Slovak Journal of Food Sciences

Potravinarstvo Slovak Journal of Food Sciences
vol. 13, 2019, no. 1, p. 823-830
https://doi.org/10.5219/1187
Received: 6 September 2019. Accepted: 18 September 2019.
Available online: 28 November 2019 at www.potravinarstvo.com

ISSN 1337-0960 (online)

DYNAMICS OF CHANGES IN TOTAL CAROTENOIDS AND ANTIOIXDANT ACTIVITY IN FRUITS OF SELECTED VARIETIES OF *CUCURBITA MOSCHATA* DUCH. DURING STORAGE

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ABSTRACT

Cucurbita moschata Duch. is a vegetable, native to the Central America and the northern parts of South America, not very well known in Slovak republic. It is a seasonal crop which is appreciated for its nutrimental and bioactive components providing human health benefits and its option of relatively long period of storage. The aim of this study was to assess the dynamics of changes of total carotenoids content and antioxidant activity in the pulp of the fruit of *Cucurbita moschata* Duch. after the harvest and during the storage, as well as the effect of the variety on total carotenoids content and antioxidant activity. The experiment was realised in 2018 in the experimental fields of the Botanical Garden of Slovak University of Agriculture (SUA) in Nitra. Six different varieties of *Cucurbita moschata Duch.* – Liscia, Matilda, Orange, Serpentine, UG 205 F1 and Waltham were examined. The harvest was was held in the second week of September 2018. The storage took place in the hall of Departmet of Vegetable. The analysis were realised after the harvest (day 0), after the storage (day 60 and day 120). Total carotenoids content after the harvest ranged from 3.80 to 8.42 $mg.100g^{-1}$ FM. In the DM the content ranged from 49.66 to 91.32 $mg.100g^{-1}$ .The period of 60 days of storage had positive influence on total carotenoids content in FM, as we have recorded an increase of TCC in the case of all observed varieties. After the period of 120 days of storage we have recorded both increase and decrease, depending on the variety. The increase of the total carotenoids content during the whole period of storage was by 15%. The values of the antioxidant activity after the harvest ranged from 2.76% to 10.31%. After the 60 days of storage, we have recorded both increase in ˈLiscia, Serpentine, Waltham' and decrease in the ˈMatilda, Orange, UG 205 F1' variety. During the following 60 days of storage significant differences were found for all the varieties in all observed variants (storage period), except for the ˈMatilda' variety. Antioxidant activity significantly decreased after 60 days of storage (by 15%), but it was followed by statstically significant increase (by 25%) after 120 days of storage. The increase of the antioxidant activity during the whole period of storage was by 6.5%, but this change was not statistically significant. The variety of *Cucurbita moschata* Duch. had stastically proven effect both on the total carotenoids content and the antioxidant actvity.

Keywords: *Cucurbita moschata* Duch.; storage; total carotenoids content; antioxidant activity; variety

INTRODUCTION

Cucurbita moschata Duch. (pumpkin) is an annual plant representing the family of *Cucurbitaceae*. Alongside with *Cucurbita pepo* L. and *Cucurbita maxima* Duch. it belongs to the most economically important species in the genus of *Cucurbita*. This species have different climatic adaptations and are widely distributed in agricultural regions worldwide **(Darrudi et al., 2018)**.

Pumpkin is a very popular vegetable species, especially in tropical and subtropical countries. *Cucurbita moschata* is originating in Central America and northern part of South America. However cultivation of *Cucurbita moschata*, also known as butternut squash, in Slovakia is only at its development stage being cultivated in small areas of the southern parts of Slovak territory **(Andrejiová et al., 2016)**.

Butternut squash is grown mainly for its fruits, but edible parts of the plant include the flowers, leaves, roots and seeds **(Kaur, 2017)**. There are many results showing the beneficial effects of the consumption of butternut squash fruits. This vegetable is considered as a rich source of nutrients and phytochemicals, such as vitamins (vitamin A, vitamin B2, vitamin C and vitamin E), minerals (potassium and calcium), carbohydrates, aminoacids, fiber and the most abundant bioactive compounds – carotenoids and polyphenols **(Bouamar et al., 2017)**. *Cucurbita moschata* is also popular for its low energetic value and an option of relatively long time of storage. The recent increase in the popularity of *Cucurbita* species has stimulated the researches in the area of their nutritional composition. Therefore, the main component of the pumpkin pulp is its levels of carotenoids **(Provesi and Amante, 2015)**.

