

## THE STUDY OF A TOMATO ASSORTMENT WITH MULTI-USE (FOOD, MEDICINAL AND ORNAMENTAL)

### STUDIUL UNUI SORTIMENT DE TOMATE CU MULTIPLE UTILIZĂRI (ALIMENTARE, MEDICINALE ȘI ORNAMENTALE)

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**Abstract.** *The study was conducted in Bacau County, Podiș Farm, during 2015 - 2016, under open field conditions. The fruits stood out by (were noted for) the content of the anthocyanin type antioxidants (Indigo™ 'Apple', Indigo™ 'Blue Beauty', Indigo™ 'Blue Berries'), the excellent taste of all the cultivars and the aesthetic appearance: indigo and red: Indigo™ 'Apple', Indigo™ 'Blue Berries', indigo, red and pink: Indigo™ 'Blue Beauty', indigo, yellow and red: Lucid Gem, indigo and yellow: Indigo 'Blue Gold', Indigo 'Goldberries', Indigo™ 'Sun' F1.*

**Key words:** tomato, open field, multiple use

**Rezumat.** *Studiul s-a efectuat la Ferma Podiș din județul Bacău, în perioada 2015 – 2016, în condiții de câmp. Fructele s-au remarcat prin conținutul de antioxidanți de tip Antocianină (Indigo™ 'Apple', Indigo™ 'Blue Beauty', Indigo™ 'Blue Berries', Indigo 'Blue Gold'), gustul foarte bun al tuturor soiurilor și provocarea estetică a culorilor: mov cu roșu Indigo™ 'Apple', Indigo™ 'Blue Berries', mov cu roșu roziiu: Indigo™ 'Blue Beauty', indigo cu galben și roșu: 'Lucid Gem', indigo și galben: Indigo 'Blue Gold', Indigo 'Goldberries', Indigo™ 'Sun' F1.*

**Cuvinte cheie:** tomate, câmp, utilizare multiplă

## INTRODUCTION

The tomato metabolites are recognized as having health benefits in cardiovascular diseases and cancer, due, in part, to the bioactive properties of the plant derived compounds like polyphenolics and carotenoids (Kris-Etherton *et al.*, 2002, Gonzali *et al.*, 2009). The anthocyanins produced by the fruits of the studied tomato cultivars are determined by two genes which have been initially transferred from two wild tomato varieties to a cultivated tomato (Boches and

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Myers, 2007; Mes *et al.*, 2008). Tomato plant is an attractive plant, and it's true that the sprawling nature of indeterminate varieties can pose an aesthetic challenge. Such anthocyanin varieties produce beautiful fruits, and they can bring color and an aesthetic value to the garden (Crist, 2012).

## MATERIAL AND METHOD

During 2015 - 2016, open field experiments were performed at Podis Farm Bacau - Romania, in order to evaluate an assortment of cultivars for food, medicinal and ornamental use: Indigo™ 'Apple', Indigo™ 'Blue Beauty', Indigo™ 'Blue berries', Indigo 'Blue Gold', Indigo 'Goldberries', Indigo™ 'Sun' F1, 'Lucid Gem'.

The collection of improved cultivars with purple fruit with red, pink or yellow colors was placed in the field in permaculture system.

Phenological observations and biometric measurements were carried on the food, medicinal and decorative qualities of tested cultivars. All the pictures presented below are genuine.

## RESULTS AND DISCUSSIONS

### Food qualities study of the tomato assortment

The results of the quantitative and qualitative characteristics of the studied biological material are presented in table 1.

