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CONTRIBUTIONS REGARDING THE STUDY OF THE NARDO-CALLUNETEA PRSG. 1949 CLASS IN THE UPPER BASIN OF LUNCAVĂŢ RIVER (VÂLCEA COUNTY)

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Abstract: On the occasion of certain vegetation research made in the superior area of Luncavăţ River (Vâlcea County), between 1997-2004, we found 3 vegetal associations as being part of class *Nardo-Callunetea* Prsg. 1949, that will present in this paper: *Poetum mediae* Csűrös 1956, *Scorzonero roseae-Festucetum nigricantis* (Puşcaru et al. 1956) Coldea 1987, and *Violo declinatae-Nardetum* Simon 1966.

As part of identified associations description, referring to sinchorology, physionomy and floral composition and to the importance of those associations, too.

Introduction

The present paper aims at presenting the associations of the *Nardo-Callunetea* Prsg. 1949 Class, met in the upper basin of the Luncavăţ River. In the territory under research, there were identified three vegetal associations as being part of this class: *Poetum mediae* Csűrös 1956, *Scorzonero roseae-Festucetum nigricantis* (Puşcaru et al. 1956) Coldea 1987, and *Violo declinatae-Nardetum* Simon 1966.

1. Poetum mediae Csűrös 1956 (Table 1)

Chorology. In the upper basin of the Luncavăţ River this association covers relatively small areas, being met at the sub-alpine level, at an altitude of 1700-1950 m, on plain or slightly inclined surfaces. Its roots catch easily on humico-feriluvial soils, which are rich in nutritive substances and they are very acid. Such phytocoenoses have been analysed on the Piatra Roşie and Dârjala Mountains, the Funicelu Peak and under the Ursu Peak.

Physiognomy and floristic contribution. In the vegetal carpet, besides the specific and telling species of *Poa media*, there is also present a series of recognition species for the Potentillo-Nardion alliance, among which we can mention: *Nardus stricta*, *Geum montanum*, *Ligusticum mutellina*, *Festuca nigrescens*, *Antenaria dioica*, *Viola declinata* etc. There are also met numerous species which are characteristic to the Caricetalia curvulae order: *Agrostis rupestris*, *Hieraci*um *alpinum*, *Campanula alpina*, *Primula minima*. As far as the sindynamics is regarded, because of the intense grazing, these meadows develop into nards.

Importance. The *Poa media* meadows are characterized by a good fodder value, but the cultivated areas are reduced and the productivity is low.

2. Scorzonero roseae-Festucetum nigricantis (Puşcaru et al. 1956) Coldea 1987 (Table 1)

Chorology. The meadows of *Festuca nigrescens* are highly spread in the upper basin of the Luncavăţ River, and they are met both at the mountain level and the sub-alpine one, between 1500 and 1900 m altitude. These meadows cover the forest clearings and glades, as well as the gaps in the upper mountain sublevel and the sub-alpine level. They vegetate on brown podzol-like feriluvial and deeply humico-feriluvial soils, which are rich in humus, whether acid or moderately acid. One can meet them on the Ursuleţu Mountain, Căşăriei Mountain, Funicelu

