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VEGETATION SPECIFIC TO THE SANDS FROM THE RESEARCH STATIONS SANISLĂU" MLAŞTINA VERMEŞ (VERMES MARSH)" AND URZICENI "GRĂDINA CAILOR (HORSES GARDEN)"

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ABSTRACT. In the Northern part of continental sands of Nirului Plain there are two representative research stations, especially by the variety of the vegetal layer of the interdune lands and sand dunes: Sanislău Marsh "Vermeş" and Urziceni pasture ″Horses Garden″. The great diversity of phytocenoses is explained by the specific pedological conditions, diverse topoclimate and varied microrelief conditions. The associations from"Vermeş" populate damp stations, some of the associations having a relictary character. On the sand dunes from the reseach station "Grădina Cailor" a sparse vegetal layer forms, made up of shorter plants, with a well-developed system. At Urziceni in the structure of psamosoils, limonite bands contribute to the storage of a sufficient quantity of water in the upper layers of the soil. In the marshy lands of interdunes from Sanislău Marsh "Vermeş", the decisive factor in the biodiversity of cenoses is the excess of edaphic humidity.

Keywords: Sand dunes, interdunes, psamosoils, environmental indices, ruderal plants

INTRODUCTION

The nature reserve "Vermeş" Marsh from the research station Sanislău is located in the central part of the sands of North-Western Romania, where it occupies a surface of 80 ha, being drained by streams and canals in different directions. The name ″Horses Garden″ is a quite old toponymy used since the previous centuries for the communal pasture, where the horses of the village used to graze. This research station with sand dunes, located in the Eastern direction, towards the former Ecedeea Marsh and drained by the brook Valea Neagră, is quartered at the outskirts of the sands area.

MATERIALS AND METHODS

The study of the vegetal layerwas performed in the research station Sanislău Mlaştina „Vermeş" (Marsh) and Urziceni „Grădina Cailor" (Horses Garden).

The research methods were based on criteria elaborated by J. Braun-Blanquet, taking into consideration the particularities of Romania′s vegetation.

The species nomenclature is based on new romanian botanical studies, especially Flora R.P.R./R.S.R. vol I – XIII, the second edition of Flora României (Ciocîrlan, 2009). We took into account the studies edited abroad and, among the, especially Flora Europaea, Vol. I – V (Tutin et al., 1967 -1980).

The identification of associations was carried out based on the floristic criterion (characteristic and constant species), apart from which a special attention was given to self-evident, differential and dominant species. The results of the releves were processed by the methods of the Central-European phytosociological system Braun-Blanquet, formulating conclusions regarding the dynamics of vegetation from this area. The interpretation of results was based on the data offered by the stock taking from the field, analysed especially by UPGMA method (Krebs 1998), of dissimilarity matrix, for the obtaining of which we used the similarity index Sorensen, making comparisons between samples and evaluating the global homogeneity of the relevés. We obtained the similarity matrix which presents a symetry axis along the main diagonal occupied by unit values. The values of the index used vary between 0 (maximum heterotonitycaused by the absence of prevalent species) and 1 (the ideal case in which all the species are prevalent). Later, for the realization of dendograms and similarity matrix on the computer we used the software SYN-TAX 2000.

Used abbreviations: U = umidity, T = temperature, R= soil reaction, Adm = abundance, quatity – the averege dominant, K= constance, H= Hemicryptophyte, TH = terophyte, Ph = phanerophyte, G = geophytes, Hh = helo-hidatophyte, Ch = chmaephyte, Eua = Eurasiatic, E = European, Ec = central European, Cp = circumpolar, Pan = panonic, Adv = adventive, Cosm = cosmopolites.

RESULTS AND DISCUSSIONS

As. *Typhaetum latifoliae* Lang 1973

We identified the association at Sanislău Mlaştina „Vermeş".It is wide spread in damp research stations, which explains the high weight of species from the class Phragmitetea. The characteristic species Typha latifolia which populates the edge of marshes of the territory, prefering waters in progress of eutrophication rich in nitrogen and calcium, has maximum abundance. (Figure 1).

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Fig. 1. As.*Typhaetum latifoliae*-Sanislău Mlaştina „Vermeş”

The association is made up of reeds represented by: *Typha latifolia, Schoenoplectus lacustris, Glyceria maxima, Alisma plantago-aquatica, Mentha aquatica, Lycopus europaeus, Rumex palustris, Galium palustre, Eleocharis palustris, Angelica sylvestris, Typha angustifolia.* The floristic composition of phytocenoses of this association counts 21 species. Typha latifolia edifies well outlined phytocenoses, which develop in the marshy areas where water bogs almost the entire vegetation season, not exceeding the depth of 40-50 cm.

