

CHANGES IN THE PHYSICAL PARAMETERS OF ORGANIC AND CONVENTIONAL CARROTS DURING HOUSEHOLD STORAGE

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Hypotheses: (1) The storability of organic carrot differs from conventional one, because of lower level of nitrogen using in organic farms; (2) Packed organic carrots keep storability better than bulk products.

Materials and Methods

In this study, the impact of generally applied household storage practices on the physical parameters were compared, using commercial organic and conventional carrot samples. Two temperature settings (4°C, 12°C) were combined with two packaging (bulk, plastic bag) for both samples; storage was maintained for three weeks.

For packed storage, resealable and perforated plastic bags were used. The experiment used codes for the identification of samples (Table 1). The firmness of the carrots was measured using non-destructive methods. A Sinclair IQ benchtop stiffness tester was used to measure surface firmness. The color of the carrots was measured using a computer vision system, a Hitachi camera captured the picture and the average red, blue and green parameters of the segmented image were evaluated.

Temperature	4°C (A)				12°C (B)			
Storage type	Bulk (NP)		Packaged (P)		Bulk (NP)		Packaged (P)	
Storage type code	NPAC	NPAO	PAC	PAO	NPBC	NPBO	PBC	PBO

Table 1: Storage type codes for modeling typical household carrot storage technologies. NP: non-packed, P: packed, A: 4 °C, B: 12 °C, last character: C refers to conventional, while O refers to organic cultivation origin

