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NEW ASSOCIATIONS IN NIRULUI PLAIN

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ABSTRACT. The local factors of relief, microclimate and especially the pedological factors determined the appearance of many specific associations which are missing from the vegetation of geomorphological units adjacent to Nirului Plain. The vegetation of Nirului Plain, is made up of a series of primary and secondary associations. Some phytocenoses – of semifixed sands, of marsh and forest – which used to occupy large surfaces, are now present on limited spaces. Following the research into the vegetal layer of Nirului Plain, we identified a number of 53 associations of which 4 are new vegetal associations for the researched area: B*otriochloetum* (*Andropogonetum*) *ischaemi* Kristiansen 1937 Pop 1977, *Onopordion acanthii* Br. – Bl. *et* al. 1936, *Ambrosietum artemisiifoliae* Viţalariu 1973, *Calamagrostietum epigei* Juraszek 1928.

Keywords: ruderal plants, vegetation of sands, floristic elements, fallow grounds, phytocenoses, xero-mesophyll

INTRODUCTION

The flora and vegetation of Nirului Plain represented a theme of vast research for many botanists of our country. This territory which has horizons (layers) in sand and which at the same time has moors and marshes, shelters a very diversified flora resulted from the interactions of climate, edaphic and microrelief factors. Following the studies that we carried out we noticed that in this area there are floristic elements from very different geographical regions, against the background of domination of European elements, we encountered here Mediterranean species, Dacian-Balkan species, Pontic species, Pannonian species, Atlantic species, circumpolar species, cosmopolitan species, but also endemisms. Therefore, we can say that the study of vegetation of Nirului Plain offers the researchers surprising results. The associations of mesophyll and xero-mesophyll meadows, of moors and marshes, of ruderalized lands, respectively agricultural surfaces are well represented here. Our studies highlighted a large number of vegetal associations in the studied area, being the key to the special variety of vegetal layers. A part of vegetal associations turned out to be characteristic only to this territory.

MATERIALS AND METHODS

The study of the vegetal layer was carried out throughout the entire Nirului Plain. The research methods were based on criteria elaborated by J. Braun-Blanquet, taking also in consideration the particularities of Romania's vegetation. The identification of associations was carried out based on the floristic criterion (characteristic and loyal species), apart from which a special attention was given to self-evident, differential and dominant species. The results of relevés were processed by the methods of the Central-European phyto-sociological system Braun-Blanquet, by formulating conclusions regarding the dynamics of vegetation in this area.

RESULTS AND DISCUSSIONS

1.*Botriochloetum* (*Andropogonetum*) *ischaemi* Kristiansen 1937 Pop 1977

We identified for the first time in Nirului Plain the association *Botriochloetum* (*Andropogonetum*) *ischaemi* which populates degraded lands from the sunny slopes of Văşad (Bihor county).

Table 1

As. *Botriochloetum (Andropogonetum) ischaemi* (Krist. 37) I. Pop 68 (Văşad)

Biof	El. flor.	U.	T.	R.	Car	Number of relevé	1	2	3	4	5	ADm
						Analyzed surface (m^2)	16	25	20	20	20	
						Coverage of vegetation (%)	90	90	95	80	90	
						Exhibition	V	S-V	V	S	V	
						Inclination (degrees)	10	8	8	10	10	
						CHAR. ASS. *Dichanthium*						
H	Eua(M)	1,5	3	3	P	*ischaemum*	5	4	5	4	4/5	77,50
						FESTUCETALIA VALESIACAE						
Th-TH	Eua(C)	2	3,5	0	D	*Berteroa incana*	+	-	-	+	-	0,04
Th	Eua	3,5	0	2,5	D	*Apera spica-venti*	+	-	+	-	-	0,04

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						FESTUCO-BROMETEA						
H	Ec	2	3	3	P	*Achillea collina*	+	+	+	+	-	0,08
H	P	1	5	4	D,P	*Eryngium campestre*	+	+	-	+	-	0,06
G(H)	Cosm	2	3,5	0	D,P	*Cynodon dactylon*	+	-	+	-	+	0,06
H	Cp	0	0	0	P	*Agrostis capillaris*	+	-	-	-	-	0,02
Th	Eua	0	3	0	P	*Bromus mollis*	-	-	+	+	+	0,06
H	Ec	2,5	4	3	D,P	*Salvia nemorosa*	-	-	-	+	+	0,04
						MOLINIO-ARRHENATHEREA						
H	Eua	0	0	0	D	*Plantago lanceolata*	+	+	+	-	+	0,08
H	Eua(M)	3	0	4	D	*Dactylis glomerata*	+	-	-	+	-	0,04
Th-TH	Eua	2,5	3	4	D,P	*Medicago lupulina*	-	-	-	+	+	0,04
						VARIAESYNTAXA						
Th	Eua	3,5	3,5	4	P	*Xanthium strumarium*	+	+	-	-	+	0,06
H	Eua(M)	3	3	4,5	P	*Sambucus ebulus*	+	-	-	-	-	0,02
Th	Adv	2	0	0	P	*Ambrosia artemissifolia*	+	-	-	+	-	0,04
Th	Cosm	2,5	4	0	P	*Setaria pumila*	+	-	+	-	-	0,04
TH	E	2	3	4	D	*Carduus acanthoides*	+	+	-	-	+	0,06
TH	E	2,5	3,5	4	P	*Verbascum phlomoides*	+	-	-	-	-	0,02
Th-TH	Adv	2,5	0	0	D	*Conyza canadensis*	+	-	-	-	+	0,04
H(TH)	Eua	2,5	3,5	4,5	D	*Cichorium intybus*	-	+	-	+	-	0,04
Th	Ec-M	2,5	2,5	3	D	*Crepis capillaris*	-	+	-	-	-	0,02
Th-H	Cosm	3	3	4	D	*Verbena officinalis*	-	-	-	-	+	0,02
H	Eua(M)	3,5	3	4	D	*Lotus tenuis*	-	-	-	-	+	0,02