Table 1. As.*Typhaetum latifoliae*Soó 1927

Biof.	El. flor.	U.	T.	R.	Car.	Number of relevé	1	2	3	4	5	ADm.
						Analysed surface (m^2)	30	20	25	20	25	
						Coverage of surface (%)	100	95	85	90	90	
						CHAR. ASS.						
Hh	Cosm	6	3,5	0	D	*Typha latifolia*	4-5	4	3	5	4	67,5
						PHRAGMITETEA						
Hh	Cosm	6	0	0	D	*Alisma plantago -aquatica*	+	+	1	+	-	0,36
Hh	Cosm	6	3	4	P	*Schoenoplectus lacustris*	1	+	-	+	+	0,36
Th – TH	Eua	5	3	4	P	*Rumex palustris*	+	+	-	+	-	0,06
H-Hh	Cosm	4	3	0	P	*Lythrum salicaria*	1	+	+	-	-	0,34
H	Eua	5	3	0	D	*Lycopus europaeus*	1	+	-	+	+	0,36
H	Eua	5	3	4,5	P	*Epilobium parviflorum*	+	+	+	+	+	0,10
Hh – H	Eua	5	3	0	P	*Mentha aquatica*	+	+	-	+	-	0,06
Hh	Eua	6	3	0	D	*Oenanthe aquatica*	+	+	+	-	-	0,06
Hh	Eua	6	4	0	D	*Sium latifolium*	+	-	+	-	+	0,06
H	Eua	4	3	4	D	*Calystegia sepium*	+	+	-	-	+	0,06
						MAGNOCARICION						
Hh	Eua	6	3	0	P	*Carex elata*	+	1	+	-	-	0,34
H	Cp	5	3	0	D, P	*Galium palustre*	+	+	+	-	-	0,06
Hh	Eua(M)	6	3	4	P	*Carex acutiformis*	+	+	+	-	-	0,06
						MONILINIO- ARRHENANTHEREA						
H	Cp	4	0	0	P	*Agrostis stolonifera*	+	1	+	+	+	0,38
Th	Cosm	4	0	3	P	*Echinochloa crus - galli*	+	+	+	-	-	0,06
TH – H	Pan	4	3	0	P	*Cirsium brachycephalum*	+	+	+	-	-	0,06
H	Ec	4	3,5	0	D	*Cirsium rivulare*	+	+	+	-	-	0,06
Ch	E	4	3	0	P	*Lysimachia nummularia*	+	+	-	+	+	0,08
						VARIAE-SYNTAXA						
Th	Eua	4,5	3	0	D	*Polygonum persicaria*	-	+	+	-	-	0,04
Th	Eua	4,5	3	0	P	*Bidens tripartita*	+	+	-	-	-	0,04

Spectrum of biophorems: Hh – 38,09% / Hh–H -2,62%/; H – 33,33% / H-Hh – 3,00%/; Ch – 4,76%; Th – 19,04% / Th- H- 5,25%/; TH-H – 4,76%.
Spectrum el. florisice: Eua - 47,61% / Eua(M) – 2,10%/;E – 4,76%; Ec – 4,76%; Cp–9,52%; Pan – 4,76%; Cosm – 23,80%.
Place and date of releves: 1 - 5 Sanislău Mlaştina "Vermeş" 25. VI. 2007.

The species *Echinochloa crus – galli, Cirsium rivulare* and *Lysimachia nummularia* were not mentioned so far in as. *Typhaetum latifoliaefrom* „Vermeş” Marsh.

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The spectrum of bioforms highlights the large weight of helohidatophytes (38,09%) followed by hemicryptophytes (33,33%). Among the geoelements, the eurasian species prevail (47,61%) followed by cosmopolites (23,80%) (Figure 2).

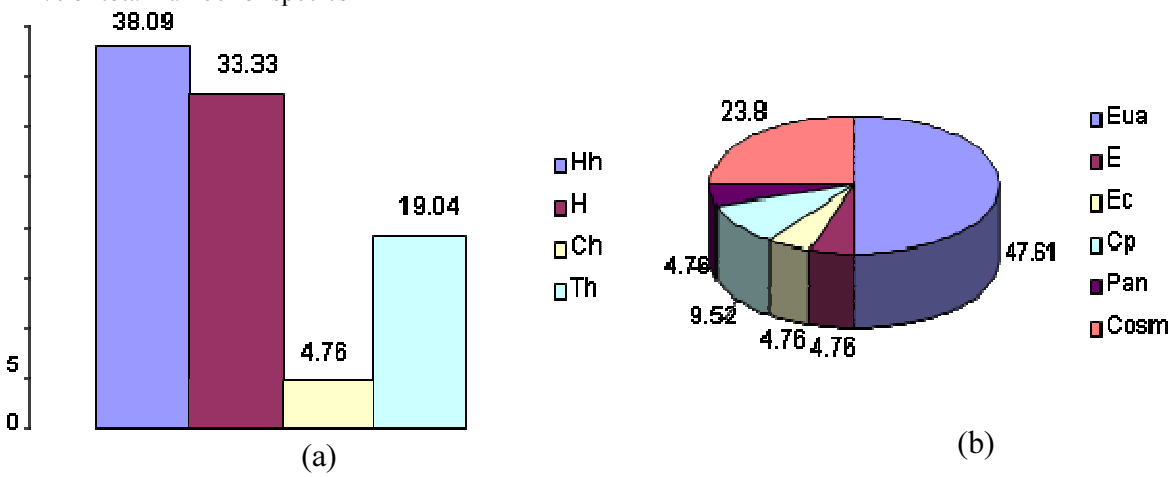

Fig. 2. Spectrum of bioforms (a) and of geoelements (b) ale As. *Typhaetum latifoliae*

