

CONSIDERATIONS ABOUT THE WOODY VEGETATION OF THE BĂIȚA-CRĂCIUNEȘTI AREA, HUNEDOARA COUNTY

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Key words: woody plant communities, corology, ecology, beech forests

ABSTRACT

Băița Craciunesti area is situated on the territory of 3 localities: Peștera, Ormindea and Crăciunești, which belong to the locality of Băița, Hunedoara County, about 27 km North from Deva. This project aimed to identify and monitor rare endemical endangered and jeopardized plant species of Nature 2000 plant communities and habitats that lived in the quarry and nearby, since it is placed close to the contact limit of the protected area ROSCI0110- Băița Hills. In terms of flora a number 360 taxons have been identified, which shows the floristic richness of the area and a low human impact regarding the activity of a mining quarry. Both in the area and nearby the quarry a number of rare, endemic, endangered and vulnerable species have been identified. In terms of phytocoenology we have identified and analyzed a number of 38 plant communities. Some of them are mentioned for the first time in this area. Several types of habitats have been identified and their conservation status has been noted. The permanency of grasslands and forest ecosystems across quarry has been observed and analyzed. These ecosystems should be viewed as dynamic ecosystems.

INTRODUCTION

The topic field of this research is part of the Ore Mountains, placed between Deva-Ormindea and Ampoi corridor, between Mureș Valley and Brad basin (Fig. 1). This area is very important in terms of geo-botany, fauna and landscape. Researched area is located on the contact line of the west crest of the protected area ROSCI0110- Baița hills, highly important area which nestles a number of species and habitats Nature 2000, most of these being found in the area of Baita-Craciunesti Quarry. The general aspect of vegetation in this area represents an image of the very different stationary conditions, to which one can add the influence of the anthropo-zoogenous factors.

The wooden vegetation is represented by forests, underwoods and riverside coppices, the forests occupy the largest area.

MATERIALS AND METHODS

In order to identify the flora species and the inter-taxa, we looked into: *Romanian Flora*, vol. I-XII (1952-1976); *Flora Europaea*, vol. I-V (1964-1980); *Flora Italica*, vol. I-II, by P. Zangheri (1976); *The Romania illustrated Flora – Pteridophyta et Spermatophyta*, by V. Ciocârlan (2000); *Alpina Flora*, Vol. I, II, III by D. Aeschmann et al. (2004). Regarding the nomenclature, we chose the nomenclature solutions which are considered correct, in accordance with The International Code of Botanical Nomenclature (Melbourne, 2011).

For the study of the vegetal carpet in this area, we have used methods of phytosociologic research characteristic to the Central European phytosociologic School, which was based on the principles and methods elaborated by J. Braun-Blanquet (1926) and adapted by A. Borza (1934) to the particularities of our country's vegetation.

The woody plant communities have been analyzed and characterized from the chorological, ecological point of views. They were also examined according to their floristic

composition and physiognomy and syndynamics. We gave a special attention to the calculation of the quantitative index *Bray-Curtis* and to performing the dendograms, by using the Group-Average method (UPGMA) in the program SYN-TAX 2000 (for the associations with minimum 10 surveys). In order to identify the habitats, we looked into: *Natura 2000 in Romania Habitat fact sheets* (2008); *Habitats from Romania* by Doniță N. & al. (2005); *Manual interpretation of Natura 2000 Habitats in Romania* by D. Gafta & O. Mountford- coord. (2008); and *Interpretation Manual of European Union Habitats - EUR27* (European Commission. DG Environment. Nature and biodiversity, 2007).



Fig. 1. Aspect from the Băița-Crăciunești area (Foto M. Niculescu, 2014)

RESULTS AND DISCUSSION

Following field research conducted in Băița-Crăciunești area, the presence of an extremely interesting vegetation cover was discovered, characterized by a very large biodiversity, with a quite good state of preservation due to the influence of anthropozoogen factors in this area.

Woody vegetation is represented by forest and shrub vegetation particularly specific to the limestone sub-layer. The main forest plant associations found here are: *Bromo sterilis-Robinetum* (Pocs 1954) (tabel 1, fig. 3, 4, 5), *Balloto nigrae-Ailanthetum altissimae* Sirbu & Oprea 2010, *Quercetum petraeae-cerris* Soo (1957) 1969, *Corylo-Tilietum cordatae* Vida 1959, *Lathyro hallersteinii-Carpinetum* Coldea 1975 (Syn. *Quercetum pataeae-Carpinetum* auct. transsilv.), *Carpino-Fagetum* Paucă 1941, *Populo-Betuletum pendulae* Coldea 1972 (Syn. *Junipero-Betuletum albae* Soó ex Borza et Boșcaiu 1965), *Genisto tinctoriae-Quercetum petraeae* Klika 1939.