Table 1: Floristic composition of the investigated associations

Ass. no	1		2		3		3a											
Altitude m.o.s.(x10m)	180 – 200		150 – 192		150 – 195		190	192	195	188	190	192	195	195	192	192		
Coverage (%)	85 – 100		90 – 100		95 – 100		95	100	95	100	100	100	100	95	100	100		
Area (m^2)	100		100		100		100	100	100	100	100	100	100	100	100	100		
No. of releves	15		15		13													
	K	ADm	K	ADm	K	ADm	1	2	3	4	5	6	7	8	9	10	K	ADm
Characteristics species																		
Poa media	V	52.50	IV	0,33	IV	0,30	+	+	+	-	-	-	-	+	+	-	III	0,25
Scorzonera rosea	-	-	V	0,43	III	0,26	+	+	-	+	-	+	+	-	+	-	III	0,30
Viola declinata	V	0,47	V	0,47	V	1,06	+	-	+	-	+	+	+	-	+	-	III	0,30
Potentillo - Nardion																		
Potentilla aurea spp.chrysocraspeda	V	4,21	V	0,50	V	0,50	+	+	+	+	+	+	+	+	+	+	V	0,50
Phleum alpinum	IV	0,33	III	0,27	III	0,26	+	+	-	+	-	-	+	+	+	+	IV	0,35
Campanula abietina	IV	0,33	V	0,47	III	0,26	-	-	-	+	-	-	+	+	-	-	II	0,15
Hipochoeris uniflora	IV	0,40	II	0,20	III	0,26	+	+	-	+	-	+	+	+	+	-	IV	0,35
Geum montanum	IV	0,33	IV	0,33	IV	0,35	+	+	+	-	+	-	+	-	-	+	III	0,30
Ligusticum mutelina	IV	0,40	III	0,27	IV	0,35	-	+	+	-	+	+	-	+	+	-	III	0,30
Hieracium aurantiacum	IV	0,46	IV	0,33	V	0,46	-	+	+	-	-	+	-	+	-	+	III	0,25
Thymus balcanus	III	0,27	III	0,23	IV	0,30	+	-	-	+	+	-	-	+	-	-	II	0,20
Leucorchis albida	-	-	II	0,23	II	0,19	+	-	+	-	-	+	+	-	-	+	II	0,25
Nardedatalia et Nardo-Calluneta																		
Nardus stricta	V	7,50	V	17,20	V	72,11	3	3	2	3-4	3-4	2-3	3-4	3	3	3-4	V	38,25
Festuca nigrescens	V	1,21	V	41,98	V	4,92	1	1	+	1	+	+	+	+	1	1	V	2,25
Antennaria dioica	IV	0,26	V	0,43	V	0,46	+	+	-	-	+	+	-	+	+	+	III	0,35
Arnica montana	III	0,27	III	0,23	III	0,26	-	+	+	-	+	-	-	+	+	-	II	0,25
Luzula sudetica	III	0,27	II	0,20	III	0,15	-	+	+	-	+	-	-	+	-	+	II	0,25
Hypericum maculatum	IV	0,36	IV	0,33	IV	0,30	+	+	-	+	-	-	+	+	+	-	III	0,30
Luzula campestris	II	0,13	II	0,20	II	0,15	+	-	+	-	-	+	-	-	-	-	II	0,15
Caricion et Caricetalia curvulae																		
Agrostis rupestris	V	4,43	II	0,20	II	0,15	-	+	+	-	-	+	+	-	+	+	III	0,30
Primula minima	II	0,13	-	-	-	-												
Phyteuma confusum	III	0,23	II	0,13	-	-	-	+	-	+	-	+	+	+	+	-	III	0,30
Helictotrichon versicolor	IV	1,.30	II	0,17	III	0,26	+	+	+	-	-	+	-	-	+	-	III	0,25
Festuca airoides	IV	0,93	II	0,20	III	0,61	-	+	-	-	+	-	+	+	-	+	III	0,25
Luzula spicata	II	0,13	-	-	II	0,15	-	-	+	-	+	-	-	+	+	-	II	0,20
Pulsatilla alba	-	-	II	0,17	-	-	-	-	+	-	+	+	-	-	+	+	III	0,25
