MEADOW ASSOCIATIONS IN THE VASLUI RIVER BASIN (I)

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This study presents a xeromesophyte meadow association in the basin of Vaslui river – *Taraxaco serotinae – Festucetum valesiacae* (Burduja *et al.* 1956) Sârbu, Coldea et Chifu 1999, considering both its phytocoenological characteristics and the aerial phytomass it produces.

Key words: phytocoenology, meadow vegetation, aerial phytomass.

The Vaslui river is located on the territory of both Iaşi and Vaslui districts, having a total length of 66 km. Its hydrographic basin covers a surface of approximately 646 km^2 [16]. In what concerns the habitat conditions, the climate is moderate continental, with an annual average temperature of 10.2 °C, and mean annual rainfall of 560.8 mm. The predominant winds are from north and northwest.

The study of the meadow vegetation was based on the phytosociological method of Braun-Blanquet. For calculation of the phytomass aerial made of us working procedures were taken over from the recent literature in the field [1, 4, 6, 9].

Ass. *Taraxaco serotinae – Festucetum valesiacae* (Burduja *et al.* 1956) Sârbu, Coldea et Chifu 1999

(Syn. *Medicagini – Festucetum valesiacae* auct. rom., incl. *Koelerietum macranthae* Răv. *et al.* 1950).

The association belongs to suballiance *Jurineo arachnoideae – Euphorbinenion nicaeensis* Dobrescu et Kovacs 1975 corr. Sârbu, Coldea et Chifu 1999, within alliance *Festucion valesiacae,* Klika 1931, order *Festucetalia valesiacae* Br. – Bl. et R. Tx. ex Br.-Bl. 1949, class *Festuco-Brometea* Br.-Bl. et R. Tx. ex Klika et Hadač 1944 (Table 1).

The association stretches over plains or sunny and dry slopes, given a leached (degraded) chernozem soil, and has a 70–95% vegetation covering.

Due to the high anthropogenic and zoogenic impact (that is, overgrazing and conversion to agricultural land), the sites of this association can be found within limited boundaries, and grow even smaller.

Fields displaying the association are used as grazing land. If irrational grazing is allowed, conditions are created for the emergence of secondary xerophile associations, with a smaller number of species.

The floristic analysis of these phytocenoses reveals their heterogeneous composition, with a number of 133 species in the association, and an average of 31 species / relevé.

Table 1

Taraxaco serotinae – Festucetum valesiacae (Burduja *et al.* 1956)
Sârbu, Coldea et Chifu 1999

Number of relevé	1	2	3	4	5	6	7	8	9	10	11	12	13	
Altitude (m.s.m.)	370	360	360	360	360	370	291	291	370	380	340	230	230	
Exposition	N	NE	W	N	SE	SW	N	S	NE	NW	E	NW	NW	K
Cover of the vegetation (%)	85	80	80	80	85	95	90	80	80	95	70	95	80	
Surface (m²)					100					50		100		
Number of species	29	47	22	18	22	22	42	47	32	25	26	34	28	
Characteristics of association														
Taraxacum serotinum	-	+	-	-	-	-	-	+	-	-	-	+	-	II
Jurineo arachnoideae-Euphorbinenion nicaeensis														
Euphorbia glareosa ssp. glareosa	+	-	-	-	-	-	+	+	1	-	-	-	-	II
Echium maculatum	-	+	-	-	+	-	-	+	-	-	-	-	-	II
Dianthus membranaceus	-	+	-	+	-	-	-	-	-	+	-	+	-	II
Ajuga chamaepytis ssp. chamaepytis	-	-	-	-	-	-	-	+	-	-	-	-	-	I
Astragalus dasyanthus	-	-	-	-	-	-	+	-	-	-	-	-	-	I
Cleistogenes bulgarica	-	-	-	-	-	-	-	+	-	-	-	-	-	I
Ajuga laxmanni	-	-	-	-	-	-	+	+	-	-	-	-	-	I
Centaurea marschalliana	-	-	-	-	-	-	+	+	-	-	-	-	-	I
Linum austriacum	-	-	-	-	-	-	-	-	-	-	-	1	+	I
Artemisia austriaca	-	-	+	-	-	-	-	+	-	-	-	-	-	I
Festucion et Festucetalia valesiacae														
Festuca valesiaca	3	4	4	4	4	4	4	3	3	4	2	2	3	V
Achillea setacea	1	1	+	+	+	+	+	1	+	-	+	+	+	V
Galium humifusum	+	+	+	-	+	-	+	+	+	+	-	-	+	IV
Salvia nemorosa	-	-	+	-	-	-	+	+	+	-	+	+	+	III
Centaurea biebersteinii	-	+	-	+	-	+	+	-	-	-	+	-	-	II

