IDENTIFICATION OF NEW GENETIC RESOURCES IN AROMATIC AND MEDICINAL HERBS BELONGING TO SOME SPECIES WITH POTENTIALLY EXTENDED CULTIVATION

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Abstract: *Romanian flora gathers a number of over 3500 different species of plants, out of which, traditional medicine uses approximately 10%, respectively 350 species (E. Paun, 1995). Out of a total no of medical species, only 160 have been used for tea production and other different medicinal products. Approximately 110 species have been taken from the spontaneous flora, while over 50 species have been introduced in culture. The introduction in culture of some species is not only the consequence of the fact that such species have been used to replace the species disappeared from our country spontaneous flora, but it has also been the consequence of the introduction of other more valuable species. At present, the situation of medicinal herbs is severely affected. More precisely, in 1989, 52 species have been cultivated in Romania on a surface of 40 thousand of hectares. In the present, the number of species has been reduced to approximately half, while the cultivated surface has been reduced to 20 thousand hectares. It is very important to identify the spontaneous flora of valuable species and their amelioration, more precisely, the creation of new productive species with high content of active principles. We shall present the actual situation, respectively, the official catalogue of all culture plants species from Romanian territory for year 2011, respectively, the chapter regarding aromatic and medicinal herbs which includes 40 species and a total of 52 genera. Important to notice is the fact that out of a number of 17 genera, there are actually only local valuable populations and that 13 biological materials have been discovered during the period 1970 – 1980. Personal research have been focused on the identification of new valuable species of aromatic and medicinal herbs representing raw material for the creation of new genera, a more productive one and with a high content of active principles. Romania disposes of pedoclimatic conditions favorable to this group of plants, ensuring thus its necessary internal production, providing also important export opportunities. This paper deals with a number of 8 species identified in this region which have been subjected determination of active principles.*

Key words: *genetic resource, aromatic and medicinal herbs, volatile oil,, alkaloids.*

INTRODUCTION

The natural framework where the researches have been performed is the region between Caras River and Danube. The genera landscape is tessellated.

The vegetation areas from this region are the following:

- steppe areas and sylvo-steppe areas with a slight extension in the field bay drained by Caras river and Nera waters;

Under such conditions, various medicinal herbs accumulate quantities of superior active principles and their regional areas, motivating thus the herein research.

MATERIAL AND METHODS

The research has been performed and focused on the active principles content found in the following species:

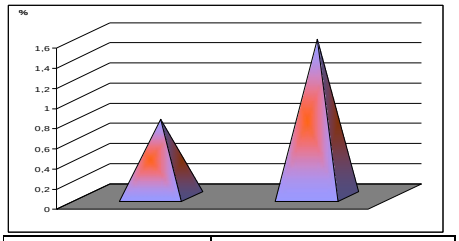
- *Achillea millefolium* L. – content of volatile oil;
- *Artemisia absinthium* L. – content of volatile oil;
- *Carum carvi* L. – content of volatile oil;

– content of fat;

- *Chelidonium majus* L. – content of alkaloids;
- *Hypericum perforatum* L. – content of volatile oil and of hypericin;
- *Hyoscyamus niger* L. – content of hyoscyamine;
- *Iris germanica* L. – content of volatile oil;
- *Oenothera biennis* L. – content of fat;
- *Saponaria officinalis* L.- content of triterpenic saponosides.

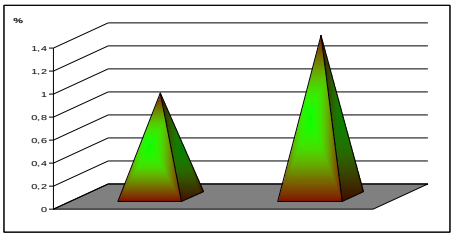
RESULTS AND DISCUSSIONS

To *Achillea millefolium* L. has been determined the content of volatile oil (%) in inflorescence, illustrated in picture 1 which shows that in the respective area a variation of 0.77% and 1.5% has been registered. The content of volatile oil from the analyzed samples is superior to the content detected in Cluj area, being of up to 0.45%, 0.37% and Salaj area and 0.595 in Sibiu area.



0,77	1,56
2010	2011

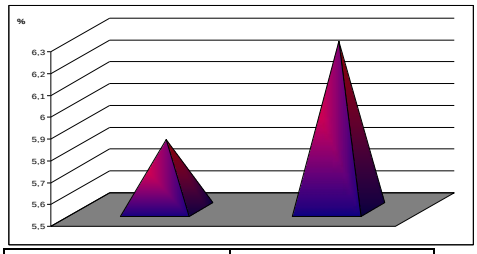
Figure 1 The average volatile oil content (%) determined in *Achillea millefolium* L. inflorescence.