Carotenoids are pigments, which naturally occurre in plants, fungi, algae and also in bacteria. There are identified more than 650 different types of these molecules in nature, including around 100 types present in the human diet. Humans can not synthesize carotenoids, we are forced to take it via supplementation **(Eggersdorfer and Wyss, 2018)**. These natural pigments are ususally C40 tetraterpenoids with a long conjugated chain of double bonds, characterized with a range of functions in human health. This particular feature is responsible for both their pigmenting properties and the ability of many of these molecules to interact with free radicals and singlet oxygen and therefore act as an effective antioxidants **(Young and Lowe, 2018)**.

Although many types of carotenoids have been identified, research focuses on those that are the most prominent in the human diet. *Cucurbita moschata* is considered to be high in carotenoids, especially β-carotene and lutein. Other carotenoids indentified in this vegetable are α-carotene and minor carotenoids as ζ-carotene, zeaxanthin, violaxanthin, β-carotene-5,6-epoxide, β-cryptoxanthin, taraxanthin, auroxanthin, phytofluene, neurosporene and neoxanthin **(Jacobo-Valenzuela et al., 2011)**. **Jaswir et al. (2014)** add, that the most important carotenoids in human diet are α-carotene, β-carotene, lutein, zeaxanthin and β -cryptoxanthine. Consumption of carotenoids has been associated with various health benefits, including their great antioxidant activity, reduced risk of age-related macular degeneration, cataract and coronary heart disease. There are further epidemiological evidences about their role in immune response enhancement and reduction of the risk of degenerative diseases such as cancer, cardiovascular diseases and atherosclerosis **(Andrejiová et al., 2016; Jacobo-Valenzuela et al., 2011)**.

Bouamar et al. (2017) reports, that it is well known that carotenoids have antioxidant activity and protect against oxidative stress, which can lead to the diseases mentioned above. *Cucurbita moschata* also contains a large heterogenous group of secondary metabolites called polyphenols, which are as well known to decrease the risk of this defects. Carotenoids and polyphenols are well-known of capability in cellular redox imbalance modulation, as well as the endothelial and metabolic processes regarding the pathogenesis of inflammatory. One of the causes of neurodegenerative diseases formation is the increased presence of free radicals, which are undesirable for the body. Therefore, antioxidants are important, they can delay the process of oxidation of vital compounds and inhibit the formation of free radicals in the early stages. Natural antioxidants, originating from plants are highly recommended in drug and food forms. It has been proven that, they had therapeutic effects, great nutrition and higher safety, while synthetic antioxidants can cause organ damages , as they can accumulate in the human body.

Cucurbita moschata is showing to be a promising plant in terms of its nutritional composition and invites several research teams to examine its premises **(Indrianingsih et al., 2019)**. However, there are many factors which can affect the level of the total carotenoids and its antioixdant activity. The content of these substances in the fruit of the pumpkin differ from one variety to another, and can also be influenced by external factors – climate, nutrition, water availability, habitat, storage conditions, etc.

Moreover, the stability of carotenoids is influenced by several factors, such as the storage time and temperature, the availability of oxygen and light, and the type of carotenoid involved **(Wibowo et al., 2015)**. The aim of the work was to determine the content of total carotenoids and antioxidant activity in fruits of 6 selected varieties of *Cucurbita moschata* Duch. and to record the changes in their dynamics.

Scientific hypothesis

Storage is one of the main factors affecting the level of the bioactive substances such as carotenoids. During the storage, the process of maturation occurs and physiological changes take place in the fruits, which are reflected in the examined values of total carotenoids and antioxidant activity. We expect, that the storage and variety of *Cucurbita moschata* Duch. have a significant impact on the dynamics of changes of total carotenoids content and antioxidant activity.

