

Evaluation of glucose and sucrose osmotic dehydrated and heat-air-dried Flordarking peach slices during conservation



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Prunus persica, commonly known as peach, is a stone fruit rich in various nutraceutical compounds. Due to its limited shelf life in its fresh state, several processing techniques have been employed to promote its consumption in different forms. One approach involves employing osmotic dehydration (OD) before conventional heat drying (D). This OD step is effective in preventing browning, sugar caramelization, and the degradation of bioactive compounds.

In a previous study, we investigated the impact of pre-treating peach slices with glucose or sucrose solutions followed by heat in oven, on their nutraceutical properties. In this study, we investigated the stability of these treated slices over a storage period of 55 days under a 50% relative humidity (RH) atmosphere.

MATERIALS AND METHODS

1

Flordarking peach fruits were harvested at commercial maturity. Fruits were washed, cut in slices and immersed in ascorbic acid and citric acid solutions to prevent browning.

2

Slices were incubated at 40°C in a solution of sucrose or glucose (47° Brix) during 3 h under stirring. Then they were dried at 58°C during 4 h until reaching a water content of 6.8-9.3 %.

3

Slices were kept in a closed jar where a supersaturated solution of BrNa was also placed inside to achieve a 50 % RH atmosphere. The chamber was kept in the dark at 25° C for 55 days.

4

Samples were taken immediately after processing (0) and after 15, 33, 41 and 55 days.

5

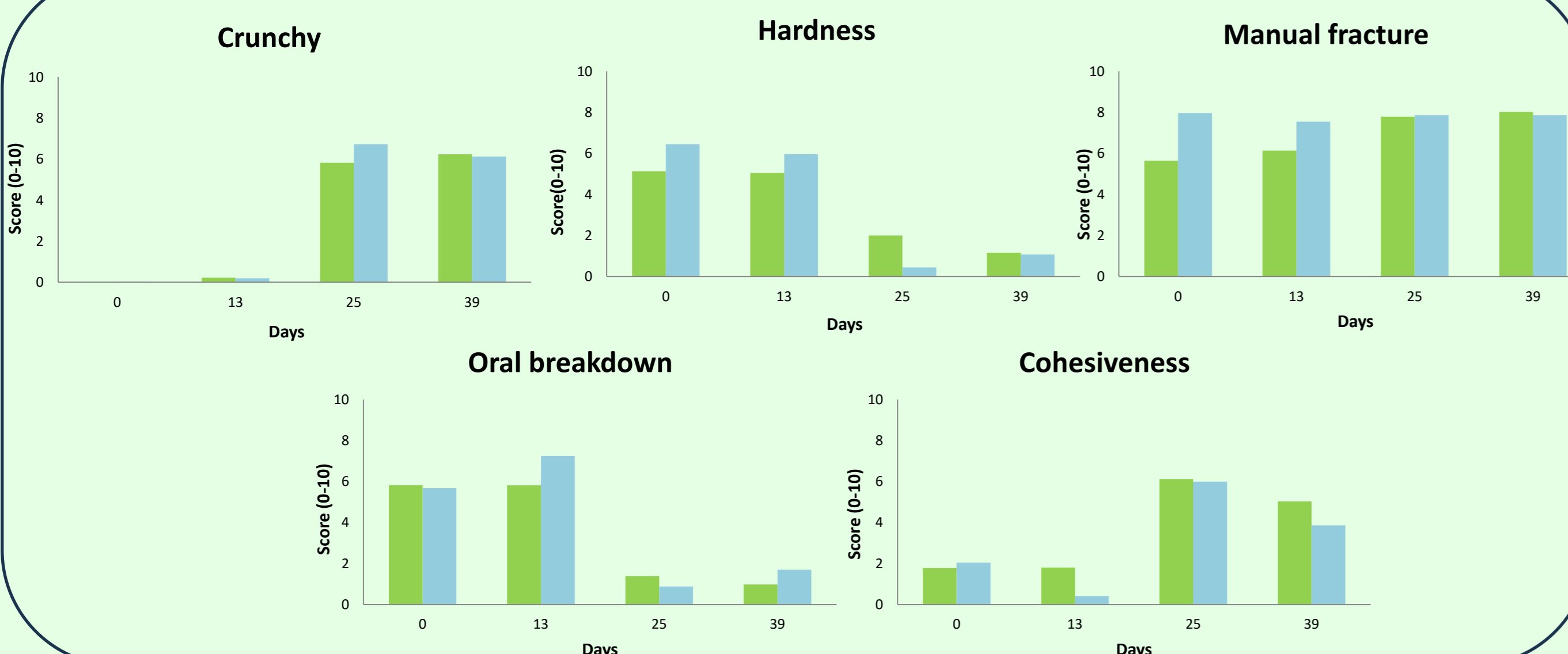
Antioxidant activity^{6,7}, total protein⁵, glucose, sucrose⁸, sorbitol⁹, ascorbic acid⁴, total phenolic compounds³, carotenoids² and flavonoids¹ contents were measured.