Table 1

(continued)

Astragalus onobrychis	+	-	-	-	-	-	+	+	-	-	-	-	-	II
Cleistogenes serotina	-	-	-	-	-	-	-	-	-	-	1	2	+	II
Thymus pannonicus	-	+	+	-	-	-	-	-	+	-	-	-	-	II
Elymus hispidus	-	+	-	-	-	-	-	+	-	-	-	+	1	II
Stipa capillata	-	-	-	-	-	-	1	+	-	-	1	-	-	II
Campanula sibirica	-	-	-	-	-	-	+	-	-	-	-	-	-	I
Inula hirta	-	-	-	-	-	-	+	-	-	-	-	-	+	I
Anthemis tinctoria	-	+	-	-	+	-	-	-	-	-	-	-	-	I
Stachys recta ssp. recta	-	-	-	-	-	-	+	-	-	-	1	-	-	I
Minuartia setacea	-	-	-	-	-	-	+	+	-	-	-	-	-	I
Knautia arvensis	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Rapistrum perenne	-	-	-	-	-	-	+	1	-	-	-	-	-	I
Reseda lutea	-	-	-	-	-	-	+	-	-	-	+	-	-	I
Inula germanica	+	-	-	-	-	-	-	+	-	-	-	-	-	I
Cerinthe minor	-	-	-	-	-	-	-	-	-	-	-	+	1	I
Euphorbia virgata ssp. virgata	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Teucrium polium	-	-	-	-	-	-	+	+	-	-	-	-	-	I
Marrubium peregrinum	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Festucetalia vaginatae														
Helichrysum arenarium	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Anchusa ochroleuca	-	-	-	-	-	-	-	+	-	-	-	-	-	I
Festuco-Brometea														
Eryngium campestre	+	+	+	1	+	+	+	+	+	-	+	-	-	IV
Plantago media	+	+	-	-	+	+	+	-	-	-	-	+	+	III
Convolvulus arvensis	+	+	-	-	-	-	+	+	-	-	+	-	+	III
Hieracium pilosella	-	1	-	+	+	+	-	-	-	+	-	+	+	III
Potentilla argentea	-	+	+	-	-	-	-	-	+	+	-	+	+	III

Table 1

(continued)

Hypericum perforatum	-	+	-	-	+	-	+	-	-	+	-	+	+	III
Agrimonia eupatoria	-	+	-	+	+	-	-	+	-	+	+	-	-	III
Galium verum	-	+	+	+	-	-	-	+	+	-	-	-	+	III
Echium vulgare	-	+	-	-	-	+	+	+	+	-	-	+	+	III
Coronilla varia	-	-	-	-	-	-	+	+	-	-	-	1	-	II
Salvia pratensis	-	-	-	-	-	-	+	+	+	+	-	-	-	II
Dichanthium ischaemum	-	-	+	-	-	-	+	+	+	-	+	-	-	II
Koeleria macrantha	-	+	-	+	-	-	-	+	1	-	1	-	-	II
Tragopogon dubius	-	-	-	-	-	-	-	-	-	+	-	+	+	II
Scabiosa ochroleuca	-	+	-	-	+	-	+	+	-	-	-	+	-	II
Salvia verticillata	-	-	-	-	-	-	-	-	-	-	-	+	1	I
Medicago minima	-	-	-	-	-	1	+	-	-	-	-	-	-	I
Asperula tenella	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Crepis foetida ssp. rhoeadifolia	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Thalictrum minus	-	-	-	-	-	-	1	-	-	-	-	-	-	I
Cynodon dactylon	-	-	-	-	-	+	-	-	-	+	-	-	-	I
Poa angustifolia	-	-	-	-	-	+	-	-	-	-	-	-	-	I
Bromus inermis	-	-	-	-	-	+	-	+	-	-	-	-	-	I
Prunella grandiflora	-	-	-	+	-	-	-	-	-	-	-	-	-	I
Euphorbia agraria	-	-	-	-	-	-	+	+	-	-	-	-	-	I
Carduus nutans	-	-	-	+	-	-	+	-	-	-	-	-	-	I
Medicago falcata	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Verbascum lychnitis	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Pimpinella saxifraga	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Prunella laciniata	-	+	-	-	-	+	-	-	-	-	-	-	-	I
Acinos arvensis	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Carex praecox	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Erigeron acris ssp. acris	-	-	-	-	-	-	-	-	-	+	-	-	+	I
Euphorbia cyparisias	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Fragaria viridis	-	-	-	-	-	-	-	-	+	-	-	-	-	I
Adonis vernalis	-	-	-	-	-	-	-	-	+	-	+	-	-	I