Spectrum of bioforms: H–43,42%/ H(TH)– 4,34%; Th –43,42% /Th-H -4,34%;Th-TH-13,04%; TH – 8,69%; G(H) – 4,34%

Spectrum of floristic elements: Eua – 47,82% / Eua(C) – 4,34%; Eua(M) – 17,39%; E – 8,69%; Ec– 13,04% / Ec-M – 4,34%/; P – 4,34%; Cp – 4,34%; Adv – 8,69%; Cosm – 13,04%

Place and date of relevés: Văşad, 3.IX.2008

Fig. 1 As. *Botriochloetum (Andropogonetum) ischaemi* - Văşad

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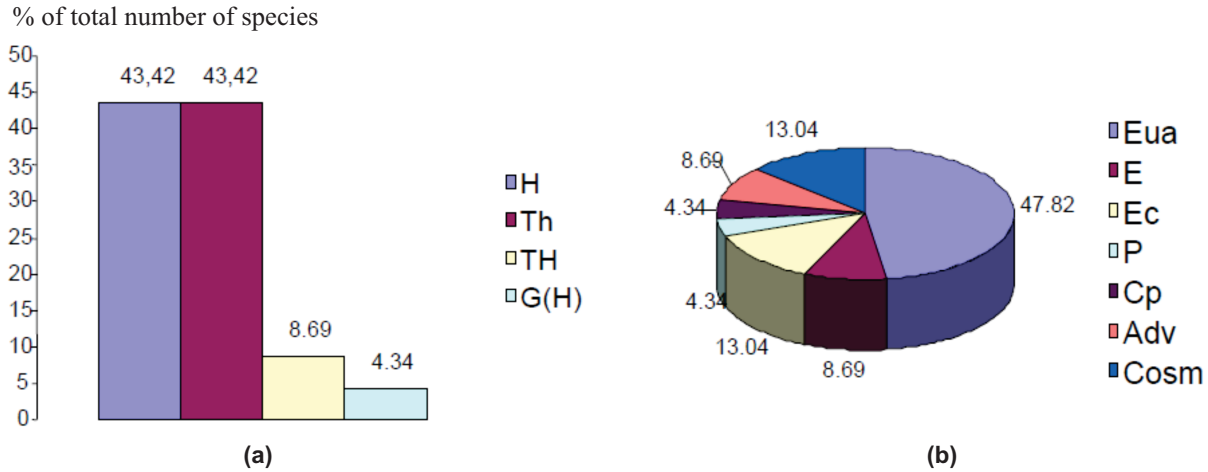

Fig. 2 Spectrum of bioforms (a) and of floristic elements (b) from *As. Botriochloetum (Andropogonetum) ischaemi*

In the spectrum of bioforms the highest percentages are represented by hemicryptophytes (43,42%) and therophytes (43,42%). The spectrum of floristic elements is dominated by Eurasiatic elements (47,82%) (Fig. 2).

Table 2

Ecological factors U, T, R, in *as. Botriochloetum (Andropogonetum) ischaemi*

	0	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6
U	13,04	4,34	4,34	21,73	30,43	13,04	13,04	-	-	-	-	-
T	21,73	-	-	-	4,34	34,78	17,39	8,69	-	4,34	-	-
R	34,78	-	-	-	4,34	17,39	-	30,43	8,69	-	-	-

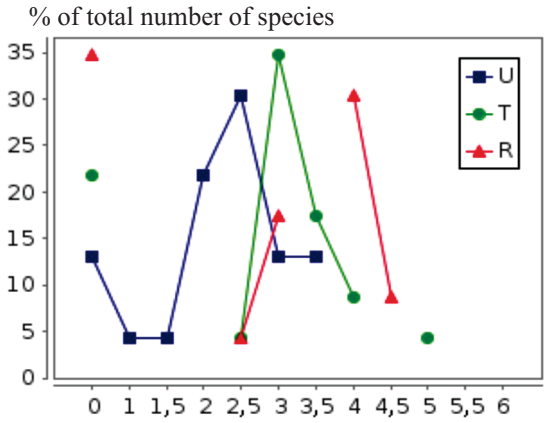

Fig. 3 Diagram of ecological indices in as. *Botriochloetum (Andropogonetum) ischaemi*

By analyzing the behaviour of species compared to the main ecological factors (U. T. R.), we can see that most of them are xero-mesophytes (30,43%), mesotherms (34,78%), respectively euriionic plants (34,78%) (Fig. 3).