Table 1

Qualitative and quantitative determinations of studied cultivars

Variety/ Hybrid	Bloomed starting	Maturity of the fruit	Fruit weight (g)	Fruit shape	Fruit taste	Yield (kg/plant)
Indigo™ 'Apple'	05.06. 2016	28.07. 2016	90.0	Round	Sweet	2.1
Indigo™ 'Blue Beauty'	05.06. 2016	01.08. 2016	180.0	Beef stake	Sweet	2.8
Indigo™ 'Blue Berries'	06.06. 2016	02.08. 2016	7.0	Cherry	Very sweet	0.9
Indigo™ 'Blue Gold'	07.06. 2016	04.08. 2016	70.0	Round	Sweet	1.9
Indigo™ 'Goldberries'	10.05. 2016	05.08. 2016	8.0	Cherry	Very sweet	1.1
Indigo™ 'Sun' F1	01.06. 2016	25.07. 2016	15.0	Cherry	Sweet	1.3
'Lucid Gem'	10.05. 2016	05.08. 2016	150.0	Slightly flat	sweet	2.4

The data presented in the above table show that:

- Indigo™ Apple variety (fig. 1, fig. 2), the first fruits have ripened 131 days after the seeds sprouted, having an average weight of 90 g, a spherical shape and a sweet, flavored taste. The average yield of a single plant is 2.1 kg.



**Fig. 1** Indigo™ 'Apple' (side view)



**Fig. 2** Indigo™ 'Apple' (top view)

- Indigo™ 'Blue Beauty' variety (fig. 3, fig. 4), the first fruits have ripened 135 days after the seeds sprouted, having an average weight of 180g per single fruit, a flattened round shape and a very good, sweet, and aromatic taste. The average production of a single plant is 2.8 kg.



**Fig. 3** Indigo™ 'Blue Beauty' (side view)



**Fig. 4** Indigo™ 'Blue Beauty' (top view)

- Indigo™ 'Blue Berries' variety (fig. 5, fig. 6), the first fruits have ripened 129 days after the seeds sprouted, having an average weight of 7g per single fruit, a round shape and a quite great amount of sugar when very well ripened. The average production of a single plant is 0.8 kg.



**Fig. 5** Indigo™ 'Blue Berries' (side view)



**Fig. 6** Indigo™ 'Blue Berries' (top view)

• Indigo™ 'Blue Gold' (fig. 7, fig. 8), the first fruits have ripened 138 days after the seeds sprouted, having an average weight of 70g per single fruit, a round shape and a sweet taste. The average production of a single plant is 1.9 kg.



**Fig. 7** Indigo™ 'Blue Gold' (side view)



**Fig. 8** Indigo™ 'Blue Gold' (top view)

• Indigo™ 'Goldberries' variety (fig. 9, fig. 10), the first cherry fruits have ripened 136 days after the seeds sprouted, having an average weight of 8.0g per single fruit, a round shape and a very sweet and rich taste when very well ripe. The average production of a single plant is 1.0 kg.



**Fig. 9** Indigo™ 'Goldberries' (side view)



**Fig. 10** Indigo™ 'Goldberries' (top view)

• Indigo™ ‘Sun’ F1 hybrid (fig. 11, fig. 12), the first cherry fruits have ripened 127 days after the seeds sprouted, having an average weight of 15.0g per single fruit, a round shape and a sweet taste when very well ripe. The average production of a single plant is 1.3 kg.



**Fig. 11** Indigo™ ‘Sun’ F1 (side view)



**Fig. 12** Indigo™ ‘Sun’ F1 (top view)

• ‘Lucid Gem’ Tomato (fig. 13, fig. 14), the first fruits have ripened 135 days after the seeds sprouted, having an average weight of 150g per single fruit, a slightly flattened round shape and a sweet, balanced taste. The average production of a single plant is 2.4 kg.



**Fig. 13** ‘Lucid Gem’ Tomato (side view)



**Fig. 14** ‘Lucid Gem’ Tomato (top view)

### **Medical qualities study of the cultivars**

The medical qualities of the analyzed varieties, indicate the presence of antioxidants like anthocyanin, carotene and lycopene as presented in table 2.

It is noticed the fruits of all the 7 varieties of tomatoes studied contain anthocyanins,  $\beta$ -carotene and flavonols. Moreover, the fruit of Indigo™ ‘Apple’ Tomato, Indigo™ ‘Blue Beauty’ Tomato and Indigo™ ‘Blue Berries’ Tomato contain lycopene.

