.m.)	120	120	130	180	170	
Exposition	-	-	-	-	-	
Slope (degrees)	-	-	-	-	-	K
Coverage of the vegetation (%)	100	95	90	100	100	
Surface (sq.m.)	100	100	100	100	100	
Number of species	33	26	30	37	37	
Caract. of ass.						
<i>Cynodon dactylon</i>	1	+	1	+	+	V
Jurineo-Euphorbinenion						
<i>Dianthus leptopetalus</i>					+	I
<i>Eryngium campestre</i>	+	+	+	+	+	V
<i>Erysimum odoratum</i>	+		+			II
<i>Euphorbia glareosa</i>		+		+		II
<i>Galium humifusum</i>	+	+		+	+	IV
<i>Jurinea arachnoidea</i>			+			I
Festucion valesiaca						
<i>Allium rotundum</i>				+		I
<i>Artemisia austriaca</i>	+	1	+	+	+	V
<i>Chondrilla juncea</i>		+	+			II
<i>Dichanthium ischaemum</i>			+			I
<i>Erysimum hispidus</i>		+			+	II
<i>Medicago falcata</i>		+			+	II
<i>M. minima</i>	+					I
Festucetalia valesiaca						
<i>Achillea setacea</i>	1	1	2	+	+	V
<i>Centaurea biebersteinii</i>	+			+	+	III
<i>Echium vulgare</i>		+				I
<i>Euphorbia cyparissias</i>	+		+	+		III
<i>Festuca valesiaca</i>	+		+	+		III
<i>Hypericum perforatum</i>					+	I
<i>Lactuca viminea</i>					+	I
<i>Linum austriacum</i>			+			I
<i>Ononis spinosa</i>				+		I
<i>Salvia nemorosa</i>		+		+	+	III
<i>Trifolium campestre</i>				1	+	II
<i>Verbascum speciosum</i>			+		+	II

<i>Festuco – Brometea</i>						
Acinos arvensis					+	I
Asperula tenella			+			I
Centaurea diffusa	+	+	+	+	+	V
Crepis foetida ssp. rhoeadifolia	+	+		+	+	IV
Daucus carota				+	+	II
Hieracium pilosella				+		I
Plantago lanceolata			+	+	+	III
Poa angustifolia	3	4	3	4	4	V
Potentilla argentea	+	+	+	+	+	V
<i>Molinio – Arrhenatheretea s.l.</i>						
Agrostis stolonifera	+	+		+	+	IV
Alopecurus pratensis				+	+	II
Bromus commutatus				+		I
Cichorium intybus	+	+		+	+	IV
Elymus repens	1	+	+	+	+	V
Erodium cicutarium	+				+	II
Lolium perenne	+	+	1	1	1	V
Lotus corniculatus	+					I
Medicago lupulina	+	+	+		+	IV
Plantago major				+		I
Potentilla reptans	+	+				II
Prunella vulgaris				+		I
Rorippa austriaca	+					I
Taraxacum officinale		+	+			II
Tragopogon pratensis ssp. orientalis				+		I
Trifolium fragiferum		+	+			II
T. pratense				+	+	II
T. repens	+		+	+	+	IV
<i>Artemisietea et Stellarietea mediae s.l.</i>						
Anagallis arvensis					+	I
Artemisia absinthium					+	I
Berteroa incana	+		+		+	III
Cardaria draba	+					I
Carduus acanthoides	+		+	+		III
C. nutans		+				II
Cirsium arvense			+			I
Convolvulus arvensis	+	+	+		+	IV
Erigeron annuus		+	+	+		III
Lathyrus tuberosus	+					I
Lepidium campestre				+		I
Vicia tetrasperma				+		I
Xanthium spinosum			+			I

X. strumarium			+	+	II
Variae syntaxa					
Arenaria serpyllifolia	+		+		II
Centaurium erythraea	+				I
Coronilla varia				+	I
Juncus gerardi				+	I
Lotus glaber			+		I

Place and date of the surveys: 1–3. Costache Negri 09.07.2005; 4–5. Rogojeni, 10.07.2005

We also have to mention to rare and in danger species, *Dianthus leptopetalus* and *Lactuca viminea*, threatened by intensive depasturage.