2. *Onopordion acanthii* Br. – Bl. et al. 1936

We identified the *Onopordetum acanthii* association on a ruderalized derelict grassland, in Vãşad resort (Bihor county). This association was not reported in literature in Nirului Plain before. Phytocenoses from *Amarantho-Chenopodietum albi* association alternate, and then they are formed by treading and grazing. They prefer sunny places in which the dominant species *Onopordon acannthium* can grow up to 2 m high. Along with it, we can see the mass appearance of the species *Carduus acanthoides* (relevé 1-3).

Tabel 3

***As. Onopordetum acanthii* Br.- Bl. (23) 26**

Biof.	El. flor.	U.	T.	R.	Car	Number of relevé	1	2	3	4	5	ADm.
						Covered surface (m^2)	25	20	25	18	20	
						Coverage of vegetation (%)	85	80	85	80	75	
						CHAR. ASS.						
TH	Eua	2,5	4	4	D	*Onopordon acannthium*	4-5	4	4-5	5	4	77,5
						ONOPORDION ACANTHII						
TH	E	2	3	4	D	*Carduus acanthoides*	4-5	4	4-5	-	+	47,8
Th	Adv	2,5	3,5	4	P	*Xanthium spinosum*	-	+	+	-	-	0,04
						CHENOPODIETEA						
Th	Cosm	3	3	0	P	*Chenopodium album*	-	-	-	-	+	0,02
H	Ec-M	2	3,5	4	D	*Balota nigra*	+	+	+	-	-	0,06
H-G	Cosm	0	0	0	P	*Convolvulus arvensis*	-	-	-	+	+	0,04
Th	Cosm	4	0	3	P	*Echinochloa crus-galli*	-	-	-	+	+	0,04
						CHENOPODIO-SCLERANTHEA						
Th	Eua	3	4	4	D	*Artemisia annua*	+	+	+	-	-	0,06
G	Eua	0	0	0	P	*Agropyron repens*	+	+	+	-	+	0,08
Th	Ec-M	2,5	3,5	4	D	*Torilis arvensis*	+	+	+	+	-	0,08
Th	Cosm	2,5	4	0	P	*Setaria pumila*	+	+	+	-	+	0,08
Th-TH	Eua(C)	3,5	3	3	P	*Malva pusilla*	+	+	+	-	-	0,06
Th	Eua	2	4	4	D	*Consolida regalis*	-	-	-	-	+	0,02
Th	Adv	2	0	0	P	*Ambrosia artemissifolia*	+	+	+	+	+	0,10
Th	Eua	3,5	3,5	4	P	*Xanthium strumarium*	-	-	-	+	+	0,04
Th	Cosm	2,5	3	3		*Bilderdyckia convolvulus*	-	-	-	+	-	0,02
H-TH	M	2,5	3,5	4,5	D	*Cichorium intybus*	+	+	+	-	-	0,06
H(G)	Eua(M)	4,5	3	0	P	*Mentha longifolia*	-	-	-	+	+	0,04
						VARIAE-SYNTAXA						
H	Eua(M)	3	3	4,5	P	*Sambucus ebulus*	1	+	+	+	+	0,38
TH	E	2,5	3,5	4	P	*Verbascum phlomoides*	+	+	+	+	-	0,08
H-G	Cosm	3	3	4	D,P	*Urtica dioica*	+	+	+	-	-	0,06
TH	Adv	2	4	0	D	*Oenothera biennis*	+	+	+	-	-	0,06
Th-H	Eua(C)	2	3,5	0	D	*Berteroa incana*	-	-	-	+	-	0,02
H	P	1	5	4	D,P	*Eryngium campestre*	-	+	+	-	-	0,04
H	Ec	2	3	3	P	*Achillea collina*	-	-	-	-	+	0,02
Th-TH	Eua	1,5	3	4	D	*Picris hieracioides*	-	-	+	-	-	0,02
H	Eua	2	3	4	D,P	*Euphorbia cyparissias*	-	-	+	-	-	0,02

Spectrum of bioforms: H – 33,33% / H-TH – 5,55%; H-G – 5,55%/; Th – 38,88% / Th-TH – 11,11%/; TH – 16,66%; G – 5,55%

