

THE GRASSLAND NATURA 2000 HABITATS FOUND IN BĂIȚA-CRĂCIUNEȘTI QUARRY AND THE SURROUNDINGS, HUNEDOARA COUNTY

MARIANA NICULESCU¹, MARIUS FĂGĂRAȘ², LUMINIȚA BUȘE-DRAGOMIR²,
ILIE SILVESTRU NUȚĂ¹

¹University of Craiova, Faculty of Agronomie, Departament of Botany, 19 Libertatii Street, 200583, Craiova, mniculescum@yahoo.com

²Ovidius University of Constanta, Faculty of Natural and Agricultural Sciences, 1 Aleea Universitatii, Constanța, marius_fagaras@yahoo.com

¹University of Craiova, Faculty of Horticulture, Departament of Plant Physiologie, 19 Libertatii Street, 200583, Craiova, luminita25dragomir@yahoo.com

*Corresponding author, e-mail: mniculescum@yahoo.com

Key words: corology, ecology, plant communities, quarry, Natura 2000, habitats

ABSTRACT

Following field research conducted in Baita-Craciunești quarry and neighboring, 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 anthropo-zoogen factors in this area. Herbaceous vegetation is the vegetation of grasslands, ruderal vegetation and saxicole vegetation, weeds vegetation and ruderal vegetation (present around households, buildings, shelters, warehouses, along the roads and trails or quarry trash pit). The most important grassland habitats are: 6520 - Mountain hay meadows; CLAS. PAL.: 38.31., 6440 - Alluvial meadows of river valleys of the *Cnidion dubii*; CLAS. PAL.: 37. and 6240* - Sub-pannonic steppic grasslands; CLAS. PAL.: 34.315. These habitats are highly significant for the ecological rehabilitation here.

INTRODUCTION

Biodiversity preservation in a mining quarry is essential regardless of where it takes place. Regarding the biodiversity existing in Baita-Craciunesti quarry, 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 the habitats, complex studies were carried out as such, which should relate exclusively to Baita-Craciunești quarry; 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.

MATERIALS AND METHODS

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. 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).

RESULTS AND DISCUSSION

Herbaceous vegetation is the vegetation of grasslands, ruderal vegetation and saxicole vegetation, weeds vegetation and ruderal vegetation (present around households, buildings, shelters, warehouses, along the roads and trails or quarry trash pit).

Grassland habitats

The most important grassland habitat is 6520 - Mountain hay meadows; CLAS. PAL.: 38.31. Characteristic species: *Trisetum flavescens*, *Heracleum sphondylium*, *Viola cornuta*, *Astrantia major*, *Carum carvi*, *Crepis mollis*, *Polygonum bistorta*, *Silene dioica*, *S. vulgaris*, *Campanula glomerata*, *Salvia pratensis*, *Anthoxanthum odoratum*, *Geranium phaeum*, *G. sylvaticum*, *Malva moschata*, *Trollius europaeus*, *Pimpinella major*, *Muscari botryoides*, *Lilium bulbiferum*, *Thlaspi caerulescens*, *Viola tricolor* subsp. *subalpina*, *Phyteuma orbiculare*, *Primula elatior*, *Chaerophyllum hirsutum*, *Alchemilla* spp., *Cirsium heterophyllum* (Gafta, D.,

In this area the plant community for this habitat is: *Festuco rubrae-Agrostetum capillaris* Csürös-Káptalan 1964 (Syn. *Festucetum rubrae-Agrostietum capillaris* Horv. 1951; *Festuco rubrae-Cynosuretum auct. roman.*, *Festucetum rubrae et Agrostis capillaris auct. roman.*) (Table 1) (fig. 1, 2).