Results

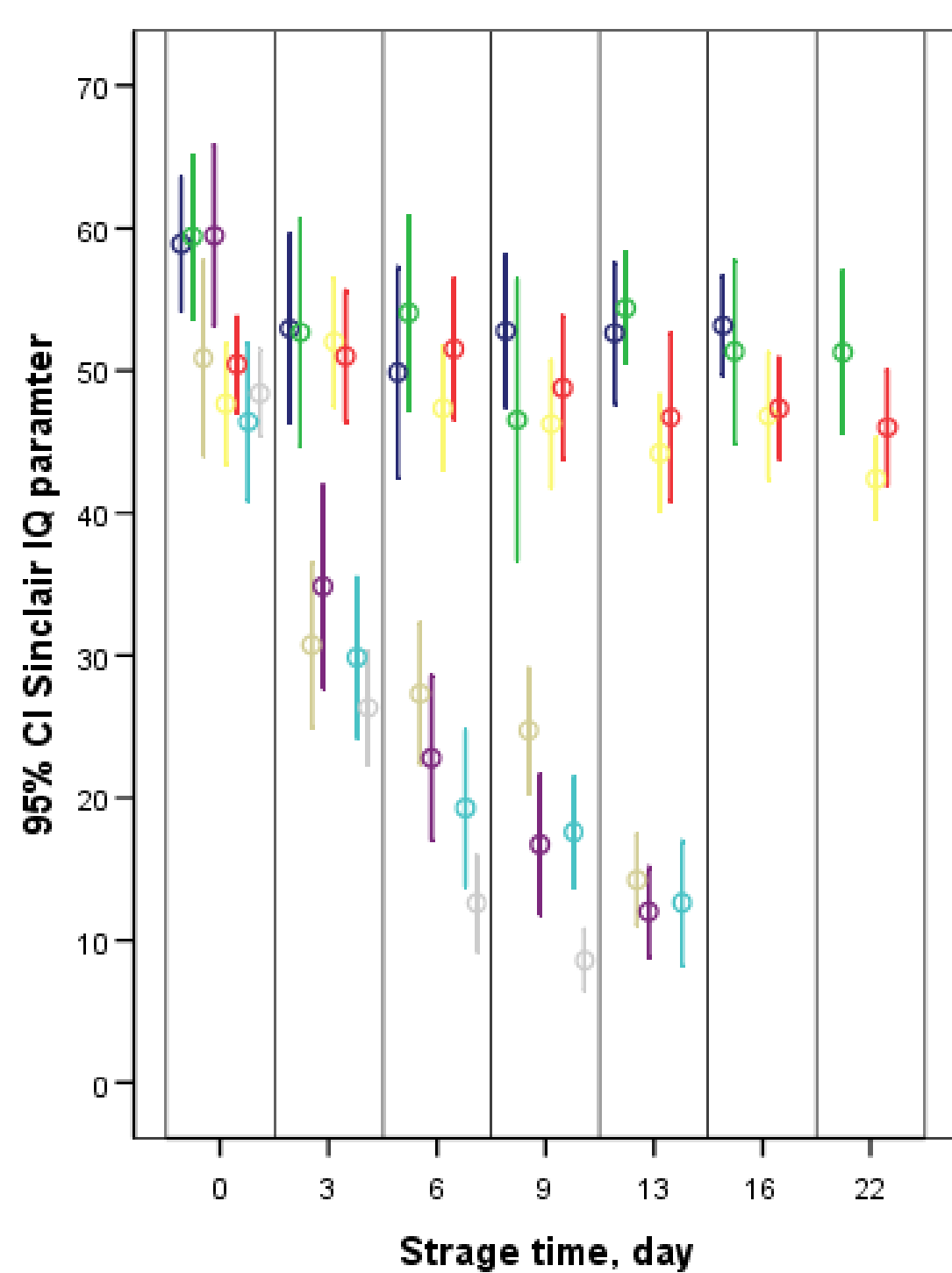


Fig.1: Changes of Sinclair IQ parameter of organic and conventional carrot samples during storage

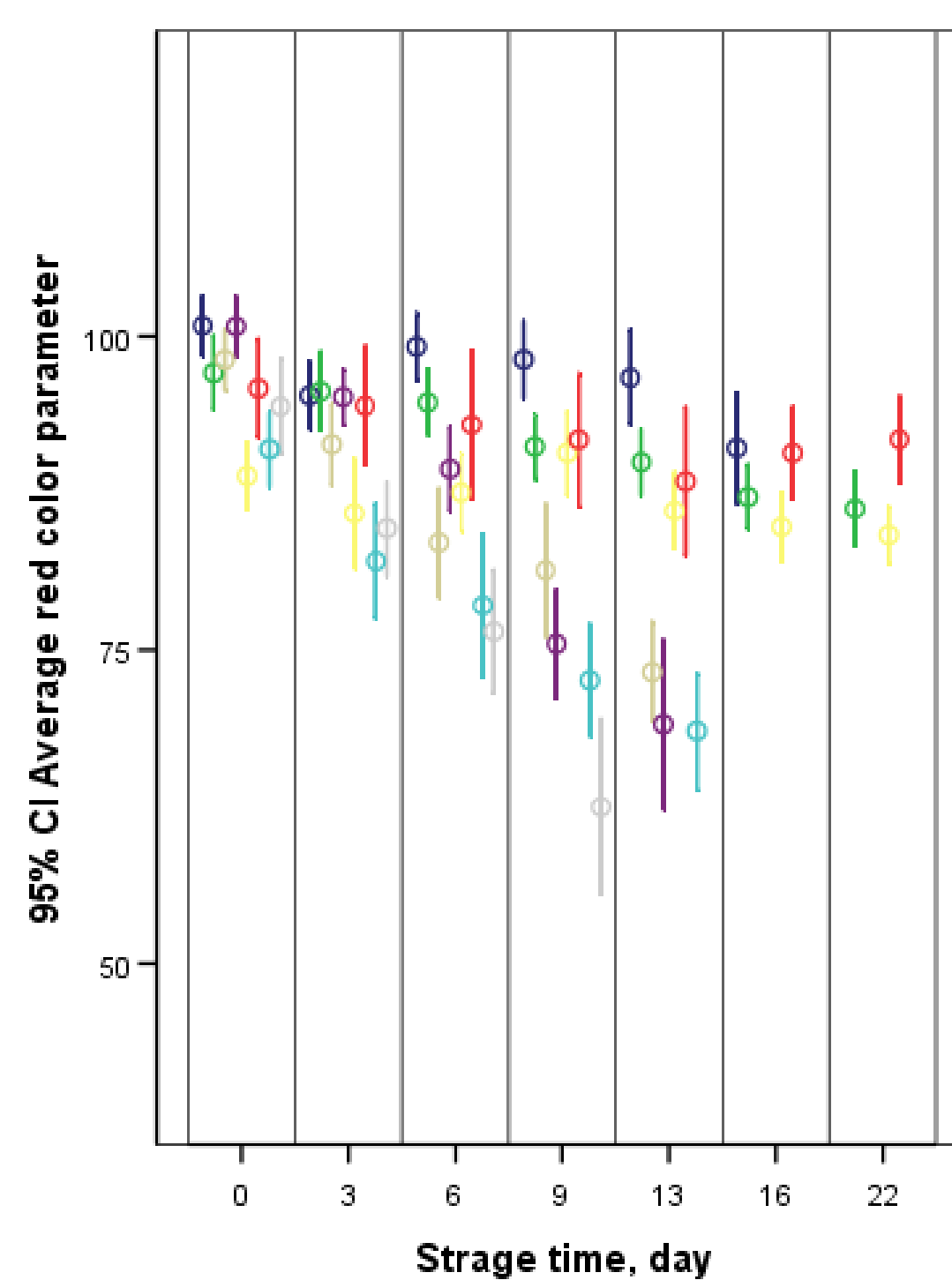


Fig.2: Changes of average red color parameter of organic and conventional carrot samples during storage measured by machine vision system