Table 1

(continued)

Molinio-Arrhenatheretea														
Lotus corniculatus	1	1	+	+	1	+	+	+	+	+	-	+	+	V
Plantago lanceolata	+	-	1	+	-	+	+	1	+	-	-	1	+	IV
Cichorium intybus	+	+	-	+	+	+	+	-	-	-	-	+	+	IV
Medicago lupulina	+	+	+	+	-	1	+	-	+	-	-	+	-	IV
Trifolium repens	1	-	+	+	-	+	-	-	+	+	+	-	-	III
Trifolium pratense	1	+	+	1	-	+	-	+	1	-	+	-	-	III
Prunella vulgaris	+	-	+	-	+	+	-	-	+	+	-	-	-	III
Daucus carota	+	-	-	-	+	-	+	-	+	+	+	+	-	III
Taraxacum officinale	+	-	+	+	-	-	-	-	+	-	-	+	-	II
Leucanthemum vulgare	-	+	-	-	-	-	-	-	-	+	-	+	1	II
Leontodon autumnalis	+	+	-	-	-	-	-	+	+	+	-	-	-	II
Lolium perenne	+	-	-	-	-	-	-	+	-	1	-	-	-	II
Potentilla reptans	+	-	-	-	-	-	-	-	+	-	+	+	-	II
Rhinanthus rumelicus	-	+	-	-	+	-	-	+	-	-	-	-	-	II
Leontodon hispidus	-	+	-	-	+	-	-	-	+	-	-	+	-	II
Plantago major	-	-	-	-	-	-	+	-	+	1	-	-	-	II
Centaurea jacea	-	-	-	-	+	-	-	-	+	+	-	-	-	II
Ranunculus acris	-	-	-	-	-	-	-	-	-	-	-	+	-	I
Eryngium planum	-	+	-	-	-	-	-	-	-	+	-	-	-	I
Luzula campestris	-	1	-	-	-	-	-	-	-	-	-	-	-	I
Bromus commutatus	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Poa pratensis	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Elymus repens	-	+	-	-	-	-	-	-	-	-	-	-	-	I

Table 1

(continued)

