

THE COROLOGY, ECOLOGY AND PHYTOSOCIOLOGY OF THE 9110 FOREST HABITAT FROM THE DANUBE VALLEY, BETWEEN CIUPERCENI AND GHIDICI SETTLEMENTS, DOLJ COUNTY

Mariana NICULESCU¹, Silvestru Ilie NUȚĂ²

¹University of Craiova, Faculty of Agronomy, Department of Botany, 19 Libertatii Street, 200583, Craiova, Romania

²Dolj Forestry Division, 19 Iancu Jianu Street, Craiova, Romania

Corresponding author email: silvestru1969@yahoo.com

Abstract

The thematic area provided in this paper is situated in the Danube Valley, between the settlements Ciuperceni and Ghidici, Dolj County. This area is studied in the Bailesti plain, on the fifth terrace of Danube, part of the Oltenia Plain. Throughout the protected area is under the continental climate with Mediterranean influences. Since geologically in this area meet recent alluvial deposits represented by carbonate sands and sandy deposits of wind origin. In this territory the biodiversity is very rich, the studied area including the protected area of community importance - ROSCI 0039 Ciuperceni-Desa. The most important habitat forest is 9110 - Euro-Siberian steppic woods with *Quercus* spp. This habitat is edified by *Quercetum roboris balsicum* Paun (1964) 1966 (Syn. *Festuca rupicolae-Quercetum roboris* Soó (1934) 1937) palnt community that we found in the Arceru (Oveaselor) and Buricliu forest. The forests from this area benefits from the contribution of groundwater, compensate for the lack of water from rainfall and low levels of nutrients in the soil.

Considering the place where the study had been located to, the eco-pedo-climatic conditions and the anthropic term exerted we have considered that is necessary to develop some ecological studies (and using statistical methods (UPGMA and WPGMA, STYN-TAX 2000) for the plants communities of the forest habitat from this area.

Key words: forest habitat, plant communities, Danube Valley.

INTRODUCTION

The territory under research is located along of the Danube Valley, part of the Southern of Oltenia, tanging between Ciuperceni and Ghidici settlements.

The natural habitats of this region in Romania are very rich and interesting. The relief, climate and soil types determine a raised diversity of the vegetal species, plant communities, habitats, and landscapes in this area.

The studied area contains a significant number of rare or vulnerable species, included in the European or National Red Lists. The present paper aims presenting one forest habitat 9110 - Euro-Siberian steppic woods with *Quercus* spp., met in the Arceru (Oveaselor) and Buricliu forest from Dabube Valley.

The forests from this area benefits from the contribution of groundwater, compensate for the lack of water from rainfall and low levels of nutrients in the soil. The vegetal carpet of this forest habitat contains many species characteristic of the Danube Valley.

MATERIALS AND METHODS

The analysis of the palnt community was done using the method of the Central - European phytocoenological school. For the plant community we have calculated the *Bray-Curtis* indices using the medium species abundance-dominance value (Podani, 2001). In order to identify the species and the inter-taxa, we looked into: *Romanian Flora*, vol. I-XII (1952-1976); *Flora Europaea*, vol. I-V (1964-1980).

The basic coenotaxonomic unit which was used to study the vegetation was the vegetal association. The associations were identified and distinguished according to the characteristic, edifying, dominant and differential species and for the classification of this plant community, we have used synthesis papers elaborated by: G. Coldea (1986, 1991) and L. Mucina et al. (2016).

As for the identified of the habitat we have used synthesis papers on the Romanian Manual for interpretation of EU habitats and Council Directive 92/43/EEC of 21 May 1992 on the

conservation of natural habitats and of wild fauna and flora, Annex I (Habitats Directive).

RESULTS AND DISCUSSIONS

According to the research carried out between 2016-2017, in the Danube Valley, between the settlements Ciuperceni and Gidici, Dolj County, there were identified one plant community: *Quercetum roboris balsicum* Paun (1964) 1966 (Syn. *Festuca rupicolae-Quercetum roboris* Soó (1934) 1937).

This plant community edifies the forest habitat 9110 - Euro-Siberian steppic woods with *Quercus* spp.

Corology: The phytocoenoses of the plant community of this forest habitat are situated in the *Arceru (Oveaselor)* and *Buricliu forests* developed on alluvial soil.

