

## THE VEGETATION OF THE ZEICANI VALLEY (HUNEDOARA COUNTY) AND BISTRA VALLEY (CARAȘ-SEVERIN COUNTY), ROMANIA

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### Summary

**The Vegetation of the Zeicani Valley (Hunedoara County) and Bistra Valley (Caraș-Severin County), Romania**

During 2009-2010, the vegetation of Zeicani Valley (Hunedoara County) and Bistra Valley (Caraș-Severin County) was studied. 10 plant associations, many of them influenced by the anthropogenic factors, were identified. For each association ecological indices and the spectrum of Life forms (Bioforms) and Geoelements are highlighted. The author also points out the slow process of resettlement of woody vegetation on cleared lands.

**Key words:** Vegetation, Zeicani Valley, Bistra Valley, Romania

### Rezumat

**Vegetația Văii Zeicani (județul Hunedoara) și Văii Bistra (județul Caraș-Severin), România**

În perioada 2009-2010 a fost studiată vegetația Văilor Zeicani (județul Hunedoara) și Bistra (județul Caraș-Severin), România. Au fost identificate 10 asociații vegetale, multe dintre ele influențate de factorul antropic. Pentru fiecare asociație au fost evidențiați indicii ecologici și spectrele bioformelor și geoelementelor. Autorul evidențiază de asemenea procesul lent de reinstalare al vegetației pe locul terenurilor defrișate.

**Cuvinte cheie:** Vegetație, Valea Zeicani, Valea Bistra, România

## INTRODUCERE

The Village of Zeicani (Sarmizegetusa Commune, Hunedoara County) is situated in the south-western part of the Hațeg Depression, at the north-eastern foot of the Țarcu Mountains and at the contact with the south-eastern part of Poiana Ruscă Mountains. The studied area is also located near the Pass of "The Iron Gate of Transsilvania", at an altitude of 400 m. The river of Zeicani, a tributary of the Breazova River (The Basin of Strei River) crosses the natural habitats nearby Zeicani locality. The north-eastern part of Tarcu Mountains are crossed by the river of Bistra, a tributary of Timiș River.

Under the climate issue, the area is characterized by moderate climatic elements. The average of the annual temperature is 8-10°C. It is a region with relatively high moisture (70-80%) and annual precipitations of 600-750 mm.

The study of the vegetation of Zeicani locality and the north-eastern part of Țarcu Mountains was conducted between 2009-2010 and highlighted a number of plant associations with a floristic composition influenced by anthropical factor. A number of associations were installed during time, after deforestation. It was found that the resettlement process of the woody vegetation occurs very slowly.

**MOLINIO - ARRHENATHERETEA** R. Tx. 1937 (Syn. *Molinio-Juncetea* Br.-Bl. ex A. De Bólós y Vayreda 1950; *Agrostietea-stoloniferae* Görs 1968)

**MOLINIETALIA CAERULEAE** Koch 1926 (Syn. *Deschampsietalia* Horvatic 1958)

*Agrostion stoloniferae* Soó (1933) 1971

**Ass. *Ranunculo repenti* – *Alopecuretum repentis*** ELLMAUER ET MUCINA IN MUCINA et al. 1993 (Syn. *Alopecuretum pratensis* Regel 1925; *Alopecuretum pratensis* Steffen 1931)

The association *Ranunculo repenti*–*Alopecuretum pratensis* is frequent in Romania from the plain until the mountain belt. In the studied area the phytocoenoses of this association were reported from the wet soil and flat lands with an excess of the humidity, in the riverside of the Cracului and Lupului rills. The characteristic species of this association *Alopecurus pratensis* and *Ranunculus repens* occupy 60-80% of the surface. Many species characteristic for the alliance, order and class (cca 30%) participate in the floristic composition. From these species, *Agrostis stolonifera*, *Festuca pratensis*, *Poa pratensis* and *Trifolium repens* have a high frequency. In some phytocoenoses, species of *Potentillion* Alliance and *Potentillo-Polygonetalia* Order participate. From these, *Elymus repens* has a constant and higher abundance in this association.

*Plantago major* has a high frequency in the Alliance *Lolio-Plantaginion* and *Taraxacum officinale*, from the Alliance *Arrhenatherion*, is seen more often. In the floristic composition some species of *Puccinellio- Salicornietea* Class are frequently and emphasize the halophil character of the phytocoenosis. From these we mention *Juncus gerardii* and *Taraxacum bessarabicum*. In the studied phytocoenosis, the Class *Phragmiti-Magnocaricetea* is represented by only two species *Bolboschoenus maritimus* and *Carex vulpina*. The analysis of the floristic composition of the phytocoenosis emphasizes the lack or a low participation of

the weeds of the Classes *Bidentetea*, *Stellarietea* and *Artemisietea*. This is because the researched phytocoenoses with *Alopecurus pratensis* are subject to moderate anthropic influences, the most part of them being utilized as meadows. As an argument of the moderate anthropozoogen pressure we emphasize the low value of the altitudinal index – Ka=11%.

*The analysis of the ecological index.* The studied phytocoenosis with *Alopecurus pratensis* have a meso-hygrophilous character with a strong mesophilous shade, reflected by the high proportion of species which show these exigencies: meso-hygrophyte - 47.1%, mesophyte – 35.3%. Other plants communities have low values: xero-mesophyte and amphitolerant species – 8.8%. Related to the temperature, 47.1% of the species are amphitolerant species and 35.3% are micromesotherms. The moderate-thermophilous species represent 11.8% and those microthermes – 5.9%. The analysis of the soil reaction emphasizes the slightly acid-neutrophilous character (38.2% species) although the euryionic species are prevalent (44.1%) (Fig. 1).

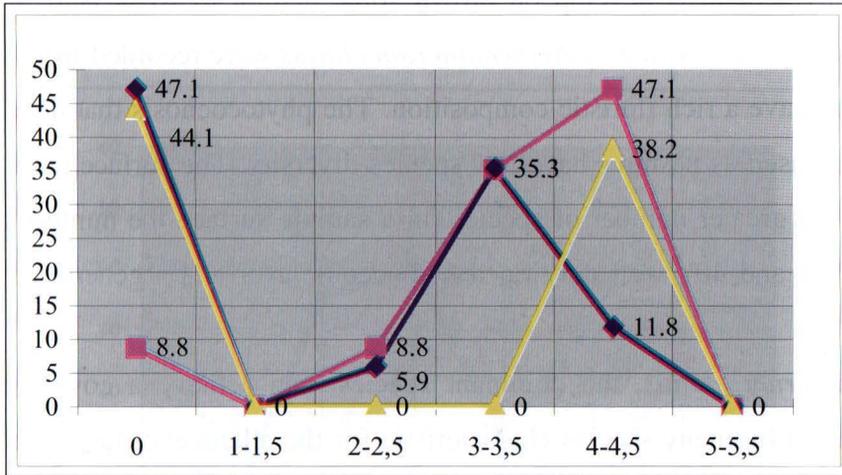


Fig. 1. The spectrum of the ecological index/Spectral indicilor ecologici

*The Bioform spectrum* is clearly dominated by the hemicryptophytes (79.4%), other categories being underrepresented in this association: geophytes - 11.8%, terophytes-8.8% (Fig. 2a).