Spectrum of floristic elements: Eua – 38,88% / Eua(C) – 5,55%;Eua(M) -5,55%/;E-11,11%; Ec-M – 11,11%; P – 5,55%; M – 5,55%; Adv – 16,66%; Cosm – 11,11%

Place and date of relevés: Văşad, 3.IX.2008

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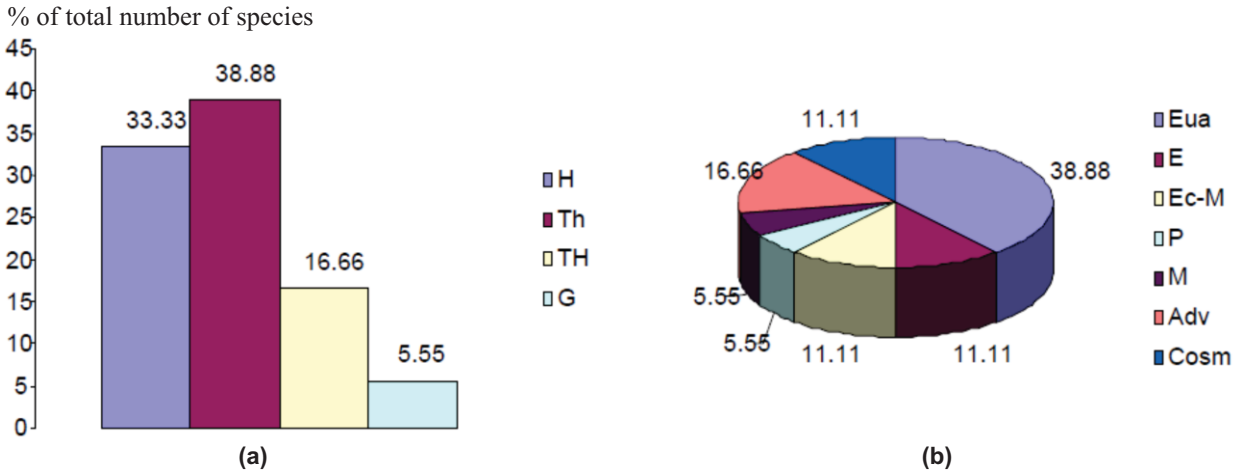

Fig. 4 Spectrum of bioforms (a) and of floristic elements (b) of *As. Onopordetum acanthii*

In the spectrum of bioforms (a) the highest percentages are represented by therophytes (38,88%) followed by hemicryptophytes (33,33%). The spectrum of floristic elements (b) is dominated by Eurasiatic elements (38,88%) (Fig. 4).

This association is widely spread in our country (Sanda and colab., 2008).

3.*Ambrosietum artemisiifoliae* Viţalariu 1973

It is a new association for the sands from Nirului Plain which we identified for the first time in the resorts: Urziceni, Foieni, Sanislău. *Ambrosia artemissifolia,* which was identified as new plant in the North-West of Romania three decades ago, has now invaded all the resorts from Nirului Plain. It is installed on free ecological niches, on culture lands, fallow grounds, on the edge of roads, having here and there an invading character.

Ambrosia artemsiifolia prefers clayish soils, dominates solitarily the analyzed phytocenoses, usually covering the whole soil. Among the species with high constance we can see: *Conyza canadensis, Iva xanthiifolia, Amaranthus albus, Daucus carota, Xanthium strumarium, Chenopodium album, Plantago lanceolata, Polygonum aviculare, Taraxacum officinale, Bromus sterilis.*