6

Color¹³, fresh, and dry weights were determined, sensory texture analysis was conducted by a trained panel¹². Texture was instrumentally measured¹¹.

SENSORY PERCEPTION (SP)

SENSORY PERCEPTION (0-10)



INSTRUMENTAL TEXTURE



SP

Manual fracture and instrumental texture were constant over time. After 15 days, cohesiveness and crunchy perception was increased and accompanied with a decrease in oral breakdown and hardness.

COLOUR (C)

Day	L	SD	a	SD	b	SD
0	79.72	1.20B	-2.18	1.97A	51.91	1.65D
15	77.64	2.13AB	-0.52	0.88AB	36.64	5.19C
33	76.00	2.31A	0.42	0.67B	34.39	5.73CB
41	76.49	1.70A	0.55	1.07B	31.88	5.03B
55	77.03	1.41A	0.27	0.80B	25.73	1.98A
0	81.14	1.34C	-2.86	1.19A	49.90	2.27B
15	76.34	2.00B	0.37	1.28B	38.61	3.50A
33	76.53	2.31B	-0.26	1.03B	37.28	4.30A
41	70.73	5.77A	0.12	1.14B	35.93	4.37A
55	73.75	3.12BA	0.36	1.30B	35.42	3.71A

L

Luminosity (L) experiences a subtle decrease over the course of the days

a & b

Minor alterations in slices colour were noted during storage, with slices stored for 55 days displaying a redder hue and less yellowness compared to recently dehydrates peach slices. **These shifts in slice coloration may be attributed to the reduction in the carotenoid content.**