Ass. *Festucetum rubrae-Agrostietum capillaris* Csürös-Káptalan 1964

Table 1

No. of relevée	1	2	3	4	5	K
Altitude m.o.s. (x 10 m)	43	43	45	47	48	
Exposure	-	10	10	10	5	
Inclination (in grades)	-	SV	S	V	SV	
Coverage of herbaceous layer (%)	100	100	100	100	100	
Sampling surface (m ²)	100	100	100	100	100	
Char. ass.						
<i>Festuca rubra</i>	4	3	3	3-4	3	V
<i>Agrostis capillaris</i>	2	1	1	1	1	V
Molinio-Arrhenatheratea						
<i>Briza media</i>	+	+	-	+	+	IV
<i>Anthoxanthum odoratum</i>	-	+	+	+	+	IV
<i>Bromus mollis</i>	+	-	+	-	-	III
<i>Holcus lanatus</i>	+	-	+	-	-	III
<i>Thymus pulegioides</i>	-	+	+	+	+	V
<i>Genistella sagittalis</i>	3	3	+	+	+	V
<i>Poa pratensis</i>	+	+	+	-	+	IV
<i>Trifolium pratense</i>	+	+	-	+	+	IV
<i>Trifolium montanum</i>	-	+	+	+	+	IV
<i>Trifolium repens</i>	+	+	+	-	-	III
<i>Vicia cracca</i>	-	+	+	-	+	III
<i>Medicago lupulina</i>	+	-	+	+	-	III
<i>Colchicum autumnale</i>	+	+	3	3	+	V
<i>Ranunculus acris</i>	-	+	+	-	-	II
<i>Dactylis glomerata</i>	+	+	+	+	+	V
<i>Cerastium fontanum</i>	-	+	+	+	+	IV
<i>Stellaria graminea</i>	+	-	+	-	+	III
<i>Phleum pratense</i>	+	-	+	+	-	III
<i>Betonica officinalis</i>	-	+	+	+	+	IV
<i>Luzula campestris</i>	+	+	+	+	+	V
<i>Ononis arvensis</i>	+	+	-	-	-	II
<i>Polygala vulgaris</i>	+	+	+	+	+	V
<i>Lychnis flos-cuculi</i>	-	+	+	-	+	III
<i>Rumex acetosa</i>	-	-	+	-	-	I
<i>Rhinanthus minor</i>	+	-	+	-	-	II
<i>Achillea millefolium</i>	+	+	+	-	+	IV
<i>Leontodon autumnalis</i>	+	+	-	+	+	IV

<i>Lathyrus pratensis</i>	-	-	+	+	-	II
<i>Centaurea phrygia</i>	+	+	+	+	+	V
<i>Centaurea jacea</i>	-	+	+	-	-	II
<i>Plantago lanceolata</i>	-	+	+	-	+	III
<i>Leucanthemum vulgare</i>	-	+	+	+	+	IV
<i>Ranunculus repens</i>	+	-	-	-	+	II
Arrhenatheretalia						
<i>Cynosurus cristatus</i>	-	+	+	+	+	IV
<i>Rhinanthus rumelicus</i>	-	+	+	+	+	IV
<i>Veronica chamaedrys</i>	-	+	-	-	+	II
<i>Trifolium dubium</i>	-	+	+	+	+	IV
<i>Arrhenatherum elatius</i>	+	+	-	+	-	III
<i>Viola tricolor</i>	-	-	+	-	+	II
<i>Campanula patula ssp. patula</i>	-	+	+	+	+	IV
Festuco-Brometea						
<i>Carex caryophyllea</i>	+	+	+	+	+	IV
<i>Medicago falcata</i>	-	+	+	-	-	II
<i>Galium verum</i>	+	+	+	+	+	V
<i>Galium mollugo</i>	-	-	+	-	-	I
<i>Lotus corniculatus</i>	+	+	+	-	-	III
<i>Dianthus carthusianorum</i>	+	+	-	-	+	III
<i>Fragaria viridis</i>	+	-	+	-	+	III
<i>Pimpinella saxifraga</i>	+	-	+	-	+	III
<i>Potentilla argentea</i>	+	-	-	+	-	II
<i>Peucedanum oreoselinum</i>	-	+	-	-	+	II
<i>Centaurea micranthos</i>	-	+	-	+	-	II
<i>Helianthemum nummularium</i>	-	-	+	+	-	II
<i>Gentiana cruciata</i>	-	-	+	+	-	II
<i>Filipendula hexapetala</i>	-	+	+	-	-	II
Variae Syntaxa						
<i>Rorippa sylvestris</i>	-	-	+	+	+	III
<i>Lychnis viscaria</i>	-	-	+	-	+	II
<i>Prunella vulgaris</i>	+	-	+	+	+	IV
<i>Briofite diverse specii</i>	+	+	+	+	+	V