The bioforms spectrum (Fig. 10). The floristic composition is dominated by hemicytrophites (49.2%), followed by terophytes and hemiterophytes (38%), but also important are geophytes (11.1%).

The phytogeographic elements spectrum (Fig. 11) is dominated by Eurasiatic elements (52.3%), a significant percentage of Pontic, cosmopolite, circumpolar and European, central-European elements (6–15%).

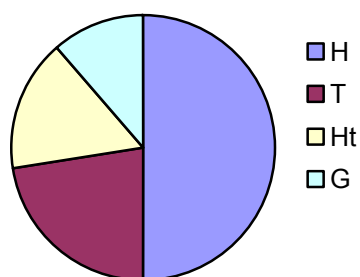


Fig. 10. The bioforms spectrum in the *Cynodonti – Poëtum angustifoliae* ass.

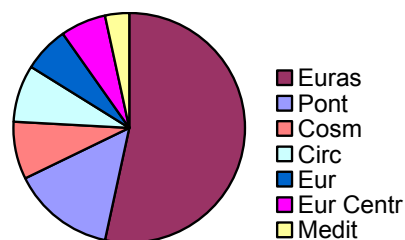


Fig. 11. The phytogeographic elements spectrum in the *Cynodonti – Poëtum angustifoliae* ass.

The ecological indices spectrum (Fig. 12) proof the majority of the species are xeromesophile and xerophile (58.7%), but also important are mesophile species (23.8%) and even mesohygrophilic (6.3%).

Also, the majority consists of moderate-termophile (34.9%) and low slab acido-neutrophile and neutrophile (50.6%).

Economical significance. Association has an average forager productivity since main species are low quality forage and also due the intrusion of some toxic species (*Eryngium campestre*, *Artemisia austriaca*, *Euphorbia glareosa*, *Carduus acanthoides*, *Carduus nutans*, *Cirsium arvense*, *Xanthium spinosum*, *Xanthium strumarium* etc.).

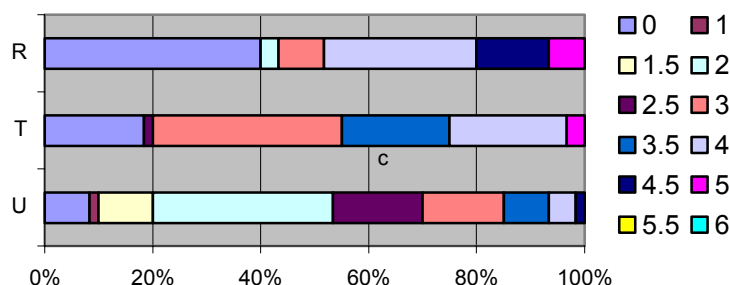


Fig. 12. The ecological indices spectrum of the *Cynodonti – Poëtum angustifoliae* ass. (U = humidity, T = temperature, R = soil reaction).

Ass. *Bromo squarrosi – Xeranthemetum annui* Coroi 2001

Chorology. Is a relatively new association appearing in degraded pastures. In the investigated area, was identified only around the locality Brănești.

Stationary conditions. Associations *Bromus squarrosus* and *Xeranthemum annuum* are spread in small islands, vegetating on dry terrains (and sometimes sandy banks), on planes or moderate inclination hills.

The floristic and phytocoenological composition (Table 5). Phytocoenosis formed by *Xeranthemum annuum* represents a degraded stage of the association *Taraxaco serotinae– Festucetum valesiaca*e having a poor floristic composition (62 species).

Therefore, floristic composition is dominated by species characteristic class *Festuco-Brometea* (60%), where the most frequent are: *Salvia austriaca*, *Euphorbia glareosa*, *Artemisia austriaca*, *Salvia nemorosa*, *Galium verum*, *Poa angustifolia* etc.

Along with species above vegetates an important number (27%) of species characteristic to the classes *Artemisietea* and *Stellarietea mediae*, accentuating decay process of pastures.

Phytocoenosis are covering around 90% of the land and are dominated by *Xeranthemum annuum* and *Bromus squarrosus*. In some phytocoenosis the species *Euphorbia glareosa*, *Dichantium ischaemum*, *Artemisia austriaca* and *Echium vulgare*, are covering around 5–10%.

