STUDIES CONCERNING THE MAIN CHARACTERISTICS OF *CALENDULA* SEEDS APPERTAINING TO DIFFERENT LOCAL POPULATIONS FROM THE WESTERN OF COUNTRY

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Abstract

The purpose of that study was to identify the differences existent among the main characteristics of marigolds seeds (the length, the width, the thickness, MMB) that appertained to 12 local populations from four districts of the western country (Arad, Caras-Severin, Hunedoara, Timis). After the investigations realized on seed-tree material collected from Zaradeni, Alunis, Covasint, Berzovia, Ghertenis, Ocna de Fier, Geoagiu, Ostrov, Rachitova, Fibis, Birda and Alios it could observe that existed differences among all the morphological characteristics of those. Local populations with the biggest value of seeds length were Birda (19.33 mm) and Fibis (17.44 mm) from Timis district, also Alunis (17.62 mm) and Covasint (17.98 mm) from Arad district. About the seeds length of *Calendula* the local populations of Geoagiu (13.16 mm) and Ostrov (13.89 mm) were registered with superior differences, statistically assured face to the local populations of Rachitova (13.34 mm) and Zadareni (15.36 mm). Concerning the seeds thickness, that had limits between 1.75 mm (local population of Fibis-Timis district) and 2.85 mm (local population of Ostrov-Hunedoara district). After MMB making it observed that oscillated between 8.33 g in case of local population Birda (Timis district) and 16.66 g to local population Covasint (Arad district). No one of the main seeds characteristics registered significant differences among local populations taken in study. Thanks to multiple usages of *Calendula* plants, the study of main seeds characteristics was absolutely necessary thanks to the importance that it had on the production. Accordingly, we concluded the fact that to all five characteristics of seeds taken in study had registered differences regarding the 12 local populations from the western of country.

Key words: marigolds, seeds, morphological differences, biometrical determinations, local populations

The medical plants produced fewer and more reduced secondary effects than the synthesis medicaments. That category of plants could exploit the surfaces less productive, could assure great capitals to the growers, could constitute ornamental crops or melliferous, and the crop of medical plants could constitute an important material of export. They could be extended in big culture, in scholar lands, in parks and gardens, combining the beautiful with practical (Muntean and colab., 2007).

The medical plants market was in continuous development in the world, the naturist treatments being more and more searched. The inquiry was so bigger, that, for the moment, it wasn't cotes for the plants export towards the UE countries, that imported from China 80% from the medical plants used. They would anytime prefer to import from the member countries, an additional chance for Romania. Now, we crop around 20 species of plants, the rest of them being cropped from the spontaneous flora, developed over 80% in the forests. The specialists sustained that it need a guard of medical plants, which protected the areas where they developed. Some countries such Hungary, Moldavia Republic or Croatia now export more than Romania, country with tradition in that domain. At the same time with the climatic modifications we could acclimatize also others plants, as in the neighbor countries had developed (www.marketwatch.ro, quaoted by Vaida S., 2012).

The original plant from the Mediterranean region, *Calendula officinalis* growed up on uncultivated areas, on the roads and railroad margins, but also was cultivated as ornamental plant. In medical purpose it used only the variety characterized through double flowers of yellow-orange color. As spread, the plant met from the plain to mountainous region and blew from May to September.

The achenes *Calendula* formed seeds with an accentuated polymorphism, with a variability more or less varied, in function of the species and

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genotype of the perspective species (Shishin N.B., 1962; Acosta and collab., 2001, quoted by Baciu A., 2011). In general, seeds from the interior of achenes were small, with circular shape, the length of 2,0-10,0 mm, the width of 1.5-2.0 mm, the weight of 2.5-4.0 mg, and the color of seed at the maturity was very varied from cream to grizzle sad. The exterior seeds were bigger, a little curved, with the length of 10.00-18.0 mm, the width of 2.0-6.0 mm and the weight of 4.0-28.0 mg (Ismagilov P.P. and Carja D.A., 2000; Goncearіuc M., 2001 quoted by Baciu A., 2011).

MATERIAL AND METHOD

Regarding the investigations realization of differences establishment existent among the main characteristics of marigolds seeds had collected seed-tree material from 12 local populations from the western of the country such as: Zadareni, Alunis, Covasint, Berzovia, Ghertenis, Ocna de Fier, Geoagiu, Ostrov, Rachitova, Fibis, Birda and Alios, from Arad, Caras-Severin, Hunedoara and Timis districts. (*fig.1*).

Figure 1 ***Calendula*** **seeds collected from the western of the country**

After collecting the seed-tree material it was introduced in labeled envelopes and transported in the laboratory of phytotechny to analyze from the point of view of the main biometrical determinations. The characters considered that could illustrate the morphological differences existent among local populations taken in study were the following: the length, the width, the weight and thickness of the seeds. (*fig.2*).

