FRUIT QUALTY CHARACTERİSTICS OF ORGANICALLY GROWN STRAWBERRYVARIETIES

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INTRODUCTION

Strawberries (*Fragaria x ananassa* Duch.) are one of the most popular fruits in Turkey and their consumption has increased with the development of new day neutral and short-day cultivars available at almost all seasons (Kafkas et al., 2007). Strawberries contain high levels of antioxidant compounds such as anthocyanins, flavonoids, and phenolic acids, which provide protection against harmful free radicals. Antioxidants have also been associated with lower occurrences and mortality rates due to cancer and heart disease as well as offering a number of other health benefits (Zheng et al., 2007).

AIM

In this study, fruits of organically grown Albion and Benicia strawberry strawberries identified and quantified individual sugars such as fructose, glucose and sucrose, carboxylic acids such as malic and citric acid and L-ascorbic acid using HPLC (High Performance Liquid Chromatography) techniques. Total anthocyanin and antioxidant capacity of organically cultivated Albion and Benicia strawberry fruits were also compared.

MATERIAL AND METHODS

Plant Material

- **Albion**
- **Benicia**

Total Anthocyanin Capacity

Determination of the total anthocyanin content was done according to Giusti and Wrolstad (2001), with slight modifications.

ABTS radical cation scavenging activity

The ABTS [2.2'-azinobis-(3-ethylbenzothiazoline-6-acid)] assay was used to antioxidant activity according to the method described by Arnoa et al., 2001.

Sugars, organic acids and Vitamin C analysis

Determination of sugar contents in strawberry fruits was done according to Miron and Schaffer (1991) by HPLC (HP 1100 series) using a Shim-Pack HRC NH2 column (300 × 7.8 mm, 5 µm) with a refractive index detector (RID). External standards were used to identify and calculate organic acid contents from the retention times and calibration curves (Bozan *et al.*, 1997).

RESULTS

The results of total anthocyanin and total antioxidant capacity of the strawberry varieties are given in Table 1. Albion had the higher anthocyanin content (185,61 mg/L), compare to the Benicia (170.08 mg/L).

As seen in Figure 2, fructose was found to be the most common sugar in *both cultivars* (Albion and Benicia; 2.73 and 3.47%, respectively) while the higher in Benicia *variety.* The amounts of sucrose ranged between 0.61–0.94 g/100 g (Albion and Benicia, respectively), the glucose contents ranged between 1.69 to 2.29%. Similar to our results, sucrose contents were reported to lowest sugar by Mahmood et al (2012).

Table 1. Total anthocyanin, antioxidant capacity, carboxylic acids and L-ascorbic acid content of Benicia and Albion strawberry fruits.

	ABTS (mmol TE/g)	Total anthocyanin (mg/L)	Citric acid (%)	Malic acid (%)	L-Ascorbic acid (%)	Succinic acid (%)
Albion	98.41±3.85	185.61±1.57	0.97±0.08	0.47±0.05	74.76±3.35	0.13±0.01
Benicia	94.38±4.63	170.08±2.56	0.82±0.02	0.57±0.02	68.76±2.85	0.12±0.03

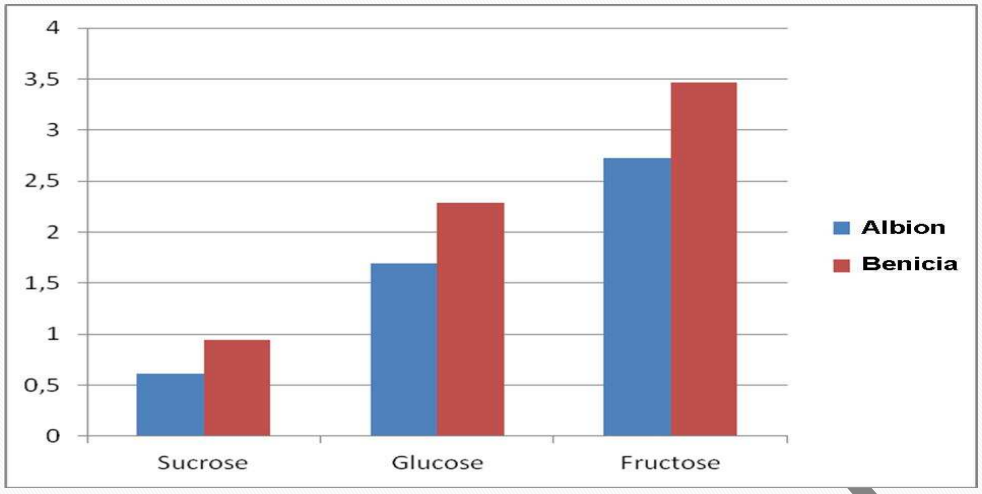

Figure 2. The fructose, glucose, sucrose content of Benicia and Albion strawberry fruits (%).

CONCLUSION

- There are previously numerous reports on organically produced strawberry fruits have been found to contain higher concentration of phytochemicals which contribute to antioxidant capacity such as phenolic compounds and ascorbic acid. Similar results were obtained in this study.

- As a conclusion, fruit quality characteristics especially total anthocyanin, antioxidant capacity, carboxylic acids and L-ascorbic acid were found higher in Albion while sugars in Benicia variety. However, both genotypes had the higher concentration of phytochemicals compare to the conventionally grown strawberries.