Physiognomy and floristic composition. In the phytocoenotic composition of this plant community, apart from species *Quercus robur*, there are also constant many species that belong to the coenotaxa: QUERCETEA PUBESCENTI-PETRAEAE (Oberd. 1948) Jakucs 1960, ACERI TATARICI-QUERCION Zólyomi et Jakucs 1957. In the phytocoenotic composition of this plant community, beside the dominant species *Quercus robur*, there are also: *Vincetoxicum hirundinaria*, *Scilla bifolia*, *Viola odorata*, *Asparagus tenuifolius*, *Astaragalus glycyphyllos*, *Viola suavis*, *Anthriscus cerefolium*, *Ornithogalum pyrenaicum*, *Carex michelii*, *C. tomentosa*, *Viola alba*, *Festuca rupicola*, *Urtica dioica*, *Helleborus odoratus*, *Anemone nemorosa*, *Ranunculus ficaria*, *Verbascum phoeniceum*, *Carex remota*, *Silene alba*, *Geranium phaeum*, *Phytolaca americana*, *Lathyrus vernus*, *L. nissolia*, *Glechoma hirsuta*.

The coverage of trees is poor 50-65%. The herbaceous and bush cover layer are developed. Threats to these phytocoenosis are the alien invasive plants: *Ailanthus altissima* and *Phytolaca americana* developed excessive (Figure 1).

They were also examined according to their floristic composition and physiognomy, syndynamics and economics. We paid much attention to the determination of the Bray-Curtis quantitative index (Figure 2), Kulczynski symmetric index (Figure 3),

Sørensen qualitative index (Figure 4), using the Group-Average method (UPGMA), and Jaccard index (Figure 5), using the WPGMA method and the achievement of dendrograms, using the program SYN-TAX 2000 (for the associations with minimum 10 relevées).



Figure 1. *Ailanthus altissima* in the forest habitat 9110

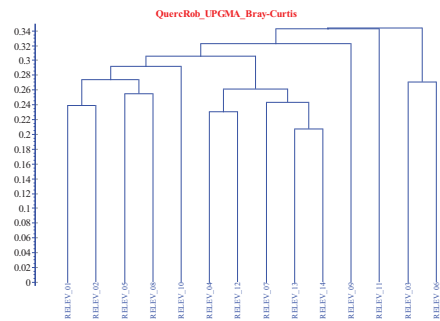


Figure 2. Bray-Curtis quantitative index

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, 4, 5, 7, 8, 9, 10, 11, 12, 13 and 14, especially due to floristic.

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

Given this dendrogram, the values of the quantitative index, *Bray-Curtis* varies, reflecting the heterogeneity of the floristic structure of the phytocoenoses of this pant community (Figure 2).

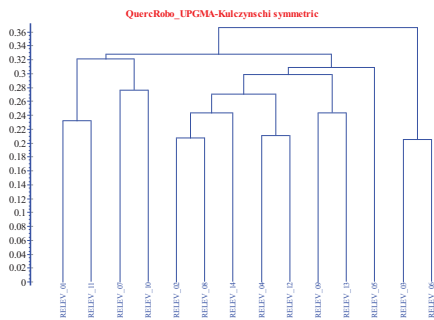


Figure 3. Kulczynski symmetric index

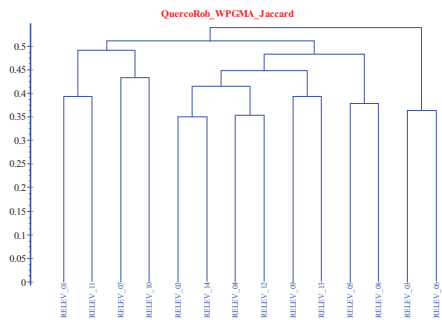


Figure 5. Jaccard index

The dendrogram made using the Group-Average method (UPGMA) and the Kulczynski symmetric 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 survey 5 based on the present of the species *Viola alba*, absent in all the other surveys (Figure 3).

