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ASSOCIATIONS OF THE JUNCETEA TRIFIDI KLIKA ET HADAČ 1944 CLASS FROM LEAOTA MASSIF

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Abstract: The Leaota Mountains are well individualized, with special pastoral activities. Ecopedological conditions and the vegetation arrangement in tiers of the massif permitted the systematization of the types of meadows, on belts of vegetation: the superior mountain belt, subalpine and alpine one. After the phytocoenological investigations that have been done in this region of the Meridional Carpathians we discovered three vegetal associations from *Juncetea trifidi* class: *Potentillo chrysocraspedae* – *Festucetum airoidis* Boşcaiu 1971, *Oreochloo* – *Juncetum trifidi* Szafer et al. 1927 and *Cetrario* – *Loiseleurietum procumbentis* Br. - Bl. et al. 1939.

Key words: plant associations, Leaota Massif, Romania.

Introduction

The Leaota Massif is situated in the North-Western of the Bucegi, being delimited by the Brătei Valley. The uniform crystalline geological constitution of the massif gives it, a distinct morphological aspect, compared to the massives nearby. Leaota Mountains represents an uniform zone made by cloritical schists with porfiroblastes of albit, amphibolical schists and albiticals with clorit, from the geological point of view.

In the alpine belt the dominant meadows are affiliated in the association *Potentillo chrysocraspedae*–*Festucetum airoidis*, that vegetates on oligotrophical soils, characterized by a very high acidity and strongly desaturated in the bases. The meadows belonging to the association *Oreochloo*–*Juncetum trifidi* have reduced surfaces on the montaneous peaks of the Leaota, where they populate the peaks exposed all the time to winds. On the high plateaus of Leaota Mountains are instalated groups, with aspect of short bushes belonging to the association *Cetrario*–*Loiseleurietum procumbentis*.

Materials and methods

The research method follows the Central-European School of Zürich-Montpellier methodology, elaborated by J. Braun-Blanquet and adapted by Al. Borza [5] to the particularities of the vegetation in our country. The plant association has been the basical syntaxonomical unity adopted. The name of the plant associations has been adopted according to the syntaxonomical foresighs established in the Code of Phytosociological Nomenclature [2]. We realized a synthetic phytocoenological table for all studied associations.

For the classification of the plant associations have been used works of synthesis of some authors and collectives of authors [7, 8, 10, 11].

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Results and discussions

The research done on the terrain put into light three plant associations of *Juncetea trifidi* class, grouping in two alliances, one order and one class. The relevés done are 17, being grouped in one synthetic phytocoenological table.

The coenoses of *Potentillo chrysocraspedae* – *Festucetum airoidis* Boşcaiu 1971 cover great surfaces of the alpine belt of Leaota Mountain and vegetate on the peaks and little inclined slopes.

The Dacian-Balkan species, *Potentilla aurea* ssp. *chrysocraspeda* presents in the structure of this phytocoenoses a maximal presence, having a coverage between 5 and 20%. Beside the species that edificate this grouping, in the floriferous composition one can notice, the presence of the specific taxa of *Potentillo-Nardion* alliance (*Geum montanum*, *Ligusticum mutellina*, *Campanula serrata*, *Viola declinata*, *Phleum alpinum*). The presence of this species put into the light, the direction of evolution of these coenoses to nardets, by intensive pastoral activities.

Meadows with *Festuca airoides* have a secondary origin, from the furrow-slice lands on which grubbed up *Pinus mugo*, *Rhododendron myrtifolium* and *Vaccinium myrtillus*. During the stage of furrow-slice are installed *Deschampsia flexuosa*, *Agrostis rupestris*, and later, *Festuca airoides*. A great number of species to the *Juncetea trifidi* class present a representative coverage: *Agrostis rupestris*, *Juncus trifidus*, *Carex curvula*. (**Tab. 1**) In the alpine belt, the herbaceous vegetation of this association evolves to the *Rhododendro-Vaccinietum*, and further to bushes of *Pinus mugo*.