*The spectrum of the goelements.* The Eurasian elements are dominant (73.5%), followed by Circumpolar species (14.7%), Cosmopolite (8.8%) and European species (2.9%) from all the species (Fig. 2 b).

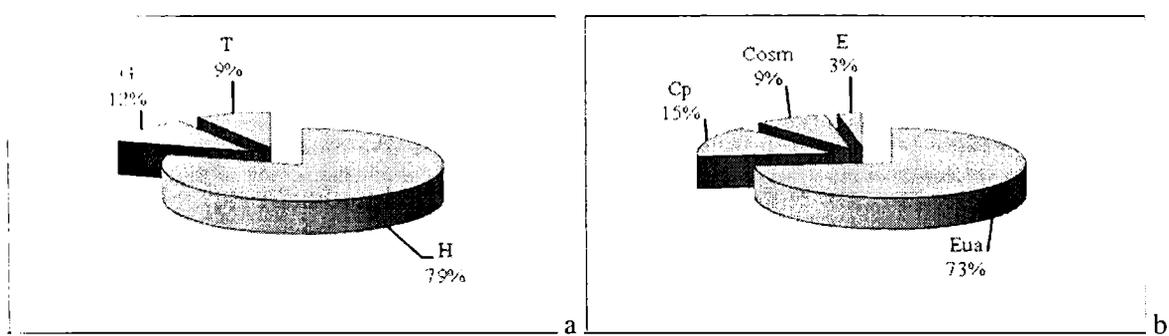


Fig. 2. The spectrum of the biophorms (a) and geoelements (b)/  
Spectrele bioformelor (a) și geoelementelor (b)

**ARRHENATHERETALIA** R. Tx. 1931 (Syn. *Arrhenatheretalia* Pawlowski 1928)

***Arrhenatherion*** KOCH 1926

**Ass. *Arrhenatheretum elatioris*** BR.-BL. EX SCHERRER 1925 (Syn. *Pastinaco-Arrhenateretum elatioris* Passarge 1964)

These phytocoenosis develop on brown soils, neutral to weak acid, wet and fertile soils. The phytocoenosis edified by *Arrhenatherum elatius* were recorded from all the studied river valleys and have a rich floristic composition. The phytocoenosis that develop near rural localities and are used as pastures have low species diversity. The surface used as hayfield is characterized by a greater number of species (in a sample surface the number of the species varies between 21 and 40), well developed herbaceous layer and a general coverage of 95-100%.

*Arrhenatherum elatius*, the dominant species, can achieve a coverage of 60-80%, being accompanied by many species characteristic for the alliance, order and class, that give to the meadows a mesophilous character. Of them, *Geranium pratense* and *Lotus corniculatus* are frequent species. The floristic composition reveals many characteristic species of other syntaxa of the class. Of *Alopecurion pratense* Alliance, *Agrostis stolonifera* is the frequent species. Of *Potentillo-Polygonetalia* Order, *Elymus repens* and *Potentilla reptans* are dominant species. Of *Lolio-Plantaginion* alliance, *Lolium perenne* is the frequent species.

The presence of the species characteristic for the *Puccinellio-Salicornietea* Class indicates the brackish degree of the soil. Of halophyte species *Juncus gerardii* has a high frequency. In some phytocoenosis, xero-mesophyte species of *Festuco-Brometea* Class or meso-hygrophyte and hygrophyte of *Phragmiti-Magnocaricetea* and *Bidentetea tripartiti* Classes are spreading. The presence in the floristic composition of many species of

*Artemisieta* and *Stellarieta* Classes emphasizes the anthropozoogen influence in these phytocoenosis.

*The analysis of the ecological index.* The analysis of the index of the humidity emphasizes the dominance of the mesophytes (39.4%), followed by xero-mesophytes (35.4%), meso-hygrophytes (12.1%) and euryhygrous elements (6.1%). Referring to the exigencies of species for the thermic factor, 55.6% represents micro-mesotherme elements and 25.3% are eurytherme elements. The moderate-thermophyte species represent 15.2% and microtherme elements only 3% from all the species. According to the soil reaction, the phytocoenosis have a slightly acid-neutrophil character (43.4%). 33.3% are euryionic species, 11.1% are neutro-basiphile and 10.1% are acido-neutrophile species (Fig. 3). The most species have not a preference for the soil nitrogen content. However, 13.4% prefer an average content of this element and 7.2% of the species prefer low soil nitrogen supply. In the floristic composition six nitrophyte species were reported that represent 6.2% of the total of the species.

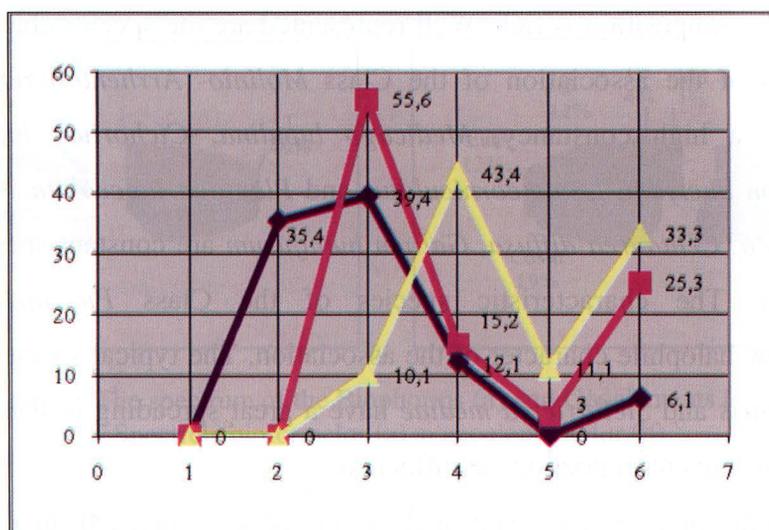


Fig. nr. 3. The spectrum of the ecological index/Spectral indicilor ecologici

*The Bioform Spectrum* (Life Form elements) is dominated by hemicryptophyte species (56.6%) and terophytes (31.3%). Geophytes are represented by 7.1%, chamaephytes – 3% and hydro-helophytes – 1% of all the species (fig. 4 a).

*The Spectrum of the Geoelements.* The phytocoenosis of the association are dominated by Eurasian species (59.6%), followed by Cosmopolite (16.2%), European (10.1%), Circumpolar (5.1%), Pontic (5.1%) and Mediterranean elements (2%) (Fig. 4b).

