

‘Camelia’, A NEW GENOTYPE OF *SOLANUM MELONGENA* L. OBTAINED AT V.R.D.S. BUZĂU

Camelia BRATU¹, Florin STĂNICĂ², Costel VÎNĂTORU¹, Bianca MUȘAT (ZAMFIR)¹

¹Vegetable Research and Development Station Buzău, 23 Mesteacănului St., Buzău, Romania

²University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd.,
District 1, Bucharest, Romania

Corresponding author email: botea_camelia2007@yahoo.com

Abstract

*The pedoclimatic conditions of the Buzau vegetable reservoir are favorable for the *Solanum melongena* species, therefore, beginning with 1996 the researches aiming breeding *Solanum melongena* were made in an intensive approach at V.R.D.S Buzau. At this time, the unit owns a rich germplasm collection comprising over 200 genotypes that are in different breeding stages. The unit has patented and registered in the Official Catalogue of Romanian Plant Crops the following cultivars: Dragaica, Zaraza and Rebeca F1. Beginning with the year 2018, a new cultivar of white eggplants has been patented and will be expanded widely in crop cultivation. While being tested at ISTIS Bucharest, V.R.D.S Buzau has offered seeds and seedlings promotionally for the growers and included in the internal program of conservative selection the seed production for this cultivar. The feedback received from the consumers was positive, the cultivar being distinguished by a great production capacity of a very high quality. In the present, in the internal program of conservative selection the seed had reached the stage of Basic seed, recording in fields a visible decrease of the main features variability starting with the Author's seed until Basic seed. The cultivar is suitable for growing under protected spaces and open field conditions being distinguished by distinct phenotypic characteristics.*

Key words: white eggplants, cultivar, germplasm, variability, productivity.

INTRODUCTION

In Romania, eggplant crop production is very common, this being practiced both in the household system and by the big farmers. (Lagunovschi & Vîntor, 2016). The most important growing areas of this plant are located in the southern, south-eastern, and south-western parts of Romania and are usually cultivated on open fields as well as in unheated greenhouses. (Kovács et al., 2016)

Eggplants are mainly consumed in the summer-autumn season, and the way they are prepared is quite varied. Eggplant is cultivated for its fruit consumed upon maturity; it is used in the preparation of different dishes such as salads, moussaka, potlatch, and stuffed eggplants. (Posta et al., 2012)

V.R.D.S Buzau gave a special attention for breeding eggplants since April 1957, this being the year of its founding (Bratu et al., 2018) Considering that in Romania the eggplants are a very common vegetable grown and consumed seeing that the pedoclimatic conditions are extremely favourable for producing this

species, the Laboratory of Genetic, Breeding and Biodiversity Preservation from Vegetable Research and Development Station Buzau oriented its activity towards obtaining new cultivars of eggplants in order to improve the range of varieties and hybrids that currently are produced and sold on the Romanian market. Consumers started to enrich and vary their taste for vegetables, therefore the farmers needed to vary their crops, species and most important needed to vary the cultivars used.

There is a great demand on the market for Romanian vegetables and people started to ask more and more for Romanian cultivars.

At the present the Research Station germplasm collection is extremely valuable, and has two cultivars and one variety registered in the Official Catalogue of Romanian Crop Plants under the name of Dragaica, Zaraza and Rebeca F1.

Beginning with the year 1996, new and improved programs in breeding eggplants were conducted in an intensive system by the Genetic, Breeding and Biodiversity Preservation Laboratory due to the varied

requests launched by the farmers and consumers. (Vinătoru et al., 2013) Although the climatic conditions allow us to produce vegetables that can supply the consumers requests there is a deficit for autochthonous vegetables. Only 60% of registered vegetable consumption nationwide is provided by domestic production. This means that 40% of consumption of vegetables is provided by imports (Soare et al., 2016). The aim of the researches were mainly concerned in achieving a new eggplant cultivar that has the following characteristics: white fruits, high yield potential, superior quality production, great adaptability to the Romanian pedoclimate conditions, ecological plasticity, the capacity for being grown in open field and protected spaces conditions.

MATERIALS AND METHODS

The germplasm collection held by the Vegetable Research and Development Station Buzau at the present, consists of over 280 distinct genotypes that are in different breeding stages (Figure 1).

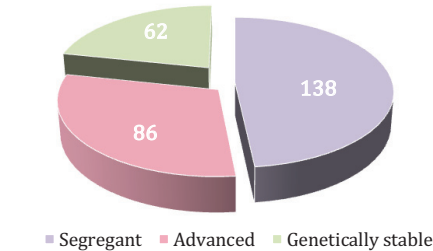


Figure1. Categories of genotypes studied at V.R.D.S. Buzau

Researches debuted with the consolidation and evaluation of the genetic material owned in the germplasm collection. After evaluation, the accession A10 that was introduced in the collection since 2006 was subjected to intensive breeding works. The breeding method used was the one specific to eggplants, respectively “repeated individual selection”. In the year of 2015 the breeding program was finalised with the achievement of the desired cultivar, therefore, starting with 2016 the newly obtained cultivar was introduced in the conservative selection program, applying the following conservative selection scheme: first

was established the Selection Field with plants obtained from the Author Seed from which 100 elite plants were retained; with the elite plants retained, the Field of Study of Descendants was established, and after careful evaluation of the descendants, 36 typical descendants plants were withheld and used in the establishment of the Pre-Basic field (Figure 2).