The plant community *Bromo sterilis-Robinetum pseudacaciae* (Pocs 1954) Soó 1964 (syn. *Robinetum pseudacaciae* (Arvat 1939) Balasz 1942; *Agropyro-Robinetum pseudacaciae* Szabó 1971) is very widespread around the area. Even if the vegetal association is enlightened by an invasive plant, in this respect the association being present in the area is a benefit. This has a very important role against erosion, rearranging and fixing the soil through the invasive and characteristic specie- *Robinia pseudo-accacia*.

The plant community is very prevailed in the whole area and has a huge stability. A complex study regarding the phisionomy and floristical composition was accomplished as well as calculating the Bray- Curtis quantity index and making the dendogram for this plant community using the Group-Average UPGMA from the SYN-TAX programe - for plant communities with minimum 10 relevées. From the dendrogram analysis one can

notice that this is formed by 2 clusters, the first having a higher stability from the quantity point of view, in which the relevés are grouped 1, 2, 6, 5, 4, 8, 9, 10 (fig. 2).

These relevés were performed close to the quarry of the closed exploits, in the neighbouring of the area where we realised the experiment of establishing the brush.

This proves the great stability of the present photocenos. The second cluster groups only two relevés, 3 and 7, and were done very close to the digging area, exactly on the brim of the quarry access road, the quantity stability of the photocenos being very reduced.

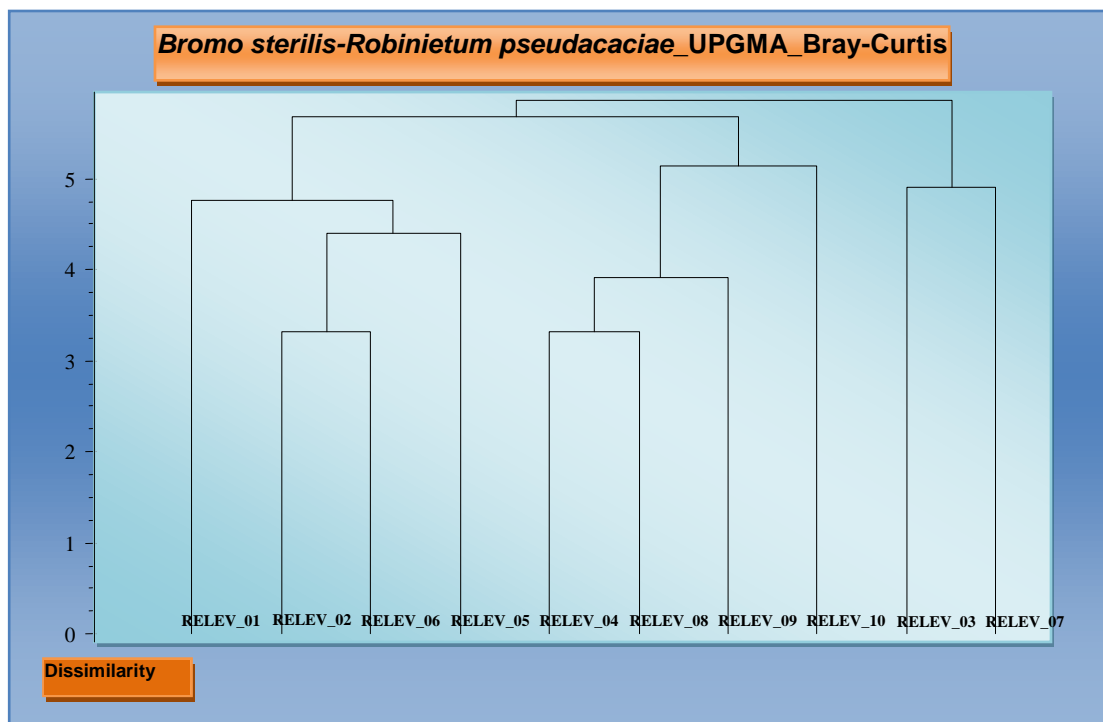


Fig.2. The dendrogram of plant community *Bromo sterilis-Robinetum* (Pócs 1954) Soó

Populo-Betuletum Pendulae Coldea 1972 (Syn. *Junipero-Betuletum albae* Soó ex Borza et Boşcaiu 1965) appear on the degraded land of the quarry and help soil restore, being an intermediary association, a succession phase to genuine forest vegetation.