Fig. 5 *As. Ambrosietum artemisiifoliae* - Urziceni Grădina Cailor

Tabel 4

***As. Ambrosietum artemisiifoliae* Viţalariu 1973**

Biof.	El. flor.	U.	T.	R.	Car.	Number of relevé	1	2	3	4	5	ADm
						Analyzed surface (m^2)	25	20	30	25	20	
						Coverage of vegetation (%)	85	95	90	90	85	
						CHAR. ASS.						
Th	Adv	2	0	0	P	*Ambrosia artemissifolia*	5	4-5	4	4-5	5	82,5
						FESTUCETALIA VALESIACAE						
Th	P-Pan	1	3,5	0	P	*Plolygonum arenarium*	1	+	-	+	-	0,34
H	Eua(C)	2	4	4	D,P	*Festuca pseudovina*	+	+	-	-	-	0,04
Th	Eua(C)	2	3	2	D,P	*Gypsophylla muralis*	+	+	-	-	+	0,06
Th-H	Eua(C)	1,5	3	4	P	*Erysimum diffusum*	-	+	-	+	-	0,04
E	Eua(C)	2	4	4,5	P	*Festuca rupicola*	-	-	1	+	-	0,32
H	Eua(C)	1,5	3,5	4	P	*Chondrilla juncea*	+	+	+	-	+	0,08
H	Eua(M)	1	3,5	4	P	*Euphorbia seguieriana*	-	-	+	-	+	0,04
						CHENOPODIO-SCLERANTHEA						
Th	Cosm	3	0	0	D	*Portulaca oleracea*	1	+	-	+	+	0,36
Th	Cosm	3	3	0	P	*Chenopodium album*	+	+	-	-	+	0,06
Th	Eua(C)	3,5	3,5	4	P	*Xanthium strumarium*	+	+	-	-	+	0,06
TH	M	2,5	4	4	D	*Onopordon acanthium*	+	+	-	+	-	0,06
Th	Cosm	2,5	0	3	D	*Polygonum aviculare*	+	+	-	-	-	0,04
TH-H	E(M)	2	3,5	0	D	*Anchusa officinalis*	+	+	-	-	+	0,06
Th-TH	Eua(M)	3,5	2	3	D	*Silene alba*	+	+	-	+	-	0,06
Th	Eua	3,5	0	2,5	D	*Apera spica-venti*	-	+	+	+	-	0,06
Th	Ec-M	2,5	2,5	3	D	*Crepis capillaris*	-	-	+	-	-	0,02
Th-TH	Adv	2,5	0	0	D	*Conyza canadensis*	-	-	+	-	+	0,04
						FESTUCO-BROMETEA						
H	Eua	0	0	0	D	*Plantago lanceolata*	+	+	-	-	-	0,04
H	Eua	2,5	2,5	0	P	*Galium verum*	+	+	-	+	-	0,06
H	E	2	4	0	D	*Potentilla arenaria*	-	+	-	-	+	0,04
						VARIAE-SYNTAXA						
G(H)	Cosm	2	3,5	0	D,P	*Cynodon dactylon*	+	+	+	+	+	0,10
Th	Cosm	2,5	4	0	P	*Setaira pumila*	+	+	-	+	-	0,06
H	P	1	5	4	D,P	*Eryngium campestre*	+	+	+	-	+	0,08
H	P-Pan-Ba	2	4	4,5	D,P	*Centaurea arenaria*	+	+	+	+	-	0,08
Th	Eua	4,5	3	0	D	*Polygonum persicaria*	+	+	-	-	+	0,06
Th	E(C)	2	4	4	D	*Anthemis ruthenica*	+	+	-	-	+	0,06
Th	Cosm	1,5	0	4	P	*Digitaria sanguinalis*	+	+	-	-	-	0,04
H	Cp	2,5	3	3	D	*Solidago virgaurea*	-	-	1	+	-	0,32
Th	Adv	4	0	4	P	*Erigeron annuus ssp. annuus*	-	-	+	-	+	0,04
Th	Eua	2	3	4	P	*Filago minima*	-	-	+	-	-	0,02
TH	E	2,5	3,5	4	P	*Verbascum phlomoides*	-	-	+	+	-	0,04

Spectrum of bioforms: H – 31,25%; Th -50% / Th-H – 3,12%; Th-TH – 6,25%/; TH – 9,37% / TH- H – 3,12%/; G(H) – 3,12%

Spectrum of floristic elements: Eua- 40,62% / Eua(C) – 18,75%; Eua(M) – 3,12%/; E – 12,50% / E(C) – 3,12%; E(M) – 3,12%; M – 3,12%; P – 3,12%; Cp – 3,12%; P-Pan-Ba – 6,25% / P-Pan – 3,12%; Adv – 9,37%;Cosm – 18,75%

Place and date of relevés: Urziceni Grădina Cailor, 6.VIII.2008

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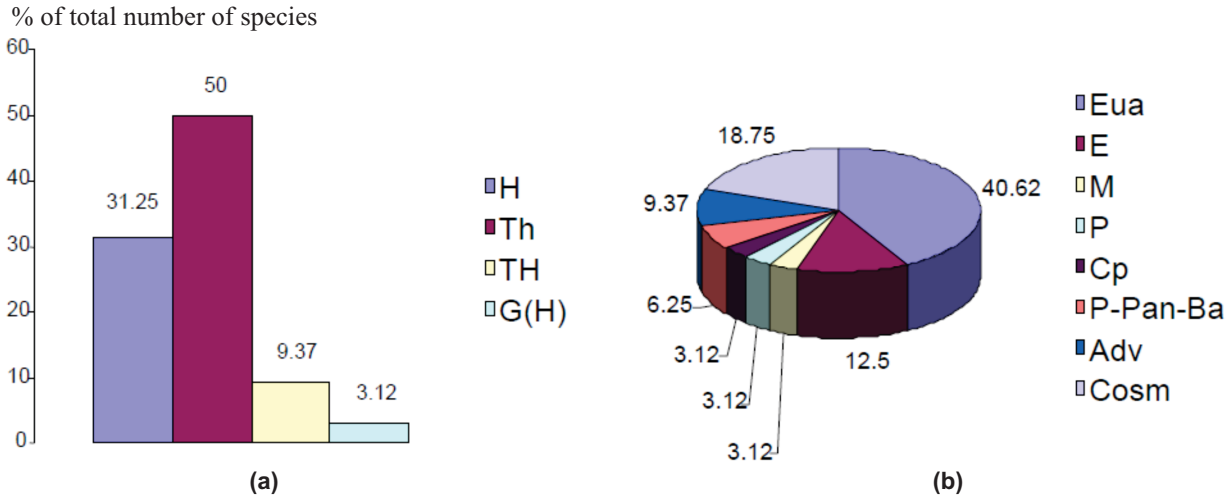

