CONTRIBUTIONS REGARDING THE STUDY OF THE *PILOBION ANGUSTIFOLII* (RÜBEL 1933) SOÓ 1933 (SYN. *CARICI PILULIFERAE-EPILOBION ANGUSTIFOLII* TX. 1950) ALLIANCE IN THE UPPER BASIN OF THE LUNCAVĂŢ RIVER

Mariana NICULESCU[1] , Alma Lioara NICOLIN[2], Ilinca MERIMA IMBREA[2]

[1,] University of Craiova, Faculty of Agriculture,
e-mail:*mniculescum@yahoo.com*

[2]Banat's University of Agricultural Sciences and Veterinary Medicine, Timişoara,
e-mail:*alma_grigoriu@hotmail.com, mocioi_i@yahoo.com*

The present paper focuses on the complex analysis of 3 plant communities within the EPILOBION ANGUSTIFOLII (Rübel 1933) Soó 1933 (SYN. CARICI PILULIFERAE-EPILOBION ANGUSTIFOLII TX. 1950) alliance: 1. Senecioni sylvatici-Chamaenerietum angustifolii (Tx. 1937), Soó 1961 (Syn. Epilobietum angustifolii Rübel 1933, Senecioni sylvatici-Epilobietum angustifolii Tx. 1937; Senecioni-Epilobietum angustifolii (Hueck 1931) Tx. 1950), 2. Calamagrostio arundinaceae-Digitalietum grandiflorae (Silling. 1933) Oberd. 1957 (Syn. Calamagrostietum arundinaceae Puscaru et al 1959; Digitali ambigue-Calamagrostietum arundinaceae Sillinger 1933) şi 3. Deschampsietum flexuosae Issler 1942 emend. Borza 1946. The phytocoenoses of the first two plant communities takes place in the interpenetration of the beech, fir tree and of spruce, usually springing up on slightly or heavily slanted lands, rarely on the flat one in the mountainous region. These plant communities are widespread in the investigated territory, because of the massive woodcutting that took place in the past few years. The phytocoenoses represented by Deschampsia flexuosa covers limited areas in the the researched territory, usually growing at the edge of forest paths, on stubbed fields, at the edge of the forests, on eroded slopes. The three associations have a particular significance, being pioneer associations in afforestation playing an important antierosive role.

***Key words**:plant communities,chorology, ecology, floristic composition, alliance, the Bray-Curtis dissimilarity index.*

The studied area is situated along the upper basin of the Luncavăţ river, in the southern part of Meridional Carpathians. n this paper, we present 3 plant communities, belonging to *the EPILOBION ANGUSTIFOLII (Rübel 1933) Soó 1933 (SYN. CARICI PILULIFERAE-EPILOBION ANGUSTIFOLII TX. 1950) aliance: 1. Senecioni sylvatici-Chamaenerietum angustifolii (Tx. 1937), Soó 1961*

(Syn. Epilobietum angustifolii Rübel 1933, Senecioni sylvatici-Epilobietum angustifolii Tx. 1937; Senecioni-Epilobietum angustifolii (Hueck 1931) Tx. 1950), 2. Calamagrostio arundinaceae-Digitalietum grandiflorae (Silling. 1933) Oberd. 1957 (Syn. Calamagrostietum arundinaceae Puscaru et al 1959; Digitali ambigue-Calamagrostietum arundinaceae Sillinger 1933) şi 3. Deschampsietum flexuosae Issler 1942 emend. Borza 1946.

MATERIALS AND METHODS

The field research on the field was carried out between 1997-2004, during all seasons and having clearly defined itineraries. The research underpinned solid bibliographical documentation with respect to the physical and geographical environment: the relief, geology-lithology, types of rocks, hydrographic net, soils and the general and local climate. The materials used were topographic, geological and pedological maps. The itinerary was marked on the topographic map. The findings included vegetal associations, and the vascular flora was closely analyzed, especially taking into consideration the anthropic factor. For the study or the vegetal carpet we have used methods of phyto-sociologic research characteristic to the Central European phyto-sociologic School, which was based on the principles and methods elaborated by J. Braun-Blanquet (1926). The association were identified and distinguished according to the characteristic, edifyng, dominant and differential species. The name of the vegetal association was given taking into account the regulations stated by the Phytosociologic Nomenclature Code (2000).

RESULTS AND DISCUSSIONS

1. Ass. Senecio sylvatici-Chamaenerietum (Epilobietum) angustifolii (Hueck 1931) Tx. 1950**.**

The phytocoenoses of this association grow at the interference of the beech, beech with fir tree and of spruce, usually growing on slated lands, and rarely on flat ones. It is a widespread association in the investigated territory, due to the massive clear-cutting that took place in the past few years. This kind of phytogenesis was analysed on V. Luncavăţului, V. Blajului, V. Curpenilor.

