

## THE DISTRIBUTION AND STRUCTURE OF THE PLANT COMMUNITIES FOUND IN THE DOBRICENI AND JGHEABURI FORESTS OF THE GOVORA RIVER BASIN, ROMANIA

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### Abstract

The thematic area provided in this paper is situated in the Govora river basin, Vâlcea County. Within this study had been aimed the identification, description, diversity, ecological analysis and monitoring of the herbaceous and wooden plant communities, which belong to the Natura 2000 habitats and implicitly of the rare plant species, vulnerable, endemic within Dobriceni and Jgheaburi Forests from the Govora river basin. In this area we identified the following plant communities: *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 (syn.: *Deschampsio flexuosae-Fagetum* Soó 1962); *Stellario nemorum-Alnetum glutinosae* (Kästner 1938) Lohmeyer 1957; *Quercetum petraeae-cerris* Sóo (1957) 1969 and *Carpino-Fagetum sylvaticae* (Paucă 1941). According to the targets of this research, a very important place we gave to the complex study of the habitats: 91M0 Pannonian-Balkan oak sessile oak forests (CLAS. PAL.: 41.76); 9110 *Luzulo-Fagetum* beech forests (CLAS. PAL.: 41.11.); 91E0\* *Aluvial forests with Alnus glutinosa and Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*) (CLAS. PAL.: 44.3, 44.2 și 44.13.) and 9130 *Asperulo-Fagetum* beech forests (CLAS. PAL.: 41.13). Considering the place where the study had been located to, the eco-pedo-climatic conditions and the anthropic term exerted I have considered that is necessary to develop some ecological studies (and using statistical methods (UPGMA și WPGMA, STYN-TAX 2000) for the most important plant community - *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 from this area.

**Key words:** Govora river, plant communities, forest, diversity, habitats.

### INTRODUCTION

The flora and the vegetation of a territory, besides its scientific importance, also presents a significant bioeconomic value, if we take into consideration its use in the economic-household activities (Niculescu, 2009). The vegetal carpet for this area of Oltenia in is a reflection of the very diverse stationary conditions, adding to a certain extent to the influence of the anthropo-zoogenic factors. The forests grow on large areas in Oltenia. They have a great importance in terms of biodiversity, but they also have a eco-pedo-genetic and economics role (Niculescu and Nuță, 2018).

### MATERIALS AND METHODS

#### Study area

The territory under research is located in the Govora river basin, part of the SubCarpathian Area of Oltenia, in the Dobriceni Forest and Jgheaburi Forest, Valcea County.

The forest plant communities from this area have been analyzed and characterized from the chorological, ecological point of views. We also examined the floristic composition and physiognomy of the plant communities found in the phytocoenoses structure.

For the study of the plant communities 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). Regarding the classification of plant communities it will be used the synthetic work written by J. S. Rodwell et al. (2002) and Applied Vegetation Science, Vol. no. 19 by Mucina et al. (2016). The quantitative assessment of the participation of every species to the vegetal association was performed with the help of the abundance-dominance index, according to the Braun-Blanquet scale. We gave a special attention to the calculation of the quantitative index *Bray-Curtis* (1957) and to performing the dendograms, by using the Group-Average method (UPGMA) in the

program SYN-TAX 2000 (for the plant communities with minimum 10 relevés). So, to identify the habitats, we looked into: *Natura 2000 in Romania Habitat fact sheets* (2008); *Habitats from Romania* by Doniță N. et 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) (Niculescu, 2016).

## RESULTS AND DISCUSSIONS

In this area we identified the following plant communities: *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 (syn.: *Deschampsio flexuosae-Fagetum* Soó 1962; *Stellario nemorum-Alnetum glutinosae* (Kästner 1938) Lohmeyer 1957; *Quercetum petraeae-cerris* Sóo (1957) 1969 and *Carpino-Fagetum sylvaticae* Paucă 1941. According to the targets of this research, a very important place we gave to the complex study of the habitats: 91M0 *Pannonian-Balkan turkey oak sessile oak forests* (CLAS. PAL.: 41.76); 9110 *Luzulo-Fagetum beech forests* (CLAS. PAL.: 41.11.); 91E0\* *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* (CLAS. PAL.: 44.3, 44.2 și 44.13.) and 9130 *Asperulo-Fagetum beech forests* (CLAS. PAL.: 41.13).

1. Ass. *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 (syn.: *Deschampsio flexuosae-Fagetum* Soó 1962) (Figure 1).

*Distribution:* The phytocoenoses of this plant community are situated in the Jgheaburi and Dobriceni Forests developed on poorly inclined to strongly inclined lands on acid brown soil. In the Jgheaburi forest the phytocoenoses it grows on very steep slopes.

