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THE STUDY OF SOME LANDRACES OF GARLIC FROM THE WESTERN REGION OF ROMANIA REGARDING CERTAIN QUANTITATIVE CHARACTERS

Petcov Andreea Adriana[1], Buzdugan Emilia[1], Moatăr Maria Mihaela[1], Velciov Ariana[1], Orboi Manuela Dora[1*]
[1*]University of Life Sciences "King Mihai I" from Timisoara
** Correspondence author. E-mail*: manuela_dora@yahoo.com

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ABSTRACT

The processes of growth, development and formation of production are determined genetically. They take place permanently under the influence of environmental conditions and agro-phytotechnical cultivation interventions. The objectives of this study were to analyze certain quantitative characteristics of the landraces of garlic from Timis county and Arad county, taken into study that can be useful for garlic production. This study shows us the fact that the landraces from Timis county, in terms of the quantitative characteristics bulbs weight and cloves weight, have the highest values, and the landraces from Arad county, namely the one from Ineu, stood out with a higher value for the number of cloves from the bulbs.

INTRODUCTION

Some researchers studied the ontogeny and taxonomy of a number of wild and cultivated plants, including garlic, in different climatic zones. (Kamenetsky R. et al. 2006) Their studies developed along with the scientific knowledge of crop diversity and the establishment of plant classification with certainty. Later researchers from different research centers and farmers contributed to expanding the study of local flora in the region and compiled, corrected and updated the database. Researchers from the CAC region, studying the horticultural characteristics of garlic, mention a high quality conservation and prohibitive importance. In order to evaluate the behavior of the populations, the study of the germplasm helps to group the characteristics and establish the genetic selection criteria of the promising lines. The genetic diversity of germplasm has proven to be essential for production. Harlan (1992) refers to Masi et al. (2001), who emphasizes the importance of detailed knowledge of the bioecology of landraces as a fund of genetic resources, which are required in culture and especially as initial material for improvement.(Serecka et al. 2001). According to le Brand's cytological studies, somatic gene mutations are expressed through stable changes (such as leaf color mutants) or as: the color of bulb tunics, physiological adaptations as an effect of latitudes, respectively of photoperiodism and regarding the requirement of cold for the differentiation of the floral stem in the induction of precocity, in conditioning the color of the bulb, the size of the plant, the distribution

of the buds in relation to the tunics and the degree of multiplication of the bulb. (Lowe et al., 2004) The production of garlic in the west of our country is obtained as everywhere in the country, using varieties of local empirical selection, non-uniform material, not having gone through an ameliorative process and with a productive potential. (Petcov et al. 2019)

MATERIAL AND METHODS

Biological material consisted from garlic landraces (*Allium sativum* L.) collected from Timis County (landraces of Cenad and Valcani) and Arad County (landraces of Ineu and Pancota).

The culture was established in the experimental field of ULST Timisoara through vegetative propagation, the garlic cloves were planted in the fall in September. During the vegetation period, the crop was left irrigated as was the case, and the first signs of plant emergence were in the first weeks of November. The harvest was carried out at the moment when the first signs of ripening were observed, i.e. the yellowing of the leaves in the middle of June. (Fig. 1) After harvesting, the bulbs of garlic were weighed and the bulbils obtained were counted for each bulb of garlic, to quantify the quantitative differences in the landraces. (Fig. 2).

Figure 1. *Ex situ* culture of *Allium sativum* L.in Timişoara area

Figure 2. Garlic yield

RESULTS AND DISCUSSIONS

Studying the three characters of the landraces of garlic that are of interest for production, namely the weight of the bulbs, the weight of the cloves and the number of cloves in the bulbs. In table no. 1 and the graphic representations (Fig. 3; 4; 5) the general average of the characters of interest for production are exposed. According to the data regarding the weight of the bulbs and the weight of the cloves, the highest values are found in the two landraces from Timis county, namely: Cenad (11.19±2.49) and Valcani (10.56±1.85). And as far as the character is concerned, the number of cloves in the bulbs of the Ineu landraces garlic. Arad county, has a higher value (9.60±1.13), but this does not mean that a higher number of cloves is an advantage, because for example in the food industry, a larger clove of garlic is preferable and implicitly the number of cloves per bulbs, should be smaller.