Physiognomy and floristic composition. In the floristic composition, in addition to the most representative species, the following species are also present: *Calamagrostis arundinaceea, Luzulala luzuloides, Poa nemoralis, Myosotis sylvatica, Senecio ovatus, S. rupestris, Valeriana tripteris, Deschampsia flexuosa, Solidago virgaurea*, *Spiraea chamadrifolia*, *Rubus idaeus*, *Campanula patula* ssp. *abietina*, *Stellaria nemorum*.

The dendrogram of *Senecio sylvatici-Chamaenerietum (Epilobietum) angustifolii* (*fig. 1*), emphasizes the separation of the samples in two clusters. The first one groups together the following: 1, 6, 3, 4, 5, 7 and 8 having the value of the quantitative index *Bray-Curtis* between 0.36 and 0.13. The second cluster groups together the 2 and 9 subgroups, the quantitative index having the value of 0.37. Sample 10 interlocks with 2 and 9 subgroups, having the value of the quantitative index *Bray-Curtis very* close (0.38) due to it s resembling floral composition. Samples 2 and 9 are group together because of the high value of luxuriance-

dominance of the *Chamaenerion angustifolii* speciea, compared to the other species of the association. The first cluster is divided into subclusters, identifying, among these, sample 4, different from the others by the species *Calamagrostis arundinacea*.

The grouping of 4, 5, 7 and 8 in a subcluster can be explained on account of the luxuriance-dominance value of the *Solidago virgaurea* (1) species in comparison to the other samples. The branches of the dendrogram are individualized enough for each sample group, even if the quantitative *Bray-Curtis* index variation is between 0.38 and 0.13.

The phytocoenoses of this plant communities is to be found in the clear-cutting of spruce forests or beech and fire tree forests, and can evolve toward the phytocoenoses of raspberry cane or elder with *Salix capraea.*

Importance. It has a particular importance because it is a pioneering plant communities in afforestation. Numerous species with medical, melliferous, alimentary and fodder value participate to phygenesis. Among the species having phytopharmaceutical importance, we can mention: *Rubus idaeus*, *Hypericum maculatum*, *Solidago virgaurea*, *Vaccinium myrillus*, *V. vitis-idaea*.

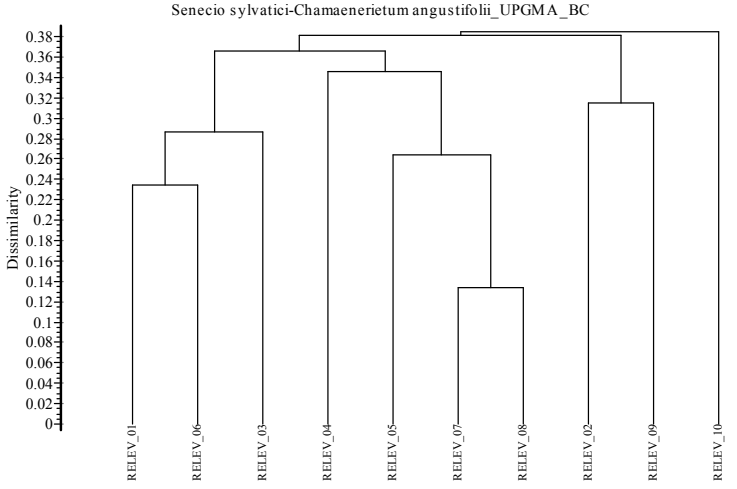

Figura 1 **The dendrogram of ass. *Senecio sylvatici-Chamaenerietum (Epilobietum) angustifolii***

2. Ass. *Calamagrostio arundinaceae-Digitalietum grandiflorae* (Silling. 1933) Oberd. 1957

Chorology. The phytocoenoses of the *Calamagrostio arundinaceae-Diditalietum grandiflorae* is present on sunny very steepy slopes in the mountainous region. In the higher basin of Luncavăţ this kind of phytocoenoses have been analysed at Cabana Ursu, Culmea cu Larice, V. Blajului, V. Curpenilor at altitudes between 950-1,350 meters.

Physiognomy and floristic composition. In the floristic composition of the plant communities, besides the two most representative species, there are also a series of species which belong to the alliance *Epilobion angustifolii* and *Sambuco-*

Salicio, alongside a few species that belong to the *Atropetalia* class. Being an plant communities of clear-cut forests in the researched phytogenesis, it also includes a series of species of the *Fagetalia* class: *Luzula luzuloides*, *Dryopteris filix-mas*, *Athyrium filix-femina*, *Daphne mezereum*, *Veronica urticifolia*, *Mycelis muralis*, *Epilobium montanum*. The vegetation coverage is between 70% and 90% even if this kind of phytogenosis is present on slopes and superficial soils.