Table 2

**The study of the antioxidants presence in the cultivar's fruits**

No.	Variety/hybrid	Antioxidants		
		Lycopene	Anthocyanins	$\beta$ -carotene and flavonols
1	Indigo™ 'Apple'	Yes	Yes	Yes
2	Indigo™ 'Blue Beauty'	Yes	Yes	Yes
3	Indigo™ 'Blue Berries'	Yes	Yes	Yes
4	Indigo™ 'Blue Gold'	-	Yes	Yes
5	Indigo™ 'Goldberries'	-	Yes	Yes
6	Indigo™ 'Sun' F1	-	Yes	Yes
7	'Lucid Gem'	Some	Yes	Yes

**Ornamental qualities study of the cultivars**

**1. INDIGO™ 'APPLE'** (fig. 15). It's an indetermined variety which produces dark indigo fruits on their shoulder and dark red on the blossom end. The fruits exposed to sun become almost black due to the high level of anthocyanins. The leaves are quite purple. The immature fruits have the same indigo color on the stem-end. It is a great looking garden plant due to its decorative clusters of 7 – 8 dark fruits.

**2. INDIGO™ 'BLUE BEAUTY'** (fig. 16). It's an indetermined variety which is the result of a crossing between 'Beauty King' variety and a blue tomato. The fruits are also indigo on the upper side where the sunlight strikes. When they ripe, they become red-pink on the blossom end. The fruits are big, pulpy, resistant to sunburn, holding well on the vine for a long time, thus offering a very pleasant decorative view.

**3. INDIGO™ 'BLUE BERRIES'** (fig. 17). It's an unusual indetermined cherry variety which has almost black with a brick red blossom end fruits, very high levels of anthocyanin, and has the fruits arranged as 8 in a cluster. The plants, with pulpy leaves, are vigorous and quite resistant against diseases.

**4. INDIGO™ 'BLUE GOLD'** (fig. 18). It's an indetermined variety created by Brad Gates from Wild Boar Farms, which produces fruit of average weight, dark indigo and yellowish when ripened. The first two clusters produce

many fruits, up to 8-12 in a bunch. The fruits are sunburn resistant and have a very decorative effect.



**Fig. 15** Indigo™ ‘Apple’



**Fig. 16** Indigo™ ‘Blue Beauty’



**Fig. 17** Indigo™ ‘Blue Berries’



**Fig. 18** Indigo™ ‘Blue Gold’

**5. INDIGO™ ‘GOLDBERRIES’.** It’s an indetermined cherry variety. The long clusters are packed with beautiful indigo to bright yellow cherry fruits. The plants are very productive, being attractive in the garden.

**6. INDIGO™ ‘SUN’ F1** (fig. 19). It's an indetermined cherry type hybrid with small (15 g), purple fruit which can be dark yellow on the blossom end. It has thin and fewer leaves, the decorative effect of the plant being assured by the beautiful clusters packed with 7 – 8 outstanding fruits.



**Fig. 19** Indigo™ ‘Sun’ F1

**7. ‘LUCID GEM’.** It's an indetermined variety, which produces big and very beautiful, decorative fruits. They may range from dark purple to orange and yellow. Inside they may have small red lines. The plant is very productive, can tolerate heat, the fruits do not crack and they can be kept for a long time after harvesting.

## CONCLUSIONS

The study was conducted in Bacau County, Podiș Farm, during 2015 - 2016, under open field conditions. The fruits stood out by (were noted for) the content of the anthocyanin type antioxidants (Indigo™ ‘Apple’, Indigo™ ‘Blue Beauty’, Indigo™ ‘Blue Berries’), the excellent taste of all the cultivars and the aesthetic appearance: indigo and red: Indigo™ ‘Apple’, Indigo™ ‘Blue Berries’, indigo, red and pink: Indigo™ ‘Blue Beauty’, indigo, yellow and red: ‘Lucid Gem’, indigo and yellow: Indigo™ ‘Blue Gold’, Indigo™ ‘Goldberries’, Indigo™ ‘Sun’ F1.

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