

STUDY REGARDING THE INFLUENCE OF THE SOIL ON THE SPONTANEOUS FLORA IN THE PĂDUREA CRAIULUI MOUNTAINS

Țarenco Monica*, Brejea Radu**

*Herbamon Apples Street srl, 12 Merilor St, 410117 Oradea, Romania, e-mail: mona.tarenco@gmail.com

** University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048, Oradea, Romania, e-mail: rbrejea@yahoo.com

Abstract

The present work is based on field studies conducted in the Pădurea Craiului Mountains which considered the collection of soil samples from the established perimeters (Bradea, Drumul Aștilenilor and Podul Pancului), the collection and processing of samples were performed according to existing methodologies. The soil analyzes were processed within OSPA Bihor. The soil samples were collected at a depth of 0-25 cm.

Laboratory analyzes were performed to establish environmental factors, which should show the conditions conducive to the growth and development of the following medicinal plants: elderberry-sambucus nigra, wild garlic-allium ursinum, hawthorn-crataegus monogyna, yarrow-Achillea millefolium and St John's wort-hypericum perforatum

Key words: massive, spontaneous flora, climate, forest, soil

INTRODUCTION

With very varied climate and soil conditions, our country has a diverse and very rich spontaneous flora. Optimization of plant growth and development conditions is done according to biological requirements for temperature, water, light and soil. To go through a vegetation cycle, a species needs a certain amount of heat expressed in thermal constant (the sum of average daily temperatures higher than 5 ° C), with values between 9° C and 22° C for the vast majority of medicinal and aromatic plants (Brejea, 2010). Soil requirements are particularly related to structure and texture, given that most plants have small and very small seeds and require, in the early stages of development, a favorable ratio of air, water and nutrients. The chemical properties of the soil must correspond to the needs of micro and macroelements. The reaction of the soil, expressed by a neutral pH, ensures the best conditions for growth and development for most species of medicinal plants (Brejea, 2017). Depending on the pedogenetic factors, the pedogenetic processes and the current stage of genetic evolution, the soils are enriched in ions and different ion generating substances (acids, bases, salts), which give the soil a more acidic or alkaline character. Knowing the value of soil agrochemical parameters that characterize the state of fertility has a special importance in the growth and development of

plants in spontaneous flora, as well as on bioactive components.(Domuța, 2005).

Due to the development conditions, the plants are also differentiated according to the ecological conditions, namely:

1. Hill medicinal plants - species adapted to the conditions that characterize the sub-Carpathian areas as well as forested areas (*Atropa belladonna*-nightshade, *Vinca minor*-sachiu, *Crataegus monogyna*-hawthorn, *Geum urbanum*-cernetel - species of spontaneous hill flora; *Papaver somniferum*-mac, *carum carvi*-cumin, *Valeriana officinalis*-valerian - cultivated species).

2. Mountain medicinal plants - species adapted to the conditions characterized by altitude, winds, lower temperatures throughout the year (*Gentian sp*-ghințură., *Arnica-arnica* .., *Angelica archangelica*-angelica etc.), vegetation cycle and going through the phenophases.

3. Medicinal water plants and swampy places - water-loving species (*Iris-iris*, *Colchicum autumnale*-brândușă, *Acorus calamus*-obligeană, *Valeriana officinalis*-valerian, etc.).

MATERIAL AND METHOD

Samples were harvested from the three points located in the middle and lower part of the Craiului Forest Mountains. The collection points were located in different areas and altitudes:

- point 1.- Bradea, is located at an altitude of 639 m, Latitude 46° 54'44 "N, Longitude 22°26'18" E, located in Tomnatic locality, Vadu Crișului commune

- point 2.- Drumul Aștilenilor, at an altitude of 608 m, Latitude 46°54'41" N, Longitude 22°26'46" E, located in Tomnatic locality, Vadu Crișului commune

-point 3.- Podul Pancului, located at an altitude of 445m, Latitude 46°58'6"N and Longitude 22°24'23" E, located in Călățe locality, Aștileu commune.

The soil samples were collected with a drill probe at a depth between 0-25 cm. The aim was to determine the soil reaction, the content of humus, total nitrogen and trace elements. Depending on these values, the influence of soil quality on the growth and development of spontaneous flora will be estimated. The analysis was summarized in a series of medicinal plants, the most important of which are: elderberry (*Sambucus nigra*), wild garlic (*Allium ursinum*), hawthorn (*Crataegus monogyna*), yarrow (*Achillea millefolium*) and St. John's wort (*Hypericum perforatum*).