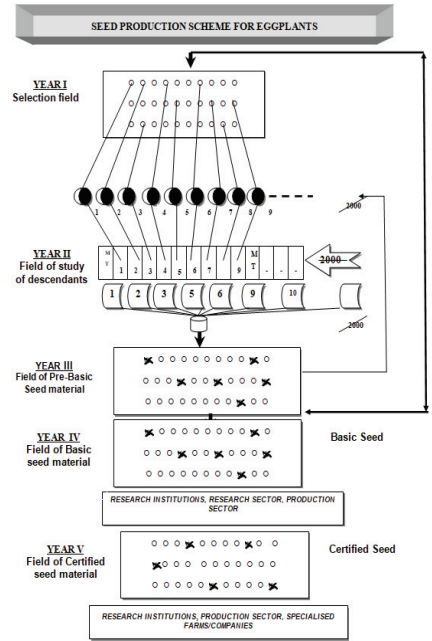


Figure 2. Selection scheme for eggplants

Biometrical and phenological determinations were made at two weeks after sowing and continued during the growing season until harvest, performing biological controls rigorously, eliminating from culture atypical and phonologically delayed plants, or the ones that showed sensibility to pests and diseases. The crop technology used was the one specific for growing eggplants in open field. The eggplant crop design was realised using the following distances: 70 cm between rows and 40 cm between plants per row (Figure 3).

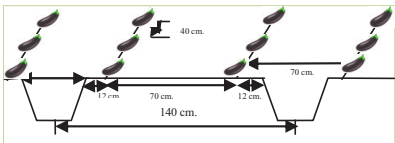


Figure 3. Eggplant crop design

RESULTS AND DISCUSSIONS

In order to obtain the established cultivar, from the Selection Field were harvested the plants

that phenotypically showed the desired characteristics. Therefore, this fruit were analyzed from a biometric point of view. The collected results are synthetized in Table 1.

Table 1. Variability of the main characters at the 'Camelia' cultivar in the conservative Selection Field

Studied character	\bar{X}	S	CV %	$\bar{X} \pm S$
Fruit length (cm)	15	3	20	12-18
Median fruit diameter (cm)	9.5	1.7	18.4	7.8-11.3
Fruit weight (g)	592.5	263.5	44.4	329-856
Fruit no./plant	11	3	27.2	8-14
Total weight/plant(g)	4475	215	4.8	4260-4690

Table 2. Variability of the main characters at the 'Camelia' cultivar in the conservative Field of Study of Descendants

Studied character	\bar{X}	S	CV %	$\bar{X} \pm S$
Fruit length (cm)	16.5	2.5	15.1	14-19
Median fruit diameter (cm)	10.3	1.4	14.0	8.9-11.8
Fruit weight (g)	668	206	30.8	462-784
Fruit no./plant	11.5	2.5	21.7	9-14
Total weight/plant (g)	4695	115	2.4	4580-4810

Table 3. Variability of the main characters at the 'Camelia' cultivar in the conservative Pre-Basic Field

Studied character	\bar{X}	S	CV %	$\bar{X} \pm S$
Fruit length (cm)	18	2	11.1	16-20
Median fruit diameter (cm)	11.0	1.1	10	9.9-12.2
Fruit weight (g)	688.5	193.5	28.1	495-882
Fruit no./plant	14	2	14.2	12-16
Total weight/plant (g)	4946	157	3.1	4789-5103

The main indexes used are the ones recommended for realising these types of studies: arithmetic mean (\bar{X}), standard deviation (S), variation coefficient (CV %),

Amplitude variation, frequency on variation classes and standard selection interval ($\bar{X} \pm S$) (Potlog & Velican, 1971).

In Table 2 we registered the results collected in the second year, from the Field of Study of Descendants. As we can see, the stability of the plants and the fruit quality grew.

In Table 3 are synthesized the results collected from the Pre-Basic field, in the third year. As we can see, the selected genotype for the process of breeding became stable and phenotypically uniform. The variation coefficient value demonstrates that in this field we managed to obtain a relatively homogenous genotype.

Researches have resulted so far with the achievement of a new cultivar with distinct phenotypic expressivity. Also it has been

registered and patented in the Official Catalogue of Romanian Crop Plants under the name of 'Camelia' (former A10).

The main characteristics of the new achieved cultivar are: the plant has a mean height of 96 cm in open field and 166 cm under greenhouse conditions; the main stalk has a mean height of 23 cm in open field and 28 cm in protected spaces; mean diameter of the main stalk is of 17 mm in open field and 19 mm in protected spaces. Near the ground the stalk becomes woodier and has a brownish colour.

It presents 3 lateral branches, two from the first division of the main stalk, and one from the second division of the main stalk that should be kept both in open field and protected spaces production.

