

TWO NEW MESO-HYGROPHYTIC PLANT COMMUNITIES IN THE NORTHERN PART OF DEALURILE DE VEST (WESTERN HILLS) AREA (ROMANIA)

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Abstract: Research conducted in the northern part of Dealurile de Vest (Western Hills) area of north-western Romania has revealed two interesting new meso-hygrophilic associations, described here as *Serratulo tinctoriae-Sanguisorbetum officinalis* and *Dactylidi glomeratae-Geranium pratensis*. Anthropogenic activities play a crucial role in the formation and evolution of these plant communities. The first develops in areas which are repeatedly mown, whilst the latter spreads along river banks where nutrients derived from fertilizers, washed away by temporary floods, accumulate. These two plant associations were not described in the international or Romanian phytocoenological literature reviewed [3, 6]. We consider them, accordingly, new for science.

Keywords: *Serratulo tinctoriae-Sanguisorbetum officinalis*, *Dactylidi glomeratae-Geranium pratensis*; Romania.

Introduction

The Banato-Crișana Plain is flanked by the peri-Carpathian hills aligned on the western side of the Apuseni Mountains. The northern part of this hilly tract, named the Tășnadului Hills (also known as Crasnei Hills), reaches this area. The highest point on the Dorian Peaks is only 381.5 a.s.m. with a relief energy of 246 m.

Hills of low altitude are found here extending along the river banks. The surface of this area is mainly covered by Pleistocene red clay. The vegetation within the area is poorly studied, but research conducted here in the last few years has revealed a flora consisting of 1060 vascular plant species, some of which are considered to be rare [2]. Two new meso-hygrophilic phytocoenological associations are described in this paper.

Material and Methods

Within the vegetation, a total of 89 plant associations were registered and analysed using classical floristic and coenological methods [1, 2, 3, 4, 6, 8, 14].

Results and Discussion

Two new meso-hygrophilic associations are described here:

1. *Serratulo tinctoriae-Sanguisorbetum officinalis*
2. *Dactylidi glomeratae-Geranium pratensis*

Both belong to *MOLINIO-ARRHENATHERETA* R. Tüxen 1937

These two plant associations were not described in the reviewed international or Romanian phytocoenological literature [3,6]. We consider these, accordingly, new for science.

1. *Serratulo tinctoriae-Sanguisorbetum officinalis* Ass. nova

This new association belongs to *Molinietalia caeruleae* Koch 1926 and *Molinion caeruleae* Koch 1926.

The association develops on the damp clay soils of river banks over wide areas. It was identified on the stream banks of the Rivers Cehal, Inot, Boianu and Carastelec.

The plant communities dominated by *Sanguisorba officinalis* and *Serratula tinctoria* are distinct due to their physiognomy and floristic composition. Based on mathematical analysis (both in the dendrogram and in the dissimilarity matrix of the analysed association), two distinct groups can be recognized within this new phytocoenosis. In the first, *Sanguisorba officinalis* is dominant alone (samples 5-8); in the second, *Serratula tinctoria* (samples 10-14, Tab. no. 1) also.

Studies carried out in north-eastern Germany on *Sanguisorba officinalis* communities found on the stream banks of the rivers Elba, Saale and Mulde were considered by some specialists to be variants of the *Deschampsia caespitosa*-*Cnidium dubium* association [8]. In the modern phytocoenological literature the last mentioned phytocoenoses are included in the *Sanguisorba officinalis*-*Silaetum silai* Klapp 1951 plant community (incl. *Cnidio-Deschampsietum caespitosae* (Walther 1950) Hundt 1958) [12]. Even though some similarities exist between this association and our one in north-western Romania, the two are not identical. Based on empirical analysis, besides *Silaum silaus*, the majority of species characteristic of the German communities are absent from our samples: *Cnidium dubium*, *Thalictrum flavum*, *Viola stagnina*, *Allium angulosum*, *Ranunculus auricomus* and *Deschampsia caespitosa*. Nevertheless, *Deschampsia caespitosa* does occasionally occur. The association described by Klapp is included in the alliance *Deschampsion caespitosae* Horvatić 1930, whilst the one analysed in this section cannot be fitted here.

