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THE ECONOMIC IMPORTANCE OF THE SPONTANEOUS FLORA IN THE AREA OF THE PIEDMONT AND SUBCARPATHIAN HILLS OF OLTENIA, ROMANIA

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Abstract

The research carried out by us had as its main purpose the identification of the way of use of spontaneous flora by the local populations, from the regions studied, on the one hand, and on the other hand, to make people aware of the advantages of using natural products over artificial ones. The work methodology consisted in making trips to different places in Oltenia, from the Getic Piedmont and the Subcarpathian Depression in order to collect information about the phytodiversity of these areas and how the locals use these plants in the local economy. The field survey was made on a sample of 524 persons who were interviewed based on a structured questionnaire including 10 questions regarding the economic importance of spontaneous flora in the region and for their life. The results presented in this present paper represent a segment of a more complex study concerning the importance of spontaneous vascular plants in the local economy of a certain region in Oltenia. The obtained data were compared with those corresponding to the plain region of Oltenia in order to observe, on the one hand, the potential of each area and, on the other hand, the level of interest shown by population towards the capitalization of the natural material found in the area where they live. By analysing the usage of spontaneous plants in the Getic Piedmont and the Subcarpathian hills of Oltenia, the author concluded that the interest shown by the population is greater in these regions than in the lowland. Just as in the plain region, medicinal plants occupy an important place in terms of use. The number of tinctorial species is much lower as compared to the plain region. They are employed only by very poor families, who cannot afford to use commercial products.

Key words**:** *the Subcarpathian depression, useful flora, Oltenia, the Getic Piedmont, Romania*

INTRODUCTION

Spontaneous plants have been used since the beginning of the evolution of mankind. The human evolution cannot be separated from that of plants because the latter represented a source of food and treatment for various diseases, a fodder source for domestic animals, providing the necessary building materials for homes as well as for boats, with which our ancestors sailed the rivers and the Danube in search of better living conditions. During all these migrations, the spontaneous flora accompanied people in the form of the products that they consumed. The plants that survived can still be found today, while those that failed to adapt have disappeared.

In addition to the scientific importance, the flora of a region also presents an economic significance, taking into account the fact that over time it has been used in the household economic activity [48]. Unlike the plain region of Oltenia, the areas corresponding to the Piedmont and the Subcarpathian hills are characterized by a variety of vegetation types. The surfaces occupied by the spontaneous vegetation of these areas are much larger because the agricultural land in this part of Romania is significantly less extended.

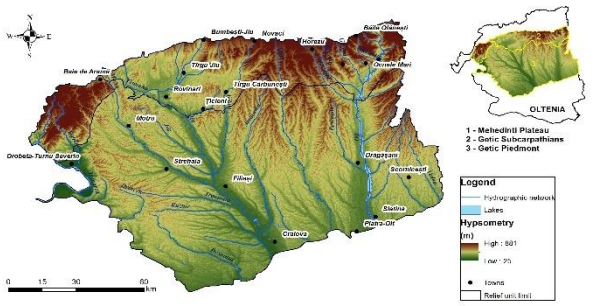
The natural conditions that characterise the Getic Piedmont and the Subcarpathian Depression in Oltenia led to an interesting flora and vegetation, which have drawn the attention of many naturalists [16, 17] and researchers; the results obtained by them were published in numerous specialized works [23, 32, 34, 36, 38].

The founder of higher education from Craiova made contributions from different places of Oltenia, especially Dolj county [5, 6, 7, 8]. From Mehedinți county we find data in the works published by Maloș C. and Costache I.

[12, 13, 20], from Vâlcea county, by Ciurchea M. [10, 11] and Popescu Gh. [29, 30, 31], from Olt and Gorj county by Popescu Gh. [35, 37]. Information from the northern part of Oltenia can be found in several works [24, 25, 26, 27, 28, 33]. Alongside these works, other important research papers contributed to the understanding of the repartition of spontaneous plants in this part of Romania [14, 39, 43, 44]. The influence of climate changes in recent years have brought important changes to the chorology of some vascular species in Oltenia [40, 41, 42, 45, 46, 47]. Sporadic research papers were written with the main objective of presenting the importance of spontaneous flora in the economy of a certain region of Oltenia [21, 39, 48]. The human influence and that exerted by domestic animals on the spontaneous flora in this part of Romania is lower [19], as compared to the plain region. The surfaces covered by agricultural lands are much smaller, mowing is generally done only once, rarely two times, and the quality of underground and surface waters is good. In addition, some of these areas are either national parks or Natura 2000 protected areas, where quality tourism is practiced. Thus, we can state that the floristic wealth of this area located in the Piedmont and the Subcarpathian hills in Oltenia surpasses the one characteristic to the plain. The diversification of the tourist offer, as well as the better information of the local population regarding the importance of these areas would significantly contribute to restoring and improving the link between man and nature and it would positively influence the long-term preservation of biodiversity.