Rumex crispus	-	-	+	-	-	-	-	-	-	-	-	-	-	I
Cerastium holosteoides	-	-	+	-	-	-	-	-	-	-	-	-	-	I
Campanula patula	-	-	-	-	-	-	+	-	-	+	-	-	-	I
Stachys officinalis	-	-	-	-	-	-	-	-	-	+	-	-	+	I
Agrostis stolonifera	-	-	-	-	-	-	-	-	-	+	-	-	-	I
Vicia cracca	-	-	-	-	-	-	-	-	-	-	-	+	+	I
Ononis arvensis	-	-	-	-	-	-	-	-	-	-	-	+	+	I
Bromus hordeaceus	-	-	+	-	-	-	-	-	-	-	-	-	-	I
Cynosurus cristatus	-	-	-	-	-	-	+	-	-	-	-	-	-	I
Equisetum arvense	+	-	-	-	-	-	-	-	-	-	-	+	-	I
Stellarietea mediae														
Lappula squarrosa	+	-	-	-	-	-	-	+	-	+	-	-	-	II
Lathyrus tuberosus	-	+	-	-	-	1	-	+	-	-	-	-	-	II
Stachys annua	-	-	-	-	-	-	-	+	-	-	+	+	-	II
Artemisia annua	+	-	-	-	-	-	-	-	+	-	-	-	-	I
Bromus arvensis	+	-	-	-	-	-	-	+	-	-	-	-	-	I
Vicia villosa	-	+	-	-	+	-	-	-	-	-	-	-	-	I
Rumex acetosella	-	+	-	-	-	-	-	-	-	-	-	-	-	I
Centaurea cyanus	-	-	-	+	-	-	-	-	-	-	-	-	-	I
Atriplex tatarica	+	-	-	-	-	-	-	-	-	-	-	-	-	I
Nigella arvensis	-	-	-	-	-	-	+	-	-	-	-	-	-	I
Anthemis cotula	-	-	-	-	-	-	-	-	+	-	-	-	-	I

Table 1

(continued)

Hibiscus trionum	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Cuscuta campestris	-	-	-	-	-	-	-	-	-	-	-	+	-	I
Artemisietea vulgaris														
Berteroa incana	+	+	-	-	+	+	-	+	+	-	-	-	-	III
Carduus acanthoides	+	-	-	-	-	-	-	-	+	-	-	-	-	I
Artemisia absinthium	-	-	-	-	-	-	-	+	-	-	-	+	-	I
Dipsacus fullonum	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Tanacetum vulgare	-	-	-	-	-	-	-	-	-	-	-	-	+	I
Sambucus ebulus	-	-	+	-	-	-	-	-	-	-	-	-	-	I
Verbascum phlomoides	-	-	-	-	-	-	-	-	-	-	+	-	-	I
Companion														
Astragalus glycyphyllos	-	+	-	-	+	-	-	+	-	-	-	-	-	II
Origanum vulgare	-	+	-	-	-	-	-	+	-	-	-	-	-	I
Calamintha vulgare	-	+	-	-	+	-	-	-	-	-	-	-	-	I
Glechoma hederacea	-	-	+	-	-	-	-	-	-	-	-	-	-	I
Rosa canina	-	-	-	-	-	+	-	-	-	-	-	-	-	I
Galium album	-	-	-	-	-	-	+	+	-	-	-	-	-	I
Robinia pseudoacacia	-	-	-	-	-	-	+	+	-	-	-	-	-	I

Date and place of relevé:

1. Deleni, 07.2002; 2-5. Protopopeşti, 11.06.2003, 06.2001; 6,9,10. Emil Racoviţă, 6.07.2003; 7,8. Movila lui Burcel, 11.07.2002, 6.08.2003; 11–13. Dobrovăţ, 24.07.2002, 26.07.2003.

Next to the prevailing species, *Festuca valesiaca*, one notices the predominance of species characteristic of the *Festucion valesiacae* alliance, *Festucetalia valesiacae* order and to *Festuco-Brometea* class over the species characteristic of the class *Molinio-Arrhenatheretea*. Phytocenoses are also characterized by the presence of species from *Stellarietea mediae* and *Artemisietea vulgaris* classes.

The analysis of bioforms [3, 5] reveals that the highest share within the total species making up the association is taken by hemicryptophytes (H) with 63.85%, followed by therophytes (T) with 13.85%, hemitherophytes (Ht) with 12.30%, geophytes (G) with 5.38%, camephytes (Ch) with 3.07%, and phanerophytes (Ph) with 1.55% (Figure 1).

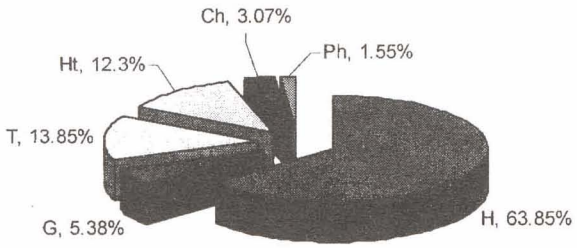


Fig. 1 – Bioforms spectrum.