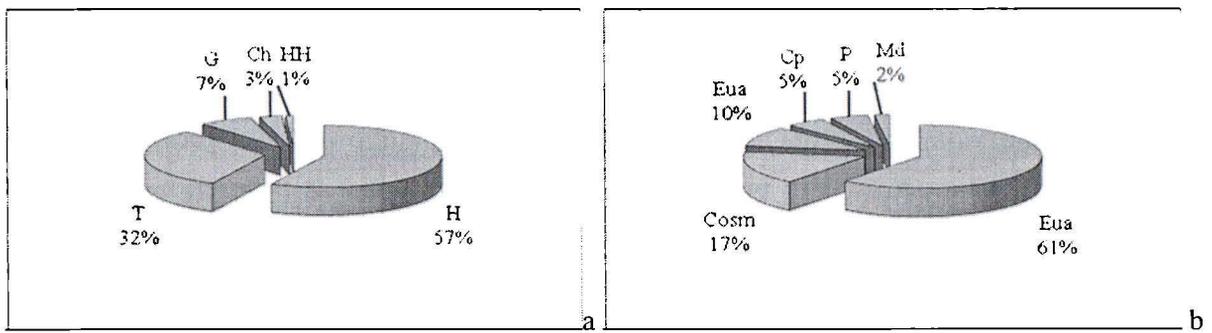


Fig. 4. The Spectrum of the Bioforms (a) and Geoelements (b)/  
Spectrele bioformelor (a) și geoelementelor (b)

*Cynosurion* R. Tx. 1947

**As. *Trifolio repenti* - *Lolietum*** KRIPPELOVA 1967 RESMERIȚĂ ET POP 1967 (Syn. *Lolio* – *Trifolietum repentis* Resmeriță. et al. 1967; *Lolietum perennis* and *Trifolietum repentis* Răvăruț et al. 1956)

The phytocoenosis of *Lolium perenne* are spread on flat lands and have a good fodder value. The floristic composition is rich. Well represented are the species characteristic for the superior cenotaxa of the association of the Class *Molinio- Arrhenatheretea*. Of these, it distinguished, by a high constancy, *Medicago lupulina*, *Cichorium intybus*, *Hordeum murinum*, *Cynodon dactylon*, *Lotus corniculatus* and *Plantago lanceolata*. *Achillea setacea*, *Artemisia austriaca*, *Centaurea diffusa*, *Galium humifusum* are constant species of the Class *Festuco-Brometea*. The characteristic species of the Class *Puccinellio-Salicornietea* emphasize the low halophile character of the association. The typical species for the Classes *Artemisietea vulgaris* and *Stellarietea mediae* have a great spreading in these phytocoenosis and emphasize a strong anthropozoogene influence.

**Analiza indicilor ecologici.** The analysis of the exigencies from the soil humidity emphasizes the dominance of the xero-mesophyte species (44%) followed by mesophyte species (25.3%). Meso-hygrophyte species represent 9.3%, xerophytes (8%) and amphitolerantes (5.3%). Concerning the temperature, the most species are micro-mesothermes (42.7%). The euritherme species represent 29.3% and moderately-thermophyte species – 21.3%.

On soil chemical reaction, while the most species are euryionics (37.3%), the low-neutrophile character is due to the species with this kind of exigencies and represent 33.3%. The acid-neutrophile represent 12% and those neutro-basiphile – 8% (Fig. 5).

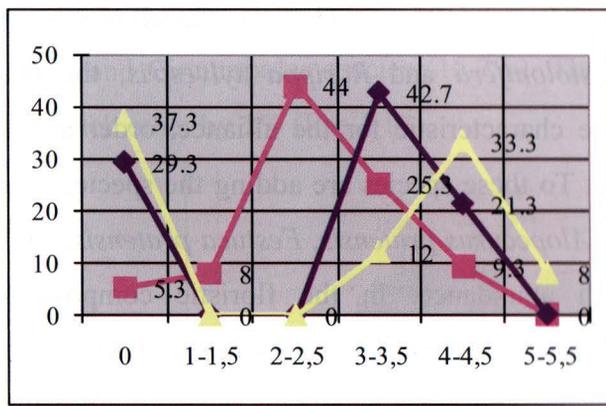


Fig. 5. The spectrum of the ecological index/Spectrul indicilor ecologici

The *Biophorm Spectrum* is dominated by therophyte species (44%) and hemicryptophyte species (41.3%). The geophytes represent 5.3% and the chamaephytes – 4% (Fig. 6a).

The *Spectrum of the Geoelements* shows the prevalence of the Eurasian species (48%) followed by Cosmopolite species (17.3%). European and Pontic species have equal share (each 10%), Circumpolar species – 4% and Mediterranean species - 1.3% (Fig. 6 b).

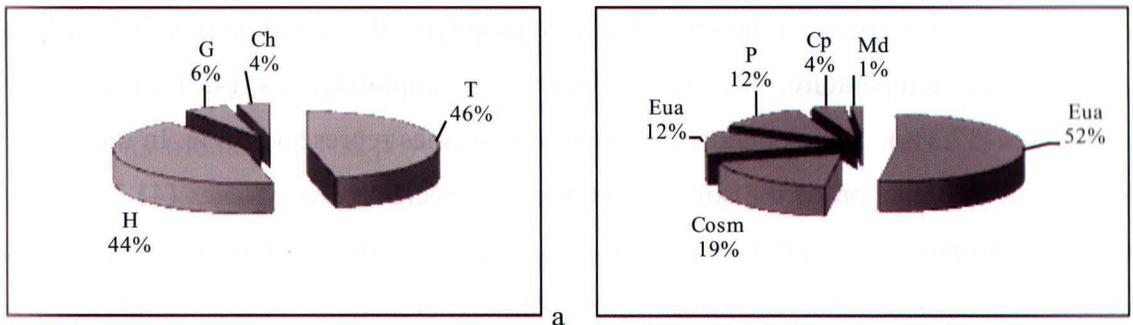


Fig. 6. The spectrum of the Biophorms (a) and Geoelements (b)/  
Spectrele bioformelor (a) și geoelementelor (b)

**POTENTILLO – POLYGONETALIA** R. Tx. 1947 (Syn. *Agrostietalia stoloniferae* Oberd. in Oberd. 1967)

*Potentillion anserinae* R. TX. 1947 (Syn. *Agrostion stoloniferae* Görs in Oberd. et al. 1967; *Agropyro-Rumicion crispis* Nordhagen 1940; *Agrostion stoloniferae* Soó 1971)

**Ass. *Agrostietum stoloniferae*** BURDUJA et al. 1956 (Syn. *Rorippo - Agrostietum stoloniferae* (Moor 1958) Oberd. et T. Müller in T. Müller 1961; *Rumici - Agrostietum stoloniferae* Moor 1958)

The Association *Agrostietum stoloniferae* is one of the most spread associations of the riverside, being found along rivers. In the studied area the most representative areas with *Agrostis stolonifera* were identified in the Upper of Bistra River and in the middle part of the

Florosu, Cracului and Lupului Rivers. They are developing on flat land with an abundant humidity. *Agrostis stolonifera* and *Rorippa sylvestris*, the characteristic species of the association and those characteristic for the alliance, order and class represent 25% of the floristic composition. To these species are adding the species characteristic for other sintaxa of the class such as *Alopecurus pratensis*, *Festuca pratensis*, *Arrhenatherum elatius*, *Lolium perene* with a high abundance. In the floristic composition the Class *Puccinellio-Salicornietea*, *Juncus gerardii*, *Trifolium fragiferum* and *Taraxacum besarabicum* have a high frequency. These species and other halophyte species with a low constance emphasize the strong halophil character of some phytocoenosis of the association. The characteristic species of the association are also accompanied by hygrophile species of the *Phragmiti-Magnocaricetea* Class. The most frequent species are *Bolboschoenus maritimus* and *Phragmites australis*. Under the anthropic influence, some phytocoenosis are penetrated by weeds from the classes *Artemisietea*, *Stellarietea* and *Bidentetea*.