MATERIAL AND METHODOLOGY

This field experiment was founded in 2018 in the experimental fields of the Botanical Garden of Slovak University of Agriculture (SUA) in Nitra. Six different varieties of *Cucurbita moschata Duch.* – Liscia, Matilda, Orange, Serpentine, UG 205 F1 and Waltham were examined. The growing cycle at the experiment location was initiated on April 2018 and was followed by cultivating routine season. The cultivation area is located in a very warm agro-climatic region, characterized with a very dry subregion, the average annual temperature is 10 °C and the average annual rainfall is 584.5 mm. The soil is characterized as a glue fluvisol, formed on alluvial sediments.

Experiment organisation

The total experimental area was 202.5 m^2. This area was fertilized on the basis of the agrochemical soil analysis, which was carried out at the Department of Agrochemistry and Plant Nutrition of SUA. Ammonium nitrate (27%) have been applied before the sowing and then short before the blooming. For all cultivars 3 seeds were sowed to the nest to the dept of 3 cm. After the plant growth, unification took place. Nine plants were cultivated within one cultivar. The crop management was carried out in accordance with the usual agrotechnical procedures. Studied varieties belong to the group of medium early to medium-late with maturing from mid-September. The harvest was held in the second week of September 2018. Fruits were botanically mature, having a typical skin and pulp color, showing the best qualities in terms of growing conditions. They were primarily intended for storage and analysis. They were harvested manually and placed unwashed in the storage hall at the Department of Vegetable Production. This hall is not primarily intended for vegetable storing. It is covered, spacious, airy, without the possibility of storage conditions regulation (temperature, humidity). Storage was free, airy, on concrete floor according to varieties. Absenting regulation of storage conditions and uninsulated space caused storage conditions to be influenced by the development of outdoor weather. The average temeperature in the hall during the storage was 20 °C. By lowering the outside air temperature, the temperature inside the hall also decreased, also the relative humidity of the air increased in the hall, as evidenced by a certain percentage of rotting fruit found at the beginning of December. The fruits were covered with a white nonwoven fabric to prevent the surface wetting of the fruits, its freezing and cold.

Average sample preparation

The average sample for each variety was prepared from 5 fruits. The size of the fruits was more or less identical and of the same stage of maturity. We washed the fruits and thoroughly cut them into 4 parts. Two opposing parts were stripped of peel, seeds and cut into the cubes of the same size. The average samples were prepared by homogenizing an mixing the prearranged material.

Total carotenoid content estimation (TCC)

The extraction of samples have been done at the Laboratory of Beverages, AgroBioTech Research Center of SUA in Nitra. The estimation of total carotenoid content was realised in the laboratory of Department of Vegetable Production of SUA in Nitra. The content of total carotenoids was estimated by spectrophotometric measurement of substances absorbance in petroleum ether extract in three repeatings on spectrophotometer PHARO 100 at 445 nm wavelengths **(Hegedűsová, Mezeyová, Andrejiová, 2015)**. Total carotenoid content was recalculated according to the relationship reported by **Biehler et al. (2010)**.

Antioxidant activity estimation (AOA)

Determination of antioxidant activity was realised in the laboratory of Department of Chemistry, Janos Selye University in Komárno by DPPH method (2,2-diphenyl-1-picrylhydrazyl, Merck, Darmstadt, Germany). Determination of AOA was performed with a spectrophotometer Jenway 6301, Bibby Scientific Ltd., UK. 10 g of homogenized mixture of the used material (*Cucurbita moschata* Duch.) and 40 mL of methanol (70%, V/V, Fisher Scientific UK, Loughborough, UK) were added into 250 mL extraction flasks. They were standing at room temperature for 20 hours and then extracted with horizontal shaker for 4 hours. DPPH inhibition and spectrophotometric measurements were performed after a constant time of 30 min 0.2 mL of the extract was pipetted into the spectrophotometer cuvette, supplemented with 70% methanol to 2.0 mL, and 4 mL of DPPH solution about 25 mg.L^{-1} concentration was added. Immediately after the DPPH solution was added, the absorbance of the mixture was measured at 517 nm (At_0). After 30 min the absorbance of each sample was measured at 517 nm (At_{30}). The AOA was calculated based on this following relationship **(Hegedűs et al., 2019)**.

Figure 1 Field experiment with pumpkins.

Figure 1 *Cucurbita moschata* Duch. – Serpentine variety during ripening.