Along Căinelului Valley meadow plant communities are to be found: *Stellario nemori-Alnetum glutinosae* (Kärstner 1938) Lohm. 1957, *Salicetum purpureae* (Soó 1934 a.n.) Wendelbg.-Zelinky 1952.

Shrubs vegetation is well represented. It is represented by the following plant communities: *Pruno spinosae-Crategetum* (Soó 1927) Hueck 1931, *Coryletum avellanae* Soó, *Syringo-Fraxinetum orni* Borza 1958 em. Resmeriță 1972 (syn.: *Syringeto-Fraxinetum orni coryletosum colurnae* Borza 1958), *Euonymo-Sambucetum nigrae* Moor 1967.

The most important is *Syringo-Fraxinetum Orni* Borza 1958 em. Resmerita 1972 specific to the cliffs in the area. This plant community is characterized by a great biodiversity and the presence of thermophilic species bearing a particular scientific importance, becoming a part in building the priority habitat 40A0* [Subcontinental peri-Pannonic scrub] CLAS. PAL.: 31.8B12p, 31.8B13, 31.8B14, 31.8B3p.

Forest habitats

Several types of forest habitats have been identified in the quarry and its neighboring.

One important habitat in this area is the habitat 91M0 - Pannonian-Balkan turkey oak-sessile oak forests; CLAS. PAL.: 41.76. Characteristic species and dominante for the

91M0 habitat: *Quercus petraea* Q. *dalechampii*, *Q. polycarpa*, *Q. cerris*, *Q. frainetto*, *Acer tataricum*, *Tilia tomentosa*, *Ligustrum vulgare*, *Euonymus europaeus*, *Festuca heterophylla*, *Carex montana*, *Poa nemoralis*, *Potentilla alba*, *Potentilla micrantha*, *Tanacetum corymbosum*, *Campanula persicifolia*, *Digitalis grandiflora*, *Vicia cassubica*, *Viscaria vulgaris*, *Lychnis coronaria*, *Achillea distans*, *Silene nutans*, *Hieracium sabaudum*, *Galium schultesii*, *Lathyrus niger*, *Peucedanum oreoselinum*, *Helleborus odoratus*, *Asperula taurina*, *Luzula forsteri*, *Brachypodium sylvaticum*, *Crocus flavus*, *Carex praecox*.

Another important forest habitat is habitat 91Y0 - Dacian oak-hornbeam forests; CLAS. PAL.: 41.2C, Characteristic species and dominante: *Carpinus betulus*, *Quercus robur*, *Quercus petraea*, *Quercus dalechampii*, *Quercus cerris*, *Quercus frainetto*, *Tilia tomentosa*, *Pyrus pyraeaster*, *Fraxinus excelsior*, *Carex brevicollis*, *Dentaria quinquefolia*, *Carpesium cernuum*, *Crataegus pentagyna*, *Melampyrum bihariense*, *Ornithogalum flavescens*, *Scutellaria altissima*.

On the on the hillside of this area well develop good the habitats: 9180* - *Tilio-Acerion* forests of slopes, screes and ravines; CLAS. PAL.: 41.4 and 9130 - *Asperulo-Fagetum* beech forests; CLAS. PAL.: 41.13.

Phytocoenoses illustrating habitat 91E0 * are to be found in the Căinelului Valley. Name of the habitat is Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*); CLAS. PAL.: 44.3, 44.2 și 44. Characteristic species: *Alnus glutinosa*, *Alnus incana*, *Fraxinus excelsior*; *Populus nigra*, *Salix alba*, *S. fragilis*; *Ulmus glabra*; herbaceous layer – *Angelica sylvestris*, *Cardamine amara*, *C. pratensis*, *Carex acutiformis*, *C. pendula*, *C. remota*, *C. strigosa*, *C. sylvatica*, *Cirsium oleraceum*, *Equisetum telmateia*, *Equisetum* spp., *Filipendula ulmaria*, *Geranium sylvaticum*, *Geum rivale*, *Lycopus europaeus*, *Lysimachia nemorum*, *Rumex sanguineus*, *Stellaria nemorum*, *Urtica dioica*.