Table 5

Ass. *Bromo squarrosi – Xeranthemetum annui* Coroi 2001

No. of survey	1	2	3	4	5	K
Altitude (m.s.m.)	120	125	130	120	125	
Exposition	E	E	SE	E	SE	
Slope (degrees)	3	5	10	15	10	

Coverage of the vegetation (%)	95	80	95	90	95	
Surface (sq.m.)	100	100	100	100	100	
Number of species	23	29	29	36	34	
Caract. of ass.						
Bromus squarrosus	+	1	1	+	1	V
Jurineo-Euphorbinenion						
Ajuga laxmannii				+		I
Eryngium campestre			+		+	II
Euphorbia glareosa	+		1	1	1	IV
Galium humifusum	+		+	+		III
Salvia austriaca	+	+	+	+	+	V
Stachys germanica				+	+	II
Festucion valesiaca						
Artemisia austriaca	+	+	1	+	1	V
Asperula cynanchica				+		I
Dichanthium ischaemum		+	1	1		III
Koeleria macrantha				+	+	II
Medicago falcata	+		+	+		III
Sanguisorba minor				+	+	II
Festucetalia valesiaca						
Achillea setacea				+	+	II
Centaurea biebersteinii		+	+		+	III
Echium vulgare	+	1			+	III
Euphorbia cyparissias			+			I
Festuca valesiaca			+	+	+	III
Galium verum		+	+	+	+	IV
Hieracium bauhinii					+	I
Linum austriacum		+	+	+		III
Melica ciliata					+	I
Salvia nemorosa	+	+	+	+	+	V
Trifolium campestre				+	+	II
Verbascum speciosum				+		I
Festucetalia vaginatae						
Alyssum desertorum		+				I
Anthemis ruthenica	+	+		+		III
Bromus tectorum	+			+		II
Erysimum diffusum	+	+	+			III
Potentilla arenaria				+		I
Scabiosa ochroleuca				+	+	II
Festuco - Brometea						
Crepis foetida ssp. rhoeadifolia	+	+	+		+	IV
Daucus carota				+	+	II
Plantago lanceolata					+	I

Poa angustifolia	+	+	+	+	+	V
Potentilla argentea			+		+	II
Xeranthemum annuum	5	4	3	4	3	V
<i>Molinio-Arrhenatheretea s.l.</i>						
Bromus commutatus	+	+			+	III
Lotus corniculatus				+		I
Medicago lupulina		+	+	+		III
Polygonum aviculare					+	I
Serratula tinctoria		+	+			II
Taraxacum officinale	+	+	+	+	+	V
Tragopogon pratensis ssp. orientalis			+			I
Trifolium repens				+	+	II
<i>Artemisietea et Stellarietea mediae s.l.</i>						
Anthriscus sylvestris	+		+			II
Artemisia absinthium		+			+	II
Berteroa incana				+	+	II
Cichorium intybus				+		I
Cirsium vulgare		+				I
Convolvulus arvensis	+	+	+	+	+	V
Erigeron annuus	+		+	+		III
Erodium cicutarium					+	I
Filago arvensis	+	+				II
Marrubium vulgare	+	+	+	+	+	V
Matricaria perforata	+	+				II
Melilotus officinalis		+			+	II
Nigella arvensis		+				I
Reseda lutea	+					I
Trifolium arvense				+		I
Xanthium spinosum		+		+		II
X. strumarium		+	+			II

Place and date of the surveys: 1–3. Brănești, 10.07.2005; 4–5. Brănești, 24.07.2004

The bioforms spectrum (Fig. 13) is dominated by terophytes and hemiterophytes (53.7%) followed hemicryptophytes 41.4%.

The phytogeographic elements spectrum (Fig. 14) proof the dominance of Eurasiatic elements (65.8%), along with Pontic elements (17%). Also adventive elements were remarked (4.8%).

The ecological indices spectrum (Fig. 15) reveal the clear dominance of xeromesophile and xerophile (76.9%), mesophile and termophile species (84.5%) and low acid-neutrophilic (53.8%).

Economical significance. Pastures consisting of *Xeranthemum annuum* have a low economical importance, being improper for forage.