Figure 2 Homogenized average sample.

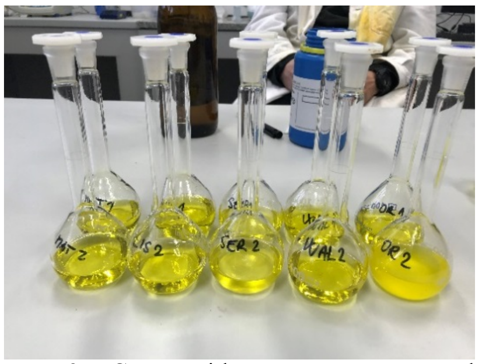

Figure 3 Carotenoids extracts prepared for measuring.

$$\% ARA = \left(1 - \frac{At_{30}}{At_0}\right) \times 100 \times V_2 / (n \times V_1)$$

At_{30} – absorbance of the sample after 30 min; n – weigh of the sample in g; V_1 – pipetted volume of the sample (0.2 mL); V_2 – supplemented volume of the extract by methanol (according to the stated method always 2.0 mL); At_0 – the initial sample absorbance value.

Statistic analysis

The obtained data were processed into tables in Microsoft Office Excel 2007. Statgraphics Centurion was used XVII (StatPoint, USA) using ANOVA (Multivariate Analysis of Variance) analysis and testing LSD differences at significance level α = 0.05. Uncertainty of the analytical method for AOA determination was expressed as an expanded uncertainty and was calculated in program Metro2003.

RESULTS AND DISCUSSION

The total carotenoids content in the pulp of the fresh fruits of selected varieties of *Cucurbita moschata* Duch. after the harvest and after the storage is given in the Table 1. The values ranged from 3.80 to 8.42 mg.100g^{-1}. In the dry matter the content ranged from 49.66 to 91.32 mg.100g^{-1}. The highest content was determined in ʽOrangeʼ variety, which is known for its intensive orange colour of the pulp. Our results are comparable with those, which determined **Andrejiová et al. (2016)** in the range from 9.33 to 15.10 mg.100g^{-1}. Other authors examined various genotypes of *Cucurbita moschata* Duch., while the total carotenoid content in the fresh fruits ranged from 12.46 mg.100g^{-1} to 69.9 mg.100g^{-1} **(Carvalho et al., 2015)**. **Priori et al. (2017)** reports the total carotenoid content ranging from 10.8 mg.100g^{-1} to 36.7 mg.100g^{-1}. The stability of carotenoids differs depending on many factors. One of the main factors which has a great impact on the stability and the associated total carotenoids content is the storage. It is important to study the factors related to the loss of colour of foods based on pumpkin since colour retention during storage is one of the parameters of food quality **(Gliemmo et al., 2009)**. On the basis of our results, we can generalize that the period of 60 days of storage had positive influence on total carotenoids content (TCC) in fresh matter. We have recorded an increase of TCC in the case of all observed varieties. A similar result has been reported by **Andrejiová et al. (2016)**, who stated that the 52 days of storage had positive impact on TCC with the exception of one variety. After the period of 120 days of storage we have recorded interesting results. In the case of five observed varieties the TCC decreased, while the values were still slightly higher than after the harvest (Liscia, Matilda, UG 205 F1) and for the ʽOrangeʼ and ʽSerpentineʼ lower. On the contrary in case of ʽWalthamʼ variety the TCC increased by 35%. Statistically significant differences were found in this variety, both between the 0. day – 60. day and the 0.day – 120. day.