Place and data of relevés: **Băița-Crăciunești Quarry, 15.V.2014**

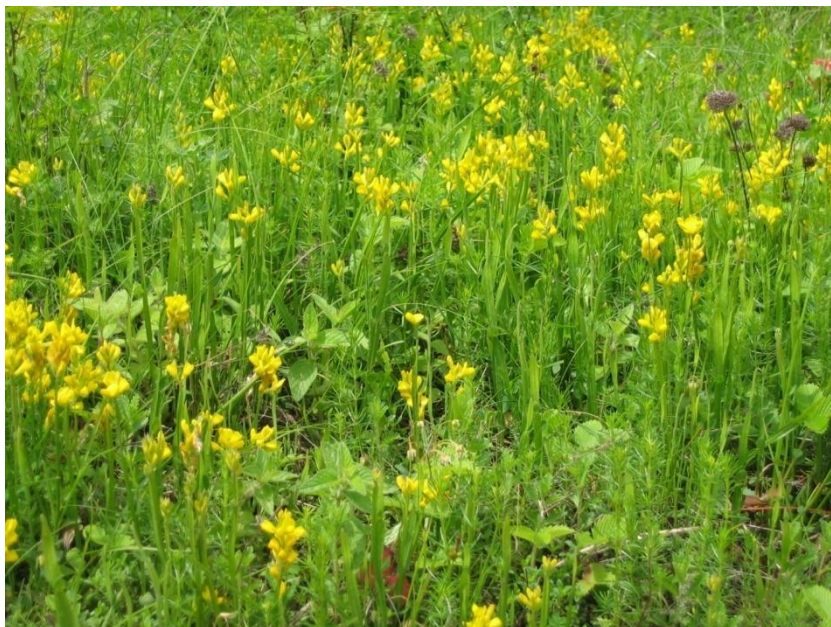


Fig. 1. Abundance of the *Genistella sagittalis* in the *Festucetum rubrae-Agrostietum capillaris* Csürös-Káptalan 1964 plant community (Foto M. Niculescu)



Fig. 2. Abundance of the *Colchicum autumnale* in the *Festucetum rubrae-Agrostietum capillaris* Csürös-Káptalan 1964 plant community (Foto M. Niculescu)

The habitat 6440 -Alluvial meadows of river valleys of the *Cnidion dubii*; CLAS. PAL.: 37. is well represented. Characteristic species and dominant: *Cnidium dubium* (*C. venosum*), *Viola persicifolia*, *Scutellaria hastifolia*, *Allium angulosum*, *Gratifolia officinalis*, *Carex praecox*, *Juncus atratus*, *Lythrum virgatum*. This grassland habitat is represented for these plant communities: *Festucetum pratensis* Soó (1938) 1955, 1969.), *Poëtum pratensis* Răvăruț et al 1956 (*Syn. Trifolio-Poëtum pratensis* (Răvăruț et al. 1956) Resmeriță 1958) (Table 2).

Ass. *Poëtum pratensis* Răvăruț et al 1956
(*Syn. Trifolio-Poëtum pratensis* (Răvăruț et al. 1956) Resmeriță 1958)

Table 2

No. of relevée	1	2	3	4	5	K
Altitude m.o.s. (x 10 m)	45	45	46	47	47	
Exposure	V	-	-	SV	NV	
Inclination (in grades)	10	-	-	5	7	
Coverage of herbaceous layer (%)	90	95	95	100	100	
Sampling surface (m ²)	100	30	50	100	100	
Char. ass.						
<i>Poa pratensis</i>	4	4	4	4	4	V
Molinietalia et Molinio-Arrhenatheretea						
<i>Alopecurus pratensis</i>	+	+	-	1	-	III
<i>Agrostis stolonifera</i>	+	1	+	+	1	V
<i>Cirsium caum</i>	+	-	+	-	+	III
<i>Briza media</i>	+	+	+	+	+	V
<i>Anthoxanthum odoratum</i>	-	+	+	+	-	III
<i>Holcus lanatus</i>	+	+	+	+	+	V
<i>Festuca pratensis</i>	+	+	+	+	+	V
<i>Trifolium pratense</i>	1	1	+	+	+	V
<i>Trifolium repens</i>	+	+	+	+	+	V
<i>Vicia cracca</i>	+	-	+	+	-	III
<i>Medicago lupulina</i>	-	+	+	+	-	III
<i>Ranunculus acris</i>	+	+	+	+	+	V
<i>Dactylis glomerata</i>	+	+	+	+	+	V
<i>Cerastium glomeratum</i>	-	+	+	+	-	III
<i>Stellaria graminea</i>	+	+	+	+	+	V
<i>Taraxacum officinale</i>	+	-	+	+	+	IV
<i>Luzula campestris</i>	-	+	+	+	-	III