Sanguisorba officinalis is the dominant species in several areas in Romania, e.g. in the Căşilor Valley near Baia Mare [13], but it appears not to play a relevant role in ass. *Cnidio-Deschampsietum* Passarge 1960 that has been recently analysed in mountainous regions of Romania [5]. One should emphasize that *Cnidium dubium* has only been found once in the area under study, namely in Cheţ. This discovery was recorded over half a century ago [9].

Along with *Sanguisorba officinalis* and, respectively, *Serratula tinctoria*, species of the *Molinion* alliance (*Symphytum officinale*, *Senecio erucifolius*, *Stachys officinalis*) and of the order Molinietalia (*Cirsium canum*, *Ranunculus strigosus*, *Rhinanthus angustifolius*, etc.) play an important role in the phytocoenoses of the Tăşnadului Hills area. Furthermore, the presence of some Eurasiatic species with continental affinities, such as *Eryngium planum*, *Clematis integrifolia*, *Geranium palustre* and *Peucedanum officinale*, has been also recorded.

The holotype of the new association described here is sample number 9 (Table 1), from Viişoara.

In the bioform spectrum of this new plant community, hemicryptophytes are dominant (72.82%), followed by terophytes (15.53%), whilst helohidatophytes are almost completely absent (2.91%). The poor representation of helohidatophytes is a consequence of summer drought. Phytogeographically, the percentage of European geographical elements (Eua, E, Ec) is overwhelming (82.53%), followed by circumpolar (6.80%).

Ecological indicators such as humidity, light and soil reaction determine the preponderance of mesophytes (40.77%), mesotherms (62.14%) and, respectively, amphytolerants (43.69%) and slightly acid-neutrophyles (32.04%), are represented in the community.

These phytocoenoses are abundant in species (103 species in 19 vegetation samples) when they are fully developed during summer. Scattered culms of *Alopecurus pratensis* emerge just before the first mowing. Then, the rosettes of the basal leaves of *Sanguisorba officinalis* expand horizontally and the dense vegetation can reach chest height.

Presumably anthropogenic activities, such as the repeated mowing, make a major contribution to the formation and expansion of these *Serratulo tinctoriae*-*Sanguisorbetum officinalis* plant communities.

In the series of community successions, ass. *Serratulo tinctoriae*-*Sanguisorbetum officinalis* follows generally after associations belonging to *Magnocaricion*. When soil water levels fall, *Arrhenatheretalia* and *Potentillo-Polygonetalia* associations are developed in these stands.

Table 1: *Serratula tinctoriae*-*Sanguisorbetum officinalis* ass. nova; holotype rel.: 9

No. sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	K
Vegetation coverage (%)	95	95	100	95	100	100	100	100	100	100	95	100	95	100	100	100	100	90	100	K
Investigated surface (m ²)	50	50	40	40	40	40	40	40	50	50	50	50	40	40	40	40	80	50	50	
Char ass.																				
<i>Serratula tinctoria</i>	+	-	+	-	+	+	+	1	2	2	2	2	2	2	1	1	1	2	+	V
<i>Sanguisorba officinalis</i>	4	4	5	4	5	5	5	5	5	4	4	4	4	4	5	5	5	4	5	V
Molinion																				
<i>Symphytum officinale</i>	+	+	+	1	+	+	+	+	+	+	-	-	+	-	+	-	+	1	+	IV
<i>Stachys officinalis</i>	+	-	+	+	-	-	-	+	+	+	+	+	+	+	-	-	+	-	-	III
<i>Senecio erucifolius</i>	+	+	+	+	+	+	1	-	-	-	-	-	-	-	-	-	-	+	-	III
<i>Galium boreale</i>	-	-	-	-	-	-	-	-	+	+	-	+	-	-	+	+	-	-	-	II
<i>Euphorbia lucida</i> +(12)																				
Molinetalia																				
<i>Cirsium canum</i>	-	-	+	2	+	+	1	-	+	+	1	+	1	-	+	+	+	1	-	IV
<i>Ranunculus strigosus</i>	+	+	-	-	+	+	+	+	+	+	-	-	+	+	-	+	-	+	-	IV
<i>Selinum carvifolia</i>	+	1	-	-	-	-	-	-	+	+	+	-	+	+	+	-	-	-	1	III
<i>Rhinanthus angustifolius</i>	-	-	+	+	-	+	+	+	-	-	+	+	-	+	+	-	-	-	-	III
<i>Thalictrum lucidum</i>	-	-	-	-	+	-	-	-	+	-	+	+	-	-	+	-	+	-	+	II
<i>Colchicum autumnale</i>	+	+	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	II
<i>Veronica longifolia</i>	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	+	-	-	II
Filipendula ulmaria var. denudata + (9, 16, 17); Lychnis flos-cuculi + (1, 2, 9); Trifolium hybridum + (9, 10, 11); Scutellaria hastifolia +(6, 7); Festuca arundinacea +(11, 12); Carex divisa +(9); Deschampsia caespitosa +(19); Angelica sylvestris +(4)																				
Agrostion																				
<i>Achillea millefolium</i>	-	-	+	-	+	+	-	+	-	-	-	+	+	+	-	-	+	+	-	III
<i>Festuca pratensis</i>	-	-	-	+	-	+	+	+	-	+	+	+	-	-	-	-	-	+	+	III
<i>Alopecurus pratensis</i>	2	2	-	-	-	-	-	-	1	2	+	2	-	-	-	-	-	+	-	II
<i>Agrostis stolonifera</i>	-	-	-	-	-	-	-	-	1	+	+	+	-	-	-	-	-	-	-	II
<i>Juncus atratus</i> + (10)																				
Potentillo-Polygonetalia																				
<i>Inula britannica</i>	-	-	-	-	+	+	+	+	+	-	-	-	-	-	+	+	-	-	-	II
<i>Ranunculus repens</i>	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	+	-	II
<i>Potentilla reptans</i>	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	+	-	II
<i>Rumex crispus</i> +(9, 10, 12); <i>Carex hirta</i> +(16, 17, 18); <i>Potentilla anserina</i> +(18)																				
Molinio-Arrhenatheretea																				
<i>Lythrum virgatum</i>	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	-	-	+	III
<i>Inula salicina</i>	-	-	-	-	-	+	+	+	-	+	+	1	+	-	+	-	+	-	-	III

Lathyrus pratensis	+	+	-	+	-	-	-	+	+	-	+	+	+	+	-	-	-	-	III
Centaurea jacea	-	-	-	+	+	+	+	-	+	-	-	-	+	+	-	+	-	-	III
Galium mollugo	-	-	+	-	+	+	+	-	+	+	-	+	-	-	-	-	+	-	III
Ononis arvensis	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	-	-	+	II
Tragopogon pratensis ssp. orientalis	-	-	+	-	-	-	+	-	+	-	+	-	+	-	-	-	-	+	II
Leucanthemum vulgare	-	+	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	II
Trifolium pratense	-	-	-	-	-	-	-	-	+	+	+	-	-	+	-	+	-	-	II
Campanula patula ssp. patula	+	+	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	II
Centaurea macroptilon ssp. oxylepis	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	II
Trifolium campestre	-	-	+	+	-	-	-	-	+	+	-	-	-	-	-	-	-	-	II
Cichorium intybus	-	-	-	+	-	-	-	-	-	-	-	-	+	+	-	-	-	+	II
Daucus carota	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	+	II
Geranium pratense	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	II
Stellaria graminea	+	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	II
Pimpinella saxifraga	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	II

Clematis integrifolia +(1, 3, 8); Plantago lanceolata +(3, 4, 18); Pastinaca sativa +(15, 16); Ranunculus acris +(3, 13); Trifolium repens +(3, 4); Briza media +(10, 13); Bromus commutatus +(9, 12); Cynosurus cristatus +(11, 12); Medicago lupulina +(1, 2); Eryngium planum + (13, 14); Phleum pratense +(19); Rumex acetosa +(9); Mentha longifolia +(19); Lolium perenne +(19); Agrostis capillaris +(9)

Varia

Galium verum	1	+	-	-	+	+	+	+	+	-	+	+	+	+	+	-	-	+	+	IV
Filipendula vulgaris	+	+	+	-	+	+	+	+	+	+	1	1	-	-	-	-	-	-	+	IV
Lotus corniculatus	+	+	+	+	+	+	+	-	-	-	-	-	+	+	-	-	-	+	-	III
Peucedanum officinale	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	+	-	-	-	II
Fragaria viridis	+	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	-	II
Vicia hirsuta	+	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	II
Vicia grandiflora	+	+	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	II
Glechoma hederacea	+	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	II
Inula helenium	1	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	II
Cruciata glabra	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	II
Agrimonia eupatoria	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	+	-	II
Lysimachia vulgaris	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	+	II
Erigeron annuus ssp. annuus	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	+	II