Conti et al. (2015) indicate in his research an intensifying in colour in the pulp of the fruit of *Cucurbita moschata* Duch. after 60 days of storage and similary a very slight decrease after 180 days of storage. The incongruitties of these results suggest that the post harvest dynamics of TCC in the fruits of *Cucurbita moschata* Duch. may result from the interaction of various factors, affecting the metabolism of these important compounds. Biosynthesis of carotenoids continue in fruits even during the postharvest period, until the plant material is not treated in the way, which could inactive the carotenogenesis responsible enzymes. Obviously, the high storage temperature and conditions supporting wilting may cause carotenoids degradation as well **(Rodriguez-Amaya, 1997)**. Antioxidants are a heterogeneous category of molecules, which play an important role in human health such as preventing cancer and cardiovascular diseases, and lowering the incidence of many different diseases. The beneficial influence of many foodstuffs and beverages, including fruits, vegetables, tea, coffee and cacao, on human health has been recently recognized to originate from their antioxidant activity. Antioxidants are compounds or systems that can safely interact with free radicals and terminate the chain reaction before vital molecules are damaged. They can use several mechanisms: (I) scavenging species that initiate peroxidation, (II) chelating metal ions so that they are unable to generate reactive species or decompose peroxides, (III) quenching superoxide, preventing formation of peroxides, (IV) breaking the auto-oxidative chain reaction, or (V) reducing localized oxygen concentrations **(Oroian and Escriche, 2015; Gülçin, 2012)**. The evolution of antioxidant activity (AOA) in the fruits of Cucurbita moschata Duch. is presented in the Table 2. The values of AOA in fresh pulp of the fruits ranged from 2.76% to 10.31%. The highest rate was recorded for the ʽMatildaʼ variety. After the 60 days of storage changes have occurred. In the case of ʽLiscia, Serpentine, Walthamʼ variety we have recorded an increase, while in the ʽMatilda, Orange, UG 205 F1ʼ we have observed an decrement of AOA. On the basis of our results, we can declare during the following 60 days of storage an increase of AOA in all the observed varieties.

Table 1 Total carotenoids content in the pulp of the fruit of *Cucurbita moschata* Duch. after the harvest and after the storage.

Variety	TCC after the harvest (mg.100g^{-1} ±*SD*)	TCC after 60 days of storage (mg.100g^{-1} ±*SD*)	TCC after 120 days of storage (mg.100g^{-1} ±*SD*)
	FM	FM	FM
Liscia	6.78 ±3.85^{a}	7.95 ±1.82^{ab}	6.92 ±5.07^{b}
Matilda	5.69 ±1.43^{a}	7.37 ±5.27^{a}	5.81 ±3.85^{a}
Orange	8.42 ±6.08^{a}	8.58 ±1.22^{a}	5.34 ±0.81^{a}
Serpentine	3.80 ±1.22^{a}	3.98 ±2.23^{a}	3.22 ±11.54^{a}
UG 205 F1	6.25 ±2.63^{a}	7.61 ±1.22^{b}	6.64 ±1.22^{ab}
Waltham	6.39 ±0.41^{a}	8.28 ±2.23^{b}	8.66 ±1.02^{b}

Note: TCC – total carotenoids, FM – fresh matter, *SD* – standard deviation. Values with different italics letters are significantly different at p <0.05 by LSD in ANOVA.

Table 2 Antioxidant activity in the pulp of fresh fruit of *Cucurbita moschata* Duch. after the harvest and after the storage.

Variety	AOA after the harvest converted to 1 g (% ±*SD*)	AOA after 60 days of storage converted to 1 g (% ±*SD*)	AOA after 120 days of storage converted to 1 g (% ±*SD*)
Liscia	3.15 ±0.35*a*	5.36 ±0.59*b*	6.95 ±0.76*c*
Matilda	10.31 ±1.13*a*	7.08 ±0.78*b*	7.19 ±0.79*b*
Orange	8.34 ±0.92*a*	5.58 ±0.61*c*	7.43 ±0.82*b*
Serpentine	2.76 ±0.30*a*	4.73 ±0.52*b*	5.77 ±0.64*c*
UG 205 F1	6.98 ±0.77*a*	3.00 ±0.33*c*	5.33 ±0.59*b*
Waltham	5.65 ±0.62*a*	6.04 ±0.66*b*	7.33 ±0.81*c*

Note: AOA – antioxidant activity, *SD* – standard deviation. Values with different italics letters are significantly different at $p < 0.05$ by LSD in ANOVA.

