





The Influence of Antioxidant Treatment on the Quality of Fruit Juices



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³Horticultural Research Station Cluj-Napoca, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Horticultorilor St., No. 5, Cluj-Napoca, Romania Fruit juice is a beverage produced by squeezing or crushing fresh fruits and vegetables and is often consumed for its health benefits.

There is always a desire to find alternatives to sugary and artificial drinks.

Both apples and grapes are fruits rich in antioxidants.

Apple is a fruit with a pleasant aroma and rich in pectin, a gelling agent and a natural thickening agent that prevents the separation of the juice phases.

Fresh juice obtained from fruits is the most unstable material from both a chemical and microbiological point of view.







Within seconds of its extraction from the fruit, the juice undergoes a sequence of enzymatic changes to produce the color and flavour with which we are familiar.

To highlight different aspects, we used juices obtained from apples and grapes.

To determine the quality of the raw material used, the mass of the fruits, the firmness and the dry matter content of the fruits were analysed, and the pH and acidity of the juice obtained were determined.





Results and discussions

	Cultivars	Fruit length (cm)	Fruit width (cm)	Fruit thickness (cm)	Fruit shape index	Fruit weight (g)	Firmness (kgf/cm²)
1	Topaz R	1.23± 0.01 ^b	6.245±0.31ª	7.739±0.08 ^b	7. 964±0.09 ^b	170.14±13.26ª	6.95±0.03ª
2	Jonagold ^s	1.10 ± 0.02^{a}	6.810±0.14 ^b	7.713±0.09 ^b	7.502±0.13ª	203.10±16.32°	6.62±0.17ª
3	Pinova R	1.07±0.01ª	6.872±0.23 ^b	7.622±0.16ª	7.406±0.21ª	189.83±22.67 ^b	7.46±0.63 ^b

The main physical traits of the apple cultivars under study at harvest

*Note: R-scab resistant; s-susceptible to scab. The data presented are means \pm S.E. Lowercase letter in common indicate no significant differences between the apple cultivars within the same fruit quality parameter according to Tukey's HSD test at p<0.05, n=30.







Results and discussions

Grape variety		No. berries	No. of damaged berries	% damaged berries	Skin (g)	Pulp (g)	Seeds (g)	Rachis (g)
1	Muscat of Hambrug	433±30.23b	20±0.2 ^b	5.46±0.42 ^b	120±11.12 ^b	767±0.15ª	75±0.45ª	38±0.61ª
2	SV 18402	366±24.71ª	15±0.1ª	3.46±0.44ª	118±10.18ª	785±0.19ª	63±0.42ª	39±0.54⁵

The main physical traits of the grape cultivars under study at harvest (1 kg of grapes)

The data presented are means \pm S.E. Lowercase letters in common indicate no significant differences between the grape cultivars within the same fruit quality parameter according to Tukey's HSD test at p<0.05, n=15.





Cultivars			Total Soluble solids – TSS (%)	Total sugars (g/l)	Titratable acidity malic (%)	Titratable acidity tartric (%)	pH	C vitamin (mg/100g)
1	Topaz ^R	Treated	16.23±2.19°	147.0±12.51°	4.92±1.37°	2.42±0.2°	3.51±0.06ª	3.01±1.18 ^b
		Untreated	16.04±2.15°	144.9±11.23°	4.91±1.39°	2.40±0.3°	3.45±0.03ª	2.96±1.21 ^{ab}
2	Jonagold ^s	Treated	12.87±2.17ª	111.0±10.42ª	4.52±1.24b	2.31±0.1 ^{bc}	3.69±0.07b	2.56±1.10 ^{ab}
		Untreated	12.32±2.11ª	105.6±9.12ª	4.48±1.28b	2.14±0.8 ^b	3.58±0.0 ^{ab}	2.22±1.13ª
3	Pinova ^R	Treated	14.45±2.41 ^b	127.9±10.98 ^b	3.14±1.26ª	1.35±0.4 ^{ab}	3.90±0.05°	5.42±1.23°
		Untreated	13.81±2.91ab	121.6±10.98 ^b	3.05±1.16ª	1.29±0.4ª	3.68±0.05 ^{bc}	5.39±1.23°

*Note: R-scab resistant; S-susceptible to scab. The data presented are means \pm S.E. Lowercase letter in common indicate no significant differences between the apple cultivars within the same fruit quality parameter according to Tukey's HSD test at p<0.05, n=30.



Apple juice samples

From right to left: fresh sample, treated sample after 12 months, untreated sample after 12 months

Grape variety			Total Soluble solids – TSS (%)	Total sugars (g/l)	Titratable acidity malic (%)	Titratable acidity tartric (%)	pH	Vitamin C (mg/100g)
1	Muscat of	Treated	18.4±1.15 ^b	169.5±12.14ª	8.99±1.19ª	7.12±0.85b	3.23±0.04ª	38.6±3.17b
	Hamburg	Untreated	17.8±2.13ª	160.2±21.15b	8.92±1.25ª	6.91±0.79ª	3.19±0.05ª	37.8±2.95 ^b
2	SV 18402	Treated	16.6±1.45ª	152.3±14.19°	9.23±0.95°	7.34±1.15°	3.99±0.09b	29.6±3.55ª
		Untreated	16.2±1.16ª	148.2±13.21°	9.12±0.88b	7.29±1.36b	3.94±0.06 ^b	28.9±2.45ª

The main chemical properties of the juice grape before storage

The data presented are means \pm S.E. Lowercase letter in common indicate no significant differences between the variants within the same juice quality parameter according to Tukey's HSD test at p<0.05, n=35.



Muscat of Hamburg Grape juice samples

SV 18402

From right to left: fresh sample, treated sample after12 months, untreated sample after 12 months

Conclusions

- □ It is known that vitamin C is an easily oxidizable and unstable compound whose content in a fruit juice sample gets lowered during storage. Higher values for the vitamin C content of the fruit juice samples (apples and grapes) when compared to those of its indicative standard values as per international standards indicate that the fruit samples considered are a good sources of vitamin C.
- Our research demonstrated that the antioxidant activities, and the quality of grape juices, were significantly affected by the variety and storage length period. Antioxidant activities and nutritional properties of grape juice were the highest at the beginning of the storage period, and decrease after the long period of storage (24 month).





Thank You!

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