The mean value regarding the length of the lateral branches is of 52 cm in open field and 92 cm in protected spaces. The bush diameter is of 86 cm in open field and 105 cm in protected spaces and has a large, globular constitution.

Leaf length is of approximately 29 cm in field crops and 36 cm in greenhouse crops. The mean values for width of the leaf are 21 cm in open field and 23 cm in protected spaces. The fruit peduncle has a length of 10.5 cm in field and 12 cm in protected spaces. The aerial vegetative organs were studied and concluded that there is no trace of anthocyanic coloration on them (Figure 4).



Figure 4. Plant aspect of A10

On the sepals, the cultivar has thorns that are not very aggressive. Thorns occurs both on plants grown in protected spaces and in the open field (Figure 5).



Figure 5. Thorns on sepals detail for genotype A10

The fruit has a medium length peduncle, with a mean value of 7.5 cm in open field plants and 9.5 cm in protected spaces. The peduncle and sepals are light green coloured. It has 5 sepals, 2 of which are conjoined (Figure 6).

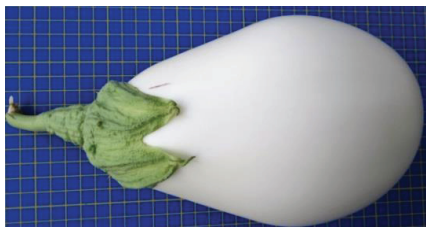


Figure 6. Sepals detail for genotype A10

The peduncle is thickened near the basis and has rare thorns that are not very aggressive.

The sepals are quite large and thick; they have a length with a mean value of 5 cm in open field and 7.5 cm in protected spaces.

The flower has a light-purple colour (Figure 7). The fruit length is of approximately 16 cm in open field and 20 cm in the protected spaces plants. The fruits have a shape between obovate and pear-shape aspect. The fruit diameter near the peduncle is 5.5 cm in open field and 6.8 cm in protected spaces, the median diameter is 9.9 cm in open field and 12 cm in protected spaces and near the apex the diameter is 6.4 cm in open field and 7.8 cm in protected spaces. The fruit has an indented fruit apex; the pistil area is ellipsoidal, with dimensions between 0.4-0.6 cm in open field fruits and 0.5-1.1 cm in protected spaces fruits (Figure 8).



Figure 7. Flower detail of genotype A10



Figure 8. Indented fruit apex of genotype A10

The fruit weight varies between 495-882 g in open field and in protected spaces between 870-1200 g (Figure 9).

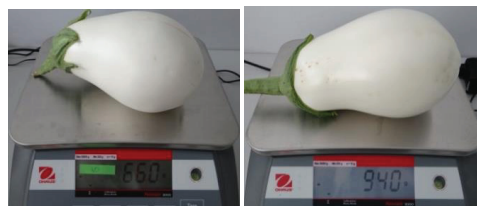


Figure 9. Fruit weight in open field and protected spaces for A10

The fruits are white and shiny on the outside, with a pleasant commercial aspect and the mesocarp is buttery-white with a more aerated texture than the commonly known eggplants (Figure 10).

The fruits must be harvested while the exocarp is white and shiny.

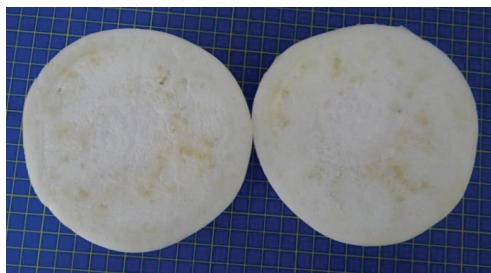


Figure 10. Cross section of eggplants fruits for genotype A10

The fruit has a reduced number of seeds, which are mainly placed towards the fruit apex. The seeds are brown, glossy and kidney-shaped (Figure 11). Thousand seed weight is 3.539 g and 1 g has 290 seeds.



Figure 11. Eggplant seed aspect for genotype A10

CONCLUSIONS

After prospecting the market, the Plant Breeding Laboratory of V.R.D.S. Buzau obtained a cultivar suitable for the pedoclimatic conditions of Romania.

The conservative selection programme applied for this new cultivar allowed us to obtain a relatively homogenous genotype, in the Pre-basic field, from a morphological point of view. After stabilization of the genotype, the accession A 10 was sent at ISTIS Bucharest for further examination in order to be registered in the Official Catalogue of Romanian Crop Plants under the proposed name as ‘Camelia’. While being tested at ISTIS Bucharest, V.R.D.S Buzau has offered seeds and seedlings promotionally for the growers and included in

the internal program of conservative selection the seed production for this cultivar. The feedback received from the consumers is positive, the cultivar being distinguished by a great production capacity of a very high quality. In the present, in the internal program of conservative selection the seed had reached the stage of Basic seed, recording in fields a visible decrease of the main features variability starting with the Author's seed until Basic seed.

The new achieved cultivar is suitable for growing under protected spaces and open field conditions with great yield productions and high quality fruit production. It mainly differentiates by distinct phenotypic characteristics, especially due to the white color of the fruits, the aerate fruit pulp texture and buttery- white pulp aspect.

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