<i>Lychnis flos-cuculi</i>	+	+	+	-	+	IV
<i>Achillea millefolium</i>	-	-	+	+	+	IV
<i>Leontodon autumnalis</i>	-	+	+	+	+	IV
<i>Plantago lanceolata</i>	-	-	+	+	+	IV
<i>Leucanthemum vulgare</i>	+	+	+	+	-	IV
<i>Ranunculus repens</i>	1	1	1	+	1	V
Arrhenatheretalia						
<i>Agrostis capillaris</i>	-	+	+	1	+	IV
<i>Veronica chamaedrys</i>	+	-	+	+	-	III
<i>Cynosurus cristatus</i>	-	+	+	+	-	III
<i>Rhinanthus rumelicus</i>	-	+	+	-	-	II
<i>Arrhenatherum elatius</i>	+	+	+	-	-	III
<i>Festuca rubra</i>	-	+	+	-	+	III
<i>Campanula patula ssp. patula</i>	+	+	-	+	+	IV
Festuco-Brometea						
<i>Galium verum</i>	+	+	+	-	-	III
<i>Filipendula vulgaris</i>	+	+	+	-	-	III
<i>Lotus corniculatus</i>	-	+	+	+	-	III
<i>Sanguisorba minor</i>	+	-	+	-	-	II
<i>Coronilla varia</i>	-	+	+	-	+	III
<i>Salvia pratensis</i>	+	+	-	+	-	III
<i>Dianthus carthusianorum</i>	-	+	+	-	+	III
<i>Fragaria viridis</i>	-	+	-	-	+	II
<i>Thymus pulegioides</i>	+	+	+	+	+	V
<i>Potentilla argentea</i>	+	+	+	+	+	V
Variae Syntaxa						
<i>Vicia sativa</i>	-	+	+	-	-	II
<i>Rorippa sylvestris</i>	-	-	+	-	+	II
<i>Lychnis viscaria</i>	+	-	+	-	-	II
<i>Cirsium arvense</i>	+	-	+	+	+	IV
<i>Potentilla reptans</i>	+	+	+	-	+	V
<i>Prunella vulgaris</i>	+	+	+	+	+	V
<i>Rumex crispus</i>	+	-	+	+	+	IV
<i>Gentiana cruciata</i>	+	+	-	-	-	II
<i>Salvia verticillata</i>	+	-	+	-	-	II
<i>Bromus arvensis</i>	+	-	+	+	-	III
<i>Elymus repens</i>	+	-	+	+	+	IV
<i>Valerianella locustris</i>	+	+	-	-	-	II
<i>Briofite diverse specii</i>	+	+	+	+	+	V

Place and data of relevés: **Băița-Crăciunești Quarry, 15.V.2014**

Another important grassland habitat is habitat 6240* - Sub-pannonic steppic grasslands; CLAS. PAL.: 34.315. *Characteristic species and dominant*: *Festuca valesiaca*, *Allium flavum*, *Gagea pusilla*, *Teucrium chamaedrys*, *Medicago minima*, *Helianthemum canum*, *Poa badensis*, *Scorzonera austriaca*, *Potentilla arenaria*, *Seseli hippomarathrum*, *Alyssum alyssoides*, *Artemisia austriaca*, *Chrysopogon gryllus*, *Iris humilis* subsp. *arenaria*, *Carex humilis*, *Festuca rupicola*, *Stipa capillata*, *S. joannis*, *Botriochloa ischaemum*. In this area the plant community for this habitat is: *Medicagini minimae-Festucetum valesiaca* Wagner 1941 (Table 3, fig. 3, 4), *Festucetum valesiaco-rupicola* Csűrös et Kovács 1962.

Ass. *Medicagini minimae-Festucetum valesiaca* Wagner 1941

Table 3

No. of relevée	1	2	3	4	5	K
Altitude m.o.s. (x 10 m)	1	2	3	4	5	
Exposure	45	45	46	47	47	
Inclination (in grades)	SV	-	V	SV	V	
Coverage of herbaceous layer (%)	10	-	10	5	7	
Sampling surface (m ²)	100	95	95	100	100	
Char. ass.						
<i>Festuca valesiaca</i>	4-5	5	5	5	5	V
<i>Medicago minima</i>	-	+	+	+	-	III
Molinietalia et Molinio-Arrhenatheretea						