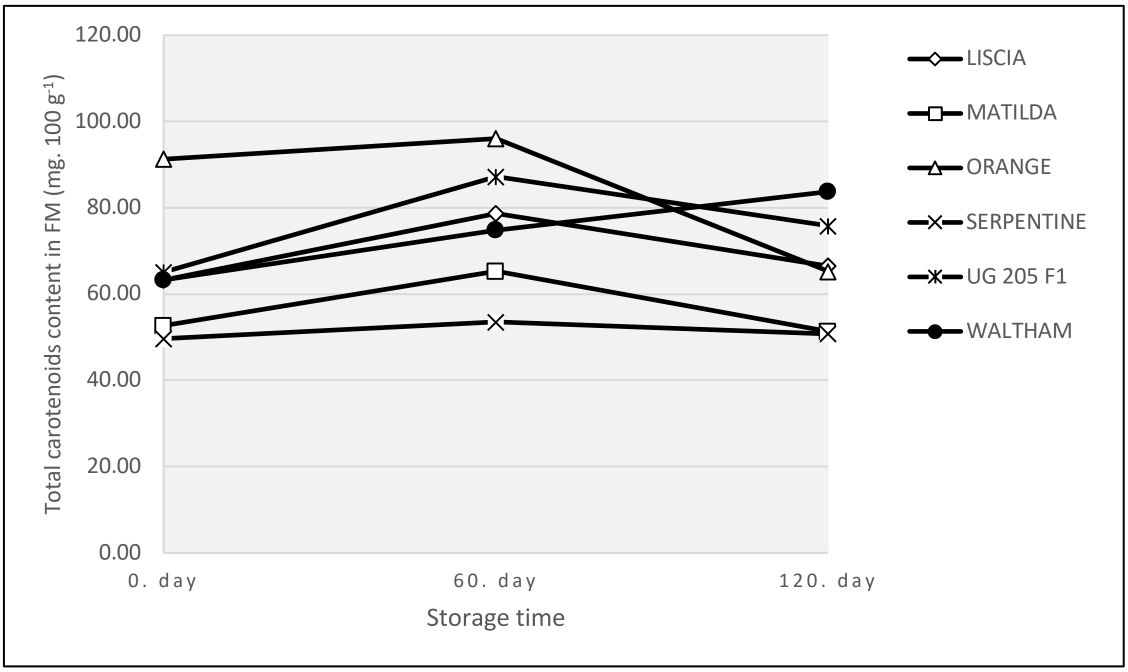

Figure 5 Dynamics of changes of total carotenoids content in the dry matter of the fruit of *Cucurbita moschata* Duch.

Significant differences were found for all the varieties in all observed variants (storage period), except for the'

The evolution of antioxidant activity (AOA) in the fruits of Cucurbita moschata Duch. is presented in the Table 2. The values of AOA in fresh pulp of the fruits ranged from 2.76% to 10.31%. The highest rate was recorded for the 'Matilda' variety. After the 60 days of storage changes have occurred. In the case of ' Liscia, Serpentine, Waltham' variety we have recorded an increase, while in the' Matilda, Orange, UG 205 F1' we have observed an decrement of AOA. On the basis of our results, we can declare during the following 60 days of storage an increase of AOA in all the observed varieties.

Significant differences were found for all the varieties in all observed variants (storage period), except for the 'Matilda' variety for the storage period variant 60 to 120 days of storage. The antioxidant activitiy in general is affected both by physical and chemical factors.

Li et al. (2012) reports, that the postharvest storage may affect the composition of some phytochemicals in plants; however, the degree of the effect depends more on the storage conditions. Metabolism of the phytochemicals begins right after harvest, and it can involve complex biochemical reactions during transportation and postharvest storage. These reactions can lead to significant changes in plant attributes (taste, smell, appearance and texture), and the health promoting phytochemicals, such as those with strong antioxidant activities. Storage temperature, atmosphere gas composition and use of chemicals are major factors that influence the quantity and quality of phytochemicals and so AOA.

The Figure 5 is showing the dynamics of changes in the dry matter of the fruit for each variety after the harvest and the storage period. As we can see, in each case there is an increasing tendency in TCC after the 60 days of storage. However, after this period a decrement appears. Despite, we recorded an exception as well at the 'Waltham' variety, characterized by 12% increment during the next 60 days of storage. The biggest abundance of TCC in DM was recorded in the 'Orange 'variety, by 28% during the 120 days of storage.