Arrhenatheretalia incl. Arrhenatherion																		
Centaurea nigrescens	-	-	II	0,20	-	-	-	+	+	-	+	-	+	+	-	-	III	0,25
Anthoxantum odoratum	IV	0,63	IV	0,70	V	1,15	+	+	+	-	-	-	-	-	+	-	II	0,20
Molinio – Arrhenatheretea																		
Trifolium pratense	-	-	III	0,27	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Trifolium repens	-	-	III	0,23	-	-	-	-	-	-	-	+	-	+	-	-	I	0,10
Cynosurus cristatus	-	-	III	0,27	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cerastium fontanum	-	-	II	0,20	-	-	+	-	-	+	-	-	+	+	-	-	II	0,20
Achillea millefolium	-	-	II	0,13	-	-	+	+	-	-	-	-	-	-	-	-	I	0,10
Molinietalia																		
Genista tinctoria	-	-	III	0,27	-	-	-	-	+	-	+	-	-	+	+	-	II	0,20
Gymnadenia conopsea	-	-	II	0,17	-	-	+	+	-	-	-	-	+	-	+	-	II	0,20
Ranunculus polyanthemos	IV	0,36	III	0,27	II	0,19	+	+	-	-	+	-	-	+	-	+	III	0,25
Variae Syntaxa																		
Centaurea nervosa	IV	0,33	IV	0,33	III	0,26	+	+	-	+	-	-	-	+	-	+	III	0,25
Bruckenthalia spiculifolia	III	0,23	IV	1,30	IV	0,30												
Carex sempervirens	III	0,23	-	-	II	0,15	3	3	4	3	3	4	3	3	3	2-3	V	41,50
Agrostis capillaris	V	2,00	V	1,10	V	1,09	+	+	+	-	-	+	+	+	1	1	V	1,30
Homogyne alpina	III	0,23	III	0,27	IV	0,30	-	+	-	-	-	-	+	+	-	-	II	0,15
Soldanella major	III	0,27	II	0,20	III	0,23	+	-	+	-	+	-	-	-	-	+	II	0,20
Vaccinium myrtillus	IV	0,55	III	0,27	IV	0,30	-	+	+	-	+	+	-	+	+	-	IV	0,30
Trifolium montanum	II	0,17	III	0,27	II	0,19	+	-	-	-	-	-	+	-	-	-	I	0,10
Luzula luzuloides	IV	0,36	III	0,27	III	0,19	+	+	-	+	-	-	+	-	+	-	III	0,25
Deschampsia flexuosa	V	1,40	V	1,40	V	2,75	+	+	+	+	+	+	+	1	+	+	V	0,50
Veratrum album	II	0,17	II	0,17	II	0,15	+	+	-	+	-	-	-	+	-	-	II	0,20
Crocus vernus	V	3,05	V	0,65	V	2,92	+	+	-	+	+	-	+	-	+	-	IV	0,30
Alchemilla conivens	-	-	III	0,27	III	0,23	+	+	-	-	+	-	-	+	-	+	III	0,25
Coeloglossum viride	-	-	-	-	II	0,12	+	-	+	+	-	-	-	-	-	+	II	0,20
Gentiana acaulis	-	-	-	-	II	0,15	+	-	+	-	+	-	+	-	+	+	IV	0,30
Campanula rotundifolia	-	-	-	-	II	0,19	+	-	+	-	-	-	-	-	+	-	II	0,15
Campanula polymorpha	-	-	-	-	II	0,12	+	+	+	-	-	+	-	+	-	+	IV	0.30
Juniperus communis ssp. alpina	-	-	III	0,23	II	0,15	+	-	+	-	-	-	+	-	+	+	III	0,25
Achillea distans	-	-	II	0,17	-	-	+	-	-	-	+	-	-	+	-	-	II	0,15
Vaccinium vitis-idaea	-	-	IV	0.33	IV	0,35	+	+	-	+	-	+	+	-	+	+	IV	0,35
Carex atrata	-	-	-	-	-	-	-	+	+	-	+	+	+	-	+	-	III	0,30
Polygonum bistorta	-	-	-	-	-	-	+	+	-	-	-	-	+	-	+	-	II	0,20
Dianthus compactus	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	II	0,15