*The analysis of the ecological index.* The ecological conditions mark a meso-hygrophilous character (42%) of the phytocoenosis with a strong mesophilous shade (25.5%). The xero-mesophyte species represent 15.3%, hygrophytes 9.8% and amphotolerantes 7.4%. Concerning the temperature, the most species are amphotolerants (45.1%) and micro-mesothermes (37.3%). The moderate-thermophilous species represent 13.7%. In terms of the exigencies to the reaction of the soil, although most species are euryionics (41.2%), yet the low acid-neutrophil character is printed by the species with this kind of exigencies and represent 37.3%. The other categories have insignificant values: neutro-basiphile -11.8%, acid-neutrophile -5.9%, acidophile - 2% (Fig. 7).

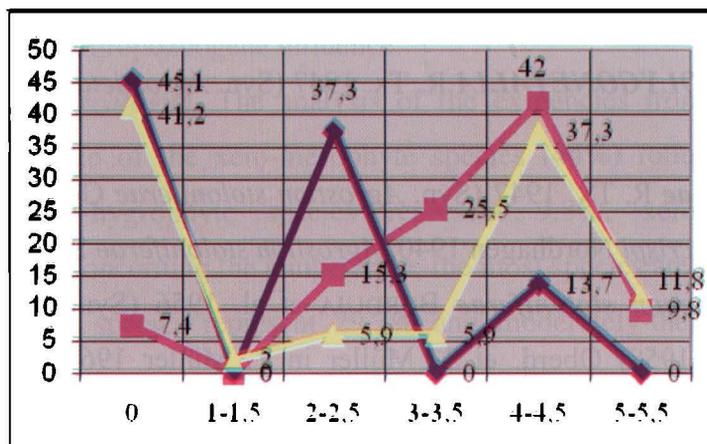


Fig. 7. The spectrum of the ecological index/Spectrul indicilor ecologici

*The Spectrum of the Bioforms* is dominated by hemicryptophytes (58.8%) followed by terophytes (19.6%) and geophytes (13.7%). (Fig. 8a).

The Floristic Spectrum shows the prevalence of the Eurasian species (58.8%) followed by Cosmopolite species (21.6%) and Circumpolar species (15.7%). The Mediterranean and pontic elements are represented each other by 2% (Fig. 8 b).

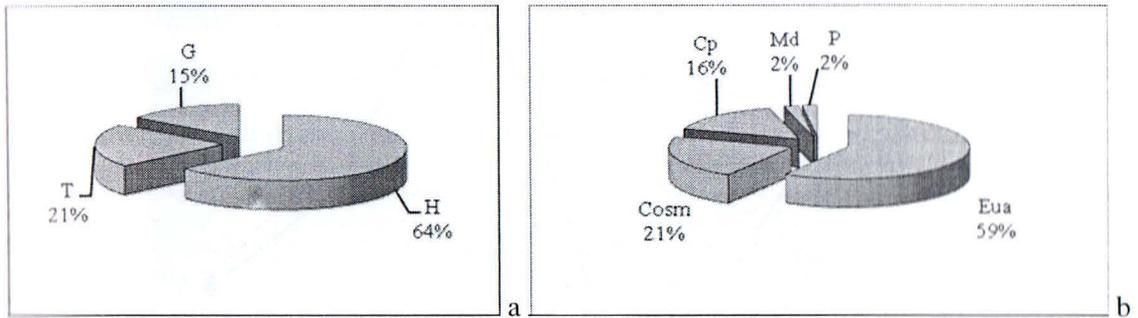


Fig. 8. The Spectrum of the Bioforms (a) and Geoelements (b)  
/Spectrele bioformelor (a) și geoelementelor (b)

***Ass. Rorippo austriacae – Agropyretum repentis* (Timar 1947) R. Tx. 1950**

*Elymus repens* (*Agropyron repens*) is a Circumpolar species with a large geographical spreading. The existence of these pastures is due to the flood regime of the riversides. They especially develop on the places with alluvial depositories. In the arid areas, the pastures dominated by *Elymus repens* also have halophyte species that make the transition to the salty pastures. Many pastures, dominated by *Elymus repens*, are spread in the riverside of Bistra Valley and its tributaries. The phytocoenosis are edified by *Elymus repens*. The vegetation cover varies between 80-100%. The species characteristic for the alliance, for the order and for the class are accompanied by some species of *Stellarietea mediae* and *Artemisietea* Classes, species that penetrated these phytocoenosis after an intense grazing.

*The analysis of the ecological index.* The analysis of the humidity index shows the prevalence, in almost equal proportions, of the xero-mesophytes (34.4%) and mesophytes (32.8%), followed by meso-hygrophytes (21.3%), xerophytes (1.6%), hygrophytes (1.6%) and amphitolerantes (4.9%). In terms of temperature, 54.1% of the species are micro-mesothermes, 29.5% are eurythermes and 14.8% are moderate-thermophytes. After the index of the soil reaction, we realize that the phytocoenosis are dominated by the weak acid-neutrophile species (44.3%) and euryionic species (34.4%). The acid-neutrophile species represent 9.9% and neutro-basiphile 8.2% from all the species (Fig. 9).

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*The analysis of the ecological index.* The ecological conditions mark a meso-hygrophilous character (42%) of the phytocoenosis with a strong mesophilous shade (25.5%). The xero-mesophyte species represent 15.3%, hygrophytes 9.8% and amphotolerantes 7.4%. Concerning the temperature, the most species are amphotolerants (45.1%) and micro-mesothermes (37.3%). The moderate-thermophilous species represent 13.7%. In terms of the exigencies to the reaction of the soil, although most species are euryionics (41.2%), yet the low acid-neutrophil character is printed by the species with this kind of exigencies and represent 37.3%. The other categories have insignificant values: neutro-basiphile -11.8%, acid-neutrophile -5.9%, acidophile - 2% (Fig. 7).