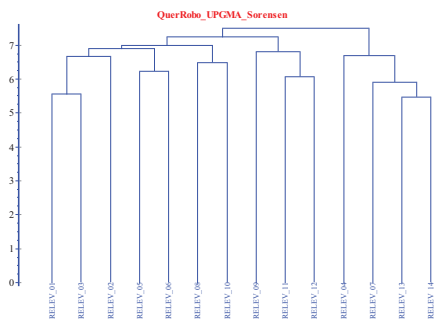


Figure 4. Sørensen qualitative index

After an analysis of the dendrogram (Figure 4) of this plant community, used WPGMA method and Sørensen qualitative index, there can be noticed the separation of the 4th, 7th, 13th and 14th surveys, from the rest of the surveys, which are grouped in a cluster, based on the presence of the species *Crataegus monogyna* in larger numbers of individuals, compared to other surveys.

WPGMA method and Jaccard index, there can be noticed the grouped of the 2th, 3th, 4th, 5th, 6th, 8th, 9th, 12th, 13th and 14th surveyings, from the rest of the surveys, based on the similarity of the phytocoenosis (Figure 5).

CONCLUSIONS

The forests grow on large areas in Oltenia. They have a great importance in terms of biodiversity, but they also have a eco-pedogenetic and economics role. In the researched area, the most important forest plant community is *Quercetum roboris balsicum* Paun (1964) 1966 (Syn. *Festuca rupicolae-Quercetum roboris* Soó (1934) 1937).

Threats to these phytocoenosis are the alien invasive plants: *Ailanthus altissima* and *Phytolaca americana* developed excessive.

The phytodiversity of this plant community and forest habitat from Southern of Oltenia is endangered because the human impact is very high, although this area it is included in the important protected area from Romania. Nowadays, great efforts are made to restore representative *Quercus robur* plant community and keep them in a favorable preservation state.

REFERENCES

- Bray J.R., Curtis J.T., 1957. An ordination of upland forest communities of southern Wisconsin. Ecological Monographs, 27, pp. 325-349.
- Braun-Blanquet J., Jenny H., 1939. Vegetations-Entwicklung und Bodenbildung. Denkschr. der Schweiz. Naturforsch. Gesellsch., 63, 2. Zürich.
- Coldea G., 1991. Prodrome des associations végétales des Carpates du Sud-Est (Carpates Roumaines), Documents Phytosociologiques, N.S., 13, Camerino, p. 317-539.
- Gafta D., Mountford O., 2008. Romanian Manual for interpretation of EU habitats, Ed. Risoprint, Cluj-Napoca, pp. 101.
- Mucina L., Bültmann K., Dierßen J.P., Theurillat T., Raus A., Čarni K., Šumberová W., Willner J., Dengler R., Gavilán García M., Chytrý M., Hájek R., Di Pietro D., Iakushenko J., Pallas F.J.A., Daniëls E., Bergmeier A., Santos Guerra N., Ermakov M.,

- Valachovič J.H.J., Schaminée T., Lysenko Y.P., Didukh S., Pignatti J.S., Rodwell J., Capelo H.E., Weber A., Solomeshch P., Dimopoulos C., Aguiar S.M., Hennekens Tichý L., 2016. Applied Vegetation Science, Volume 19, Supplement 1, December, ISSN 1402-2001.
- Podani J., 2001. SYN-TAX 2000. Computer programmes for data analysis in ecology and systematics. User's manual. Scientia, Budapest, HU.
- Rodwell J.S., Schaminée, J.H.J., Mucina L., Pignatti S., Dring Moss J.D., 2002. The Diversity of European Vegetation, Raport EC-LNV no. 2002/054.
- Sanda V., Popescu A., Stancu D., 2001. Coenotic structure and ecological characterization of the phytocoenosis of Romania, Vergiliu Publishing House, Bucharest, 359 pp.
- Săvulescu T. (ed.), 1952-1976. Flora of Romania, Vol. 1-13, Bucharest, Romanian Academy Publishing House.
- Tutin T.G., Heywood V.H., Burges N. A., Moore, D.M., Valentine D.H., Walters S.M., Webb D.A. (eds), 1964-1980. Flora Europaea, Vol. 1-5, Cambridge, Cambridge University Press.
- *** Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, Annex I (Habitats Directive).
- ***EIONET 2013. Reference List Threats, Pressures and Activities (Final Version). Availableonline:http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal (accessed on 23 July 2015).