Iris pseudacorus + (2, 7, 15); Allium scorodoprasum + (10, 11, 12); Calystegia sepium + (16, 17, 19); Lathyrus tuberosus + (11, 12, 19); Lythrum salicaria + (7, 8, 18); Euphorbia palustris + (10, 16, 17); Dipsacus laciniatus + (6, 16, 17); Aristolochia clematidis + (11, 12); Cirsium arvense + (5, 12); Sonchus arvensis + (2, 19); Carex vulpina + (9, 10); Stachys palustris + (3, 4); Linaria vulgaris + (6, 7); Artemisia vulgaris + (8, 17); Lathyrus nissolia + (1, 2); Picris hieracioides + (16, 17); Geranium palustre +(14); Phalaris arundinacea +(19); Carex acutiformis +(19); Poa palustris +(19); Humulus lupulus +(3); Peucedanum alsaticum +(5); Hypericum perforatum +(3); Cuscuta campestris +(14); Tanacetum vulgare +(11).

Place and data of ground surveyse: 1-2 – Cehăluț, 22.V.2010; 3 – Idem, 07.VII.2009; 4-8 – Idem, 14.VIII.2009; 9-12 – Viișoara, 16.VI.2010; 13-17 – Idem, 8.VIII.2009; 18 – Reghea towards Boianu Mare, 22.IX.2009; 19 – Carastelec, 3.VII.2010.

Table 2: *Dactylidi glomerati-Geranietum pratensis* ass. nova; holotype rel.: 10

No. sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Vegetation coverage (%)	100	100	100	100	100	100	100	90	100	100	100	95	100	90	90	100	100	100	100	100	K
Investigated surface (m ²)	50	50	35	35	40	40	40	40	35	50	40	40	40	40	40	40	40	50	50	80	
Char. ass.																					
Geranium pratense	5	5	5	5	5	5	4	3	5	5	5	4	5	3	4	5	5	5	5	4	V
Dactylis glomerata	1	1	1	+	1	+	1	2	+	+	+	-	+	+	-	+	-	+	-	-	IV
Arrhenatherion																					
Heracleum sphondylium	+	+	-	+	+	+	1	1	+	1	+	+	+	+	-	+	+	1	-	1	V
Arrhenatherum elatius	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	II
Pastinaca sativa ssp. pratensis	+	-	-	-	-	-	-	+	-	+	+	+	-	-	+	-	+	-	-	+	II
Daucus carota ssp. carota	+	-	+	-	-	-	-	-	-	+	-	+	-	-	+	-	+	-	-	-	II
Galium mollugo	+	+	+	+	-	-	+	+	-	+	1	+	+	+	+	-	-	-	+	-	IV
Arrhenatheretalia																					
Tragopogon pratensis ssp. orientalis	+	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-	+	-	-	+	II
Achillea millefolium	-	-	+	+	-	-	+	-	-	+	+	+	-	-	-	+	-	-	+	+	III
Campanula patula	-	-	-	-	-	-	+	-	-	+	+	+	-	-	-	-	-	+	-	-	II
Knautia arvensis	-	-	+	-	-	-	+	+	+	+	-	-	-	+	-	-	-	-	+	-	III
Anthriscus sylvestris + (1, 2, 6); Cichorium intybus +(1, 17); Rumex crispus + (1, 11); Stellaria graminea +(7).																					
Molinetalia																					
Symphytum officinale	+	+	-	-	-	1	+	-	+	+	+	+	+	2	-	+	+	+	+	+	IV
Equisetum palustre	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	+	+	II
Angelica sylvestris	-	-	-	-	-	-	-	-	-	-	-	-	+	+	2	+	+	+	-	+	II
Thalictrum lucidum	+	-	+	-	+	-	-	+	-	-	+	-	-	-	-	+	+	+	+	-	III
Ranunculus strigosus	+	+	-	+	+	+	-	-	-	+	+	+	-	-	-	-	+	-	-	-	III
Cirsium canum + (10, 11, 17); Colchicum autumnale +(8); Selinum carvifolia +(9).																					
Molinio-Arrhenatheretea																					
Agrostis stolonifera	-	-	-	-	+	+	-	+	+	-	-	1	-	-	+	-	-	+	+	+	III
Alopecurus pratensis	+	+	+	-	+	-	+	1	+	-	-	-	-	-	-	-	-	-	1	2	III
Vicia cracca	+	-	+	+	-	-	+	-	+	+	+	+	-	-	-	-	+	-	-	-	III
Lathyrus pratensis	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	II
Trifolium pratense	-	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	II
Trifolium campestre	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	+	-	-	-	II