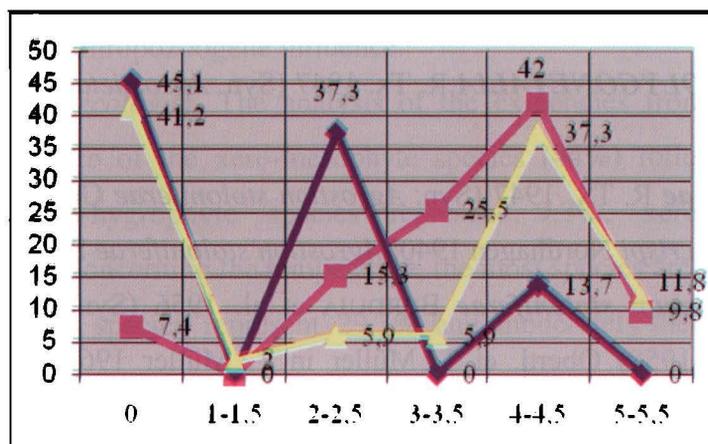


Fig. 7. The spectrum of the ecological index/Spectrul indicilor ecologici

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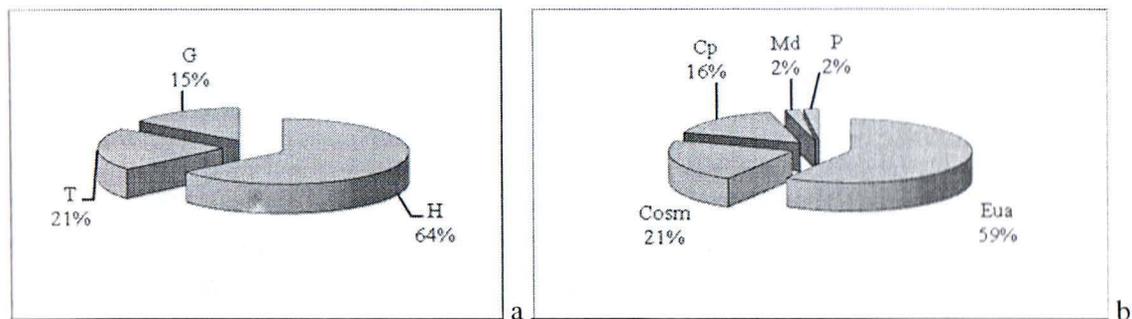


Fig. 8. The Spectrum of the Bioforms (a) and Geoelements (b)  
/Spectrele bioformelor (a) și geoelementelor (b)

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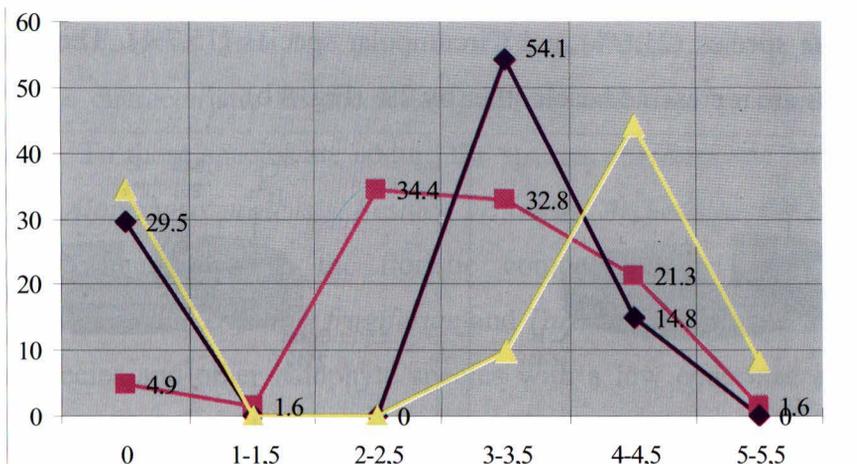


Fig. 9. The Spectrum of the ecological index/Spectrul indicilor ecologici

Depending on soil trophicity, the most species are eutrophes (46%) and mesotrophes (31%). *Elymus repens* is accompanied by many halophytes (24.6%) of which a high abundance have *Juncus gerardii*, *Puccinelia limosa*, *Alopecurus pratense* and *Bolboschoenus maritimus*.

*The Spectrum of the Bioforms.* The analysed phytocoenosis are dominated by hemicryptophytes (52.5%) followed by therophytes (32.8%), geophytes (13.1%) and hydrohelophytes (1.6%) (Fig. 10 a).

*In the Spectrum of the Geoelements,* Eurasian species are dominant (60.7%), followed by Cosmopolite species (14.8%), European (9.8%), Circumpolar (6.6%), Pontic (4.9%) and Mediterranean species (4.9%) (Fig. 10 b).

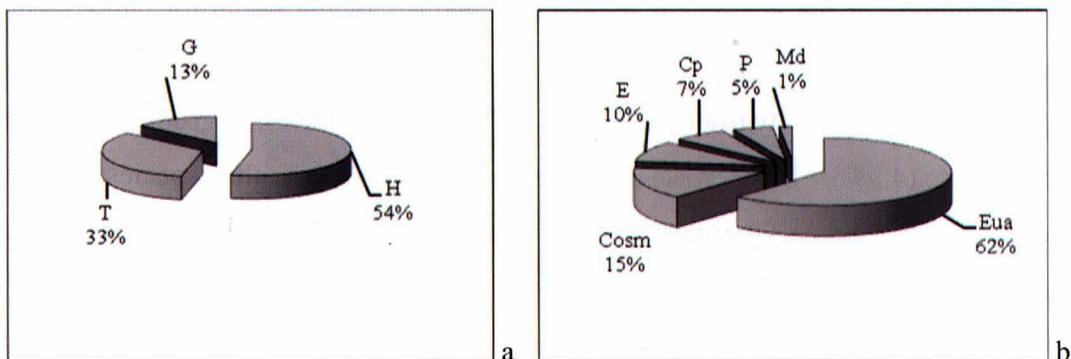


Fig. 10. The Spectrum of the Bioforms (a) and Geoelements (b)/  
Spectrele bioformelor (a) și geoelementelor (b)

**FESTUCO - BROMETEA** Br.-Bl. et R. Tx. in Br.-Bl. 1949 (Syn. *Festuco-Brometea* Br.-Bl. et R. Tx. 1943; *Festuco-Brometea* Br.-Bl. et R. Tx. ex Klika et Hadac 1947)

*Festucion valesiaca* KLIKA 1931 (Syn. *Festucion rupicolae* Soó (1940) 1964; *Festucion sulcatae* Soó (1929)1940)

**Ass. *Artemisio austriacae* – *Poëtum bulbosae*** I. POP 1970

The association *Artemisio austriacae*–*Poëtum bulbosae* is a secondary association and is developing in many ecological sites. In the studied area, the phytocoenosis of this association were identified on flat lands or low pitched. The floristic composition of the association includes species belonging to the order *Festucetalia valesiaca* and to the Class *Festuco-Brometea* but also characteristic species of other classes of vegetation: *Molinio-Arrhenatheretea* (25%), *Stellarietea mediae* (13%), *Puccinellio-Salicornietea* (6%). The accompanying species, *Lolium perenne* and *Plantago lanceolata* have a high frequency.

*The analysis of the ecological index.* The phytocoenosis of this association has a xero-mesophilous character determined by xero-mesophile species (47.8% of the total of species). The mesophyte species have a share of 32.6%. The xerophyte, meso-hygrophyte and amphitolerante species have an equal proportion (6.5%). Related to the temperature factor, the species micro-mezothermes are dominants (50%). The moderate-thermophile plants and eurytherme plants have close values: 26.1% and 23.9%. Related to the index of the reaction of the soil and the degree of the nutrient supply we found that these phytocoenosis are developing on weak acid-neutrophile (44.5%) with a high trophicity (eutrophes -50%) (Fig. 11). The presence in the floristic composition of the halophyte species (15.2%) shows the salty character of the soil.