Table 1. Ass. Bromo sterilis-Robinetum (Pócs 1954) Soó

No. of relevée	1	2	3	4	5	6	7	8	9	10	K, Medium coverage (%)
Altitude (m)	470	470	490	407	407	475	490	460	475	475	
Surface(m ²)	400	400	400	400	400	400	400	400	400	400	
Aspect	SV	SV	-	V	-	E	-	SV	V	V	
Slope (degrees)	10	10	-	10	-	5	-	10	7	15	
Cover											
Tree layer	70	70	60	60	70	70	70	70	80	70	
Herbaceous layer	70	70	50	75	65	65	50	70	70	70	
(%)											
Char. ass.											
<i>Robinia pseudoacacia</i>	4	4	3-4	3-4	4	4	4	4	4-5	4	V, 61,25
<i>Bromus sterilis</i>	1-2	1-2	1-2	1	+1	1	+1	1	1	1	V, 6,42
Prunetalia et Prunion spinosae											
<i>Prunus spinosa</i>	+	-	+	-	+	-	+	-	+	-	III, 0,25
<i>Crataegus monogyna</i>	-	+	+	+	-	+	+	+	-	+	I, 0,35
<i>Euonymus europaeus</i>	+	+	+	-	-	-	+	-	+	-	III, 0,25
<i>Rosa canina</i>	+	+	-	+	-	-	-	+	-	-	II, 0,20
<i>Cornus sanguinea</i>	+	-	+	-	+	-	+	+	+	-	III, 0,30
<i>Euonymus verrucosa</i>	+	+	+	+	-	-	+	-	+	-	III, 0,30
<i>Humulus lupulus</i>	1	1	+	1	+	+	+	+	1	+	V, 2,30
<i>Geum urbanum</i>	+	+	+	+	+	+	+	+	+	+	V, 1,00
<i>Sambucus nigra</i>	+	+	-	+	-	-	-	+	-	-	II, 0,20
Fagetalia et Querco-Fagetea											
<i>Brachypodium sylvaticum</i>	+1	1	+	+1	1	1	+	+	+	1	V, 3,20
<i>Rubus caesius</i>	+	+	-	+1	+	+	-	+	+	+	I, 0,62
<i>Mercurialis perennis</i>	1	-	-	-	+	+	+	+	+	-	III, 0,75
<i>Circaea lutetiana</i>	+	-	-	+	+	+	-	+	+	-	III, 0,30
<i>Galium odoratum</i>	-	-	+	+	-	-	-	+	+	+	III, 0,25
<i>Asperula taurina</i>	+1	-	1	1	1	-	1	+1	+1	1	V, 3,32
<i>Helleborus odoratus</i>	+	+	-	+1	+	+	+	-	+1	+	IV, 0,85
<i>Scilla bifolia</i>	+1	+1	+	+	+	+	-	-	-	+	I, 0,80
<i>Arum maculatum</i>	+	+	+	+	+	+	-	+	+	+	I, 0,45
<i>Prunella vulgaris</i>	+	-	+	+	-	-	+	+	-	-	III, 0,25
<i>Ranunculus ficaria</i>	2	1	1	2	+1	1	1-2	2	2	2	V, 11,65

<i>Campanula rapunculoides</i>	-	+	+	-	-	+	+	-	-	+	III,	0,25
<i>Viola odorata</i>	+	+	+	+	+	-	+	+	+	-	I,	0,40
<i>Poa nemoralis</i>	-	-	-	+	-	-	-	+	+	+	II,	0,20
Variae Syntaxa												
<i>Urtica dioica</i>	1	1	+	+	+1	+	+	1	1	+1	V,	2,75
<i>Alliaria petiolata</i>	+	+	+	-	+	+	+	-	-	+	I,	0,35
<i>Glechoma hederacea</i>	1	1	1	1	1	1	1	1	+	1	V,	4,55
<i>Physalis alkekengi</i>	+	+	-	+	-	+	-	+	+	+	III,	0,35
<i>Ballota nigra</i>	+	+	1	+	+	+	1	+	+1	+	V,	1,60
<i>Asparagus officinalis</i>	+	+	-	+	+	+	-	+	+	-	I,	0,35
<i>Galium aparine</i>	1	+1	+1	1	+	+	+	+	1	+1	V,	2,55
<i>Chelidonium majus</i>	+	+	-	+	+	+	-	+	+	-	IV,	0,35
<i>Hypericum perforatum</i>	+	-	+	-	+	-	+	-	-	-	II,	0,20
<i>Viola hirta</i>	+	+	+	+	+	+	+	+	-	-	IV,	0,40
<i>Anthriscus sylvestris</i>	+	-	-	-	-	-	-	-	-	-	I,	0,05
<i>Acer campestre</i>	-	+	-	-	-	-	-	-	-	-	I,	0,05
<i>Ligustrum vulgare</i>	-	-	+	-	-	-	-	-	-	-	I,	0,05
<i>Equisetum arvense</i>	-	+	-	-	-	-	-	-	-	-	I,	0,05
<i>Veronica chamaedrys</i>	-	+	-	-	-	-	-	-	-	-	I,	0,05
<i>Conium maculatum</i>	+	-	-	-	-	-	-	-	-	-	I,	0,05