Silene alba	-	-	+	+	-	-	+	+	-	-	-	-	+	-	-	-	-	+	+	+	II
Artemisia vulgaris	-	-	-	+	-	-	+	+	-	-	-	-	+	-	+	-	-	-	+	-	II
Tanacetum vulgare	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	1	-	-	-	II
Elymus repens	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	+	-	-	+	-	II
Torilis arvensis	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	II
Cirsium arvense	+	-	-	-	-	+	-	-	-	-	-	-	+	-	-	+	+	-	-	-	II
Erigeron annuus ssp. annuus	-	-	+	-	-	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-	II
Stachys officinalis	-	+	-	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	II

Lathyrus tuberosus + (9, 19, 20); Aristolochia clematitis + (6, 9, 10); Calamagrostis epigeios + - 1 (12, 13, 16); Glecoma hederacea + (1, 2, 15); Tussilago farfara +(5, 9); Polygonum hydropiper +(5, 10); Polygonum persicaria +(16, 17); Sonchus arvensis +(7, 8); Humulus lupulus +(5, 9); Chaerophyllum aromaticum +(7, 9); Trifolium alpestre +(7, 8); Cruciata glabra +(4, 5); Prunella vulgaris +(13, 15); Allium scorodoprasum +(3, 7); Lathyrus hirsutus +(8, 9); Lactuca serriola +(19, 20); Xanthium strumarium +(5, 6); Melilotus officinalis +(1, 3); Dipsacus laciniatus +(3, 7); Peucedanum officinale +(2); Lamium album +(7); Astragalus glycyphyllos +(7); Brassica nigra +(19); Galeopsis tetrahit +(19); Verbascum blattaria +(10); Linaria vulgaris +(11); Chaerophyllum hirsutum +(5); Bilderdyckia convolvulus +(7); Arctium tomentosum +(16); Conyza canadensis +(12); Chenopodium album +(9).

Place and data of ground surveyse: 1-6 – Chegea, 10.VII.2009; 7-9 – Idem, 22.VI.2010; 10-12 – Cehal, 24.VII.2009; 13-15 – Cehăluț, 24.VII.2009; 16-17 – Doh, 26.VIII.2009; 18 – Zalnoc, 3.VII.2010; 19-20 – Carastelec, 3.VII.2010.

2. *Dactylidi glomeratae-Geranium pratensis* Ass. nova

This new community belongs to *Arrhenatheretalia* R. Tüxen 1931 and *Arrhenatherion* Koch 1926.

In the references consulted, phytocoenoses where *Geranium pratense* is widespread are treated under the *Pastinaco-Arrhenatheretum elatioris* (Knapp 1954) Passarge 1964 plant community. This was first identified in the stream banks of rivers in Central Germany and Austria, up to the Pannonian Basin [11]. Nonetheless, this association is not described in Hungary [1]. Similar phytocoenoses located in the superior upper valley of the River Mureş in Romania were also considered to belong to *Pastinaco-Arrhenatheretum elatioris geranietosum pratensis* Drăgulescu 1994 (nom. nudum) [7].

Phytocoenoses with a dominance of *Geranium pratense* and phytocoenoses with a dominance of *Pastinaca sativa* accompanied by *Arrhenatherum elatius* were identified in several regions. These two communities cannot be included in the same association, not even under the form of the physiognomy of the sub-associations and, most importantly, their floristic composition.