Bonina-Noseworthy et al. (2016) also indicate an increment of TCC in DM after 60 days of storage in the ranges from 4.2 $mg.100g^{-1}$ to 14.5 $mg.100g^{-1}$ (harvest) to 8.4 $mg.100g^{-1}$ to 23.9 $mg.100g^{-1}$ (60 days of storage).

Based on the data from our research displayed in the Figure 6, we can conclude that there are significant differences between individual varieties of the observed

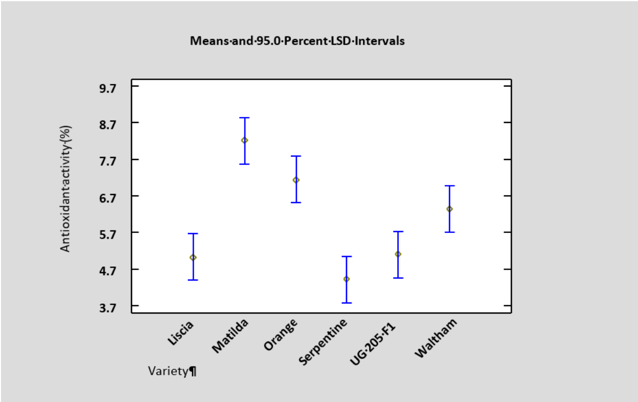

Figure 6 Antioxidant activity of *Cucurbita moschata* Duch. in dependency on selected variety (LSD test, p >0.05).

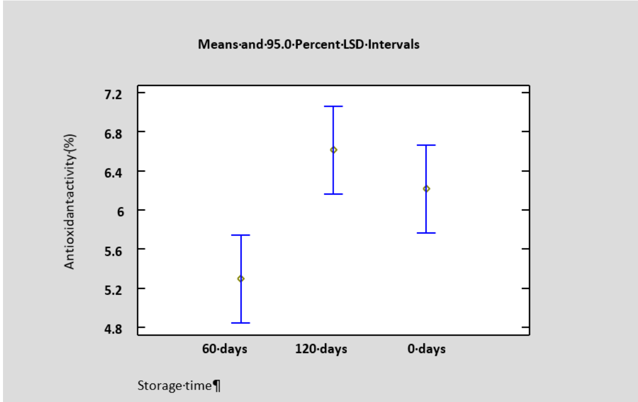

Figure 7 Total antioxidant activity of *Cucurbita moschata* Duch. during the storage (LSD test, p >0.05).

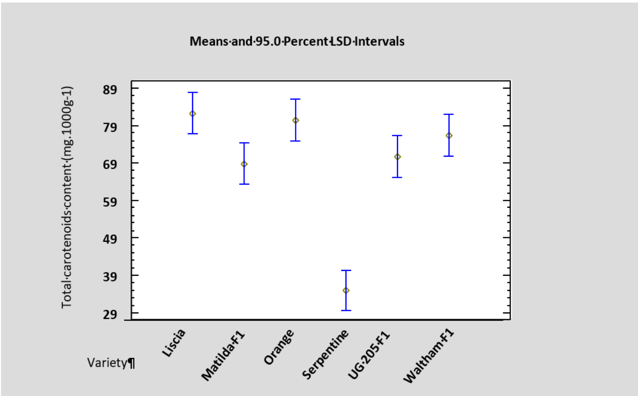

Figure 8 Total carotenoids content of *Cucurbita moschata* Duch. in dependency on selected variety (LSD test, p >0.05).

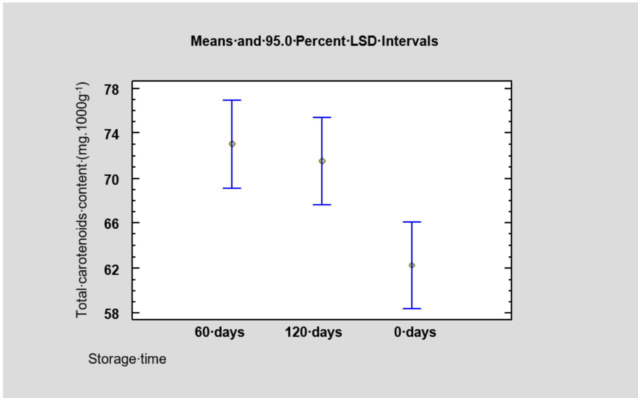

Figure 9 Total carotenoids content of *Cucurbita moschata* Duch. during the storage (LSD test, p >0.05).

varieties. Significant differences were found between 'Liscia', 'Matilda' variety and other evaluated varieties. The greatest contrast was shown between the 'Matilda' and 'Serpentine' variety. The effect of the variety on the antioxidant activity was statistically proven.