The meadows of *Juncus trifidus* (*Oreochloa* – *Juncetum trifidi* Szafer et al. 1927) occupy reduced surfaces in the South-West of the Leaota Massif, where vegetates on the slopes with podzolic, humico-silicate soils and high acid reaction. In the phytocoenoses identified (Tâncava Mt., Vaca, Leaota Peak), *Juncus trifidus* dominates the western expositions, while *Oreochloa disticha* is sporadically met. The intensive pastoral activities in this region caused the extension of these coenoses, as proof being the presence of some species as: *Homogyne alpina*, *Vaccinium myrtillus*, *Vaccinium vitis-idaea*, *Rhododendron myrtifolium*, that have a high constancy in the floriferous composition. The representative species are accompanied by the specific taxa to the *Caricion curvulae* alliance, *Caricetalia curvulae* order (*Agrostis rupestris*, *Armeria alpina*, *Festuca airoides*) and *Potentillo-Nardion* alliance. (**Tab. 1**)

In the alpine belt of the Leaota Mountains, in shaded sites exposed to cold winds, on large surfaces the coenoses of *Loiseleuria procumbens* are developed.

The association is remarkable by the domination of *Loiseleuria procumbens*, accompanied by a lot of ericaceous such as: *Rhododendron myrtifolium*, *Vaccinium myrtillus*, *Vaccinium vitis-idaea*. The species of the alliance *Loiseleurio-Vaccinion* (*Thamnolia vermicularis*, *Vaccinium gaultherioides*) have a high frequency in these coenoses. *Loiseleuria procumbens* vegetates on the plateaus where are denuded meadows with *Festuca airoides*. Also, following the destruction of bushes with *Rhododendron myrtifolium*, because of frost or intensive grazing is installed also, *Loiseleuria procumbens*.

This grouping has a pioneer character in reconstruction of vegetal layer which had been removed by the wind erosion. The fodder value of this grouping is insignificant, but the alpine azalea is a good species, for fixation of the depreciated lands, especially through intensive grazing and wind erosion. So, the groups edificated by *Loiseleuria procumbens* must be protected against the anthropozoogenic factor.