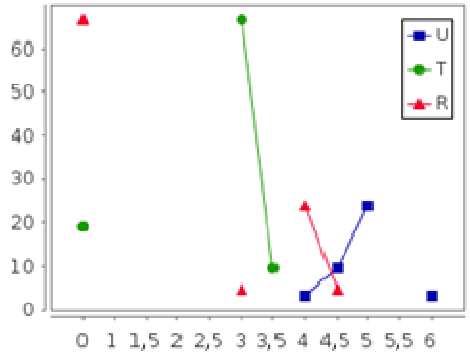

Fig. 3. Diagram of environmental indices of As. *Typhaetum latifoliae*

The analysis of environmental indices outlines the dominance from the point of view of humidity of ultrahigrophytes and higrophytes. Compared to temperature, the majority ones are mesothermes, and from the point of view of soil reaction, the eurionic plants (Figure 3). The phytocenoses of this association begin to replace the phragmites belonging to the territories influenced by men.

As. *Schoenoplectetum lacustris* Chouchard 1924

We identified the association at Sanislău Mlaştina „Vermeş” where now it occupies limited surfaces. The association populates the poorly oxygenated waters and even polluted waters. Schoenoplectetum lacustris has a system of rhizomes with a length of 1-2 m2, contributing to the clogging of waters (Figure 4).

Fig. 4. As. *Schoenoplectetum lacustris*

The variety of the floristic composition in this association is explained by the phytocenoses development in two alternative stages: an acvatic one, including a submersed and an emersed flora and a terrestrial one, with a palustral flora.

The new species, which were not mentioned before for Mlaştina „Vermeş” (Marsh), are: Iris pseudacorus, Chrysopogon gryllus and Vulpia myuros.

Table 2. As. *Schoenoplectetum lacustris* Chouchard 1924

CHAR. ASS. Hh-G Cosm *Schoenoplectus lacustris* 5; **PHRAGMITETEA** Hh Eua *Oenanthe aquatica* 1; Hh-H Cp *Glyceria maxima* +; Hh Cosm *Typha latifolia* +; **PHRAGMITETEA şi PHRAGMITETALIA** Hh Eua *Iris pseudacorus* +; H Eua *Lysimachia vulgaris* +;**MAGNOCARICION** Hh Eua *Carex elata* +; **LEMNO- POTAMETEA** Hh Cosm *Lemna minor*+; **FESTUCETALIA VALESIACAE** H Eua(M) *Chrysopogon gryllus*+; **VARIAE-SYNTAXA** H Cosm *Juncus effusus* +; Th Eua(M) *Vulpia myuros* +.
Spectrum of bioforms: H–27,27%;Hh – 63,63% / Hh-H–9,09%; Hh-H– 9,09%/; Th – 9,09%
Spectrum of geoelements: Eua – 45,45% / Eua(M) – 18,18%/; Cp – 9,09%; Cosm – 36,36%
Place and date of releves: Sanislău, Mlaştina „Vermeş”, 30.VI.2008

The spectrum of bioforms is dominated by helohidatophytes (63,63%). In the spectrum of geoelements the highest percentages are represented by eurasian (45,45%) followed by cosmopolites species (36,36%) (Figure5).

