

COMPARISON OF THE PLANT COMMUNITIES OF THE CLASS *ELYNO-SESLERIETEA* BR.-BL. 1948 FROM THE CEHLĂU MOUNTAIN

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INTRODUCTION

The class *Elyno-Seslerietea* is represented in the study area by three associations [4, 10] of the alliance *Festuco saxatilis-Seslerion bielzii* Coldea 1984, order *Seslerietea albicantis* Br.-Bl. et Jenny 1962: Ass. *Diantho tenuifolii-Festucetum amethystinae* Coldea 1984, Ass. *Seslerio bielzii-Caricetum sempervirentis* Pușcaru et al. 1956, and Ass. *Seslerio-Festucetum versicolor* Beldie 1967 [9].

The objective of our study was to compare and contrast the plant communities of the above-mentioned associations by their abiotic and biotic characteristics.

MATERIAL AND METHOD

The Ceahlău Mountain belongs to the Moldavian Oriental Carpathians and, according to its morphology, petrography, structure and genesis, pertains to the flysch mountain category. It is a complex of peaks derived from a main higher summit, which displays a north-south orientation. The dominant main summit consists in a plateau with two levels; it is approximately 10 Km long and less than 1 to 3 km wide. The main summit has an irregular surface, and it is boarded by steep slopes that can often exceed 150 m [3, 7, 11].

For the vegetation study, we used the phytosociological methods of the Central-European school, elaborated by J. Braun-Blanquet, adapted to the local conditions. The names of the associations were selected after The Phytosociological Nomenclature Code by developed by J. J. Barkman, J. Moraveç and Rauschert in 1986 [1]. Abundance-dominance indices were set in agreement with the system of J. Braun-Blanquet and J. Pavillard [2].

The relevés were processed through principal component analyses (PCA) [5, 6]. For the PCA, we considered the altitude, the exposition, the slope, the covering, and the species abundance-dominance scores of the relevés.

RESULTS AND DISCUSSIONS

In the study area we identified the class *Elyno-Seslerietea* is represented by the following associations: *Diantho tenuifolii-Festucetum amethystinae* Coldea 1984, *Seslerio bielzii-*

Caricetum sempervirentis Pușcaru et al. 1956, and *Seslerio-Festucetum versicolor* Beldie 1967.

On the sub-alpine plateau of the Ceahlău Mountain we investigated five plant communities of the association *Diantho tenuifolii-Festucetum amethystinae*, from three different locations: the base of the Toaca peak, the area towards Fântânele chalet, and the base of Ocolașul Mare peak. The characteristic species of the association is *Dianthus tenuifolius*, which is also an endemic species [8].

For the association *Seslerio bielzii-Caricetum sempervirentis* we investigated six relevés from four locations the Lespezi summit, the base of Ghedeon, the Ocolașul Mare peak, and the base of Toaca peak. The characteristic species of these plant communities is *Sesleria bielzii* (personal observations).

Regarding the association *Seslerio-Festucetum versicolor*, we found ten plant communities from five locations: the area before the Ghedeon, the base of Toaca peak, the Toaca peak, the Ocolașul Mare peak, and the Ocolașul Mic peak. The characteristic species of this association are *Sesleria bielzii* and *Festuca versicolor* (personal observations).

The comparison of the associations by the altitude, the exposition, the slope, and the covering of the relevés (Fig. 1) revealed that all these characteristics varied a lot among the investigated plant communities. The first two components explain approximately 99% of the variance. Nevertheless, there is no difference related to these factors among the associations. The plant communities of the association *Diantho tenuifolii-Festucetum amethystinae* occur at altitudes between 1750 – 1830 m, on 10 – 45° slopes orientated towards W and SW, and they have a covering of 65 – 90%. Regarding the association *Seslerio bielzii-Caricetum sempervirentis*, the relevés were identified between 1750 – 1830 m, on 20 – 60° slopes orientated W, NW, and E, covering 80 – 100% of the investigated area. The plant communities of the association *Seslerio-Festucetum versicolor* appear at 1750 – 1900 m altitude, on 30 – 60° slopes facing NW, SW, S, W, and SE, where covered 60 – 100% of the investigated area.

Regarding the species composition and abundance-dominance scores the first two components are responsible for approximately 80% of the variance (Fig. 2).