MATERIALS AND METHODS

The reasearch was carried out in Oltenia region which represents one of the most interesting areas of Romania, especially in terms of natural conditions. The Getic Piedmont, which borders Oltenia Plain towards the north [1], consists of sedimentary deposits of a very different character [27] and covers areas that administratively belong to Olt, Dolj, Vâlcea, Mehedinți, and Gorj Counties.



Map 1. Piedmont and subcarpathian hills of Oltenia
Source: GIS processing after Topographical Map, 1:25,000 [50].

The Subcarpathian hills have a very good representation in Gorj and Vâlcea Counties [2, 3] (Map 1). Insignificant areas are also located in the Eastern part of Mehedinți County [3].
The demographic analyses of these areas show migratory flows from the rural to the urban areas. At the beginning of the '70s, the rural population accounted for 72.1% [26], while the present values are much lower because of the migration of young people to cities or abroad.
The variability of soil types in these regions creates conditions for a diverse vegetation [26]. The climate of these areas is temperate continental, with some sub-Mediterranean influences in the western part.
The hydrographic network is very rich as compared to the plain region [18]. Most of the rivers have their source in the Parâng Massif and they are tributary to the two main rivers: the Jiu and the Olt. Besides these important water courses, there is a particularly developed network of autochthonous origin, characterised by a hydrological regime with great variations [26]. A source of primary importance is also represented by the groundwater reserves, which are shallow in these regions [15].
The areas covered by spontaneous flora in the Piedmont and the Subcarpathian hills are more extensive as compared to those in the plain region. The arable land accounts for about a quarter of the surface, with more than half of the area being covered by natural meadows and orchards. The rest of the surface is covered by forests, which have a good representation in the northern part of the researched area.
By corroborating the data documented from the specialized field literature with the information collected by us over time, we

analysed the importance of the spontaneous flora in the economy of these places. The obtained data were compared with those from the plain area of Oltenia.

The scientific names for the identified plants are in accordance with those in the Romanian specialized literature (various field guides that enable the correct identification of plant species) [9, 49] and the abbreviations used by authors were consistent with those in the work *Authors of plant names* [4].

The methodology was the same as that used for the study of the importance of spontaneous flora within the local economy of the plain region of Oltenia [39]. This time, for this part of Oltenia, the sample consisted of 524 persons, which belong to the same four age groups that were used in the analysis of the plain region (up to 20 years, between 20 and 40 years, between 40 and 50 years, and over 50 years old). The respondents were selected so that both rural and urban environments are represented during the survey. Those from rural areas predominated. The survey was conducted in the following cities and towns: Rm. Vâlcea, Drăgășani, Băbeni, Ocnele Mari, Băile Govora, Horezu (Vâlcea County), Tg. Jiu, Tg. Cărbunești, Novaci, Bumbești Jiu (Gorj County), and Baia de Aramă (Mehedinți County). Almost three quarters of the total of 524 participants in the survey originated in the rural settlements of: Paușești, Pietrari, Bunești, Slătioara, Stroești, Copăceni, Rugetu, Recea, Miloștea, Vaideeni, Folești, Genuneni, Francești, Mateești, etc. (from Vâlcea County), Bumbești Pițic, Ciocadia, Crasna, Larga, Radoși, Aninișul din Vale, Hirișești, Schela, etc. (from Gorj County).

The larger number of people in the analysed sample is explained by the interest shown by the inhabitants of these areas towards the use of spontaneous flora.

The field survey was based on a structured questionnaire, where the questions used for conducting the present analysis were the same as those used in the case of the sample from the plain area of Oltenia:

Q1-Do you use plants from the spontaneous flora?;

Q2- What are the most used plants in nature?;

Q3-You collect plants as .....;

Q4- What category of plants do you collect?

Q4-Since when do you collect plants from the spontaneous flora?