Table 1

Plant associations			1	2	3	
Number of relevés			7	5	5	
Altitude (mx10)			160-180	180-213	213	
Char.ass.						
H	Carp-Balc	-	<i>Potentilla aurea</i> ssp. <i>chrysocraspeda</i>	V	V	V
H	Eua (Arct.Alp)	P	<i>Festuca airoides</i>	V	V	IV
H	Alp-Carp	D	<i>Oreochloa disticha</i>	-	II	-
H	Cp(Arct.Alp)	D	<i>Juncus trifidus</i>	III	V	IV
Ch	Cp(Arct.Alp)	D	<i>Loiseleuria procumbens</i>	-	III	V
-	-	-	<i>Cetraria islandica</i>	-	-	V
Potentillo-Nardion						
H	E(Alp)	P	<i>Geum montanum</i>	III	III	-
H	Alp-Carp	D	<i>Ligusticum mutellina</i>	III	V	II
H	End(Carp)	D	<i>Campanula serrata</i>	III	III	I
H	Carp-Balc	P	<i>Viola declinata</i>	III	III	III
H	E	D	<i>Nardus stricta</i>	III	III	III
H	Cp(Arct.Alp)	P	<i>Phleum alpinum</i>	III	-	II
H	Eua	P	<i>Antennaria dioica</i>	III	III	II
TH	Carp-Balc	P	<i>Campanula patula</i> ssp. <i>abietina</i>	III	II	-
H	E(Alp)	P	<i>Homogyne alpina</i>	II	II	III
H	Alp-E	D	<i>Poa alpina</i>	-	IV	IV
Genistion						
Ch	Cp	D	<i>Vaccinium vitis-idaea</i>	III	III	II
Ch	Cp	D	<i>Vaccinium myrtillus</i>	II	III	II
Loiseleurio-Vaccinion						
Ch	Cp(Arct.Alp)	D	<i>Vaccinium gaultherioides</i>	-	-	V
-	-	-	<i>Thamnochloa vermicularis</i>	-	-	III
Caricetalia et Juncetea trifidi						
Ch	Ec(Alp)	P	<i>Primula minima</i>	III	-	II
H	Alp(E)	P	<i>Agrostis rupestris</i>	III	V	IV
H	Alp-Carp	D	<i>Campanula alpina</i>	II	-	-
H	Alp-Carp	P	<i>Armeria alpina</i>	II	I	II
Ch	E(Alp)	D	<i>Minuartia sedoides</i>	III	-	III
Variae syntaxa						
H	Cp	P	<i>Deschampsia flexuosa</i>	IV	IV	IV
H	Cp(Arct.Alp)	D	<i>Pedicularis verticillata</i>	III	-	-
nPh	Carp-Balc	P	<i>Bruckenthalia spiculifolia</i>	III	-	-
H	Alp-E	D	<i>Centaurea nervosa</i>	III	II	I
H	Eua	P	<i>Trifolium repens</i>	III	-	-
H	Cp(Arct.Alp)	P	<i>Cerastium cerastoides</i>	II	-	-
mPh	Arct. Alp	D	<i>Juniperus communis</i> ssp. <i>alpina</i>	I	III	-
H	Cp(Arct.Alp)	P	<i>Polygonum viviparum</i>	I	-	-
H	Alp-Carp	D	<i>Pulsatilla alba</i>	I	-	-
nPh	Carp-Balc	-	<i>Rhododendron myrtifolium</i>	-	V	V
TH	Carp-Balc	P	<i>Gentianella lutescens</i>	-	IV	-
H	Cp(Arct.Alp)	P	<i>Carex atrata</i>	-	III	II
H	E	P	<i>Luzula luzuloides</i>	-	III	-
Ch	Carp-Balc	P	<i>Thymus balcanus</i>	-	III	-
H	Eua(Mont)	D	<i>Rumex arifolius</i>	-	II	-
H	E(Alp)	P	<i>Soldanella pusilla</i>	-	I	-
H	Cp(Arct.Alp)	P	<i>Hieracium alpinum</i>	-	I	-
H	Eua	D	<i>Leontodon hispidus</i>	-	-	I

1 - Potentillo chrysocraspedae – Festucetum airoidis Boşcaiu 1971

(Place of the relevés - Românescu Mt., Albescu Mt., Vaca Mt., Tâncava Mt.)

2 - Oreochloo-Juncetum trifidi Szafer et al. 1927

(Place of the relevés - Vaca Mt., Tâncava Mt., Leaota Peak)

3 - Cetrario-Loiseleurietum procumbentis Br.-Bl. et al. 1939

(Place of the relevés - Leaota Peak)

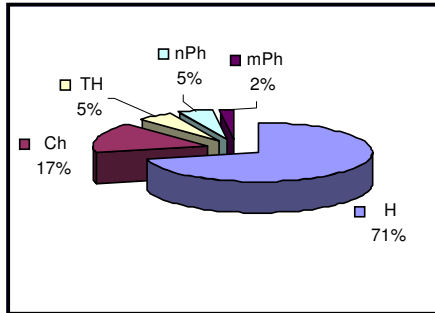


Fig. 1. Bioforms of the plant associations from *Juncetea trifidi* class

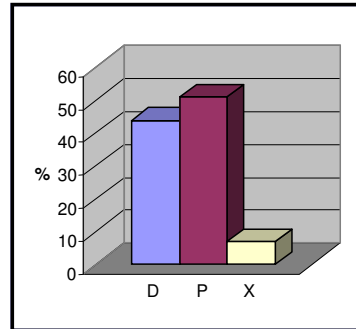


Fig. 2. Caryological index of the plant associations from *Juncetea trifidi* class