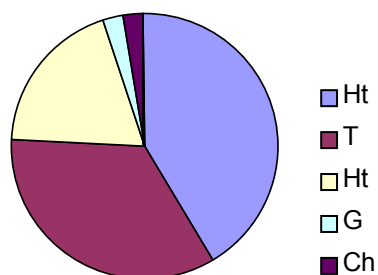


Fig. 13. The bioforms spectrum in the *Bromo squarrosi* – *Xeranthemetum annui* ass.

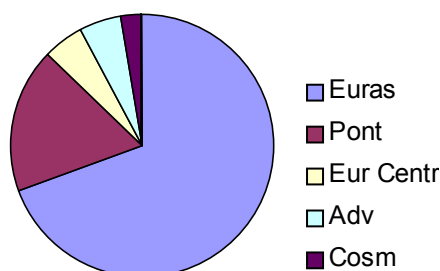


Fig. 14. The phytogeographic elements spectrum in the *Bromo squarrosi* – *Xeranthemetum annui* ass.

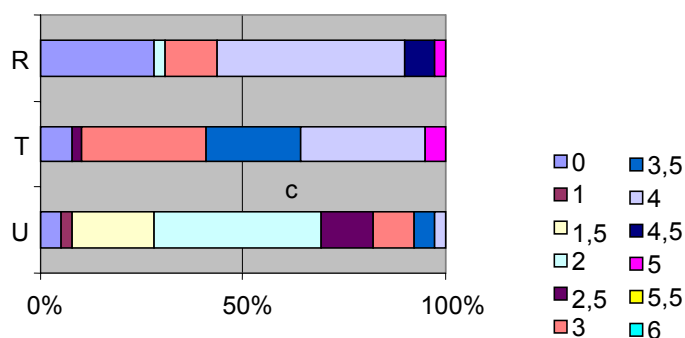


Fig. 15. The ecological indices spectrum of the *Bromo squarrosi* – *Xeranthemetum annui* ass. (U = humidity, T = temperature, R = soil reaction).

Ass. *Brometum tectorum* Bojko 1934

Chorology. Phytocoenosis formed by *Bromus tectorum* appeared during the degradation of pastures of *Festuca valesiaca*, identified around localities Suceveni, Zărnești, Jorăști, Slobozia Oancea, Rediu, Corod, Crăiești, Rogojeni, Ghinghești.

Stationary conditions. Association *Brometum tectorum* prefer planar sandy banks, and rarely moderate inclination hills, usually exposed to south.

The floristic and phytocoenological composition (Table 6). Cause the restrictive stationary conditions, floristic composition is reduced (56 species) with a remarkable kernel (more than 20%) species characteristically for the alliance *Bromion tectorum* and order *Festucetalia vaginatae*. Therefore, main specie *Bromus tectorum* is frequently accompanied by *Bromus squarrosus*, *Plantago scabra*, *Allysum desertorum*, *Anthemis ruthenica*, *Centaurea diffusa*, *Cynodon dactylon* etc.

Echium vulgare	+	+		+	+	+		+	IV
Melica ciliata	+							+	I
Salvia nemorosa				+	+				I
<i>Festuco – Brometea</i>									
Crepis foetida ssp. rhoeadifolia			+		+			+	II
Hieracium pilosella		+	+	+		+		+	III
Plantago lanceolata	+	+	+	+	+		+	+	V
Poa angustifolia				+	+		+		II
P. bulbosa		+		+		+	+	+	IV
Potentilla argentea	+	+	+			+		+	III
<i>Artemisietea et Stellarietea mediae s.l.</i>									
Anagallis arvensis								+	I
Berteroa incana		+						+	I
Capsella bursa-pastoris		+		+				+	II
Cardaria draba	+			+	+	+		+	III
Carduus acanthoides		+			+				I
Chenopodium album								+	I
Cirsium vulgare		+		+		+			II
Convolvulus arvensis	+	+	+		+	+		+	IV
Geranium pusillum		+			1		+	+	II
Erodium cicutarium		+		+		+			II
Filago arvense	+		+			+		+	II
Hordeum murinum				+	+	+		+	III
Lappula squarrosa	+		+		+		+	+	III
Marrubium peregrinum	+		+	+		+			III
Melilotus officinalis					+				I
Nigella arvensis	+			+			+	+	II
Onopordon acanthium	+	+		+	+			+	III
Reseda lutea	+	+				+		+	II
Scleranthus annuus				+					I
Senecio vernalis	+	+	+	+	+	+	+	+	V
Sisymbrium loeselii		+		+	+		+	+	III
<i>Variae syntaxa</i>									
Bromus commutatum				+				+	I
Medicago lupulina		+		+	+			+	II
Rumex crispus						+			I
Thlaspi perfoliatum					+	+		+	II
Trifolium repens					+				I
Verbascum phlomoides			+	+		+		+	II
Veronica arvensis					+			+	I