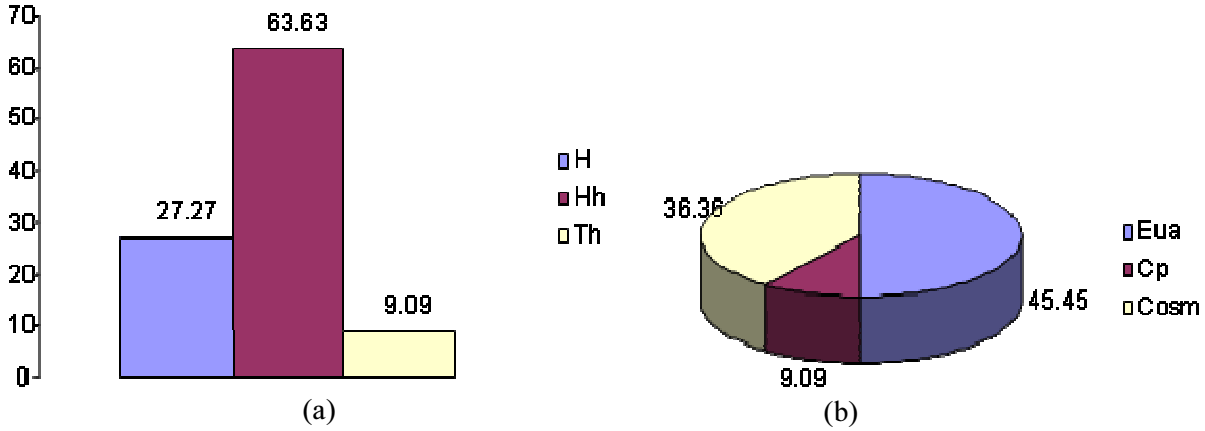

Fig. 5. Spectrum of bioforms (a) and of geoelements (b) from As. *Schoenoplectetum lacustris*

This association has a special practical significance, due to its edifying quality. On the other hand, it grows in the water catchment areas clogged up with low peroxides, which underlines the idea of including and using those species in the composition of biological filters. Also, the plant contributes to the water catchments clogging up, because it increases the level of organic deposit, preparing new phytocenoses.

***Carici-Calamagrostetum neglectae* Soó (1955) 1971**

We identified the association in two research stations: Sanislău in marsh „Vermeş” and Pişcolt „Via Varga”, being encountered in the areas where water persists throughout the summer. In Romania it was mentioned only in the research station „Vermeş” Marsh from Sanislău (C. Karácsonyi, 1980), it is characterised by the presence of „ant hills” 70-80 cm high, which are surrounded by stagnant water, which shelters a floating vegetation. In the phytocenoses of this association are present elements belonging to Al. Magnocaricion elatae, which have a high constance (III-IV). Near Calamagrostis stricta we can see the presence of species Carex elata.

Fig. 6. As. *Carici-Calamagrostetum neglectae*

Table 3. As. *Carici-Calamagrostetum neglectae* Soó (1938) 1971

Biof.	El. flor.	U.	T.	R.	Car.	Releve number	1	2	3	4	5	ADm.
						Analysed surface (m^2)	12	10	12	12	10	
						Coverage of vegetation (%)	95	90	95	95	90	
						CHAR. ASS.						
Hh	Eua	6	3	0	P	*Carex elata*	2-3	2	3	5	2	38,5
Hh	Cp	4,5	2	3	P	*Calamagrostis stricta*	4	3	2	3	3	38
						MAGNOCARICION						
H	Eua(M)	4	3	4	D	*Valeriana officinalis*	+	+	+	+	-	0,08
H	Eua	5	3	0	D,P	*Galium palustre*	+	+	+	+	+	0,10
Hh	Eua	6	3	4	P	*Carex acutiformis*	-	-	+	+	+	0,06
Hh	Cp	5	4	4	P	*Carex riparia*	1	+	+	2	+	6,36
						CALTHION						
H	Ec	4,5	0	0	P	*Caltha palustris*	-	-	+	+	+	0,06
						PHRAGMITION						
H-Hh	Cp	5	3	0	P	*Mentha aquatica*	+	+	+	+	+	0,10
Hh	Cosm	6	3,5	0	D	*Typha latifolia*	+	-	-	-	+	0,04
H	Cosm	4	3	4	D	*Calystegia sepium*	-	-	+	+	+	0,06
Hh	Cosm	5	0	4	P	*Phragmites australis*	+	+	-	1	+	0,36
Hh	Cosm	6	3	4	P	*Schoenoplectus lacustris*	+	+	-	1-2	+	3,06
H	Cp	4	3	4	P	*Stachys palustris*	-	+	+	+	+	0,08
						PHRAGMITETEA şi PHRAGMITETALIA						
H	Cp	4	3	4	P	*Scutellaria galericulata*	+	+	+	-	-	0,06
H	Eua	5	0	0	P	*Lysimachia vulgaris*	+	+	-	+	+	0,08
H	Eua	5,5	0	0	D,P	*Iris pseudacorus*	-	-	-	+	+	0,04
H	Cosm	4	3	0	P	*Lythrum salicaria*	-	-	+	+	+	0,06
Hh	Cosm	6	0	0	D	*Alisma plantago-aquatica*	+	+	-	+	-	0,06
						LEMNO- POTAMETEA						
Hh	Eua	6	3	0	P	*Polygonum amphibium f. aquaticae*	+	+	1	2	+	3,36
Hh	E	6	3	0	P	*Ranunculus trichophyllus*	+	+	+	-	-	0,06
Hh	Cosm	6	2,5	4	P	*Potamogeton natans*	+	1	-	+	+	0,36
Hh	Cp	6	0	3,5	P	*Utricularia vulgaris*	+	+	+	-	-	0,06
						MOLINIO- ARRHENANTHEREA						
H	Cp	5	2	0	P	*Juncus articulatus*	+	+	+	-	+	0,08
G	Cp	5	0	4	D,P	*Eleocharis palustris*	-	-	+	+	-	0,04
H	Eua	3,5	3	0	D	*Holchus lanatus*	-	+	+	-	-	0,04
H	Eua	4	0	0	P	*Agrostis stolonifera*	+	+	1	+	-	0,36
H	Eua	3	0	0	D,P	*Vicia cracca*	+	+	-	-	-	0,04
H	Eua	2,5	0	0	D	*Leontodon hispidus*	+	-	+	-	-	0,04
H	Eua	2,5	3	3	P	*Ranunculus repens*	-	-	-	-	+	0,02