Fig. 6 Spectrum of bioforms (a) and of floristic elements (b) from *As. Ambrosietum artemisiifoliae*

The spectrum of bioforms is dominated by therophytes (50%). In the spectrum of floristic elements we can notice the Eurasiatic elements (40,62%) (Fig. 6)

Table 5

Ecological factors U, T, R, in *As Ambrosietum artemisifoliae*

	0	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6
U	3,22	9,67	9,67	32,25	25,80	6,45	9,67	-	3,22	-	-	-
T	25,80	-	-	3,22	6,45	19,35	22,58	22,58	-	3,22	-	-
R	38,70	-	-	3,22	3,22	9,67	-	38,70	3,22	-	-	-

From the point of view of the necessity of humidity, the scale of component species is quite vast, and the xero-mesophytes are represented with the highest percentage of all (32,25%). The same thing can be said following the analysis of species based on the thermal index, among which the best represented species is the amphytolerant group (25,80%) followed by thermophyll moderate mesotherms (22, 58%). As for the reaction of the soil, the euriionic plants and poorly acid-neutrophyll plants prosper there (38,70%) (Fig.. 7).

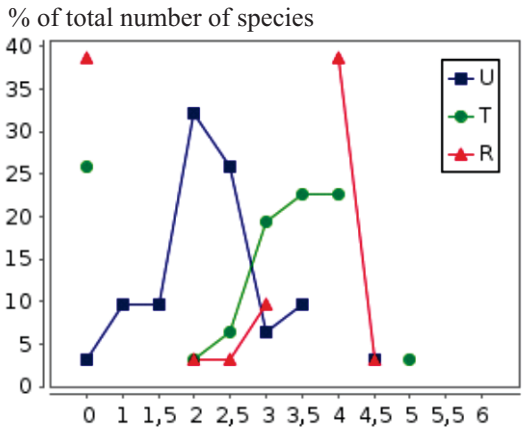

Fig. 7. Diagram of ecological indices of As. *Ambrosietum artemisiifoliae*

Ambrosia artemsiifolia, which is a dangerous weed, also causes acute allergy to pollen. The expansion of this species in the last decades is conspicuous. Based on a study carried out in Bihor county, it was classified among the dangerous quarantine weeds (Hodişan and Morar, 2008). Despite the fact that the as. *Ambrosietum artemisiifoliae* has not been so far a study subject in the North-West of Romania, it is widely spread here, occupying large surfaces in Nirului Plain.

4. *Calamagrostietum epigei* Juraszek 1928

We identified the association *Calamagrostietum epigei* Juraszek 1928, in the reservation from Foieni resort. It is a new association, in expansion, identified for the first time in Nirului Plain. The presence of elements belonging to *Cl.-sei Festuco-Brometea* shows the xeromesophyll character of the resort. Nowadays, this association is encountered at the edge of the forest of Foieni and Urziceni. The vegetation of these resorts will suffer changes in the years to come because the gramineum *Calamagrostis epigejos* is a high mesophyll which partially shadows the soil determining the disappearance of heliophyll species.

The small reed dominates an association rich in species (39), among which the ruderal plants represent a high percentage. We can also encounter here the plants characteristic to mesophyll meadows, but more numerous are the typical plants of grasslands belonging to the class Festuco-Brometea.