By examining the dendrogram (*fig. 2*), we can see the grouping of the samples into two clusters.

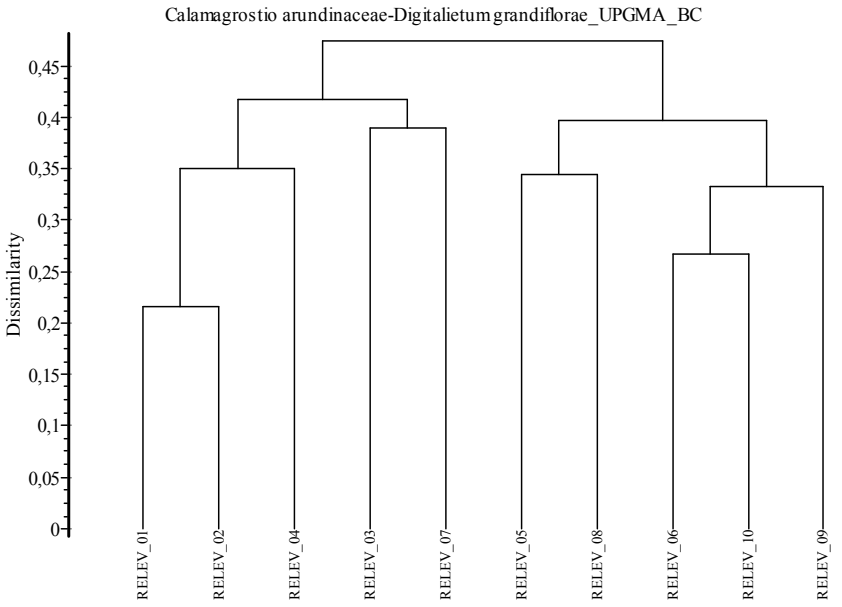

Figura 2 **The dendrogram of ass. *Calamagrostio arundinaceae-Digitalietum grandiflorae***

The first cluster couples samples: 1, 2, 4, 3 and 7, being subdivided in its turn into two clusters. In the first cluster, sample 4 is singled out on the account of the value of luxuriance-dominance of the species *Rubus idaeus* in comparison to the other samples. The second cluster groups samples 5, 8, 6, 10 and 9. In this cluster, samples 6, 10 and 9 make up a distinct subcluster because of the *Deschampsia flexuosa* species, having the value AD=1, unlike the other samples of the association. In this dendrogram the values of the quantitative index *Bray-Curtis* are between 0.42 and 0.22, which indicates the high homogeneity of the floral composition of the phytocoenoses in these associations.

Importance. In the researched phytocoenoses, we encountered a series of species with medical, melliferous and alimentary value. They have an important role in the soil protection against erosion.

Ass. *Deschampsietum flexuosae* Issler 1942 emend. Borza 1946.

Table 1

No. of relevée	1	2	3	4	5	6	7	8	K
Altitude m.o.s. (x 10 m)	120	120	125	125	170	170	160	160	
Exposure	V	V	-	-	E	E	SV	SV	
Inclination (in grades)	40	40	-	-	10	10	10	15	
Coverage (%)	70	70	80	80	100	100	100	100	
Area (m^2)	25	25	50	50	100	100	100	100	
Char. ass.									
Deschampsia flexuosa	4	4	4	4	3	3-4	3	3-4	V
Epilobietea et Epilobion angustifolii									
Chamaenerion angustifolium	-	+	+	+	+	-	+	-	IV
Fragaria vesca	+	+	-	+	+	+	+	-	IV
Calamagrostis arundinacea	+	+	+	+	-	+	-	-	IV
Galeopsis speciosa	-	-	+	+	-	-	-	-	II
Gnaphalium sylvaticum	+	-	+	+	+	-	-	-	III
Senecio ovatus	-	-	+	+	-	+	+	-	III
Secalietea									
Rumex acetosella	+	-	+	+	+	+	-	-	IV
Festuco-Brometea									
Trifolium aureum	-	+	+	+	-	-	-	-	II
Hieracium pilosella	+	+	+	+	-	+	-	-	IV
Molinio-Arrhenatheretea									
Agrostis capillaris	+	+	+	+	1	1	2	1	V
Deschampsia caespitosa	-	-	+	+	+	-	+	-	III
Leontodon autumnalis	-	-	+	+	+	-	+	+	IV
Luzula campestris	+	-	+	+	+	+	+	+	V
Anthoxantum odoratum	-	-	-	-	+	+	1	1	III
Phleum alpinum	-	-	-	-	+	+	+	+	III
Nardo-Callunetea									
Campanula patula ssp. abietina	-	-	+	+	+	+	-	+	IV
Carex ovalis	-	-	+	-	+	+	-	+	III
Potentilla aurea ssp. chrysocraspeda	-	-	-	-	+	+	+	+	III
Alchemilla conivens	-	-	-	-	+	+	+	+	III
Hypericum maculatum	-	-	+	-	+	+	+	+	IV
Festuca nigrescens	-	-	-	+	2	2	2	2	IV
Viola declinata	-	-	-	-	+	+	+	+	III
Querco-Fagetea									
Veronica officinalis	+	+	-	+	+	-	+	+	IV
Poa nemoralis	+	+	+	-	+	-	-	-	III
Luzula luzuloides	+	+	+	+	+	+	+	+	V
Vaccinio-Piceetea									
Hieracium transsylvanicum	+	+	-	-	-	-	-	-	II
Vaccinium myrtillus	+	+	-	-	+	+	+	+	IV
Homogyne alpina	-	-	-	-	+	+	+	+	III
Hieracium murorum	+	+	-	-	-	-	-	-	II
Vaccinium vitis-idaea	-	-	-	-	+	+	+	+	III
Bruckenthalia spiculifolia	-	+	-	+	+	1	1	+	IV