<i>Briza media</i>	-	+	1	+	+	III
<i>Poa pratensis</i>	-	-	+	-	+	II
<i>Trifolium campestre</i>	+	1	-	+	1	IV
<i>Alopecurus pratensis</i>	-	+	-	+	-	II
<i>Vicia tetrasperma</i>	+	+	+	+	+	V
<i>Trifolium repens</i>	+	+	+	+	+	V
<i>Rumex acetosa</i>	+	+	+	+	+	V
<i>Achillea millefolium</i>	+	+	+	+	+	V
<i>Leucanthemum vulgare</i>	+	+	-	+	-	III
Arrhenatheretalia						
<i>Cynosurus cristatus</i>	-	+	-	+	+	III
<i>Rhinanthus rumelicus</i>	+	+	+	+	+	V
<i>Campanula patula ssp. patula</i>	+	+	+	+	+	V
<i>Vicia cracca</i>	+	+	+	+	+	V
Festuco-Brometea						
<i>Carex caryophylla</i>	+	+	+	+	+	V
<i>Medicago falcata</i>	+	+	+	+	+	V
<i>Galium verum</i>	+	+	+	+	+	V
<i>Danthonia provincialis</i>	-	+	-	+	-	II
<i>Potentilla argentea</i>	+	+	-	+	+	IV
<i>Prunella laciniata</i>	-	+	-	+	-	II
<i>Hypericum perforatum</i>	-	+	-	+	-	II
<i>Ornithogalum umbellatum</i>	-	+	-	+	-	II
<i>Gagea arvensis</i>	+	+	-	+	+	IV
<i>Crepis setosa</i>	-	+	-	+	-	II
<i>Rumex crispus</i>	+	+	+	+	+	V
<i>Euphorbia cyparissias</i>	-	+	-	+	-	II
<i>Ranunculus sardous</i>	+	+	+	+	+	V
<i>Rorippa austriaca</i>	-	-	1	1	1	III
<i>Draba verna</i>	-	+	1	-	+	III
<i>Rosa gallica</i>	+	+	-	+	+	IV
Variae Syntaxa						
<i>Vicia tetrasperma</i>	+	+	+	-	-	III
<i>Lychnis viscaria</i>	-	+	-	+	-	II
<i>Cirsium arvense</i>	+	+	+	+	+	V
<i>Sisymbrium officinale</i>	-	+	-	+	-	II
<i>Chenopodium album</i>	-	+	-	+	-	II
<i>Solanum nigrum</i>	-	+	-	+	-	II
<i>Hyoscyamus niger</i>	-	+	-	+	-	II
<i>Urtica dioica</i>	+	+	-	+	+	IV
<i>Thlaspi arvense</i>	+	+	-	+	-	III

Place and data of relevés: **Băița-Crăciunești Quarry, 16.V.2014**



Fig. 3. Ass. *Medicagini minimae-Festucetum valesiaca* Wagner 1941
(Foto M. Niculescu)



Fig. 4. *Ass. Medicagini minimae-Festucetum valesiaca* Wagner 1941
(Foto M. Niculescu)

Stipetum pulcherrimae Soó 1942 plant community was quoted by Pop and Hodisan from the quarry surrounding area but it has not been found. Nevertheless, this may be a consequence of the fact that there was little time available for the whole research project. This association is very important, it builds a primary habitat - 62C0 * Ponto-Sarmatian steppes [Ponto-Sarmatic Steppes] CLAS. PAL.: 34.92 and further studies would be necessary in order to identify and establish the preservation status.

CONCLUSION

In the present research work, is presented a study on the Natura 2000 grassland Natura 2000 habitats found in Băița-Crăciunești Quarry and the surroundings, Hunedoara County. Herbaceous vegetation is the vegetation of grasslands, ruderal vegetation and saxicole vegetation, weeds vegetation and ruderal vegetation (present around households, buildings, shelters, warehouses, along the roads and trails or quarry trash pit).

Grasslands are widespread crop formation; the largest areas are filled with Festuca rubra, F. valesiaca, F. pratensis, Poa pratensis, Sesleria rigida etc. In the floristic composition of these meadows, numerous endemic and rare species are a component part, especially orchids. Among plant communities the most common are: Festuco rubrae-Agrostetum capillaris Csűrös-Káptalan 1964 (Syn. Festucetum rubrae-Agrostietum capillaris Horv. 1951; Festuco rubrae-Cynosuretum auct. roman., Festucetum rubrae et Agrostis capillaris auct. roman.), Festucetum pratensis Soó (1938) 1955, 1969.), Poëtum pratensis Răvăruț et al 1956 (Syn. Trifolio-Poëtum pratensis (Răvăruț et al. 1956) Resmeriță 1958), Medicagini minimae-Festucetum valesiaca Wagner 1941, Festucetum valesiaco-rupicolae Csűrös et Kovács 1962, Seslerietum rigidae Zólyomi 1939, Sedo hispanici-Poetum nemoralis. Stipetum pulcherrimae Soó 1942 plant community was quoted by Pop and Hodisan from the quarry surrounding area but it has not been found. Nevertheless, this may be a consequence of the fact that there was little time available for the whole research project. This grasslands plant communities identified in the Băița-