Šlosár et al. (2018) also report that, the variety of the used plant material is a major factor, which can affect the antioxidant activity.

Antioxidant activity significantly decreased after 60 days of storage (by 15%), but it was followed by statstically significant increase (by 25%) after 120 days of storage (Figure 7). The increase of the antioxidant activity during the whole period of storage was by 6.5%, but this change was not statistically significant.

Conti et al. (2015) report the data of the single antioxidants content in the fruit of *Cucurbita moschata* Duch., separately for ascorbic acid, α-carotene, β-carotene and lutein. The results of their study indicate a significant intital increase in α-carotene after 120 days of storage, but this was followed by its gradual reduction until the end of the storage period (another 120 days). Lutein dropped below the limit detection within the first 120 days, both ascorbic acid and β-carotene increased during the storage.

On the basis of our results showed in the Figure 8, we can state that there are significant differences between the examined varieties of *Cucurbita moschata* Duch. in terms of TCC. These differences were found mainly between the Serpentine' variety and the other varieties. The highest contrast was examined between the 'Liscia' and Serpentine variety.

The effect of the variety on the total carotenoids content was statistically proven. **Andrejiová et al. (2016)** also confirm the influence of the variety on the TCC.

Total carotenoids content significantly increased after 60 days of storage (by 17%). This increment was followed by 2% decrease after the next 120 days of storage (Figure 9). The increase of the total carotenoids content during the whole period of storage was by 15% and was statistically significant. **Provesi et al. (2011)** declare that storage period of 180 days did not significantly influenced the TCC in the brazil variety of *Cucurbita moschata* Duch. the 'Menina Brasileira' variety.

CONCLUSION

Cucurbita moschata Duch. is a less-known vegetable in Slovak republic, which is consumed here just a little. This cultivar is more spread in the northern part of South America and the Central America. Among the cucurbitaceous vegetables, *Cucurbita moschata Duch.* has always been very appreciated for its high yield, good storage period, longer periods of consumption, high nutritive value, and has numerous traditional medicinal uses. The aim of this study was to assess the dynamics of changes of total carotenoids content and antioxidant activity in the pulp of the fruit of *Cucurbita moschata* Duch. after the harvest and during the storage, as well as the effect of the variety on total carotenoids content and antioxidant activity. Total carotenoids content after the harvest ranged from 3.80 to 8.42 mg.100g^{-1} FM. In the DM the content ranged from 49.66 to 91.32 mg.100g^{-1} , while the highest content was determined in 'Orange' variety. The period of 60 days of storage had positive influence on total carotenoids content in FM, as we have recorded an increase of TCC in the case of all observed varieties. After the period of 120 days of storage we have recorded both increase and decrease, depending on the variety. The increase of the total carotenoids content during the whole period of storage was by 15% and was statistically significant. The values of the antioxidant activity after the harvest ranged from 2.76% to 10.31%, while the highest rate was recorded for the 'Matilda' variety. After the 60 days of storage, we have recorded both increase in 'Liscia, Serpentine, Waltham' and decrease in the 'Matilda', Orange, UG 205 F1' variety. During the following 60 days of storage an increase occurred in all of the observed varieties. Significant differences were found for all the varieties in all observed variants (storage period), except for the 'Matilda' variety for the storage period variant 60 to 120 days of storage. Antioxidant activity significantly decreased after 60 days of storage (by 15%), but it was followed by statstically significant increase (by 25%) after 120 days of storage. The increase of the antioxidant activity during the whole period of storage was by 6.5%, but this change was not statistically significant. On the basis of our results, .we can equally state that variety of *Cucurbita moschata* Duch. had stastically proven effect both on the total carotenoids content and the antioxidant actvity.

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Acknowledgments:

The work was supported by VEGA project No. 1/0087/19.

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