

LUCRĂRI ȘTIINȚIFICE SERIA HORTICULTURĂ, 62 / 2019, USAMV IASI
**GLEBIONIS CORONARIA (EDIBLE CHRYSANTHEMUM), A
MULTI-PURPOSE PLANT**

**GLEBIONIS CORONARIA (CRIZANTEMA COMESTIBILĂ), O PLANTĂ
CU MULTIPLE INTREBUINȚĂRI**

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Abstract. *Edible Chrysanthemum (Glebionis coronaria) is a plant native to the Mediterranean area. This species was acclimatized and bred at VRDS Buzau, where 3 genotypes were obtained from three distinct varieties that were tested in two culture environments, the greenhouse, and field. The plant has multiple uses, being both food, medicinal but also ornamental.*

Keywords: genotype, phenotype, breeding, acclimatization, betacarotene

Rezumat. *Crizantema comestibilă (Glebionis coronaria) este o plantă originară din zona mediteraneeană. Această specie a fost acclimatizată și ameliorată la SCDL Buzău, unde s-au obținut 3 genotipuri din trei varietăți distincte care au fost testate în două medii de cultură, seră și câmp. Planta are multiple întrebuințări, fiind atât plantă alimentară, medicinală dar și ornamentală.*

Cuvinte cheie: genotip, fenotip, ameliorare, acclimatizare, betacaroten

INTRODUCTION

Glebionis coronaria (Chrysanthemum coronarium; Asteraceae) is a valuable vegetable, medicinal, and ornamental plant known under vernacular names garland chrysanthemum, crown daisy, etc (Alvarez-Castellanos and Pascual-Villalobos, 2003; Paciolla *et al.*, 2013). *Glebionis coronaria* (L.) Cass. ex Spach with totally yellow ligules is exclusive to the meso-Mediterranean thermotype, and *Glebionis discolor* (d'Urv.) stat. nov. is found in the thermo- and meso-Mediterranean (it is exclusive to the latter thermotype) (Hauas *et al.*, 2016).

Nowadays, this species grows throughout Asia. According to references we also find that Malta is the possible area of origin. The name of the species comes from the Greek word “chrysos” which means gold and “anthemon” (Greek) which means flower, so gold flower (Mifsud, 2003; Șelaru, 2002). *Coronaria* comes from latin “corona”, which means “crown”, referring to the perfect symmetry of the flower.

For the first time, in our country, this species was studied at VRDS Buzau, the species was acclimatized and bred, obtaining three genotypes with distinct characteristics, especially regarding the color of the flower. Starting with 2010,

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promotional seeds and seedlings were offered annually to growers, and nowadays, this species is cultivated and appreciated especially by those who practice hobby vegetables.

The plant has multiple uses, is an important vegetable plant, therefore, appreciated from a food point of view, as a leaf vegetable, as well as a medicinal plant, used in teas for high potassium, beta carotene content, but can also be used as a companion plant for organic crops, being repellent for diseases and pests in vegetable crops (Flamini *et al.*, 2003; Hosni *et al.*, 2013; Shonouda *et al.*, 2008; Urzùa and Mendoza, 2003).

The addition of decomposed leaf material (*Melia azadirachta*, *Chrysanthemum coronarium*, *Tagetes patula*, *Datura fastuosa*, *Nerium indicum* [*Nerium oleander*]) or farmyard manure, but not filter-press mud, reduced the incidence of root-knot nematodes and increased green-matter yields accordingly (Hameed, 1970).

MATERIAL AND METHOD

The germplasm collection of VRDS Buzau at this species consists of a large number of genotypes belonging to the following varieties: *Glebionis coronaria* var. *coronaria*, *Glebionis coronaria* var. *discolour* and *Glebionis segetum*. Only 3 genotypes were bred and genetically stabilized and also showed distinct features (fig.1).



Fig. 1: a) *Glebionis coronaria* var. *coronaria*, b) *Glebionis coronaria* var. *discolor*,
c) *Glebionis segetum*

Glebionis coronaria is an annual plant that is multiplied especially by seeds, unlike the other varieties of chrysanthemums that multiply through cuttings.

The culture was set up by seedlings. The seedling was sown in the first decade of March, on 7.03.2019 and after 45-60 days, the seedling was planted in the field, on 4.04.2019, the seedlings technology being similar to that of the other vegetable plants. To preserve the purity of the varieties, pollen isolators were used because it was found that leaving them free, without sufficient spaces for biological isolation, the inbred is achieved with great ease.

The plant supports several technological variants of setting up the crop but, in an intensive system, it was found that the optimum variant is 70 cm between rows and 30-35 cm between plants/row (fig.2).

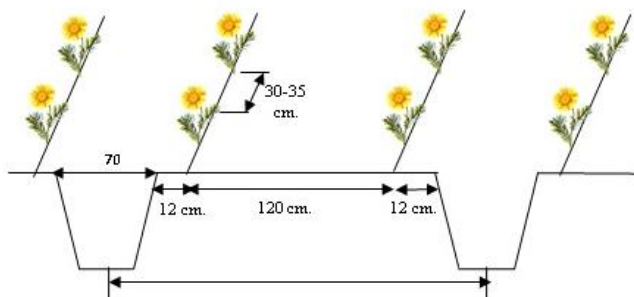


Fig. 2 Crop scheme in the field

Care works are the classic ones, consisting of manual and mechanized hoeing, executed as needed, depending on the weeds population. The mechanical lawns were made in the first vegetation period. The irrigation was carried out as needed, depending on the precipitation quantity. Usually, watering should be performed with a norm between 250-300 m³ of water/ha. The plant does not require special works.