The analysis of floristic elements [3, 5] shows the predominance of Eurasian elements (Euras.) with 50%, followed by European ones (Eur.) with 17.7%, pontic elements (Pont.) with 17.7%, cosmopolitan (Cosm.) with 5.38%, circumpolar (Circ.) with 5.38%, Mediterranean (Medit.) with 2.3%, and adventitious elements (Adv.) with 1.54% (Figure 2).

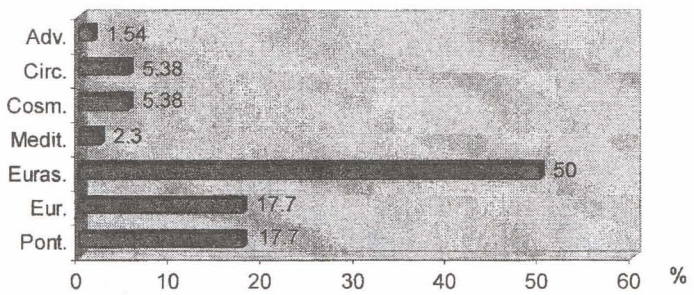
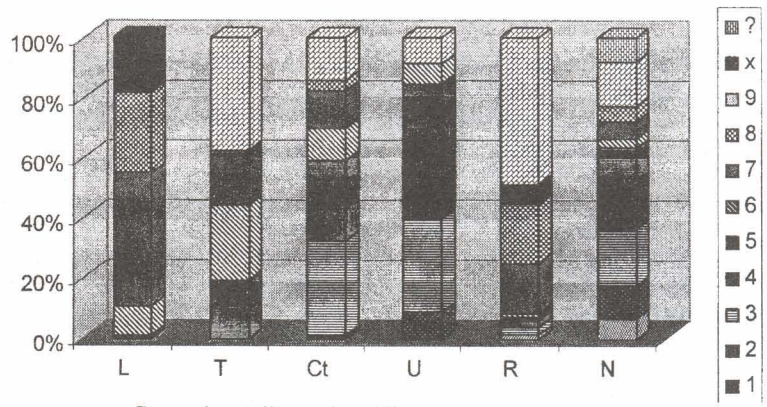


Fig. 2 – Floristic elements spectrum.

The analysis of ecological indices [8] highlights the presence of species with a low tolerance to shadow, moderately thermophile, xeromesophile, and which grow on neuter soils poor in mineral nitrogen (Figure 3).



L-light, T-temperature, Ct-continentality, U-humidity, R-pH, N- soil trophicity, based on mineral nitrogen contents

Fig. 3 – Ecological indices spectrum.

For determining the total quantity of phytomass, the aerial sections of the plants were collected, weighed (first green, and then dry, by bringing them to a constant weight at 105°C), without having them divided into systematic and economic groups. The samples were collected from three stations displaying different ecological conditions (Dobrovăţ, Emil Racoviţă and Protopopeşti), and the following results were obtained:

Station	Aerial phytomass (kg/ha)	
	Green	Anhydrous
Dobrovăţ	3600	960
Emil Racoviţă	2900	520
Protopopeşti	1600	440
Association average	**2700**	**640**

The herbaceous species belonging to this association produces an average green phytomass of 2700 kg / ha and an average anhydrous phytomass (dry substance) of 640 kg / ha.

On the pastoral value scale, a number of 123.9 points is obtained, respectively, 30 estimation points, which places the meadows in the studied association within the category of poor pasture land (8^{th} class) that may bear an optimum load of 0.41–0.60 UVM per hectare (UVM = large cattle units).

If systematic groups are considered, a significant quantity of phytomass is due to Gramineae, while Leguminosae plants bear a minor contribution, and the Cyperaceae and Juncaceae play an insignificant part.

It therefore results, both from establishing the pastoral value, and from the quantity of aerial phytomass obtained, that the meadows have a low productive value.

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