Figure 2 **The seeds scaling of *Calendula* and the results notation**

Biometrical measures were made with the ruler, and MMB was calculated for the every local population in part through scaling at the balance KERN-EG, with precision of 0.01. The biometrical coefficients calculated in conformity with the professional literature, applying the known formulas (Botez and collab., 1995) and respecting the following stages: the arithmetic mean, standard deviation, variance.

RESULTS AND DISCUSSIONS

In making investigations on differences existent among the main characteristics of *Calendula officinalis* L., the analyzed samples were collected from the western of country. After those studies it observed that the seeds length presented different values, inside of local populations taken in study. (*tab. 1.*). The seeds with the biggest length registered to local populations of Birda (19.33 mm), Covasint (17.98 mm) and Alunis (17.62 mm). The smallest length observed the seeds from the local populations Berzovia (10.25 mm), Ocna de Fier (12.00 mm) and Ghertenis (12.60 mm) from Caras- Severin district.

Table 1

Biometrical determinations to different local populations of *Calendula* from the western of country

No. crt.	District	Local populations	Seeds length (mm)	Seeds width (mm)	Seeds thickness (mm)	MMB (g)
1.	Arad	Zadareni	15.36	1.20	2.53	11.66
2.		Alunis	17.62	1.45	2.20	10.00
3.		Covasint	17.98	2.42	2.80	16.66
4.	Caras-Severin	Berzovia	10.25	1.77	2.63	13.33
5.		Ghertenis	12.60	1.24	2.42	10.33
6.		Ocna de Fier	12.00	1.55	2.11	11.33
7.	Hunedoara	Geoagiu	13.16	2.80	1.80	12.33
8.		Ostrov	13.89	2.52	2.85	16.33
9.		Rachitova	13.34	1.19	2.00	8.66
10.	Timis	Fibis	17.44	1.53	1.75	10.00
11.		Birda	19.33	1.91	1.90	8.33
12.		Alios	16.04	1.71	2.15	9.33

The seeds width oscillated between 1.19 mm (local populations of Rachitova) and 2.80 mm (local populations of Geoagiu), both from Hunedoara district. The biggest values of seeds thickness registered to local populations of Ostrov- Hunedoara district (2.85 mm) and Covasint- Arad district (2.80 mm), with superior differences, statistically assured face to the local populations of Fibis-Timis district (1.75 mm) and Geoagiu- Hunedoara district (1.80 mm). (*fig. 3.*).

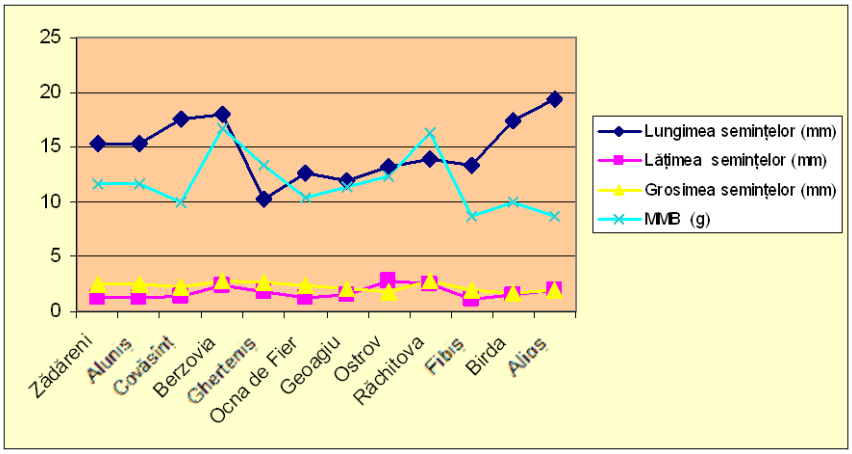

Figure 3 **The main characteristics of *Calendula* seeds collected from the western of the country**

Seeds weight presented a huge variation inside of local populations taken in study, with limits between 8.33 g to local populations of Birda collected from Timis district and 16.66 g to local populations of Covasint- Arad district.

CONCLUSIONS

The seeds with the biggest length registered to local populations from Arad and Timis district, and the smallest to the ones collected in Caras-Severin district.

Local populations to which registered the biggest width were Geoagiu and Ostrov from Hunedoara district with 2.80 mm, respective 2.52 mm, those presenting superior differences, statistically assured face to the local populations of Rachitova and Zaradeni, where registered 1.19 mm, respective 1.20 mm.

Regarding the seeds thickness the smallest values observed to local populations of Fibis, Geoagiu and Birda, and the biggest values to local populations of Ostrov, Covasint and Zaradeni. The seeds with the smallest weight registered to local populations of Rachitova from Hunedoara and Birda from Timis district. The biggest values of the seeds weight had registered to local populations of Covasint an Ostrov. Accordingly, we concluded the fact that to all five characteristics of seeds taken in study had registered differences regarding the 12 local populations from the western of country.

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