Place and data of the relevés: 1, 2, 3, 4 - V. Curpenilor, 27.VII.2001; 5, 6, - Mt. lui Roman, 30.VII. 2001; 7, 8 - Mt. Ursuleţu, 31.VII.2001.

3. Ass. Deschampsietum flexuosae **Issler 1942 emend. Borza 1946** *(table 1)*

Chorology. The phytocoenoses represented by *Deschampsia flexuosa* occupies limited areas in the investigated territory, usually growing on the forests roads, on the clear-cut lands, at the edge of the forests, on eroded slopes. In the researched area, this type of phytocoenoses has been analyzed in the Curpeni Valley, below the Roman peak and at Ursuleţu fold, at altitudes between 1,200 and 1,700 meters.

Physiognomy and floristic composition. The floristic composition of the plant communities is made up, except the most representative species, by *Calamagrostis arundinacea*, *Agrostis capillaris*, *Hieracium pilosella*, *Luzula luzuloides*, *Rumex acetosella*, *Chamaenerion angustifolium.* The vegetation coverage is lower for the phytocoenoses which are present on eroded slopes and at the forest roadsides (70-80%), and higher for the phytocoenoses present on clear-cut spruce areas (100%).

Importance. The association has an important antierosive role.

CONCLUSIONS

According to the research carried out between 1997-2007, in the upper basin of the Luncavăţ river, there were identified 3 plant communities belonging to *EPILOBION ANGUSTIFOLII (Rübel 1933) Soó 1933 (SYN. CARICI PILULIFERAE-EPILOBION ANGUSTIFOLII TX. 1950) aliance.*

For each plant communities the chorology, ecology, aspect and floral composition as well as their importance are taken into consideration. The phytocoenosis of the first two associations appear in the rocks slits and also on the limestone layer at the alpine level. The 3 described plant communities have an important pedogenetic role. In the researched phytocoenoses, we encountered a series of species with phytopharmaceutical, melliferous and alimentary value.

BIBLIOGRAPHY

1. Borhidi, A., 1995 - *Social Behaviour types, the naturalness and relative ecological indicator values of the higher plants in the Hungarian Flora*, *Acta Botanica Hungarica,* 39 (1-2), Budapest, p. 81-97.
2. Coldea, G., 1991 - *Prodrome des associations végétales des Carpates du Sud-Est. (Carpates Roumaines), Documents Phytosociologiques, N.S.*, 13, Camerino, p. 317-539.
3. Mucina, L., 1997 - *Conspectus of Classes of European vegetation*, *Folia Geobot. Phytotax.*, Praha, 32: 117-172.
4. Niculescu, M., 2006 - *Flora and vegetation in the upper basin of the Luncavat River*, Ph.D. thesis, "Babes-Bolyai" University of Cluj-Napoca.
5. Rodwell, J.S., Schaminée, J.H.J., Mucina, L., Pignatti, S., Dring, J., Moss, D., 2002 - *The Diversity of European Vegetation, Raport EC-LNV nr. 2002/054*, Wageningen.
6. Roşu, A., 1980 - *Geografia fizică a României,* Ed. Did. Şi Ped., Bucureşti.
7. Sanda, V., Popescu, A., Barabaş, N., 1998 - *Cenotaxonomia şi caracterizarea grupărilor vegetale din România*, Stud. şi comunic. Biol. veg., Ed. I. Borcea, Bacău.