*Physiognomy and floristic composition.* In the phytocoenotic composition of this plant community, apart from species *Fagus sylvatica* and *Hieracium rotundatum*, there are also constant many species that belong to the coenotaxa: QUERCO-FAGETEA and FAGETALIA: *Carpinus hetulus*, *Poa nemoralis*, *Galium odoratum*, *Anemone ranunculoides*, *Helleborus purpurascens*, *Galium odoratum*, *Prenanthes purpurea*,

*Actaea spicata*, *Dentaria bulbifera*, *Sanicula europaea*, *Brachypodium sylvaticum*, *Euonymus europaeus*, *Circea lutetiana*, *Lilium martagon*, *Galeopsis speciosa*.

The coverage of trees is good 75-85%. The herbaceous and bush cover layer are developed.



Figure 1. *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 plant community

The winds, which are mainly influenced by the relief, can lead to destructions on large areas in this region. Such destructions were made in the last years in the Jgheaburi Forest (Figure 2).

Due to the difficult access in the area, these damages could not be totally cleared, and the collecting of the fallen trees was made through non-ecological procedures, thus considering them the consequence of anthropic impacts.



Figure 2. Anthropic impact in the Jgheaburi Forest

This plant community is part of the important Natura 2000 habitat - 9110 *Luzulo-Fagetum* beech forests (CLAS. PAL.: 41.11.).

We paid much attention to the determination of the Bray-Curtis quantitative index, Euclidian index using the UPGMA method, and Jaccard index, using the WPGMA method and the achievement of dendrograms, using the program SYN-TAX 2000 (for the plant community with minimum 10 relevées).

In the UPGMA dendrogram, using the Bray Curtis index for this forest plant community, there are pointed out also 2 distinct clusters. In the first sub-cluster there are grouped relevées 1, 2, 8, 7, 4, 5, 10 and 9, especially due to floristic.

The latter clusters' relevées are grouped the relevées 3 and 6 - on high dominant values, due to the abundance of *Sambucus nigra* (abundance-dominance (AD) 2).

The values of the Bray-Curtis quantitative index reflecting the heterogeneity of the floristic structure of the phytocoenoses of the plant community with *Fagus sylvatica* from the Igheaburi Forest (Figure 3).

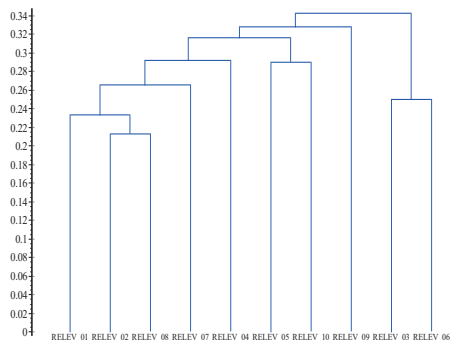


Figure 3. The dendrogram (UPGMA method, Bray-Curtis index) of *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 plant community

The dendrogram made using the Group-Average method (UPGMA) and the Euclidian index, highlights the separation of two distinct clusters, which, as it can be observed quantitative index values are very close.

In the first cluster we can notice the separation of the relevé 6 based on the present of the species *Lilium martagon*, absent in all the other relevées.

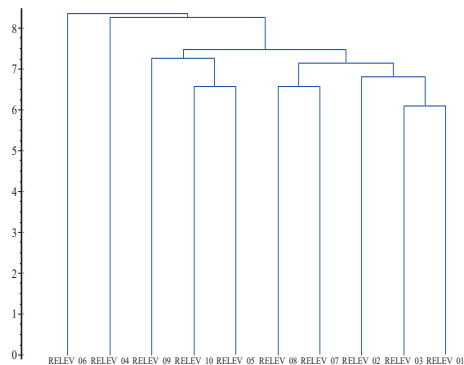


Figure 4. The dendrogram (UPGMA method, Euclidian index) of *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 plant community

The WPGMA method and Jaccard index, there can be noticed the grouped the relevées 8 and 2 relevées, from the rest of the relevées, based on the similarity of the phytocoenoses (Figure 5).

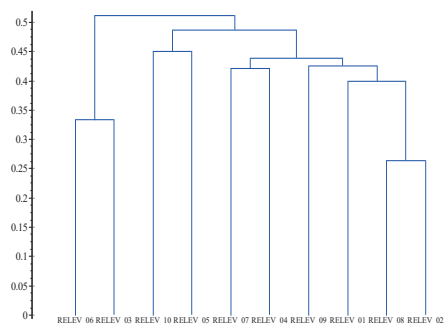


Figure 5. The dendrogram (WPGMA method, Jaccard index) of *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 plant community

## 2. Ass. *Stellario nemorum-Alnetum glutinosae* (Kästner 1938) Lohmeyer 1957

This plant community have been analyzed and characterized from the chorological, ecological, phytosociological point of views.

