

Title Postharvest color and texture retention in organic Chinese red raspberry and sea-buckthorn fruit during modified atmosphere storage

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Abstract

Color and texture are among the key quality attributes for small fruit. Approaches such as modified atmosphere packaging (MAP) along with cold chain management have been shown to support retention of fruit quality during handling and distribution. The objective of this study was to investigate the effects of various modified environments on retention of quality attributes of Chinese organic red raspberry (*Rubus idaeus* L.) and sea-buckthorn (*Hippophae rhamnoides* L.) fruit from northeast China. Fruit were harvested, cooled and sorted for quality prior to being weighed into vented clamshell containers and placed into three experimental groups using bags of varying oxygen transmission rates (OTR): 160 OTR bags, 525 OTR bags, or air control and stored over 10 days (10°C). Atmospheric composition was confirmed by headspace analysis, and retention of fruit quality attributes was measured by color (L*, a*, b* values), texture (cohesiveness, springiness), total soluble solids (TSS), pH, and moisture content at regular intervals. O₂ content was ~2% at steady state conditions inside the 160 OTR trays for both raspberry and sea-buckthorn fruit. However, the O₂ levels inside the 525 OTR trays were 12% for raspberry and higher for sea-buckthorn (16%). CO₂ levels were similar inside the 160 OTR trays for both fruit (18-20%), however slightly lower in the 525 OTR sea-buckthorn trays (4 vs. 5%). Improved color retention was shown in MAP-stored raspberry fruit. Better retention of cohesiveness and springiness were observed in MAP-treated raspberry fruit with slightly better results noted in lower OTR. No differences noted for sea-buckthorn fruit texture. MAP resulted in improved moisture retention and lower TSS vs. control in both fruit. Overall MAP improved quality retention of Chinese, organic raspberry and sea-buckthorn fruit.