Place and data of relevés: **Băița-Crăciunești Quarry, 17.V.2014**

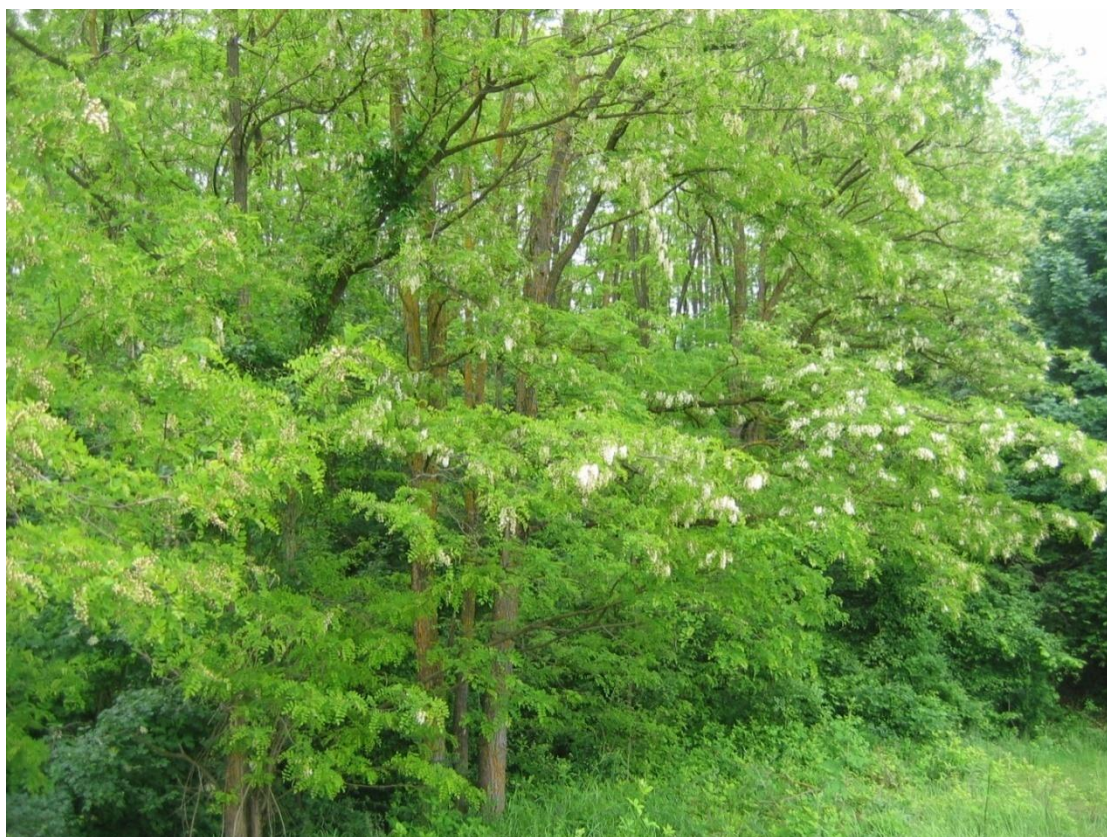


Fig. 3. Ass. *Bromo sterilis*-*Robinetum* (Pócs 1954) Soó (Foto M. Niculescu, 2014)



Fig. 4. Herbaceous layer in *Bromo sterilis-Robinieta* (Pócs 1954) Soó plant community (foto M. Niculescu, 2014)



Fig. 5. Herbaceous layer in *Bromo sterilis-Robinieta* (Pócs 1954) Soó plant community (Foto M. Niculescu, 2014)

CONCLUSIONS

Regarding the biodiversity existing in Băița-Crăciunești area, we can say that it is of particular interest in potential, variety, in the presence of many rare endangered jeopardized and endemic species or Nature 2000. Nature 2000 habitats are of the most diverse ones, here being the place where scrub and forest, grasslands and rocky, tall herbs and even ruderal habitats meet. Given the scientific, landscape, economic and social importance of this area we think that its rehabilitation is a must, therefore establishing preservation measures.

Regarding the study of flora and vegetation biodiversity in the research area, complex studies were carried out as such, which should relate exclusively to Băița-Crăciunești area; the only flora and vegetation work being written by I. Pop and I. Hodisan in 1964. Thus, our results especially on the flora, vegetation and habitats are the fruit of our personal research this summer. However, these studies can only be considered at the beginning, given the short time and the fact that we have studied only a single growing season as well as the biodiversity complexity existing here and of the phenomena that happen.

ACKNOWLEDGEMENT

This work has benefited by the financial support from the CarpatCement Romania, project for the Quarry life competition 2014.

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