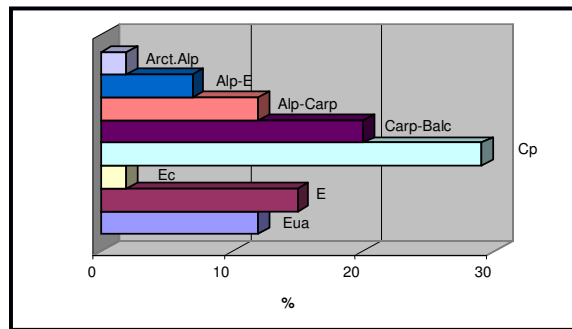


Fig. 3. Geoelements of the plant associations from *Juncetea trifidi* class

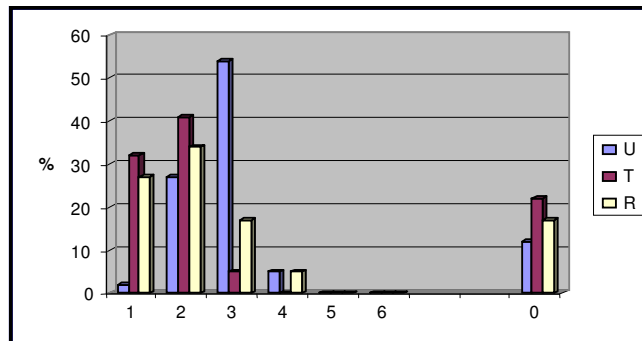


Fig. 4. Ecological index of the plant associations from *Juncetea trifidi* class

The bioforms of the plant associations from *Juncetea trifidi* class indicates besides the major hemicryptophytes (70,73%), a significant percentage of camephytes (17%); the terophytes and nanophanerophytes are presented in a considerable number (4,87%). (**Fig.1**)

The caryological study reveals a high number of polyploid species (51,21%). The diploid species represent 43,90% and the index of ratio is 0,85. (**Fig.2**)

Concerning the phytogeographical elements, the principal components of the studied phytocoenoses are Circumpolar (29,26%) and Carpathian-Balkan (20,50%) species, followed by the European (14,63%), Eurasian (12,19 %) and Alpic-European (12,19%). The Carpathian-Balkan elements are represented by taxons such as: *Rhododendron myrtifolium*, *Potentilla aurea* ssp. *chrysocraspeda*, *Viola declinata*, *Campanula serrata*, *Campanula patula* ssp. *abietina*, *Bruckenthalia spiculifolia*, *Thymus balcanus*, *Gentianella lutescens*. (Fig. 3)

In the researched sites the phytocoenoses are mesophilous ($U_{3-3,5}=53,65\%$) and xero-mesophilous (26,82%). Depending on their needs against temperature most of the species are microthermophytes ($T_{2-2,5}=41,46\%$) and cryophytes ($T_{1-1,5}=31,70\%$). (Fig. 4)

Conclusions

- In the alpine belt the dominated meadows belong to the *Potentillo chrysocraspedae* – *Festucetum airoidis* association, that vegetate on soils characterized by a very high acidity and strongly desaturated in basis.
- The meadows of *Juncus trifidus* occupy reduced surfaces in Leaota Mountains, where populate the peaks permanently exposed to the winds. They vegetate on podzolic, humic-silicate soils, where the edifying species for the association are dominant (*Juncus trifidus*, *Oreochloa disticha*).
- On the high plateaus are installed grouping with aspect of short bushes, which belonging to the *Cetrario-Loiseleurietum procumbentis* association. The floriferous composition is dominated by *Loiseleuria procumbens*, that forms a grouping, poor in species, accompanied by: *Vaccinium gaultherioides*, *Vaccinium vitis-idaea*, *Vaccinium myrtillus*, *Rhododendron myrtifolium*, *Thamnia vermicularis*.

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