STUDY OF PHYTOGEOGRAPHIC AND PHYSICAL CONDITIONS FROM THE IALOMITA SUBCARPATHIANS

Enache Răzvan-Dănuţ, Spârchez Gheorghe

Transilvania University of Braşov, Faculty of Sylviculture and Forest Engineering,
razvandanut.enache@yahoo.com

Abstract
The aim of this paper is the detailed knowledge of the phytogeographic environment of the Ialomita Subcarpathians in order to study the forestry sites from this area, as well as for their evaluation. Thus, this paper tries to support the site evaluation for the beech and sessile oak stand by means of the ecological indicators.

Key words: soil, site evaluation, site quality, beech, sessile oak.

INTRODUCTION

The forestry site as a physical-geographical unit is defined by the environmental components (geographic location, lithologic substratum, relief, soil), and as an ecologic unit by the values and regimes of climatic (Marcu, 1983) and edaphic factors.

The quantitative and qualitative determination of the forestry site components assume general knowledge of the physical-geographical environment for the researched area.

This paper, based on bibliographic research and personal observations, accomplishes the detailed study of the physical-geographical environment proper for the Ialomita Subcarpathians (Mihăilescu, 1966).

MATERIAL AND METHODS

The research methods used were the bibliographic research and direct observations, completed with measurements and laboratory analysis.

By means of bibliographical research has been achieved the general characterization of the physical-geographical environment for the researched area.

Direct observation has been used for rock and parental material identification, morphological characterization for the soil profiles performed in order to specify the soil proper for the researched area (Florea, 1964; Florea, Munteanu, 2003).

The soil profiles performed were sampled and analyzed in The Laboratory of Pedology from the Faculty of Sylviculture and Forest Engineering of Brasov, in order to establish the values of physical, chemical

and hidrophysical soil properties, which are in fact the ecologic indicators used in forestry site evaluations.

RESULTS AND DISCUSSION

Geological conditions

Based on the existent geological maps and after field observation, it was found that in the Ialomita River collecting area, the geological formations that compose the lithologic substratum are represented by the crystalline schists, which are covered discordantly with jurasic and cretacic sedimentary deposits (gray calcareous sandstones, limestone, breccia and conglomerates), neogen deposits, sandy clay, quaternary deposits, cretaceous flysch, siliceous gravel, sedimentary deposits belonging to the Meotian-Dacian type with clay, sandstones and argillaceous marl, associations which are proper to the hill area.

Geomorphologic conditions

Geomorphologically, the Ialomita Subcarpathians belong to the Land of the Curvature Subcarpathians, the Ialomita Subcarpathian Region and include the hills of: Ocnița, Târgovişte, Mitropoliei, Bezdead and Sultanu-Teişu (Antofie, 2007).

The Ialomita Subcarpathians have the form of continuous parallel rows with the Carpatian mountains and are separated by tectonical depressionary areas that are intensely populated (Tufescu, 1966).

The transition between the mountain and the hill area, is made by a level difference of 200-400m, highlighted by the presence of a depressionary groove, by the sudden enlargement of Carpatian valleys and also by a row of human settlements (Roşu, 1983).

Climatic conditions

According to the Köpen characterization, the researched area is part of the climatic province Dfbx (boreal climate with sufficient rainfall throughout the year, with temperatures exceeding 10 ° C for at least 4 months with maximum rainfall in early summer and late winter minimum), and the climate province Cbfk (with cold winters and the hottest month temperature of 18-20 ° C).

According to the Climate Division of Romania, it is part of the moderate continental climate, the forested hill climate, the forest climate district, the Getic subdistrict (II B p 6).

Edaphic conditions

Based on the management plans provided by the Forestry Districts from the studied area (I.C.A.S., 2004, 2005, 2009) and our own observations that were materialized in the morphologic description and the interpretation of analytic data from 54 soil profiles in figure 1, is presented the extent of soil classes and types from the beech, sessile oak and beech-

sessile oak sites (FD_3). As we can see the most common soil class is the Cambisoils (70%), from which the most representative is the euricambisoil with almost 60% from the entire studied area.

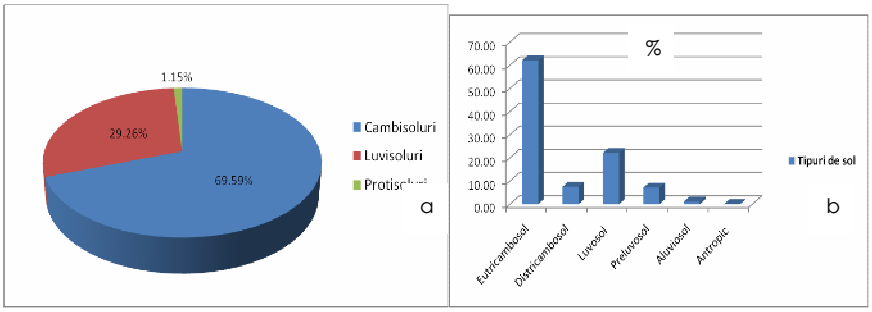

Fig. 1. The distribution of forest stands from the Ialomița Subcarpathian, on classes and types of soil

From all the profiles we decided to present two analysis bulletins for the most widespread soils, because their physical and chemical properties are directly reflected in the site quality (Târziu et al. 2000, 2001).