Spectrum of bioforms: H – 51,75%; H – Hh – 3,44%; Hh – 41,37%; G – 3,44%
Spectrum of geoelements: Eua – 41,37%; Eua (M) – 3,44%; E – 3,44%; EC – 3,44%; Cp – 27,58%; Cosm – 24,13%
Place and date of releves: Sanislău Mlaştina „Vermeş” (rel –1–4); Pişcolt „Via Varga” (rel-5); 30.VI.2008

In the composition of this association, the hidroheliophytes presence is explained by the drainage effected over the last years, action with consequences as low tides. The lack of permanent water needful to an appropriate development for those phytocenoses accelerates a fast replacing with as. *Caricetum elatae* (Kerner 58) W. Koch 26.

In the spectrum of bioforms hemicryptophytes have the highest percentages (55,17). Among the geoelements the highest weight is represented by eurasian (41,37%) followed by circumpolar (27,58%) and cosmopolites (24,13%) (Figure7).

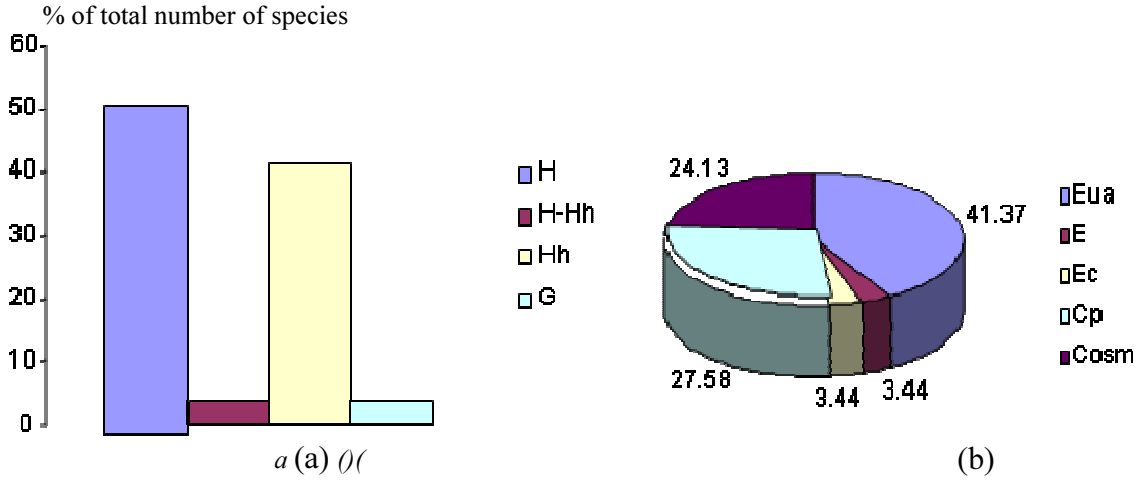

Fig. 7. Spectrum of bioforms (a) and of geoelements (b) of As. **Carici-Calamagrostetum neglectae**

It is noteworthy that regarding the need towards humidity, the highest percentages are held by ultrahigrophyles, towards temperature, mesothermes, and soil reaction, eurionic species (Figure 8).

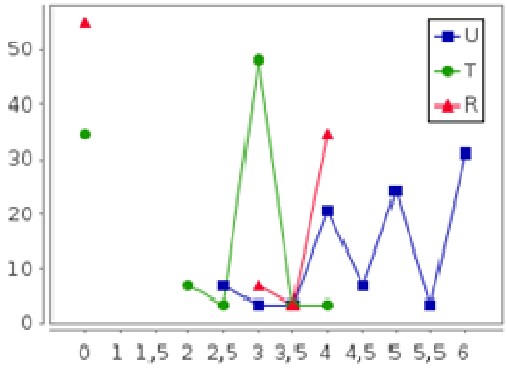

Fig. 8. Diagram of environmental indices in As. *Carici-Calamagrostetum neglectae*

As. *Calamagrostetum* neglectae was identified in the Giurgeului Basin by Raţiu Flavia and Gergely (1971), but with a different composition of the phytocenoses, comparing to as. *Carici-Calamagrostetum neglectae*.