Q5-Do you collect useful plants for your own use or do you sell them?

Q6-Where do you manage to capitalize on the production obtained?

Q7-What is the way to capitalize on production?

Q8-What is your estimated value corresponding to the revenue from spontaneous plant collection (RON)?

Q9-Have you so far accessed European funds for the establishment/ development of crops with useful plants?

Q10-In the next period, do you intend to access European funds for the development of your business?) [39].

Until the 1990s, certain collection and sorting centres existed in the rural settlements. After 1990 they were all abandoned or their destination changed.

RESULTS AND DISCUSSIONS

The analysis of the spontaneous flora within the Getic Piedmont and Subcarpathian hills shows the floristic richness that characterise these places. Among the spontaneous plants that grow in the Getic Piedmont and in the Subcarpathian Depression of Oltenia, there are taxa with important value in the economy of these places.

Among the eight categories of species that are important for the local economy (medicinal, honey, food, aromatic, seasoning, tinctorial, fodder, and ornamental), **the medicinal** ones occupy the leading place. They are traditionally used in the "family's pharmacy" or are sold in the neighbouring markets and fairs or in the spa towns (e.g. Băile Olănești, Băile Govora (Vâlcea County). Among the most used medicinal plants we mention: *Hypericum perforatum* L., *Matricaria recutita* L., *Tilia tomentosa* Moench, *Chelidonium majus* L., *Crataegus monogyna* Jacq., *Rosa canina* L., *Mentha piperita* L., *Eryngium planum* L, *Sambucus nigra* L., *Urtica dioica* L., *Agrimonia eupatoria* L., *Equisetum telmateia* Ehrh., *Plantago major* L., *P.*

lanceolata L., etc. Some medicinal plants from the spontaneous flora are also used by the local inhabitants in alimentation due to their high nutritional content in vitamins, minerals, proteins, lipids, and sugars (e.g. *Alliaria petiolata* (M. Bieb.) Cavara et Grande, *Allium ursinum* L. subsp. *ucrainicum* Kleopow et Oxner, *Artemisia absinthium* L., *Portulaca oleracea* L., *Rumex acetosella* L., *Taraxacum officinale* Weber ex F.H.Wigg., *Urtica dioica* L.).

The honey plants from the Getic Piedmont and the Subcarpathian hills are found throughout the growing season and they play an important role in the apiculture of these areas. Among them we mention: *Anemone nemorosa* L., *A. ranunculoides* L., *Cichorium intybus* L., *Eryngium campestre* L., *E. planum* L., *Echium vulgare* L., *Leonurus cardiaca* L., *Lamium* spp., *Mentha* spp., *Nepeta* spp. *Tilia cordata* Mill., *T. tomentosa* Moench, *Salvia pratensis* L., *Taraxacum officinale* Weber ex F.H.Wigg., *Symphytum officinale* L., Viola spp. *Robinia pseudacacia* L., *Acer campestre* L., *Alnus glutinosa* (L.) Gaertn., *Castanea sativa* Mill., *Corylus avellana* L., *Rosa canina* L., *Salix fragilis* L., *S. alba* L., *Sambucus nigra* L., Medicago spp., Trifolium spp., *Melilotus albus* Medik., *M. officinalis* (L.) Lam.

The spontaneous plants with **ornamental** value are highly diverse, the decorative character being their habitus. In some urban areas they are used for vegetal compositions such as tree alignments (e.g. *Tilia tomentosa* Moench, *Betula pendula* Roth), pentru înfrumusețarea parcurilor (*Leucanthemum vulgare* Lam., *Bellis perennis* L., *Juniperus communis* L., *Salix alba* L., etc.) and of residential areas, as hedges (*Ligustrum vulgare* or *Cornus sanguinea*) or vegetation covered walls (e.g. *Hedera helix* L.). In some rural settlements, where the erosion process is strong, they are used to fix these unstable lands (e.g. *Hippophae rhamnoides* L., at the level of Stroești settlement, located in Vâlcea County).

There are multiple advantages in using these plants from the spontaneous flora, such as: reducing the financial costs required for maintenance, as well as minimizing the maintenance work and ensuring a chromatic variability throughout the vegetation period [44].