ADDITIONAL INFORMATION AND REFERENCES

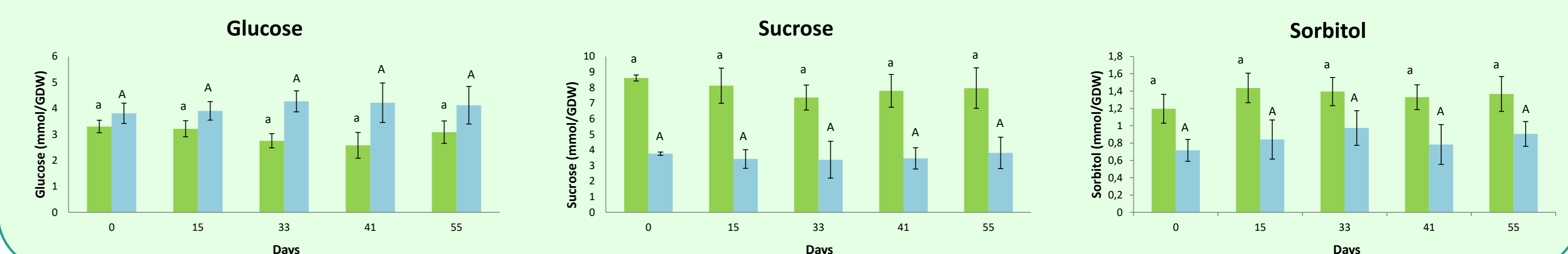


DO with Sucrose

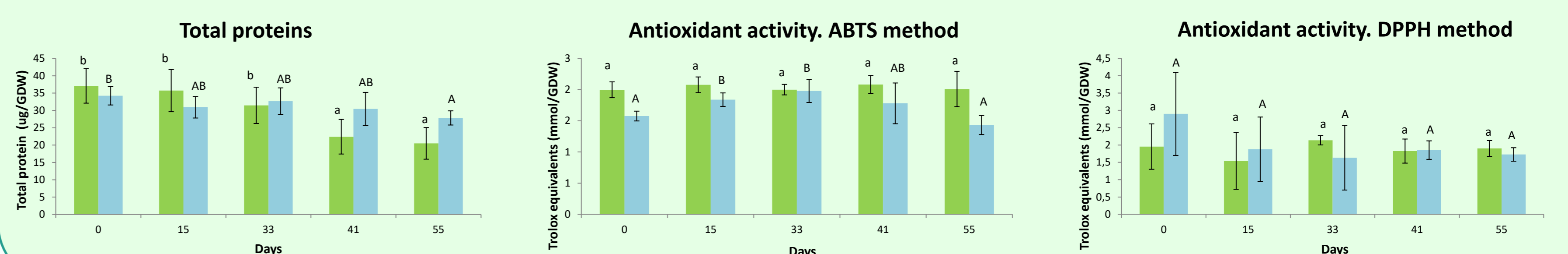
DO with Glucose

The results were expressed based on grams of dry weight (GDW). Statistics: values with different letters are statistically significantly different ($p < 0.05$), according to ANOVA followed by Tukey test.

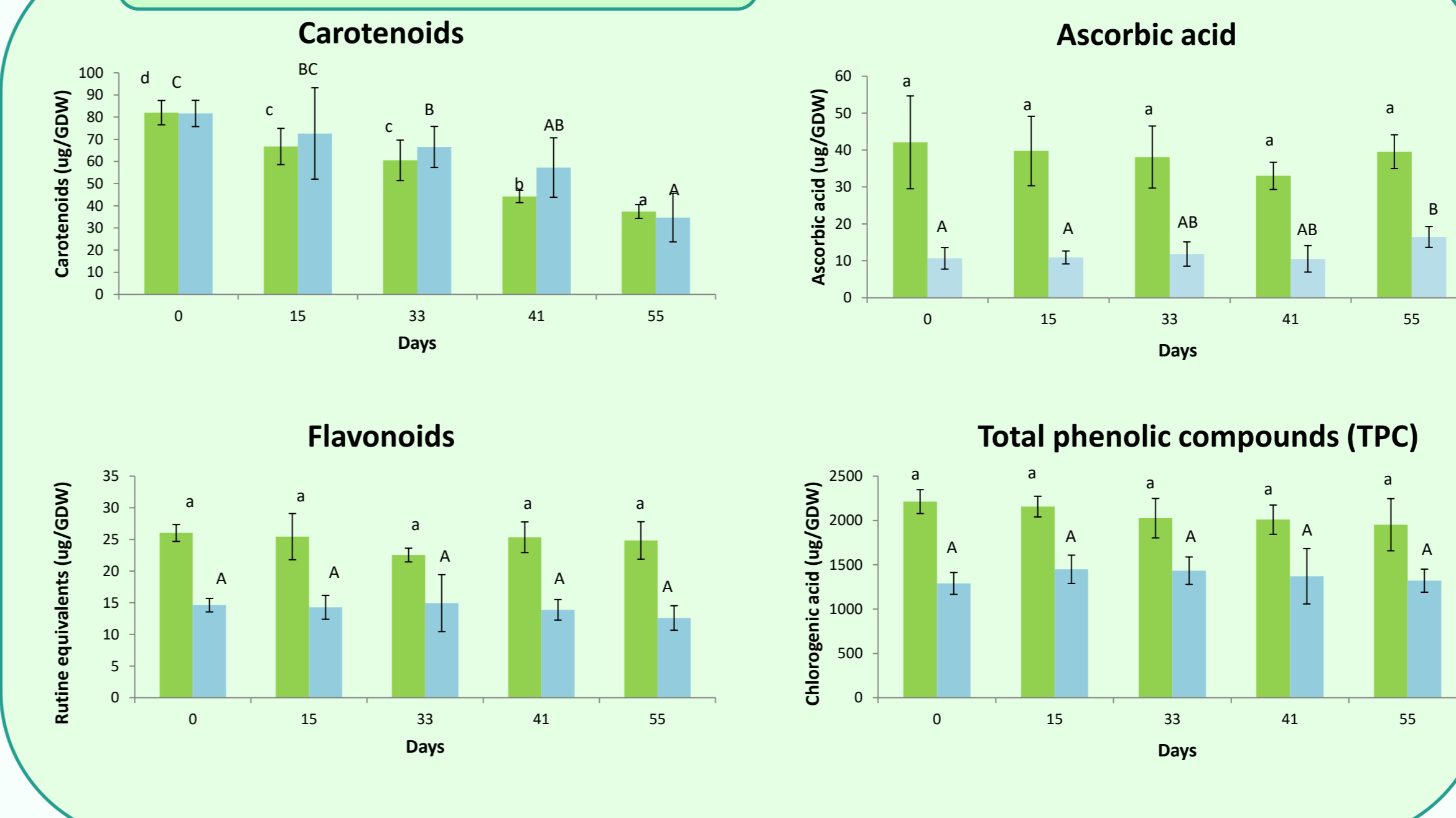
SUGARS AND SORBITOL (S)