As. *Brometum tectorum* Bojko 1934

We identified the association on the sands from Urziceni „Grădina Cailor".It is a pioneer association with an important role in the first stages of fixation of sands. It generally develops on the slopes of dunes, and occasionally in certain microdepressions with low humidity. The association comprises a number of 34 species, many being characteristic of ***Bromion tectori*** (*Apera spica-venti, Anthemis ruthenica, Potentila arenaria*).

Fig. 10 As. *Brometum tectorum*

In natural research stations, this association is follwed by as. Festucovaginatae – Corynephoretum, and on ploughed fields, by different weeds. The new species (unmentioned in the botanical studies) in the composition of Brometum tectorum is Sedeum acre.

The spectrum of bioformsis dominated by therophytes (47,22%) in the spectrum of geoelements the eurasian reach high percentages (61,11%) (Figure 11).

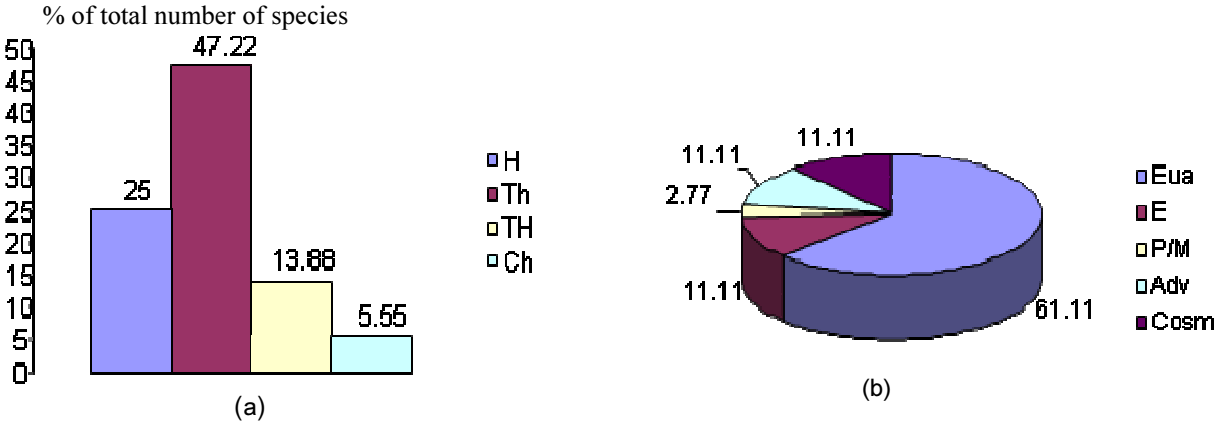

Fig.11. Spectrum of bioforms (a) and of geoelements (b) of As. *Brometum tectorum*

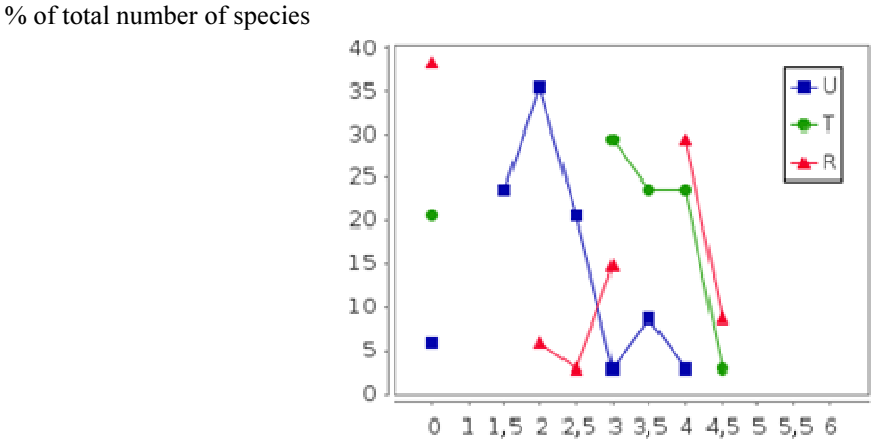

Fig. 13. Diagram of environmental indices in As. *Brometum tectorum*

The ecological spectrum highlights the predominant participation of xero-mesophyll species (35,29%). From the thermal point of view we can see the unconclusive dominance of mesothermes (29,41%), and depending on the chemical reaction of the soil, the eurionic plants stand out (38,28%) (Figure 13).