In the *Pastinaco-Arrhenatheretum elatioris* plant community the basic constituent species frequent in our communities are absent, such as *Geranium pratense*, *Dactylis glomerata* and *Thalictrum lucidum*; while *Heracleum sphodylium*, *Angelica sylvestris* and *Stachys officinalis* were identified in only one plot. Besides, it is important to highlight that both *Pastinaca sativa* and *Arrhenatherum elatius* play a secondary role in the phytocoenoses dominated by *Geranium pratense*. *Phragmitetea* species are richly represented and an important role in these phytocoenoses is played by humidity-tolerant *Daucus carota*, *Agrimonia eupatoria*, *Cichorium intybus*, *Senecio jacobaea*, etc.

Phytocoenoses dominated by *Geranium pratense* have been also affiliated with *Alopecuretum pratensis* Steffen 1931 subass. *geranietosum pratense* Zaliberová 1982 which was included in the order *Molinietalia*. Such phytocoenoses, identified in the lower mountainous area of the Mureş Valley, have been named ass. *Ranunculo repentis-Alopecuretum pratensis* Ellmauer 1933 subass. *geranietosum pratensi* Oroian 1998 [10]. Our samples show *Alopecurus pratensis* and *Ranunculus repens* as playing a secondary role in the studied phytocoenoses. However, this is not the case for *Dactylis glomerata* and *Heracleum sphondylium* ssp. *sphondylium*, which are relevant here. Additionally, a series of basic constituent species which have a high frequency in the Mureş Valley such as *Trisetum flavescens*, *Phleum pratense*, *Cerastium holosteoides*, etc., have not been found in our samples.

The new association from the Tăşnadului Hills was found on several river banks in the study area. It is likely that materials rich in nutrient substances (especially nitrogen) play a key role in its formation. These substances accumulate in the soil and provide an environment for prolific plant growth. Also, the phreatic zone is located close to the earth surface, a fact indicated by the composition of the association. Where phytocoenoses with *Geranium pratense* extend to higher levels of the river banks, as observed in Chegea, *Nepeta nuda* tends to spread extensively – forming a facies (sampling surveys 7 and 8).

The sample number 10 in Table 2 was selected as the holotype.

In line with the area's characteristics the bioform spectrum is dominated by hemipterophytes (62.54%). Concerning geographical elements, Eurasiatic appear to be dominant (62.31%). Regarding ecological indicators – humidity, temperature and soil reaction – mesophytes (41.51%), mesotherms (60.00%) and, respectively, amphytolerants (46.92%) and slightly acid-neutrophyles (36.16%) prevail.

In the succession *Dactylidi glomeratae-Geranium pratensis* follows generally the associations belonging to *Molinietalia*. If these stands become more arid, *Dactylidi glomeratae-*

Geranietum pratensis is followed by associations belonging to *Festuco-Brometea* or (in the case of excessive accumulation of nutrients) these stands become ruderalized.

It is worth noting that the distribution of these two new plant associations is not limited to the territory studied here.

Conclusions

Two plant associations: *Serratulo tinctoriae* – *Sanguisorbetum officinalis* and *Dactylidi glomeratae* – *Geranietum pratensis*, new for science, were described from Dealurile de Vest (Western Hills), north-western Romania. Anthropogenic activities play an important role in the formation and evolution of both associations.

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DOUĂ NOI ASOCIAȚII VEGETALE MEZO-HYGROFILE ÎN PARTEA NORDICĂ A DEALURILOR DE VEST (ROMÂNIA)

(Rezumat)

În urma cercetărilor efectuate în ultimii ani, au fost identificate în sectorul nordic al Dealurilor Vestice – cunoscute sub numele de Dealurile Tășnadului (sau Crasnei) – o serie de asociații vegetale remarcabile pentru această regiune. Printre ele se numără două asociații noi, pe care le descriem sub numele de: *Serratulo tinctoriae-Sanguisorbetum officinalis*, respectiv *Dactylidi glomeratae-Geranietum pratensis*.

În formarea și evoluția ambelor un rol determinant îl joacă activitățile antropice. Prima se formează în stațiuni cosite în repetate rânduri; aici *Sanguisorba officinalis* preia dominanța după cosirea efectuată la începutul verii, în detrimentul unor graminee furajere mai comune. La rândul său, *Geranium pratense* se extinde de-a lungul unor văi, unde se acumulează sărurile minerale provenite din îngrășămintele chimice, spălate spre aceste stațiuni, de apele temporare.