Table 1

Biometrics means of characters examined

Nr. crt.	Landraces	weight of the bulb (g)	weight of the cloves (g)	number of the cloves in bulb
		Means±Ab.st	Means±Ab.st	Means±Ab.st
1	Ineu - Ar	9,81±1,23	0,94±0,09	**9,60**±1,13
2	Pancota -Ar	9.11±1,06	1,00±0,10	8,87±1,07
3	Valcani -Tm	**10,56±1,85**	**1,05±0,12**	**9,84**±1,21
4	Cenad - Tm	**11,19**±2,49	**1,20**±0,19	9,45±1,17

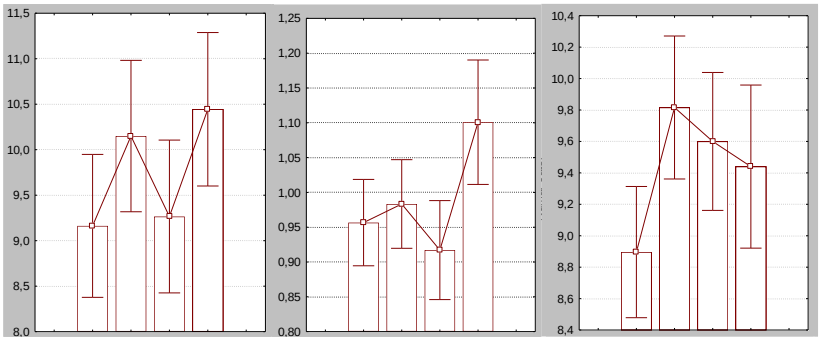

Fig. 3 Weight of garlic bulbs Fig. 4 Weight of garlic cloves Fig. 5 Number of cloves from the bulbs

CONCLUSIONS

In conclusion, we can say that the garlic landraces analyzed behaved and performed much better than those from Timis county compared to the landraces from Arad county. It can be stated that the two landraces from Timis county, namely Cenad and Valcani, can be selected for further exploitation due to their superiority in expressing the characters of interest from a quantitative point of view. There is a clear grouping of the landraces from the point of view of the quantitative characteristics analyzed according to their origin. Considering the place of origin

and the excellent behavior in ex situ conditions, these two local populations: Cenad and Valcani, of the Timis county, can be used as sources of genes for cultivated garlic.

REFERENCES

Harlan J. R.1992. Crops & Man. American Society of Agronomy,Madison: 218 221.

Kamenetsky R., Rabinowitch H.D. 2006. The genus Allium: Adevelopmental and horticultural analysis. Horticultural Reviews, 32: 329–378.

Lowe A., Harris S., Ashton A. 2004. Ecological Genetics: Design, Anlysis, and Application. Blackwell Science Ltd.: 121 – 147

Masi P., Figliuolo G., Logozzo P.L., Spagnoletti Zenli, 2001. Eco – Geographical Differentiation and n Situ Conservation of Common Bean Land Races from Southern Italy. Broad Variation and Precise Characterization – Limitation for the Future, Eucarpia Section Genetic Resources, Poznan, Poland: 28.

Petcov Andreea Adriana, Buzdugan Emilia, Arambașa V. 2019. Study on certain morphological characteristics of some local garlic (Allium sativum L.) landraces, JournaL of Horticulture, Forestry and Biotechnology Volume 23(3): 68.

Serecka D., Pilecki T., Trendak – Goska E., Turska E. 2001. Gene Resources of in vitro Potato Plants / Possibilities of Improvment of the Method in Maintainning the Plants Collection. Broad Variation and Precise Characterization Limitation for the Future, Eucarpia, Section Genetic Resources, Poznan, Poland: 44.