Table 4. As. *Brometum tectorum* Bojko 1934

Biof.	El. flor.	U.	T.	R.	Car.	Relevé number	1	2	3	4	5	6	7	8	ADm.	K
						Analysed surface (m^2)	20	25	24	20	20	25	25	20		
						Vegetation coverage (%)	70	65	60	60	70	80	75	60		
						Exposure of slope	E	S-V	V	N	N-V	V	N	N-V		
						Inclination (degrees)	8	5	10	5	20	8	5	10		
						CHAR. ASS.										
Th	Eua	1,5	3,5	0	D	*Bromus tectorum*	3	3	4	3-4	4	3	3-4	4	53,12	V
						BROMION TECTORI et FESTUCION VAGINATAE										
Th	Eua (C)	2	4	4	D	*Anthemis ruthenica*	+	-	1	+	+	-	+	+	0,18	I V
Th	Eua	3.5	0	2,5	D	*Apera spica – venti*	+	-	+	-	2	+	1	+	2,11	I V
Th	Eua(C)	2	4	0	D	*Plantago arenaria*	+	1	+	-	-	+	+	+	0,18	II
Th -	Adv	2,	0	0	D	*Conyza canadensis*	-	+	1	+	1-	+	+	1	2,30	I

TH		5									2					V
			3,	4,												II
H	E (C)	2	5	5	D	*Potentilla arenaria*	-	+	+	+	-	+	+	-	0,06	I
	Eua	1,	4,	4,												
Th	(C)	5	5	5	D	*Kochia laniflora*	-	-	-	-	+	+	-	-	0,02	I
						CORYNEPHOLETALIA										
						Rumex acetosella ssp.										
H	Eua	2	3	2	P	*tenuifolius*	+	-	-	+	+	+	-	+	0,05	II
	Eua			4,												
Th	(C)	2	4	5	D	*Veronica dillenii*	-	+	-	-	-	+	-	-	0,02	I
	E	1,														
TH	(M)	5	3	2	D	*Jasione montana*	-	-	+	-	-	-	-	+	0,02	I
						FESTUCO – BROMETEA										
			3,		D,											I
G -H	Cosm	2	5	0	P	*Cynodon dactylon*	+	2	+	-	+	1	+	+	2,12	V
	Eua	1,	3,													
H	(C)	5	5	4	P	*Chondrilla juncea*	+	-	+	+	-	-	-	+	0,05	II
	E	2,			D,											
H	(M)	5	0	0	P	*Hieracium pilosella*	+	-	-	+	-	+	-	-	0,03	I
		1,														
Th	P - M	5	4	3	P	*Petrorhagia prolifera*	-	+	-	-	-	-	-	+	0,02	I
Th -	Eua		3,													
TH	(C)	2	5	0	D	*Berteroa incana*	-	+	-	-	+	-	-	-	0,02	I
TH -	E		3,													
H	(M)	2	5	0	D	*Anchusa officinalis*	-	+	+	-	-	-	-	-	0,02	I
	Eua	1,														
Th	(M)	5	3	4	D	*Trifolium arvense*	-	+	-	+	-	+	+	-	0,05	II
					D,											
H - G	Eua	2	3	4	P	*Euphorbia cyparissias*	-	+	-	-	-	-	-	+	0,02	I
Ch	Eua	0	3	3	P	*Sedum acre*	+	-	-	-	+	-	-	-	0,02	I
						FESTUCETALIA VALESIACAE										
TH -	Eua	1,														I
H	(C)	5	3	4	P	*Erysimum diffusum*	-	+	+	+	+	-	+	+	0,07	V
	Eua				D,											
H	(C)	2	4	4	P	*Festuca pseudovina*	+	+	-	-	+	-	+	-	0,05	II
	Eua	1,	3,													
Ch	(C)	5	5	4	D	*Thymus pannonicus*	-	+	-	-	-	+	-	-	0,02	I
H	Eua	4	3	4	P	*Carex distans*	-	+	+	-	-	-	-	-	0,02	I
						VARIAE-SYNTAXA										
		3,														
Th	Cosm	5	3	3	P	*Digitaria ischaemum*	+	-	-	-	+	-	-	+	0,02	I
		2,														
Th	Cosm	5	0	3	P	*Polygonum aviculare*	+	-	-	+	-	+	-	-	0,03	I
Th	Adv	2	0	0	P	*Ambrosia artemisiifolia*	+	+	+	-	+	+	-	+	0,07	II
		3,														
H	Eua	5	3	0	P	*Holchus lanatus*	+	-	-	-	+	-	-	-	0,02	I
H	Eua	0	0	0	D	*Plantago lanceolata*	-	+	-	+	-	-	-	-	0,02	I
		2,														
Th	Eua	5	4	4	P	*Descurainia sophia*	-	+	-	-	+	-	+	+	0,05	I
TH	Adv	2	4	0	D	*Oenothera biennis*	-	-	-	+	+	-	-	-	0,02	I
		2,	3,													
TH	Eua	5	5	4	P	*Verbascum phlomoides*	-	-	+	-	-	+	-	-	0,02	I
	Eua	2,														
Th	(C)	5	0	0	D	*Crepis tectorum*	+	-	-	+	-	-	-	+	0,03	II
																II
Th	Cosm	3	3	0	P	*Chenopodium album*	-	-	-	+	+	+	+	+	0,06	I
Th	Adv	2,	4	3	P	*Xanthium spinosum*	-	+	+	-	-	-	-	-	0,02	I