Crăciunești Quarry are part for the Natura 2000 habitas: 6520 - *Mountain hay meadows*; CLAS. PAL.: 38.31., 6440 - *Alluvial meadows of river valleys of the Cnidion dubii*; CLAS. PAL.: 37. and 6240* - *Sub-pannonic steppic grasslands*; CLAS. PAL.: 34.315. These habitats are highly significant for the ecological rehabilitation here.

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

REFERENCES

1. **Braun– Blanquet, J.** – 1932, *Plant Sociology, the study of plant communities*, Ed. Mc-Graw – Hill Book Company, Inc. New – York and London, 31-33
2. **Buse Luminita** - 2011, *Fiziologia generala a plantelor*, Ed. Sitech, Craiova
3. **Gafta D., Mountford, O.**, coord. *Romanian Manual for interpretation of Eu habitats*, ED. Risoprint, Cluj-Napoca, pp. 101, 2008
4. **Mountford, O., Gafta, D. Anastasiu, P., Bărbos, M., Nicolin, A., Niculescu, M. & Oprea, Ad.** 2008. *Natura 2000 in Romania. Habitat Fact Sheets*. Available on: electronic support, 252 pp.
5. **Niculescu, M.** The scientific study assessment of Natura 2000 habitats and species to substantiation ecological reconstruction in the Lespezi Quarry, Project in the Quarry life competition, <http://www.quarrylifeaward.com/project/scientific-study-assessment-natura-2000-habitats-and-species-substantiation-ecological>, 2012
6. **Niculescu, Mariana, Grecu, F., Nuță, I. S., Iovu, I.** Researches on the meadows from *Cynosurion cristati* br.-bl. et tx. 1943 in the Bistrița-Văratec Valley (Gorj County, Romania) *Analele Universității din Craiova, seria Agricultură – Montanologie – Cadastru* Vol. XLII/2/2012, <http://agronomie.administrativ.ucv.ro/aamc/index.php/aamc>, p.188-193
7. **Niculescu, Mariana, Bercea, I., Niculescu, L., Nuță, I. S.**, - Considerations about the woody vegetation of the Băița-Crăciunești area, Hunedoara County, *Analele Universității din Craiova, seria Agricultură – Montanologie – Cadastru* (Annals of the University of Craiova - Agriculture, Montanology, Cadastre Series) Vol. XLIV 2014, Vol 1, <http://anale.agro-craiova.ro/index.php/aamc/article/view/200>
8. **Niculescu, Mariana, Făgăraș, M. M.**- THE GRASSLAND NATURA 2000 HABITATS FOUND IN LESPEZI QUARRY AND THE SURROUNDINGS, DAMBOVITA COUNTY 15th International Multidisciplinary Scientific GeoConference SGEM 2015, www.sgem.org, SGEM2015 Conference Proceedings, ISBN 978-619-7105-39-1 / ISSN 1314-2704, June 18-24, 2015, Book5 Vol. 1, 877-882 pp, DOI: 10.5593/SGEM2015/B51/S20.116, <http://www.sgem.org/sgemlib/spip.php?article6369&lang=en>
7. **Pop, I. et Hodișan, I.** – 1964, *Studii floristice și de vegetație la Cheile Crăciunești (Regiunea Hunedoara, Raionul Brad)*, Cluj-Napoca
9. **Rodwell, J.S., Schaminée, J.H.J., Mucina, L., Pignatti, S., Dring, J., Moss, D.** The Diversity of European Vegetation, Raport EC-LNV nr. 2002/054, 2002
10. XXX-1960, *Monografia geografică a R.P.R., vol.I*, Ed. Acad. R.P.R., București
11. XXX- *Flora României*. Vol. I-XIII, Ed. Acad. Române, București, 1952-1980
12. XXX- *Flora Europaea*. Vol.I-IV, University Press, Cambridge, 1964-1980
13. XXX - *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code)*, adopted by the Eighteenth International Botanical Congress Melbourne, 2012
14. XXX-2007, *European Commission Interpretation Manual of European Union, Habitats-EUR27, DG Environment - Nature and Biodiversity*, http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/2007_07_im.pdf, 2007