Legend: 1 – *Poetum mediae* Csűrös 1956 (4 relevés – Furnicelu Saddle, 12.VII.2001; 3 relevés – Pietrele Roşii Mountain; 18.VII.2003; 3 relevés – Coşana Mountain, 20.VII.2003; 5 relevés – Dârjale Mountain, 18.VII.2004.)

2– *Scorzonero roseae – Festucetum nigricantis* (Puşcaru et. al. 1956) Coldea 1987 (3 relevés – Ursuleţu Sheepfold, 18.VII.1999; 3 relevés – Roman's Mountain, 30.VII.2001; 3 relevés – Căşăriei Mountain, 12.VII.2003; 3 relevés – Balota Mountain, 13.VII.2002; 3 relevés – Dârjala Mountain, 20.VII.2003.)

3 – *Violo declinatae – Nardetum* Simon 1966. (4 relevés – Ursuleţu Sheepfold, 18.VII.1999; 3 relevés – Căşăriei Mountain, 6.VIII.2000; 3 relevés – Funicelu Sddle, 13.VII.2002; 3 relevés – Dârjala Mountain, 29.VII.2001.)

3a – *Violo declinatae – Nardetum* Simon 1966, facies *caricosum sempervirentis* (5 relevés – Dârjala Mountain, 29.VII.2003; 5 relevés – Balota Mountain, 20.VII.2004).

Saddle, Roman's Mountain, Piatra Roşie Mountain, Dârjala Mountain, Izvorul Sec, and Ciomfu Mountain.

Physiognomy and floristic composition. In the floristic composition of these phytocoenoses, there is a great number of species, among which the best represented are the species that are characteristic to the Potentillo-Nardion alliance: *Viola declinata*, *Hieracium aurantiacum*, *Campanula abietina*, *C. polymorpha*, *Poa media*, *Geum montanum*, *Phleum alpinum* etc. The species which are characteristic to the *Nardetalia* order are very well represented, too: *Nardus stricta*, *Arnica montana*, *Luzula sudetica*, *Hypericum maculatum*.

Importance. The meadows where this precious graminaceae grows are characterized by a high productivity. In time, because of the intense grazing, these meadows will be replaced by nards.

3. Violo declinatae-Nardetum Simon 1966 (Table 1)

Chorology. The meadows with matweed cover considerable areas at the mountain and sub-alpine level in the upper basin of the Luncavăţ River, between 1500 and 2000 m, being noticed in the plateaux, the ridges and the slow slopes. The largest meadows of *Nardus stricta* are found on the Căşăriei Mountain, Funicelu Saddle, Ursuleţu Mountain, Roman's Mountain, Balota Mountain, Dârjala Mountain, and Coşana Peak. They vegetate on brown podzol-like feriluvial and deeply humico-feriluvial soils, whether acid or very acid, and poor in nutritive substances.

Physiognomy and floristic composition. In the floristic composition, we can notice the exclusive dominance of the Nardus stricta species. Beside this species, one can also meet: *Viola declinata*, *Ligusticum mutelina*, *Festuca nigrescens*, *Geum montanum*, *Phleum alpinum*, *Centaurea nervosa*, *Antennaria dioica*. The vegetation cover percentage is very high, between 90 and 100%. Beside the typical association, in which the well represented species are *Nardus stricta* and *Viola declinata*, in 10 out of 14 analysed phytocoenoses, one can notice the abundance of the *Carex sempervirens* species; that is why we have considered these phytocoenoses as a facies *caricosum sempervirentis* nova prov.
Holotypus hoc loco: table 1, rel. 1.

Importance. It does not have an economic importance because the matweed meadows have a very low nutritive value and a low productivity.

The intensive grazing hurries the formation of these meadows. With optimal conditions (the nutritive regime) they evolve to meadows of *Festuca nigrescens* or *Agrostis capillaries*. They can also evolve to shrubs of *Vaccinium myrtillus* or *Rhododendron myrtifolium*.

Conclusions

The 3 identified associations have a large spread in the upper basin of the Luncavăţ River. The largest areas are occupied by the associations *Violo declinatae-Nardetum* and *Scorzonero roseae-Festucetum nigricantis*. From the economic point of view, the meadows of *Festuca nigrescens* have a special importance, due to their high fodder value and very high productivity (4,000 kg/ha). The intensive grazing has a negative impact upon the vegetation in the upper basin of the Luncavăţ River, because of the decrease in the vegetal biomass and in the number of species with a fodder value. The great number of sheepfolds and the too numerous animals sheltered here have led, lately, to a gradual degradation of the meadows with a fodder value and to the extension of the nards.