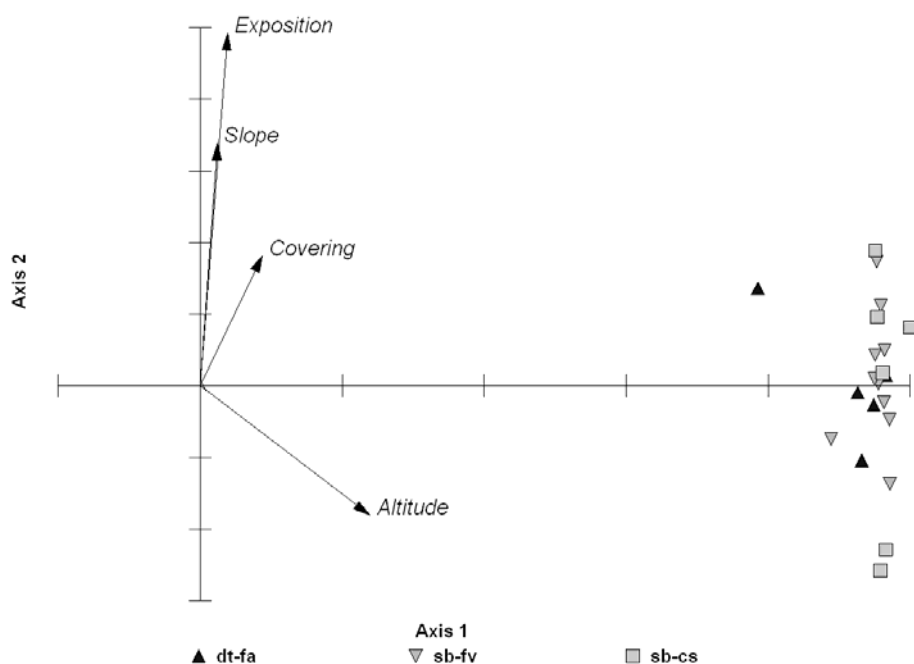


Fig. 1. Ordination diagram of the relevés assigned to the class *Elyno-Seslerietea* by altitude, slope, covering and exposition (dt-fa – *Diantho tenuifolii-Festucetum amethystinae*, sb-fv – *Seslerio-Festucetum versicolor*, sb-cs – *Seslerio bielzii-Caricetum sempervirentis*).

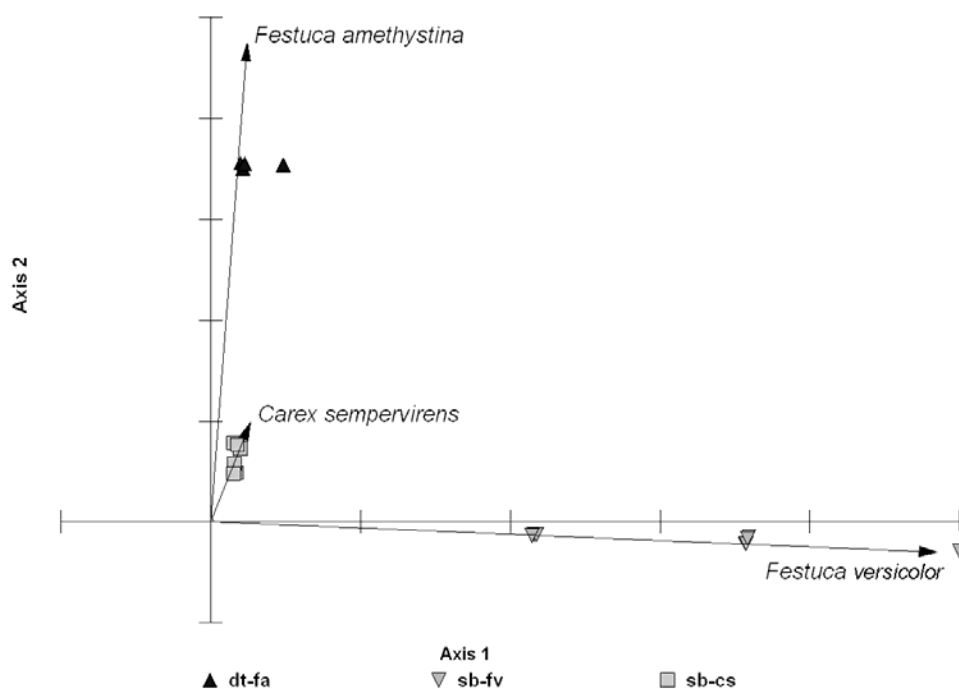


Fig. 2. Ordination diagram of the relevés assigned to the class *Elyno-Seslerietea* by the species scores (abbreviations as in Fig. 1)

The investigated plant communities assembled into three obvious groups. Each of the groups of plant communities corresponds to one of the identified associations (Fig. 2).