The tinctorial plants from the region under study were used especially for dyeing wool or home-made fabrics, but also for colouring some dishes and soft or alcoholic drinks. The most frequently used were those derived from *Alnus glutinosa* L.) Gaertn., *Juglans regia* L., *Betula pendula* Roth, *Quercus robur* L., *Taraxacum officinale* Weber ex F.H.Wigg., *Origanum vulgare* L., *Sambucus nigra* L., *Tilia tomentosa* Moench, *T. cordata* Mill., *Salix purpurea* L., *Malus sylvestris* (L.) Mill., *Linaria vulgaris* Mill., *Inula helenium* L., *Centaurea cyanus* L., etc. The most beautiful colours were obtained on wool fibres.

The natural colours were stabilised using certain natural auxiliary substances: wood ash, vinegar, wine, kitchen salt, whey, sour cabbage juice, etc. Certain evidence regarding the use of natural dyes still endures in some households, where there can be found needlework on folk blouses, towels, tablecloths, pillowcases, window curtains or carpets that were traditional in Oltenia.

The fodder plants have a very good representation in the Piedmont and the Subcarpathian hills of Oltenia. They are mainly found in meadows, rarely in other vegetation formations. Most of them belong to the Fabaceae (Leguminosae) and Poaceae (Gramineae) families. The most widespread are: *Trifolium pratense* L., *T. repens* L., *Lolium perenne* L., *Poa pratensis* L., *Festuca pratensis* Huds., *F. rupicola* Heuff., *Agrostis capillaris* L., *Anthoxanthum odoratum* L., *Lotus corniculatus* L., *Dactylis glomerata* L., *Medigago lupulina* L., *Lathyrus pratensis* L., etc. They are traditionally used for feeding the domestic animals [22], which provided (and still do) the food necessary for daily consumption, the driving force for certain agricultural works, the means for goods transportation and, sometimes, for personal travel.

The plants with food value, which are characteristic for the spontaneous flora of the researched territory, are known and appreciated especially in the countryside. These plants are present in small number and they and are consumed either fresh, as in the

case of *Rumex acetosella* L., *Fragaria viridis* (Duchesne) Weston, *F. vesca* L., *Rubus candicans* Weihe, *Prunus spinosa* L., *Cornus mas* L., *Sambucus nigra* L. species, or in various dishes (e.g. *Urtica dioica* L., *Rumex crispus* L.). Furthermore, the fruits or seeds of *Corylus avellana* L., *C. colurna* L. and *Castanea sativa* Mill.can also be used.

Aromatic and seasoning plants are poorly represented in the Piedmont and the Subcarpathian hills. They are used in various dishes, either in a dry state (e.g. *Origanum vulgare* L., *Thymus pulegioides* L.), or fresh (e.g. *Vitis sylvestris* C.C. Gmel., *Prunus cerasifera* Ehrh.).

The information provided during the survey by the inhabitants of the urban and rural areas in the Getic Piedmont and the Subcarpathian hills, leads to the observation that the importance assigned to the flora of these regions is greater among the population over 40 years old. More than half of them are over 50 years old (Fig. 1).

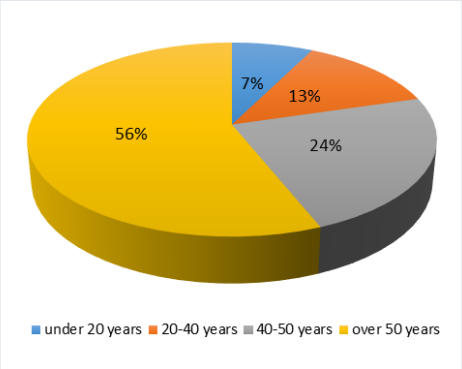


Fig. 1. Share distribution of the economic importance assigned to spontaneous flora, by age groups (%)
Source: Own calculation.

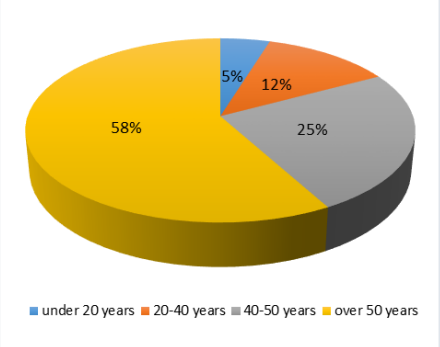


Fig. 2. Share distribution of the way of use assigned to spontaneous flora, by age groups (%)
Source: Own calculation.

As in the case of the study regarding the plain region of Oltenia, the present research reveals the low interest among young people (Fig. 2).