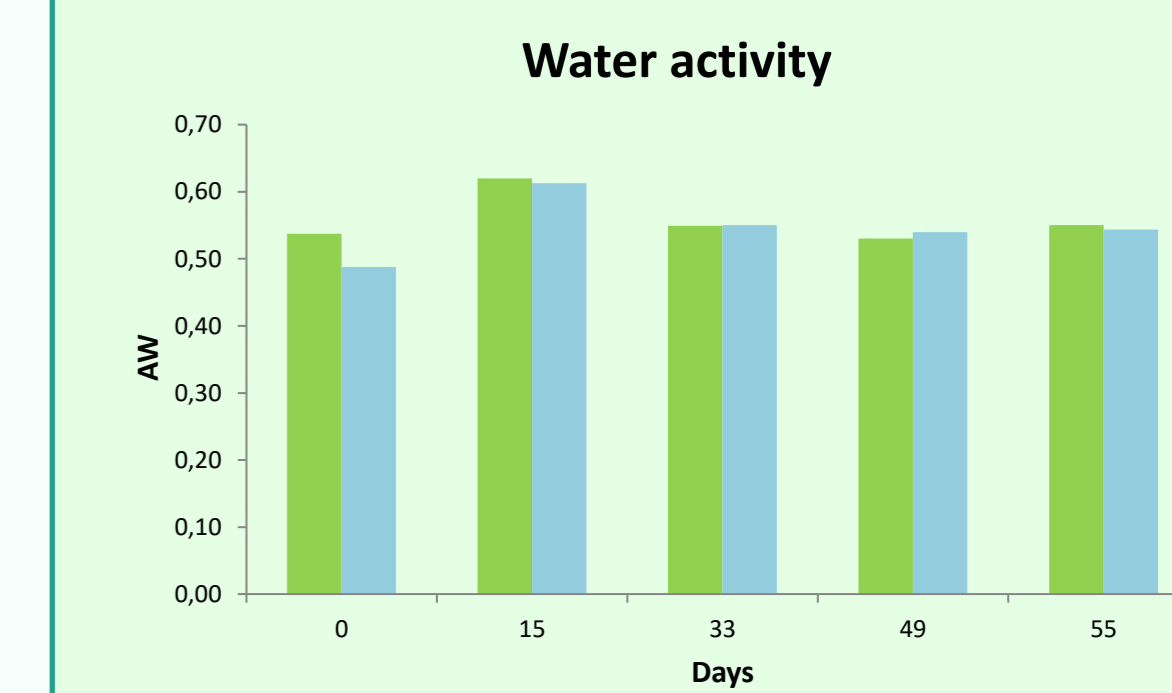
NUTRITIONAL CAPACITY (NC)



BIOACTIVE COMPOUNDS (BC)



WATER ACTIVITY (AW)



S

Sugars and sorbitol were maintained during the 55-days conservation period.

NC

There is a decay in proteins in samples dehydrated using either glucose or sucrose as osmotic agents during the conservation period.

BC

Besides carotenoids, bioactive compounds were maintained during the 55-days conservation period.

AW

AW increase reveals that peach slices were equilibrated to the atmospheric humidity, as expected.

CONCLUSION

Dehydrated peach slices with sucrose or glucose follow by heat drying preserves their bioactive compounds and nutritional capacity over a conservation period of 55 days at 55% RH. However, a slight browning effect and alteration in some sensory parameters are observed.