Thus, the plant communities of *Seslerio Festucetum versicolor* differ from the plant communities of the other two associations principally in the high scores of *Festuca versicolor* (abundance-dominance scores between 3 and 5) (Fig. 2). This species was less abundant in the relevés of the other two associations (abundance-dominance scores were + and 1).

This result falls in with the previously described characteristics of the association [9, 10].

The other two associations differ mainly in the high scores of *Festuca amethystina* and *Carex sempervirens* (Fig. 2).

Festuca amethystina had high scores in the plant communities of the association *Diantho tenuifolii-Festucetum amethystinae* (the abundance-dominance score was 4 in all the relevés), low scores in the communities of the association *Seslerio bielzii-Caricetum sempervirentis* (abundance-dominance scores were + and 1), and absent in the plant

communities of the association *Seslerio Festucetum versicolor*.

Carex sempervirens had high scores in the plant communities of the association *Seslerio bielzii-Caricetum sempervirentis* (abundance-dominance scores were 3 and 4) and low scores in the plant communities of the associations *Diantho tenuifolii-Festucetum amethystinae* and *Seslerio Festucetum versicolor* (abundance-dominance scores were + and 1).

These results agree with the description of the associations *Diantho tenuifolii-Festucetum amethystinae* and *Seslerio bielzii-Caricetum sempervirentis* [9, 10].

CONCLUSIONS

1. The associations of the class *Elyno-Seslerietea* from the Ceahlău Mountain are *Diantho tenuifolii-Festucetum amethystinae* Coldea 1984, *Seslerio bielzii-Caricetum sempervirentis* Puşcaru et al. 1956, and *Seslerio-Festucetum versicolor* Beldie 1967.
2. There are no differences among the investigated associations with regard to altitude, exposition, slope, and covering, although they vary considerably among relevés.
3. Contrary to the above situation, species composition and abundance-dominance clearly separates the investigated associations.
4. The plant communities of the association *Seslerio-Festucetum versicolor* separate themselves by the high abundance-dominance scores of *Festuca versicolor*.
5. The plant communities of the association *Diantho tenuifolii-Festucetum amethystinae* are set apart themselves the high abundance-dominance scores of *Festuca amethystina*.
6. The plant communities of the association *Seslerio bielzii-Caricetum sempervirentis* is characterised distinguish themselves through the high abundance-dominance scores of *Carex sempervirens*.

REZUMAT

Scopul acestui studiu este de a compara comunitățile vegetale ale asociațiilor din clasa *Elyno-Seslerietea* de pe platoul subalpin al Masivului Ceahlău. Cercetările fitosociologice ale comunităților vegetale s-au realizat conform metodei elaborate de J. Braun-Blanquet și J. Pavillard. Datele au fost ulterior prelucrate prin intermediul analizei multivariate a principalelor componente. În zona studiată clasa *Elyno-Seslerietea* este reprezentată prin trei asociații: *Diantho tenuifolii-Festucetum amethystinae*, *Seslerio-Festucetum versicolor* și *Seslerio bielzii-Caricetum sempervirentis*. Compararea acestora pe baza altitudinii, expoziției, pantei și acoperirii vegetației nu a condus la diferențierea celor trei asociații deși acești factori au prezentat o variabilitate considerabilă la nivelul releveelor. Considerarea compoziție specifice și a

abundenței-dominanței speciilor din relevee a permis gruparea comunităților vegetale investigate conform apartenenței la o anumită asociație. Astfel, comunitățile asociației *Seslerio-Festucetum versicolor* s-au separat datorită valorilor abundenței-dominanței speciei *Festuca versicolor*; comunitățile asociației *Diantho tenuifolii - Festucetum amethystinae* s-au separat datorită valorilor abundenței-dominanței speciei *Festuca amethystina*; iar comunitățile asociației *Seslerio bielzii-Caricetum sempervirentis* s-au separat datorită valorilor abundenței-dominanței speciei *Carex sempervirens*. Aceste rezultate sunt în acord cu caracteristicile descrise pentru cele trei asociații.

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