Fig. 8 As.Calamagrostietum epigei - Foieni

Table 6

As. Calamagrostietum epigei Juraszek 1928

Biof.	El. flor.	U.	T.	R.	Car	Number of relevé	1	2	3	4	5	Adm
						Analyzed surface (m^2)	25	18	20	20	25	
						Coverage of vegetation (%)	90	95	80	85	90	
						CHAR. ASS. *Calamagrostis*						
H(G)	Eua(M)	2	3	0	P	*epigejos*	4-5	5	5	4-5	4-5	87,5
						FESTUCETALIA VAGINATAE						
H	Ba-Pan	2	5	5	D	*Dianthus pontederae*	+	+	+	+	+	0,10
Ch	Eua	2	3,5	3	P	*Artemisia campestris*	-	-	2	2	-	6,00
Ch	E(M)	1,5	3,5	4	P	*Alyssum montanum ssp. gmelinii*	+	1	+	-	-	0,34
H	Eua(C)	1,5	3,5	4	P	*Chondrilla juncea*	+	+	+	+	+	0,10
H	Eua(C)	1,5	4	4,5	D	*Silene otites*	-	-	+	+	1	0,34
TH-H	Eua(C)	1,5	3	4	P	*Erysimum diffusum*	+	-	+	-	+	0,06
H	Eua	2	3	2	P	*Rumex tenuifolius*	-	+	+	+	-	0,06
TH-H	Eua(C)	1,5	4,5	4,5	D	*Kochia laniflora*	-	+	-	+	+	0,06
H	P-M	2	4	4,5	D	*Stachys recta*	+	+	-	-	-	0,04
H	Eua(M)	1	3,5	4	P	*Euphorbia seguieriana*	-	-	-	+	+	0,04
TH-H	Ec(M)	1,5	3	2	D	*Jasione montana*	-	-	-	-	+	0,02
						FESTUCETALIA VALESIACAE						
H	Eua(C)	2	4	4,5	P	*Festuca rupicola*	+	+	2	+	+	3,08
						Helianthemum						

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Ch-H	Ec-M	2,5	3	4	D	*nummullarium ssp. obscurum*	+	+	-	+	+	0,08
H	E	2	4	0	D	*Potentilla arenaria*	-	-	+	-	-	0,02
TH-H	Eua	2	3	4	D,P	*Verbascum chaixii* ssp. *austriacum*	+	+	-	+	-	0,06
						FESTUCO-BROMETEA						
H(G)	Cosm	2	3,5	0	D,P	*Cynodon dactylon*	-	-	+	+	+	0,06
H(G)	Eua	2	3	4	D,P	*Euphorbia cyparissias*	+	+	-	-	-	0,04
H(G)	Eua	2	3	4	D,P	*Phleum phleoides*	-	-	+	+	-	0,04
H(G)	Eua	2	4	2	D	*Potentilla argentea*	+	-	-	+	-	0,04
H(G)	Eua	2,5	3,5	3	D	*Crepis foetida ssp. rhoedifolia*	+	-	+	-	-	0,04
Ch	P-Pan	2	4	0	D,P	*Thymus glabrescens*	-	+	+	+	-	0,06
H(G)	P	1	5	4	D,P	*Eryngium campestre*	-	-	+	+	+	0,06
Ch	M-Ec	2	3,5	4	P	*Teucrium chamaedrys*	+	-	-	-	-	0,02
G	Eua(M)	1,5	4,5	3	D	*Asparagus officinalis*	-	+	-	-	-	0,02
H(G)	Eua(M)	1,5	3	3	P	*Dichanthium ischaemum*	-	-	-	-	+	0,02
						GERANION SANGUINEI						
H	E(M)	2	3	4	P	*Geranium sanguineum*	-	-	+	+	-	0,04
H	Ec(M)	2,5	3	0	D	*Peucedanum oreoselinum*	+	1	+	+	+	0,38
H	Eua	2,5	2,5	0	P	*Galium verum*	-	+	-	+	+	0,06
						VARIAESYNTAXA						
H	Eua(C)	2,5	4	4	P	*Bromus inermis*	-	-	+	-	-	0,02
Th	Cosm	2,5	4	0	P	*Setaria pumila*	+	+	+	-	-	0,06
Th-TH	Adv	2,5	0	0	D	*Conyza canadensis*	+	+	+	1	+	0,38
TH	Eua	3,5	2	3	D	*Silene alba*	-	-	+	-	-	0,02
Th-TH	Eua	3	2	3	D	*Tragopogon pratensis*	-	+	-	-	-	0,02
Th	Adv	3	3	0	P	*Chenopodium album*	+	-	-	-	-	0,02
Phn	Ec	2,5	3	0	P	*Lembotropis nigricans*	-	-	-	-	+	0,02
Phn	E	2	3	3	P	*Rosa canina*	-	-	+	-	-	0,02
Phm	Eua	2	3	3	P	*Prunus spinosa*	+	+	+	+	+	0,10
Phm	Eua	2,5	3	3	D	*Crataegus monogyna*	-	-	-	-	+	0,02

Spectrum of bioforms: H – 51,28%/ H(G)/ – 20,51%; Ch – 12,82%; Ch- H– 2,5%; G – 2,56%; Th – 10,25%; Th-TH – 2,5%; TH – 12,82%; Phm – 5,2%; Phn – 5,2%/