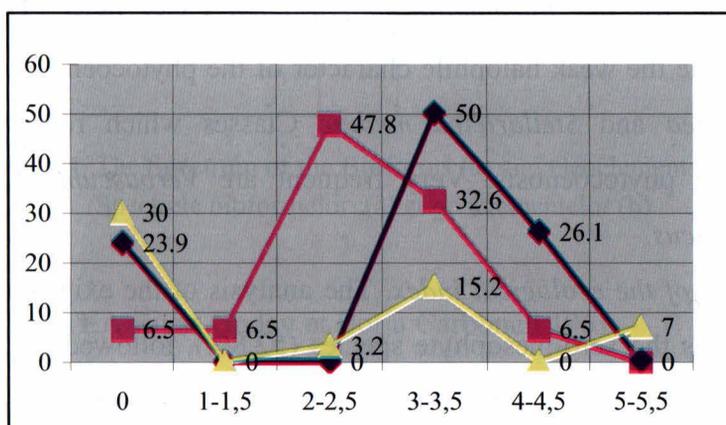


Fig. 11. The Spectrum of the ecological index/  
Spectral indicilor ecologici

In the *Spectrum of Bioformes*, the most numerous are hemicryptophytes (50%) and therophytes (37%), followed by geophytes (10.9%) and chamaephytes (2.2%) (Fig. 12 a).

The Spectrum of the geoelements is dominated by the Eurasian species (60.9%). Other floristic elements are represented by a lower share: European – 13%, Pontic – 8.7%, Cosmopolite species – 8.7% and Circumpolar species – 4.3% (fig. 12 a).

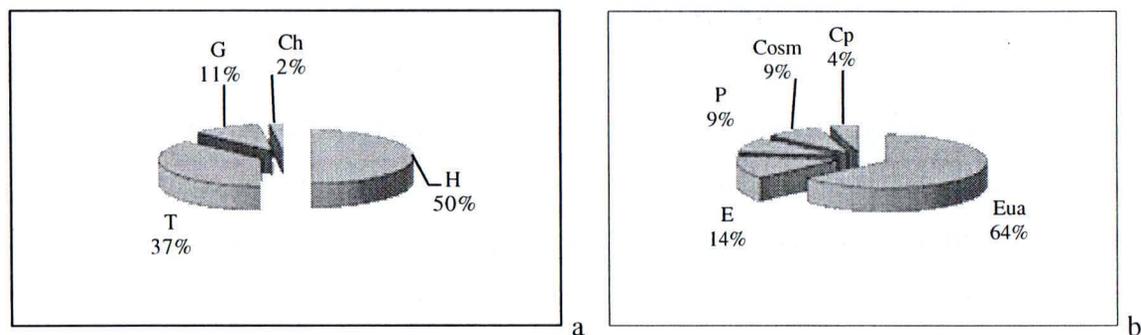


Fig.12. The Spectrum of the Bioforms (a) and Geoelements (b)/  
Spectrele bioformelor (a) și geoelementelor (b)

### Ass. *Cynodonti – Poëtum angustifoliae* RAPAICS EX SOÓ 1957

The phytocoenosis dominated by *Cynodon dactylon* are spread on dry and sunny flat lands, on alluvial soils, sometimes weak salinized. It is a secondary association with a heterogeneous floristic composition. With *Cynodon dactylon* and *Poa angustifolia*, characteristic for this association, some species characteristic for the alliance, order and class are developing. Of them, *Galium humifusum*, *Centaurea diffusa*, *Artemisia austriaca* and *Achillea setacea* have a high constancy. *Lolium perenne*, *Plantago lanceolata*, *Cichorium intybus*, *Lotus corniculatus*, *Medicago lupulina*, *Trifolium repens* from *Molinio-Arrhenatheretea* Class also have a significant constancy. In the floristic composition some species characteristic for the *Puccinellio-Salicornietea* Class exist. They have a small constancy and exprime the weak halophile character of the phytocoenosis. Numerous are the weeds of *Artemisietea* and *Stellarietea mediae* Classes which represents an index of degradation of these phytocoenosis. Very frequent are *Verbascum phlomoides*, *Bromus arvensis* and *B. japonicus*.

*The Spectrum of the ecological index.* The analysis of the exigencies to the humidity of the soil emphasizes the xero-mesophyte species (52.8%), followed by mesophyte species (22.6%). Other categories have smaller shares: xerophyte and meso-hygrophite (9.4% each other), euryhydre – 5.7%. Related to the temperature factor, in these phytocoenosis the micro-mesotherme species are dominant (54.7%) followed by eurytherme species (24.5%) and moderate-thermophilous species (18.9%). Regarding the index of the reaction of the soil, the species weak acid-neutrophile and euryionic species have equal share (39.6%). The acid-

neutrophile species have 11.3%; Neuro-basiphile species represent 9.4% from all the species (fig. 13).

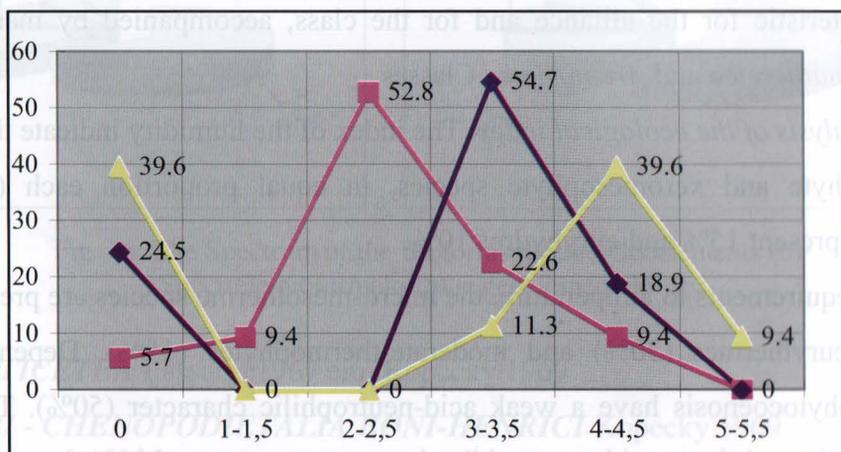


Fig. 13. The Spectrum of the ecological index/Spectrul indicilor ecologici

*The spectrum of Bioforms:* Hemicryptophyte species are dominant (52.8%), followed by therophyte (35.8%). Other bioforms have small shares (Fig. 14 a).

*The analysis of the Floristic spectrum (geoelements)* emphasises the dominance of the Euroasian species (45.3%) followed by Cosmopolite (18.9%), Pontic (13.2%), European (11.3%) and Circumpolar species (7.5%) (Fig. 14 b).