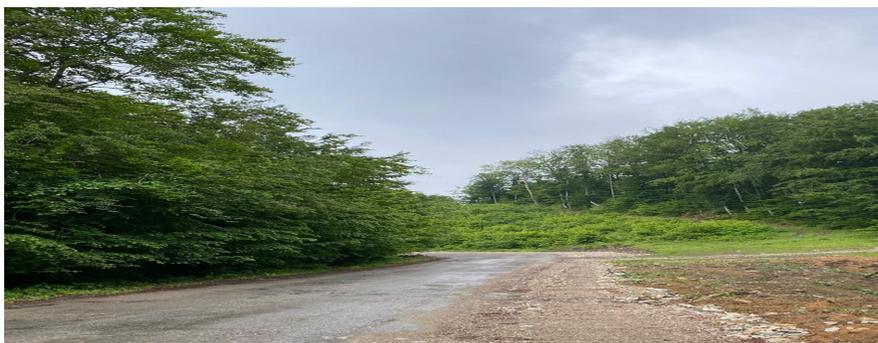


Fig. 3. Overview of the collection point (P. 2) Drumul Aștilenilor-Tomnatic 2020



Fig. 4. Overview of the collection point (P. 3) Podul Pancului-Călățea 2020

RESULTS AND DISCUSSION

In the modern sense, soil fertility is given by a complex of agro-ecopedological factors, in which the soil chemistry is centrally positioned, with a decisive role in its definition. The state of providing the soil with nutrients in assimilable forms, as well as a complex of factors and processes that influence the soil such as pH, redox potential, buffering capacity, absorption capacity, fixation and retention capacity, represent indisputable agrochemical landmarks of fertility status. Knowing the value of the agrochemical parameters of the soil that characterizes its fertility status has a special importance and allows a long-term management of them, to prevent negative manifestations in plant growth and development.

The results of the laboratory tests are presented in the table down where we see the state of the soil's supply of nutrients.

Table 1

The state of the soil supply with nutrients in the three harvesting points in the Mountains Pădurea Craiului- 2020

Harvest point	NAME ANALYSIS / UM							NITRATED	
	Name	pH	H %	Azot total	P _{Al}	K _{Al}	Rezid. fix	N - NO3	N -NH4
P1	Bradea	5.25	9.57	0.479	29	200	0.017	50.8	5.0
P2	Drumul Aștilenilor	8.15	2.49	0.125	6	130	0.044	14.6	8.5
P3	Podul Pancului	7.90	6.88	0.344	9	360	20.03	14.1	14.1

CONCLUSIONS

Following the soil analyzes performed in the three points (Bradea, Drumul Astilenilor, Podul Pancului), we can say that the Pădurea Craiului Mountains represent a perimeter conducive to the development of spontaneous flora due to the favorable soil conditions. Its quality contributes to the development of some species of medicinal plants, as follows: at point 1 Bradea-Tomnatic we meet a soil with medium texture - medium clay (LL) with a pH whose value is 5.25, conducive to the development of hawthorn and elderberry ; at point 2 Drumul Aștilenilor the soil has a fine clay-dusty (AL) texture, with a Ph whose value is 8.15, especially favorable for the growth of leurde, and at point number 3- Podul Pancului we have a fine texture -clay clay (AL), with a pH of 7.90, which helps to develop especially for St. John's wort and yarrow.

Given that the area of analysis is unpolluted, the products resulting from the harvesting of medicinal plants are recommended for use in both natural treatments and allopathic medicine, bringing a clear benefit in the treatment of various heart conditions (hawthorn), gynecological (yarrow), depurative (leurda), hepatobiliary (St. John's wort), laxatives and diuretics (elderberry).

REFERENCES

1. Bandici Gh. E., Borza I., Ardelean I, 2007, Ecoagricultura, Ed. Universității din Oradea,
2. Beldie Al., Chiriță C., 1967, Flora indicatoare din pădurile noastre. Ed. Agrosilvică, București
3. Borlan Z., Hera Cr., 1973, Metode de apreciere a stării de fertilitate a solului în vederea folosirii raționale a îngrășămintelor; Ed. Ceres, București,
4. Brejea Radu, 2014, Tehnologii de protecție solului,. Editura Universitatii din Oradea, Oradea,

5. Brejea Radu., 2017, Tehnologii de protecția solului și reconstrucție a Landșaftului în Nord-Vestul României, Editura. Academiei Oamenilor de Știință,
6. Brejea R., Domuța C., 2009, Refacerea și protecția terenurilor din carierele de bauxită din Munții Pădurea Craiului. Editura Universității din Oradea.
7. Brejea R., 2010, Știința solului – îndrumător de lucrări practice. Editura Universității din Oradea.,
8. Brejea R., Domuța C., 2011, Practicum de pedologie, Ed. Universității din Oradea,
9. Ciobanu G., 2002, Metode agrochimice de analiza, interpretare si imbunatatire a fertilitatii solului, Editura Universității din Oradea,
10. Davidescu D., 1972, Agrochimia, Editura Agro-Silvică, București, 1972
11. Domuța C., 2005, Agrotehnica terenurilor în pantă din nord – vestul României, Universității din Oradea,
12. Domuta C., Brejea R., 2010 Monitoringul mediului, Editura Universității din Oradea, ,
13. Lăcătușu R., 2000, Evaluarea nivelurilor de contaminare și poluare a solului cu metale grele în European Soil Bureau, Bruxelles,
14. Leon Sorin Muntean, 2007, Tratat de plante medicinale cultivate și spontane, Editura Rosoprint, Cluj-Napoca,
15. Nitu I și colab., 2000, Lucrarile agropedoameliorative, Editura Agris, Bucuresti
16. Târziu D.R., 2006, Pedologie și stațiuni forestiere, Editura Silvodel, Brașov
17. www.wikipedia.ro