The 19A compartment has the composition 100% beech, is situated at 620m, SE exposition and a 25^0 average slope, which provides a good external drainage. The eutricambosoil type has a high edaphic volume that favours a good supply of water and microelements, also offering adequate rooting space. Due to moderately acid pH (Blaga et al. 2005), high content of exchange bases and favorable medium texture, this soil has a high trophicity for beech stands, falling in class-II of production (Giurgiu, Decei, 1983). High trophicity for this soil is reflected in the degree of base saturation (mezobasic, V ≈ 60%) and high humus content of the Mull forest type (9.34%).

Table 2

Analysis bulletin for the soil sampled from the Ialomița Subcarpathian Hills

Compartment, Production Unit, soil type, soil subtype, Forestry district	Horizon	Level (cm)	Moisture %	pH	Humus %	Carbon %	Bases exchange %	Hydrogen exchange %	Total exchange capacity (V) %	Degree of base saturation %	Total N g%	Texture
1	2	3	4	5	6	7	8	9	10	11	12	13
19A, U.P. II, Eutricambosoil, typical, Pucioasa	Ao	10	2,52	5,03	9,34	-	18,62	14,7	33,32	55,88	0,48	L.A.
	Bv	80	3,54	5,09	0,96	--	18,13	12,31	30,44	59,55	0,05	L.
28B, U.P. IV, Luvosoil, typical, Pucioasa	Ao	10	0,389	5,64	4,26	-	5,18	4,48	9,66	53,59	0,22	L.A.
	El	15	1,31	4,76	1,98	-	3,34	5,003	8,34	40,03	0,10	L
	Bt	75	0,83	4,93	0,58	-	2,97	2,76	5,73	51,84	0,03	A

The 28B compartment has the composition 80% sessile oak and 20% beech, is situated at 380m, SE exposition and a 20^0 average slope which gives a good external drainage. The soil type is typical luvosoil with a high edaphic volume that provides a good supply of water and microelements, also offering adequate rooting space. Because of the low content of exchange bases this soil has a medium trophicity for beech and sessile oak stands, that has a medium productivity (Târziu, 1997, 2006) (class III production). Due to the fine texture, Bt horizon has a low capillary porosity and high compactness, providing favorable conditions for the development of sessile oak, which tolerates better than beech, compact soils and low aeration (Stănescu, Şofletea, 1977).

Forestry site types

In figure 2, we can observe that the most widespread forestry site is: Hilly of beech stakds (± sessile oak, common oak), Bm, eutricambosoil and preluvosoil (±hypostagnant), medium edaphic with *Asperula-Asarum* (5.2.4.2), occupying an area of 5729.7 ha, meaning 38% of the studied area. From figure 4b we can observe that 70% of the studied forestry site has medium quality.

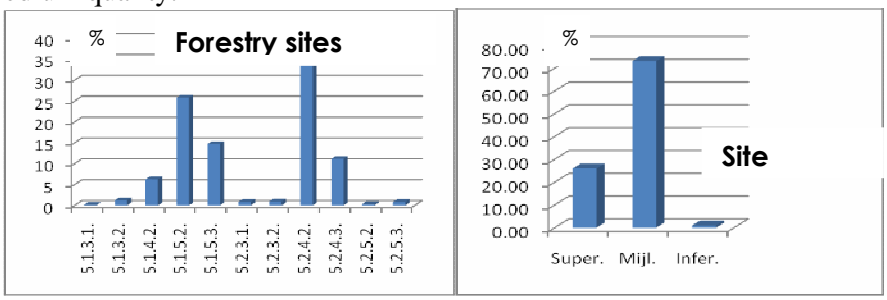

Fig.2. The distribution of studied area on forestry site types and site quality 5.1.3.1, 5.1.3.2., 5.1.4.2, 5.1.5.2, 5.1.5.3., 5.2.3.1., 5.2.3.2., 5.2.4.2, 5.2.4.3., 5.2.5.2., 5.2.5.3., the codes from "Sistematica staţiunilor forestiere", Chiriţă, Pătrăşcoiu (1972)

Analysis of vegetation

Following the analysis of forest vegetation, which falls within the forestry sites with beech, mixed beech-sessile oak and sessile oak hills (FD3) of all Production Units of the Targoviste Forestry Department, it appears that the most common is the formation of mixed beech followed by the pure sessile oak sites (figure 3).

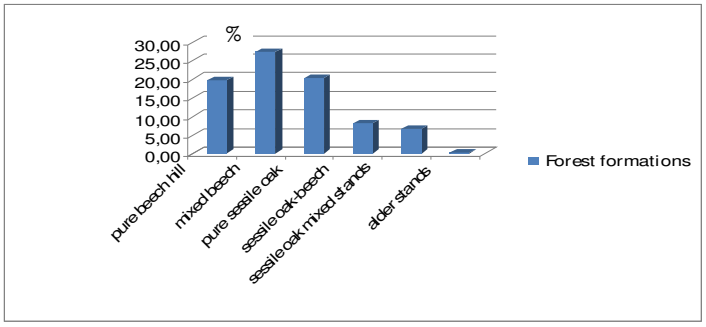

Fig.3. The distribution of forest vegetation on forest formations

CONCLUSIONS

We can observe that in most cases lithologic substratum influences the soil formation process, because the degree of base saturation is high due to their formation on the deposits with base contents (loess, conglomerate, marl).

The parental material, predominantly represented by loess and marl, favours the formation of soil rich in exchange bases (eutricambosoil, preluvosoil).

On the flat or slightly inclined landforms, we generally meet luvosoils, frequently showing stagnogleizant phenomena and high compactness Btw horizon.

Climate influences vegetation distribution especially with the altitude, because in the southern part of the investigated area the vegetation is represented by sessile oak due to warmer climate, and in the northern part its place is taken by the european beech.

Acknowledgments

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