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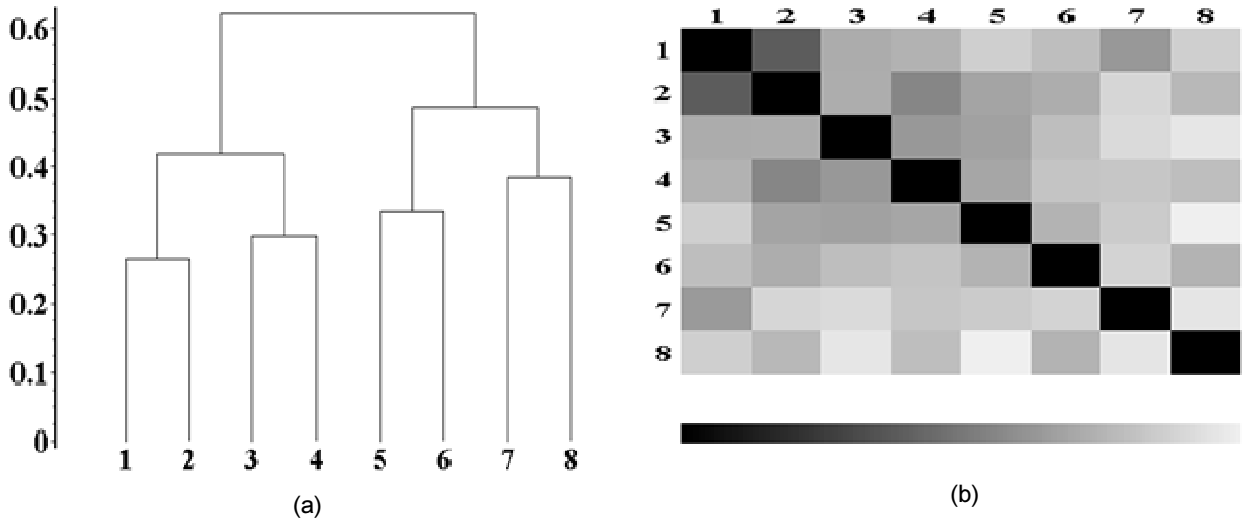
5
Spectrum of bioforms: H – 25% / H-G -2,47%/; G-H -2,77%; Th -47,22% / Th-TH – 5,55%/; TH – 13,88% / TH-H – 5,55%/; Ch – 5,55%.
Spectrum of geoelements: Eua – 61,11% / Eua(C) – 27,77%; Eua (M) – 5,55%/; E – 11,11% / E(C) – 2,77%; E(M) – 8,33%/; P-M – 2,77%; Adv – 11,11%; Cosm -11,11%.
Place and date of relevés: 1 - 8 Urziceni „Grădina Cailor", 10. VIII. 2007.

The soil is covered in a relatively low percentage. In the natural resorts, this association is usually followed on the succession scale by as. *Festuco vaginatae – Corynephoretum*, and on the lands mobilized through plough-lands, by different associations of weeds.

Table 5. Values of similarity index Sorensen in As. *Brometum tectorum*

1	1							
2	0,22727	1						
3	0,31818	0,32000	1					
4	0,32558	0,26666	0,29268	1				
5	0,36000	0,30769	0,30434	0,31111	1			
6	0,32653	0,31372	0,34042	0,34782	0,32653	1		
7	0,30769	0,38297	0,35555	0,33333	0,35555	0,35555	1	
8	0,36000	0,28125	0,38461	0,34042	0,39285	0,32653	0,38297	1
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**



(a) (b)

Fig. 12. (a) Dendrogramand (b) similarity matrix of As. *Brometum tectorum*

By analysing by comparison the 8 relevés of the association, we can see a higher similarity between relevés 1, 5, 8 (Figure 12).

Those phytocenoses aren't durable, ceding charge to other vegetal arenicolous associations. The first association (*Brometum tectorum*) of the dunes vegetation is succeded by as. *Festuco vaginatae – Corynephoretum,* on the semi-fixed sands. As a consequence, after a period of herbs increasing, apears the as. *Potentillo – Festucetum pseudovinae*, which can establish forest settlements, eventually, by the medium of shrubbery.

CONCLUSIONS

We analysed the diversity of the vegetal layer from the sands of North-Western Romania, by the comparative study of the composition of flora from the sand dunes from Urziceni, with the flora from the low interdune lands from Sanislău-Vermeş. For the establishment of the environmental conditions of these resorts, the environmental indices: humidity, temperature and soil reaction are important.

In the flora of dune coasts from Urziceni the xero-mesophyll species dominate (33,9)% and in Sanislău mesohydrophytes stand out (23,1%), along with hydrophytes (18,3%) andultrahydrophytes(15,0%).

As for the necessity of species towards temperature, on the sand dunes from Urziceni the percentage of mesotherm species is below 50%, while at Sanislău they reach 52,9%.

As for the necessity of plants towards soil reaction, we can point out the dominance of poorly acid-neutrophyll species and acid-neutrophyll species.

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