REFERENCES

1. Beldie, Al., 1967, *Flora şi Vegetaţia Munţilor Bucegi*, Ed. Acad. R.S.R., Bucureşti.
2. Boşcaiu, N., 1971, *Flora şi Vegetaţia Munţilor Ţarcu, Godeanu şi Cernei*, Ed. Acad. R.S.R., Bucureşti.

3. Coldea, G., 1990*, Munţii Rodnei. Studiul geobotanic*, Ed. Acad. Române, Bucureşti.
4. Coldea, G., Cristea, V., 1998, Floristic and community diversity of sub-alpine and alpine grasslands and grazed dwarf-shrub heaths in the Romanian Carpathians, *Pirineos*, **151-152**: 73-82.
5. Drăgulescu, C., 1985, *Flora şi vegetaţia din bazinul văii Sadului* – Jud. Sibiu, Ed. Constant, Sibiu.
6. Oberdorfer, E., 1992, *Süddeutsche Pflanzen-gesellschaften*, Teil IV: *Wälder und Gebüsche* 2, G. Fischer Verlag, Jena.
7. Mucina, L., Grabherr, G., Ellmauer, T., 1993, *Die Pflanzengesellscaften Österreichs*, Theil **III**, *Wälder uhd Gebsche*, Gusvta Fischer Verlag, Jena.
8. Rodwell, J.S., Schamineé, J.H.J., Mucina, L., Pignatti, S., Dring, J., Moss, D., 2002, *The diversity of European Vegetation – An overview of phytosociological alliances and their relationships to EUNIS habitats*, Wageningen.
9. Sanda, V., Popescu, A., Peicea, I.M., 1988, Les associations de buissons subalpins de Carpates de Roumanie, *Contrib. Bot.*, Cluj-Napoca: 85-95.
10. Sanda, V., Popescu, A., Barabaş, N., 1997, *Cenotaxonomia şi caracterizarea grupărilor vegetale din România,* Complexul Muzeal de Ştiinţele Naturii, Bacău.
11. Weber, H.E., Moravec, J., Theurillat, J.P., 2000, International Code of Phytosociological Nomenclature, *Journal of Vegetation Science*, Opulus Press, Uppsala: 739-768.

CONTRIBUȚII PRIVID STUDIUL CLASEI *NARDO-CALLUNETEA* PRSG. 1949 DIN BAZINUL SUPERIOR AL LUNCAVĂȚULUI

(Rezumat)

În urma cercetărilor geobotanice efectuate între anii 1997-2004, în bazinul superior al Luncavăţului (jud. Vâlcea) au fost identificate următoarele 3 asociaţii vegetale ierboase ce aparţin clasei *Nardo-Callunetea* Prsg. 1949: *Poetum mediae* Csürös 1956, *Scorzonero roseae-Festucetum nigicantis* (Puşcaru et al. 1956) Coldea 1987, and *Violo declinatae*-Nardetum Simon 1966. În cadrul descrierii asociaţiilor identificate, se fac referiri la corologia, ecologia, fizionomia şi compoziţia floristică, precum şi la importanţa acestor asociaţii.

Suprafeţele cele mai mari sunt ocupate de nardete şi pajiştile cu *Festuca nigrescescens.* În ceea ce priveşte asociaţia *Violo declinatae-Nardetum* Simon 1966, a fost descris un facies nou – *caricosum sempervirentis*, deoarece în 10 fitocenoze din cele 14 analizate se evidenţiază abundenţa-dominantă mare a speciei *Carex sempervirens*. Din punct de vedere economic, o importanţă deosebită o prezintă pajiştile de *Festuca nigrescens* , care au o valoare furajeră ridicată şi o productivitate foarte mare (4000 Kg/ha). Păşunatul intensiv are un impact negativ asupra vegetaţiei din bazinul superior al Luncavăţului, prin scăderea biomasei vegetale şi a speciilor cu valoare furajeră. Numărul mare de stâne precum şi efectivul prea mare de animale de la aceste stâne, au dus în ultimii ani la degradarea pajiştilor cu valoare furajeră bună şi extinderea din ce în ce mai mult a nardetelor.