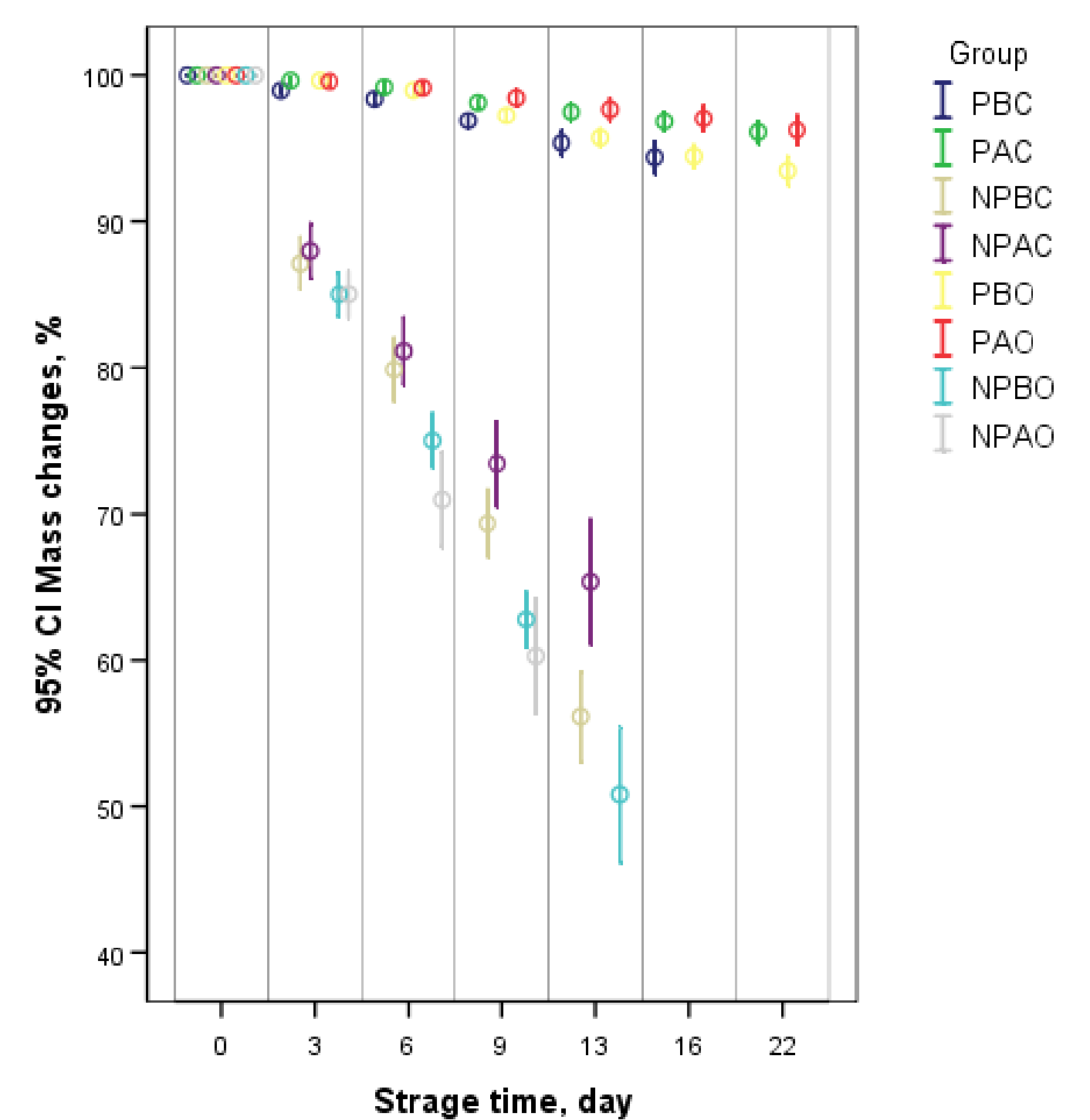


Fig.3: Mass changes of organic and conventional carrot samples during storage

Conclusion: According to the results, among the examined variables (storage temperature, packaging and cultivation type), packaging had the greatest effect on the preservation of carrot quality during storage. Packing in a resealable perforated plastic bag had a very positive effect on the shelf life of organic and conventional carrots for all measured parameters. For the Sinclair IQ parameter, weight loss and average red color change, a significant difference ($p < 0.05$) was determined already on the third day of storage between the packed and unpacked groups, independent on storage temperature and agricultural production method.