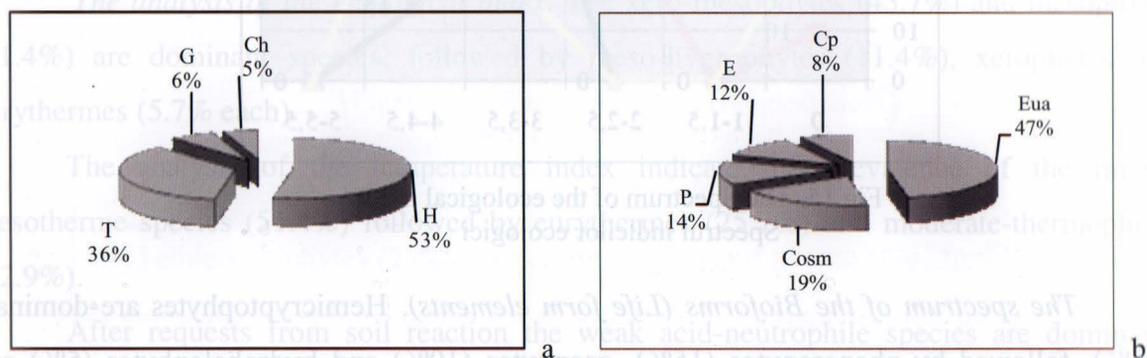


Fig. 14. The Spectrum of the Bioforms (a) and Geoelements (b)  
/Spectrele bioformelor (a) și geoelementelor (b)

### **RHAMNO – PRUNETEA** Rivas Goday et Borja Carbonell 1961

(Syn.: Crataego – Prunetea R. Tx. 1942; Sambuco-Prunetea Jurko 1964; Sambucetea Doing 1962; Prunetea spinosae Radke 1980)

### **PRUNETALIA SPINOSAE** R. Tx. 1952

### **Prunion spinosae** Soó 1951

**Ass. Pruno spinosae – Crataegetum** (Soó 1927) HUECK 1931

The phytocoenosis of this association were identified at the edge of the forest placed at the Cracului and Lupului Rivers, in deforested places. In the floristic composition enter species characteristic for the alliance and for the class, accompanied by many species of *Molinio-Arrhenatheretea* and *Artemisietea* Classes.

*The analysis of the ecological index.* The index of the humidity indicate the dominance of the mesophyte and xeromesophyte species, in equal proportion each (35%) Mesohygrophytes represent 15% and euryhydres 10%.

After requirements to temperature, the micro-mesotherme species are prevalent (55%), followed by eurythermes (30%) and moderate-thermophytes (15%). Depending on soil reaction, the phytocoenosis have a weak acid-neutrophilic character (50%). The Euryionic species have 30% and those acid-neutrophiles have a percentage of 20% from all the species (Fig. 15).

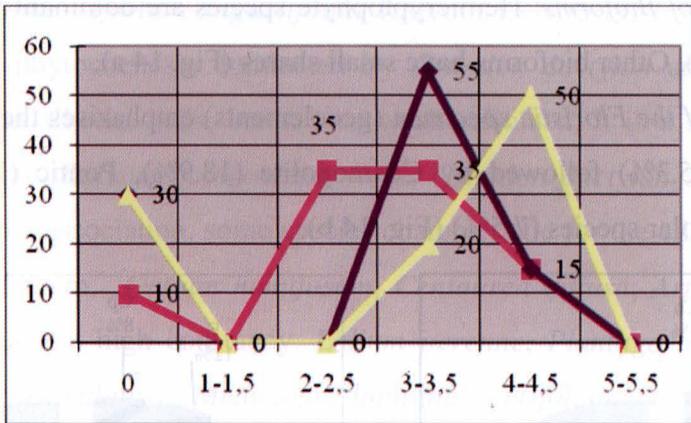


Fig.15. The Spectrum of the ecological index/  
Spectrul indicilor ecologici

*The spectrum of the Bioforms (Life form elements).* Hemicryptophytes are dominant (65%), followed by phaneropytes (15%), geophytes (10%) and hydrohelophytes (5%) and therophytes /5%) (Fig. 16 a).

*The Floristic elements.* In the floristic composition of the phytocoenosis, Euroasian species are dominant (60%), followed by Cosmopolites (15%), European species (10%), Pontic species (10%) and Circumpolar species (5%) (fig.16 b).

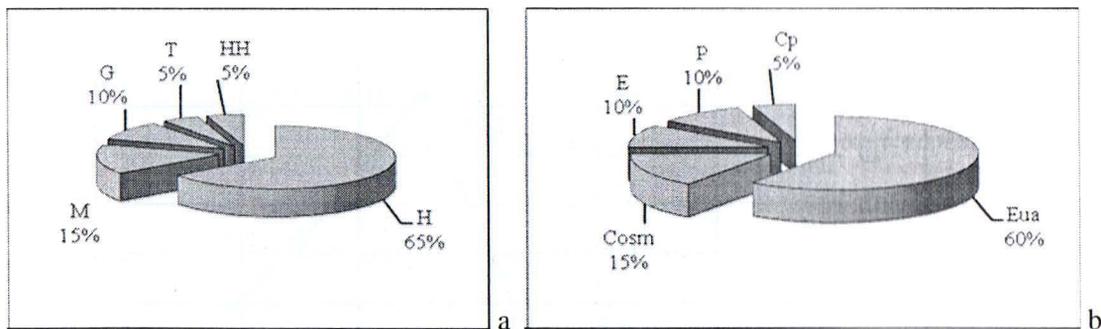


Fig. 16. The Spectrum of the Bioforms (a) and Geoelements (b)/  
 Spectrele bioformelor(a) și geoelementelor (b)

***GALIO - URTICETEA*** Passarge 1967 em. Kopecky 1969

***LAMIO ALBI - CHENOPODIETALIA BONI-HENRICI*** Kopecky 1969

***Galio-Alliarion*** LOHMEYER ET OBERD. 1967 in Oberd. et al. 1967

***Ass. Sambucetum ebuli*** FELFÖLDY 1942

The phytocoenosis of this association were identified as clusters, at the edge of roadside and riverside, nearby villages. *Sambucus ebulus* is the dominant species. In the floristic composition many species are characteristic for ruderal places but mesophilous and xerophilous species from *Molinio-Arrhenatheretea* and *Festuco-Brometea* were also found.

*The analysis of the ecological index.* The xero-mesophytes (45.7%) and mesophytes (31.4%) are dominant species, followed by meso-hygrophytes (11.4%), xerophytes and eurythermes (5.7% each).

The analysis of the temperature index indicate the prevalence of the micro-mesotherme species (51.4%) followed by eurythermes (25.7%) and moderate-thermophiles (22.9%).

After requests from soil reaction the weak acid-neutrophile species are dominants (48.6%) followed by euryionic species (27.7%) and acid-neutrophiles (19.1%) (Fig. 17).