Place and date of the surveys: 1. Suceveni 24.07.2004; 2. Zărnești 24.07.2004; 3. Jorăști, 24.07.2004; 4. Slobozia Oancea 25.07.2004; 5. Rediu, 21.05.2005; 6. Corod 21.05.2005; 7. Crăiești, 22.05.2005; 8. Crăiești, 25.07.2004; 9. Rogojeni, 22.05.2005; 10. Ghinghești, 24.05.2005.

The bioforms spectrum (Fig. 16) distinguish a high percentage of terophytes, hemiterophytes (61.3%) and hemicryptophytes.

The phytogeographic elements spectrum (Fig. 17) is dominated by Eurasiatic elements (63.6%), but Pontic and European elements are also important.

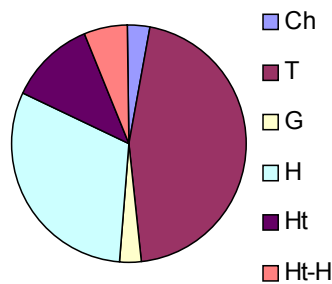


Fig. 16. The bioforms spectrum in the *Brometum tectorum* ass.

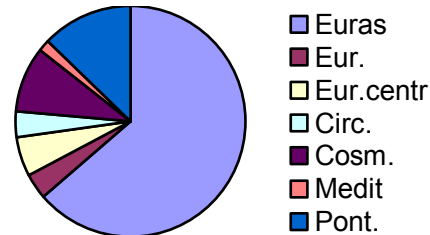


Fig. 17. The phytogeographic elements spectrum in the *Brometum tectorum* ass.

The ecological indices spectrum (Fig. 18) reveals the dominance of xeromesophile and xerophile (79.9%), mesotherme (49%) and low acid-neutrophilic (41.8%).

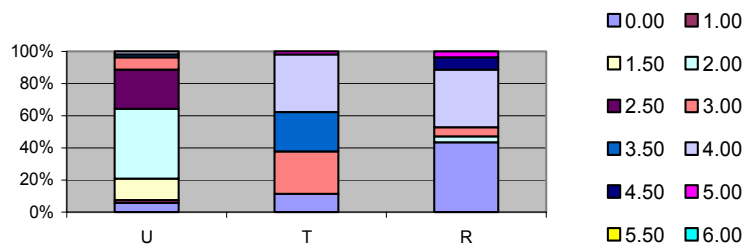


Fig. 18. The ecological indices spectrum of the *Brometum tectorum* ass. (U = humidity, T = temperature, R = soil reaction).

Economical significance of those pastures is unimportant since the main species *Bromus tectorum* is low quality forage. Even this is a degraded specie phytocoenosis form this associations have an important role in stabilisation of sandy terrains (Sârbu, 1984).

CONCLUSIONS

The base for pastures in the investigated area is represented by the association *Taraxaco serotinae – Festucetum valesiaca* useful for depasturage.

Due the intensive depasturage, the association has a low forager value, mostly degraded and replaced with phytocoenosis form the association *Taraxaco serotinae – Botriochloetum ischaemi*, also having low foragere value.

The other species resulting from the degradation of pastures of *Festuca valesiaca*, namely *Artemisio austriacae – Poëtum bulbosae*, *Bromo squarrosi – Xeranthemetum annui* and *Brometum tectorum* have a poor floristic composition and most of them are not suitable for depasturage.

Only the association *Cynodonti – Poëtum angustifoliae* has an average furagere value, but also was found limited areas.

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Received January 11, 2010

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