0,9	1,4
2010	2011

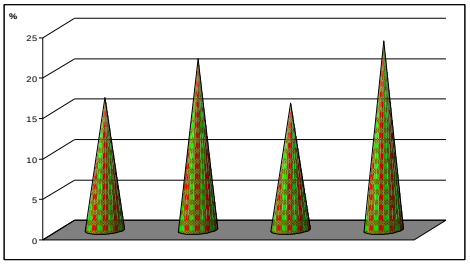
Figure 2. . The content of the volatile oil (%) determined in aerial part of *Artemisia absinthium* L.

Pictures 3 şi 4 present the results of the determinations performed at *Carum carvi* L.



5,82	6,27
0	2011

Figure 3 . The average content of volatile oil (%) determined in aerial part of *Carum carvi* L



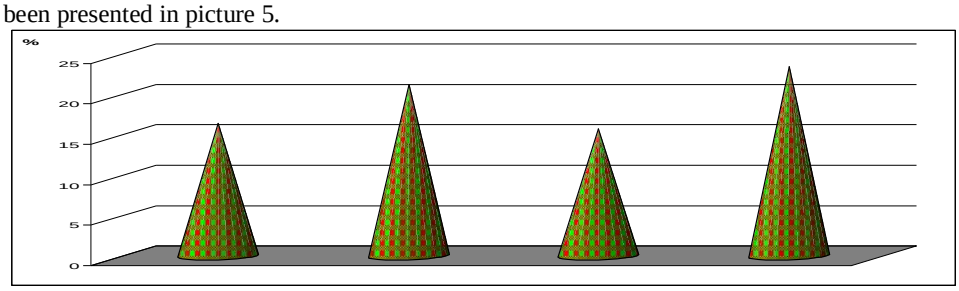
16,4	21,2	15,7	23,4
Ulei gras	Protein e	Ulei gras	Proteine
2010		2011	

Figure 4. The content of fat of land proteins determined from *Carvi fructus*

It results that in the analyzed area, the material analyzed has a volatile oil content higher than the one mentioned in the research thesis V. CUCU and collaborators (1982) for our

country 3,5 – 4% in case of samples taken from the spontaneous flora samples and 4,1 -5,8% taken from the cultivated one.

In case of *Chelidonium majus* L. species, determinations have been performed concerning the content of alkaloids from the aerial and root part of the plants, the results have been presented in picture 5.

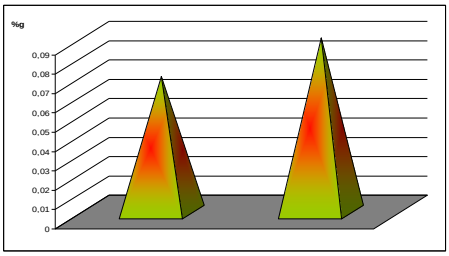


0,7	1,4	1,1	2,2
% in aerial parts	% in roots	% in aerial parts	% in roots
2010		2011	

Figure 5. Content of alkaloids determined in Chelidonium majus

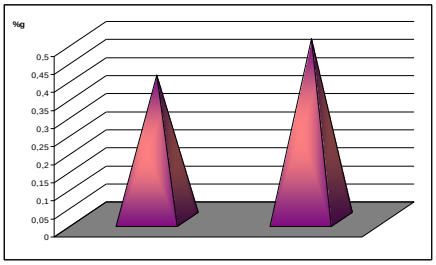
In comparison with the specialist literature data where the limits have been established between 0.1 – 1% in the aerial parts of the plant and 0.2 – 2% in the roots, the material analyzed is more valuable and can be used as important source to obtain new genera.

In pictures 6 and 7 is presented the content of hyoscyamine determined in case of *Hyoscyamus niger* L.,



0,07	0,09
010	2011

Figure 6. Content of total alkaloids, analyzed in the hyoscyamine determined in *Hyoscyamus niger* L.

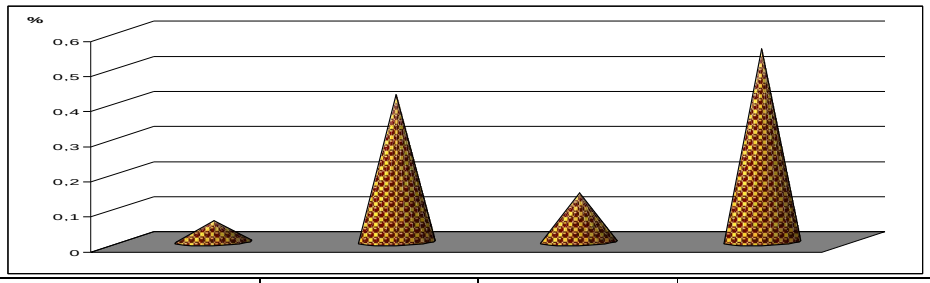


0,4	0,5
2010	2011

Figure 7. Content of total alkaloids analyzed in hyoscyane determined in *Hyoscyamui siccum*