**Distribution:** The phytocoenoses of this plant community are situated in the Govora river basin, in the Dobriceni Valley, Pietroasa Valley, Cacova Valley in Stoenești, Gruiu, Neghinești and Dobriceni settlements.

From an ecological point of view, in this phytocoenoses prevail the mesophytes, mesohygrophytes, micro-mesothermic and poorly acido-neutrophyle elements.

*Physiognomy and floristic composition.* In the phytocoenotic composition of this plant community, apart from species *Alnus glutinosa* and *Stellaria nemorum* there are also constant many species that belong to the: Alnetalia, Alno-Ulmion and Querco-Fagetea.

The coverage of trees is 70-75%. The herbaceous and bush cover layer are developed. It should be noted that these phytocenoses are strongly ruderalized and degraded due to zoo-anthropogenic factors.

3. Ass. *Quercetum petraeae-cerris* Sóo (1957) 1969

This plant community it is found on the small areas, sometimes island surfaces, in Dobriceni Forest. The phytocoenoses develops on compact forest brown soils, strongly podzolic, with a high percentage of carbonates.

*Physiognomy and floristic composition.* The phytocoenoses of this plant community have a special composition, being characterised by the dominance of the species: *Asparagus tenuifolius*, *Geum urbanum*, *Poa nemoralis*, *Glechoma hirsuta*, *Melica uniflora*, *Polygonatum odoratum*, *P. latifolium*, *Galium scultesii*, *Lathyrus niger*, *Potentilla micrantha*, *Lychnis coronaria*, *Carex michelii*, *Lithospermum purpureocaeruleum*, *Carex tomentosa*, *Festuca valesiaca*, *Euphorbia cyparissias*, *Vincetoxicum hirundinaria*, *Carex caryophyllea*, *Stachys officinalis*.

4. Ass. *Carpino-Fagetum sylvaticae* Paucă 1941.

*Distribution:* This type of forest is more common in the Stoieniști area, on the hilly floor. The phytocoenoses develops on slopes (generally shaded) slightly-inclined medium, with different exposures, peaks and plateaus on the eutricombosol.

*Physiognomy and floristic composition.*

The important and characteristic species for the phytocoenosis of this plant community are: *Fagus sylvatica* ssp. *moesiaca*, *Carpinus betulus*, *Corylus avellana*, *Crataegus monogyna*, *Euonymus europaea*, *Galium odoratum*, *G. schultesii*, *Dentaria bulbifera*, *D. glandulosa*, *Lathyrus venetus*, *Carex pilosa*, *C. brevicollis*, *C. sylvatica*, *Corydalis cava* ssp. *marschaliana*, *Brachypodium sylvaticum*, *Mercurialis perennis*, *Asarum europaeum*, *Anemone nemorosa*, *A. ranunculoides*, *Allium ursinum*, *Lamium galeobdolon*, *Melica uniflora*, *Milium*

*effusum*, *Aposeris foetida*, *Erythronium dens-canis* ssp. *niveum*.

Important species: *Neottia nidus-avis*, *Platanthera bifolia*, *Dentaria quinquefolia*, *Erythronium dens-canis* ssp. *niveum*.

We can mention it here some undesirable species which disturb the good development of the phytocoenoses of this plant community: *Phellinus igniarius* (Quel.), *Nectria galligena* Bres., *Xyleborus saxeseni*, *Trypodendron domesticum*, *Hylecoetus dermestoides*, *Taphrorynchus bicolor*, *Xyleborus monographus*, *Lymantria monacha*.

## CONCLUSIONS

Following the botanical research, carried out in the upper basin of the Govora River, in the Dobriceni and Jgheaburi Forest between, there were identified for forest plant communities: *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 (syn.: *Deschampsio flexuosae-Fagetum* Soó 1962); *Stellario nemorum-Alnetum glutinosae* (Kästner 1938) Lohmeyer 1957; *Quercetum petraeae-cerris* Sóo (1957) 1969 and *Carpino-Fagetum sylvaticae* Paucă 1941.

The forest plant communities found in this area develops at the hilly level and the lower mountainous sub-level.

Regarding the biodiversity found in the forest phytocoenoses of this area, we can say that it is of particular interest in potential, variety, in the presence of many rare endangered and endemic species or Nature 2000. The forest plant communities from this area from Dobriceni and Jgheaburi Forest are part from important Nature 2000 habitats and are of the most diverse ones. Given the scientific, landscape, economic and social importance of this area we think that study is a must, therefore establishing for the future preservation measures.

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