RESULTS AND DISCUSSIONS

The research aimed to evaluate the acclimatized genotypes in protected areas and fields, according to tables 1 and 2. There were significant differences regarding the quantitative values, in the greenhouse against the field. For all the studied features, a significant increase was observed in the greenhouse as opposed to the field.

By carefully analyzing the recorded values, it is found that between genotypes there are very small differences, both in the greenhouse and field, the strongest distinguishing character of the genotypes is given by the inflorescence (fig. 3 and 4).

Table 1
The main studied features of the three genotypes, for both field and greenhouse – mean values

| FEATURE | FIELD | | | GREENHOUSE | | |
|-----------------------------|----------|----------|----------|------------|----------|----------|
| | L1 | L2 | L3 | L1 | L2 | L3 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| MAIN ROOTS NO. (PIECES) | 14 | 16 | 15 | 18 | 19 | 19 |
| ROOT DIAMETER (CM) | 20 | 21 | 24 | 26 | 25 | 27 |
| STEM HEIGHT (CM) | 2 | 2.5 | 3 | 4 | 4.5 | 3.5 |
| PLANT HEIGHT (CM) | 86 | 92 | 79 | 122 | 126 | 118 |
| BUSH DIAMETER (CM) | 68 | 62 | 70 | 83 | 85 | 78 |
| STEM BASE THICKNESS (CM) | 1.6 | 1.5 | 1.9 | 2.2 | 2.4 | 2.1 |
| MAIN SHOOTS NO. (BUC) | 14 | 15 | 17 | 22 | 20 | 19 |
| MAIN SHOOTS LENGTH (CM) | 48 | 52 | 46 | 85 | 79 | 86 |
| MAIN SHOOTS DIAMETER (MM) | 5 | 7 | 5 | 6 | 10 | 8 |
| SECONDARY SHOOTS LENGTH(CM) | 6 | 5 | 5 | 8 | 10 | 8 |

| SECONDARY SHOOTS DIAMETER (MM) | 3 | 2 | 3 | 3 | 2 | 2 |
|--------------------------------|-----|-----|-----|------|------|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| LEAF LENGTH (CM) | 7.5 | 7.2 | 8.1 | 5.6 | 5.9 | 5.5 |
| LEAF WIDTH (CM) | 2.4 | 2.6 | 2.5 | 3.2 | 3 | 2.9 |
| FLOWER BUD DIAMETER (CM) | 1.5 | 1.4 | 1.7 | 1.9 | 2.2 | 2.3 |
| FLOWER DIAMETER (MM) | 27 | 29 | 27 | 33 | 35 | 32 |
| FLOWER NO. (PIECES) | 36 | 31 | 38 | 53 | 49 | 51 |
| VEGETATIVE MASS/PLANT (G) | 849 | 862 | 874 | 1322 | 1296 | 1312 |



Fig. 3 Root detail. leaf. and plant



Fig. 4 Flowering stage and seeds set up

To determine their character and food quality, throughout the vegetation period, starting with the seedling phase and until the phenological maturity, organoleptic tastings were made on each phase. It has been shown that the plant can be grown as a microgreen because, in the seedling phase, the plantlets are succulent, aromatic and can be used successfully in various culinary dishes. As the plant evolves, the leaves can be used permanently, as well as young shoots. In the flowering phase, the young flowers can be used and as they mature they lose their food qualities, becoming spicy concentrated in carotene.

If the young seedlings are harvested seasonally, the plant is stimulated to generate new shoots leading to an increase in the vegetative mass production capacity. This paper presented the green mass of the plants without being harvested for consumption.

As a decorative plant, it has been found that the plant produces flowers with a pleasing ornamental appearance for a long time. In cold protected areas, the flowering period begins at the end of May and ends at the arrival of the frost and in the field, the first flowers appear after June 15, the plant having the ability to bloom until the frost comes.

Table 2

Main features at seedling stage for the 3 genotypes

| FEATURE | VALUE/OBSERVATIONS | | | MEASUREMENT UNITY |
|-------------------|-------------------------------------|------|------|-------------------|
| | SEEDLING | | | |
| | L1 | L2 | L3 | |
| PLANT HEIGHT | 18.6 | 18.1 | 17.8 | CM |
| LEAVES NO. | 7 | 6 | 7 | BUC |
| LEAF LENGHT | 7.7 | 7.5 | 7.2 | CM |
| LEAF WIDTH | 2 | 2.1 | 1.9 | CM |
| STALK LENGHT | ABSENT | | | CM |
| ANTOCYANIC COLOUR | ABSENT | | | |
| PILLOSITY | VERY WEAK FOR ALL VEGETATIVE ORGANS | | | |
| LEAF SHAPE | OBOVATE | | | |
| LEAF INSERTIONS | MULTIPENATE AND PARTITE | | | |
| COTILEDONS SHAPE | OVATE LANCEOLATE | | | |
| COTILEDONS | LENGHT-1.2 | 1.1 | 1.3 | CM |
| | WIDTH-0.8 | 0.9 | 0.78 | |

CONCLUSIONS

1. The research ended with the acclimatization of the species *Glebionis coronaria* in Romania. Studies have shown that the species can be cultivated throughout the country both in protected areas and in the field as an annual plant.

2. Breeding work was completed with the obtaining of three distinct genotypes to be proposed for approval and patenting.

3. A valuable germplasm collection has been established for this species and new knowledge that can contribute to obtaining new varieties and a higher yield.

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