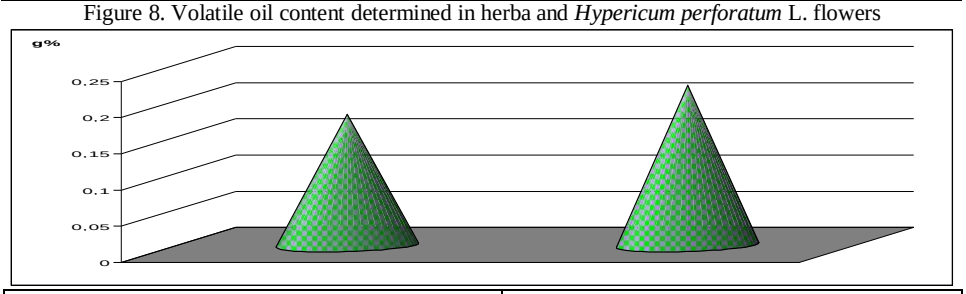
The results of the determinations reveal higher values than the ones mentioned in Romanian Farmacopeea, more precisely of 0.04% in case of Hyoscyami folium and respectively 0,3 g% in Extractum *Hyoscyami siccum*, total alkaloids expressed in hyoscyamine.

Hypericum perforatum L., due to its valuable active principles (volatile oil, polyphenole derivates tannin, hypericine) is a quested species which imposes the cultivation of such valuable genera. The determinations results from the samples taken from the researched area have been presented in picture 8 and 9.



0,06	0,42	0,14	0,55
% in herb	% in flowers	% in herb	% in flowers
2010		2011	

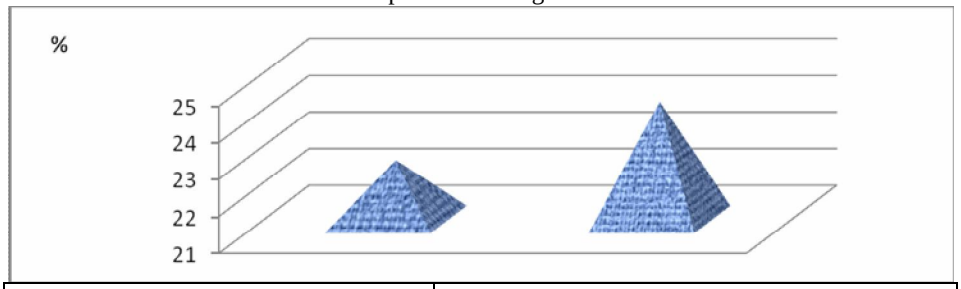
Figure 8. Volatile oil content determined in herba and *Hypericum perforatum* L. flowers



0,18	0,22
2010	2011

Figure 9. g% hypericin content variation determined at blossom

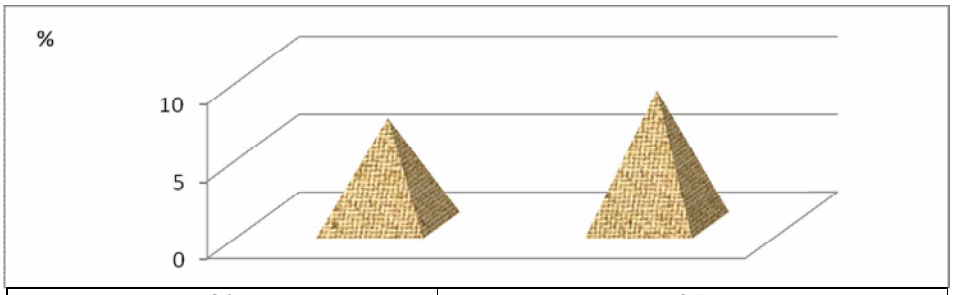
Oenothera biennis is present on sandy soils from the researched area, in Danube, Nera and Caras river flood plains. (Oenothera oleum rafinatum - raw material used in medicine industry for various kidneys and cardiovascular diseases and also in the cosmetic industry. The results of the determination have been presented in figure 10.



22,6	24,2
2010	2011

Figure 10 Fat oil content (%) determined in Oenothera biennis L. seeds (Oenothera oleum raffinatum)

Saponaria officinalis L. Has been found along the rivers from the researched area. Rhizomes and roots (Saponarie rubrae radix) contain triterpenic saponosides, and are used as pectoral, for the increase of dieresis and of digestive secretion, and also for the elimination of toxins. The samples analyzed had a content of triterpenic saponosides between 6,9 – 8,7% (picture 11).



6,9	8,7
2010	2011

Figure 11. Content of triterpenic saponosides (%) determined in the roots of *Saponaria officinalis* L.

CONCLUSIONS

The studies performed in Caras – Nera – Danube area and focused on the identification of valuable medicinal herbs used as raw material in the amelioration process, revealed the existence of a spontaneous flora and of various important species. The herein paper presents the results of determinations found in case of the following species: *Achillea millefolium* L., *Artemisia absinthium* L., *Carum carvi* L., *Chelidonium majus* L., *Hypericum perforatum* L., *Hyoscyamus niger* L., *Oenothera biennis* L. şi *Saponaria officinalis* L.

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