The analysis regarding the share corresponding to each category of used plants in the researched territory reveals the fact that, unlike the in plain region, the fodder plants have the best representation in the Getic Piedmont and the Subcarpathian depression of Oltenia. This situation can be explained by the fact that a good part of the surfaces occupied by natural vegetation belongs to meadows. This first category is followed by medicinal and honey plants (Fig. 3). The other categories have insignificant shares.

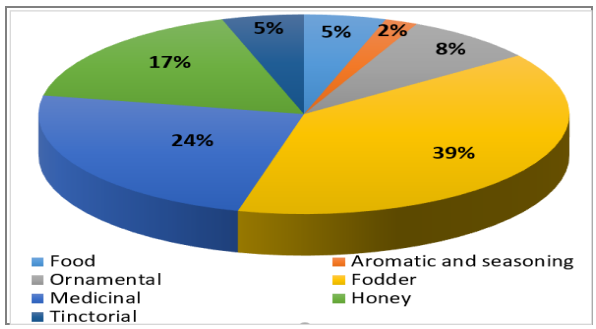


Fig. 3. Analysis of plant categories, based on their use (%)
Source: Own calculation.

The most used plants in nature are: *Matricaria recutita* L., *Hypericum perforatum* L., *Tilia tomentosa* Moench, *Chelidonium majus* L. and *Sambucus nigra* L. Most of the collected plants are used for their own use, a small part of the locals use them in the markets of the towns closest to their hometown (about 5%).

The income obtained from the collection of spontaneous plants is very low (between 100-400 RON). Nicio persoană chestionată nu a accesat fonduri europene în acest sens și sunt sceptici în realizarea acestui demers.

The analysis concerning the importance assigned to these plants by people from the rural environment as compared to those from the urban environment, reveals that, unlike in the plain region, at the level of the Piedmont and the Subcarpathian hills, the interest shown by the urban dwellers is slightly higher (Fig. 4).

The research carried out in the field, as well as in the laboratory reveals, on the one hand, a much greater floristic diversity corresponding

to the hills of Oltenia (Photos 1 and 2) and, on the other hand, a greater interest shown by inhabitants with regard to the use of spontaneous plants.

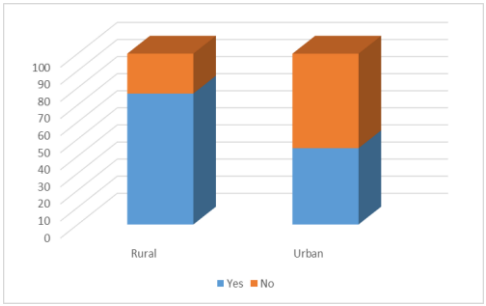


Fig. 4. The importance assigned to spontaneous flora in the rural and urban areas of the regions under study(%)
Source: Own calculation.

The landscape in these regions is sometimes impressive (Photos 3, 4 and 5).

Fig. 1. The physiognomy and use of meadows located in Larga settlement (Gorj County)
Source: Original photo.

Fig. 2. The physiognomy of meadows located in Racovița settlement (Gorj County)
Source: Original photo.

Fig. 3. Orchards with fruit trees, located in the Subcarpathian depression - Rugetu settlement (Vâlcea County)
Source: Original photo.

Fig. 4. General aspect of the meadows located on the outskirts of Stănești settlement (Gorj County)
Source: Original photo.

Fig. 5. Meadows rich in orchards, located in Paușești Otăsău settlement (Vâlcea County)
Source: Original photo.

CONCLUSIONS

The spontaneous plants in the area of the Getic Piedmont and the Subcarpathian hills are of great economic importance because the multiple usage of some of them in a dry or fresh state brings economic benefits to the inhabitants of these areas.

The widespread use of spontaneous flora is more significant in rural areas.

It is to be noticed that the inhabitants assign more importance to the use of spontaneous flora within the Getic Piedmont and the Subcarpathian Depression, as compared to the plain region of Oltenia. This is proven by the various products obtained from plants or to which plants have made a good contribution. The settlements characterised by the highest number of plant collectors are those located in the Subcarpathian hills (Păușești, Vaideeni, Stoenești, Bunești (Vâlcea County) and Crasna, Novaci, Bumbești Jiu, Pești eana (Gorj County).

The use of spontaneous flora on an industrial scale is also absent in these regions of Oltenia.

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