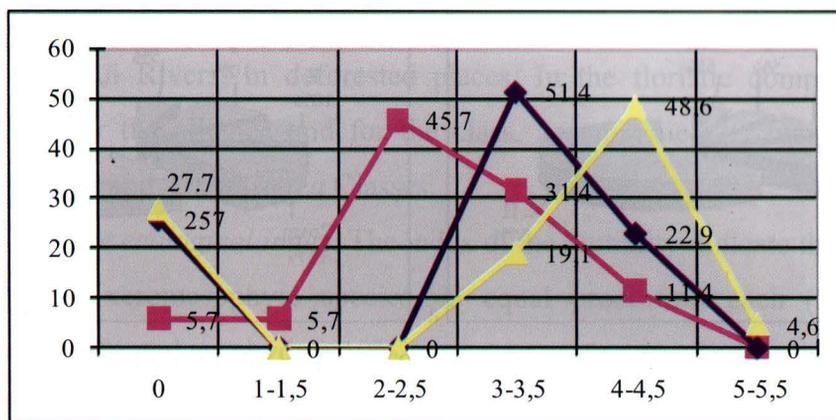


Fig.17. The Spectrum of the ecological index/  
Spectrul indicilor ecologici

*The Bioforms (The Life forms spectrum).* The phytocoenosis with *Sambucus ebulus* are dominated by hemicryptophytes (57.1%) and therophytes (34.3%), followed by geophytes 8.6% (fig. 18 a).

*The Floristic elements.* The analysis of the floristic elements reveals the prevalence of the Eurasian species (51.4%), followed by Cosmopolite (14.3%), Circumpolar (11.4%), Pontic (8.6%) and European species (5.7%) (Fig. 18 b).

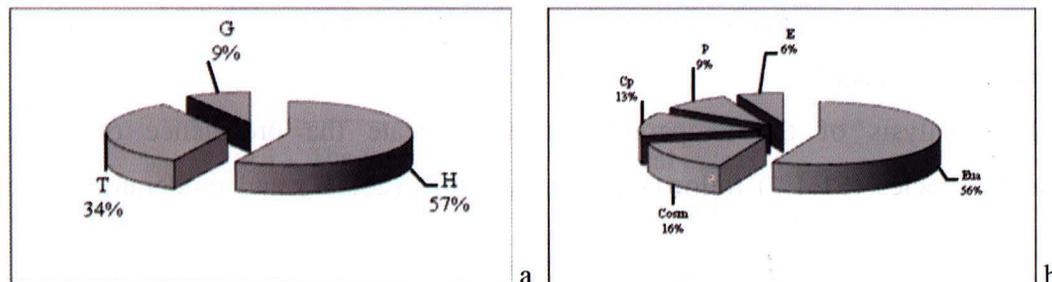


Fig.18. The Spectrum of the Bioforms (a) and Geoelements (b)/  
Spectrele bioformelor (a) și geoelementelor (b)

**ARTEMISIETEA VULGARIS** Lohmeyer et al. In R.Tx. 1950

**ONOPORDETALIA ACANTHII** Br.-Bl. et R. Tx. ex Klika et Hadač 1944 (Syn. *Artemisietalia vulgaris* R. Tx. 1947)

**Onopordion acanthii** BR.-BL. et al. 1936 (Syn. *Artemision absinthii* Elias 1979)

**Ass. Onopordetum acanthii** BR.-BL. et al. 1936 (Syn. *Carduo-Onopordetum* Soó 1947)

The phytocoenosis of this association are spread along the roadside and on the lands on which animals remained. The characteristic and dominant species is *Onopordon*

*acanthium*. The floristic composition is represented by species characteristic for the alliance and order but also for other sintaxa of the *Artemisietea vulgaris* Class. These are accompanied by many species of *Stellarietea media*, *Festuco-Brometea* and *Molinio-Arrhenatheretea* Classes.

*The analysis of the ecological index.* The index of the humidity point out the prevalence of the xero-mesophyte species (59.3%) and mesophytes (35.3%). The analysis of the temperature index indicates the prevalence of the micro-mesothermes (45.8%), followed by eurythermes (29.2%) and moderate-thermophile species (25%). After requests from soil reaction, the euryionic species are dominant (58.3%). The weak acid-neutrophile species have a percentage of 25% and those acid-neutrophile 12.5% (Fig. 19).

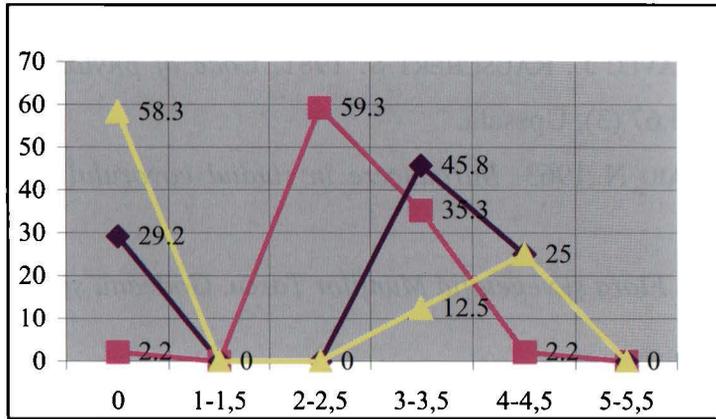


Fig. 19. The Spectrum of the ecological index/  
Spectral indicilor ecologici

*The Bioforms (The Life forms).* The phytocoenosis are dominated by therophytes (62.5%) and hemicryptophytes (25%), followed by geophytes (8.3%) (Fig. 20 a).

*The floristic elements.* The analysis of the floristic elements reveals the prevalence of the Euroasian species (41.7%) and Cosmopolite (29.2%).

Other elements are less represented: European –12.5%, Circumpolar – 4.2%, Pontic 4.2% (Fig. 20 b).

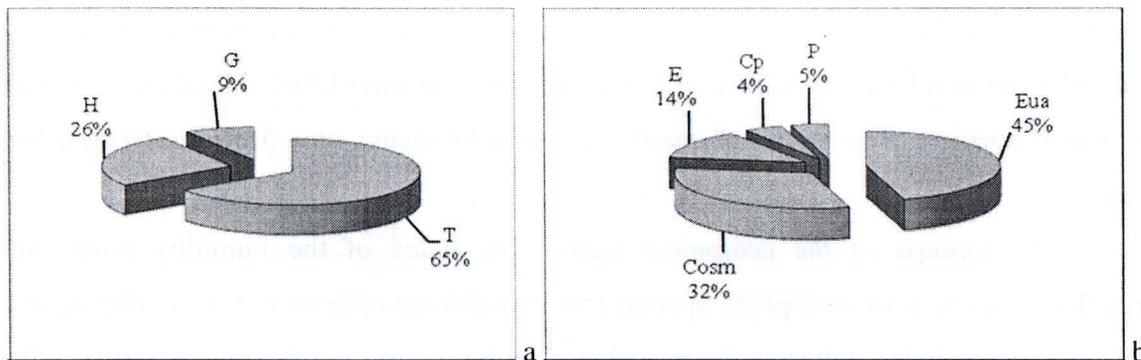


Fig. 20. The Spectrum of the Bioforms (a) and Geoelements (b)/  
Spectrele bioformelor (a) și geoelementelor (b)

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