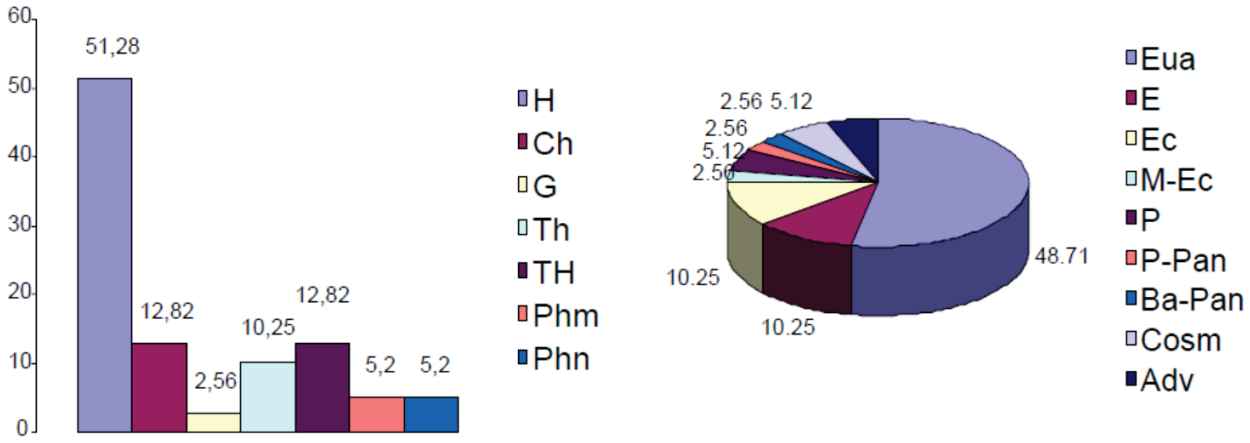
Spectrum of floristic elements: Eua – 48,71% / Eua(C) – 15,38%; Eua(M) – 15,38%/; E – 10,25%; E(M) – 7,7%; Ec – 10,25%/ Ec-M – 5,2%/; M-Ec – 2,56%; P – 5,12%; / P-M – 2,5%; P-Pan – 2,56%; Ba-Pan – 2,56%; Cosm – 5,12%; Adv – 5,12%

Place and date of relevés: Foieni – reservation, 28.VIII.2007

The spectrum of bioforms is dominated by hemicryptophytes (51,28). In the spectrum of floristic elements the highest percentages belong to eurasiatic elements (48,71%) (Fig. 9). According to the character of resorts populated by this association, the xero-mesophyll species are more numerous (41,02%), and as far as the need of light is concerned, the mesotherms are more numerous (38,46%). The chemical reaction of the soil highlights the poorly acid-neutrophyll species in the reference association (30,76%) (Fig. 10).

The phytocenoses dominated by Calamagrostis epigejos, have a high sustainability, because of thick rhizomes and long stolons which resist in the places where the vegetation was destroyed by fire, having a higher capacity of competition on the lands devastated by fire.

As. Calamagrostietum epigei in the North-West of the country was also reported in the head lands of Oaşului Mountains (Karácsonyi, 1995), and in the piedmonts of Codrului Peak a related association was analyzed called Rubo - Calamagrostietum epigei Coste 1975 (Marian, 2008).



(a) (b)

Fig. 9 Spectrum of bioforms (a) and of floristic elements (b) of As. Calamagrostietum epigei

Tabel 7

Ecological factors U, T, R, in As Calamagrostietum epigei

	0	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6
U	-	5,12	20,51	41,02	23,07	5,12	2,56	-	-	-	-	-
T	-	-	-	5,12	2,56	38,46	17,94	20,51	5,12	5,12	-	-
R	20,51	-	-	7,69	-	23,07	-	30,76	10,25	2,56	-	-

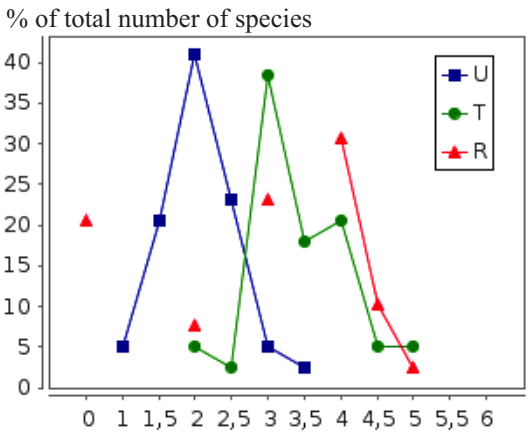


Fig. 10 Diagram of ecological indices in As. Calamagrostietum epigei

The phytocenoses dominated by Calamagrostis epigejos, have a high sustainability, because of thick rhizomes and long stolons which resist in the places where the vegetation was destroyed by fire, having a higher capacity of competition on the lands devastated by fire.

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CONCLUSIONS

Recent floristic research carried out on the continental sands from the North-West of the country highlighted changes in the composition of the vegetal layer. The limitation of surfaces of natural resorts and especially of semi-fixed dune lands has contributed to the numerical reduction of certain populations of plants. The vegetation of sand dunes was affected by the expansion of ruderal plants and weeds, which at local level have an invasive character. The increase of derelict surfaces over the last years negatively influences the persistence of rare species characteristic to the territory.

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