

Title Effect of edible coating and modified atmosphere packaging on enzymatic antibrowning of Fresh-cut Persimmons cv. Rojo Brillante

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Abstract

Persimmon fruit cv. Rojo Brillante can be marketed as a fresh-cut commodity after removal of the astringency by application of high levels of CO₂. However, the commercial success of the product is limited mainly due to enzymatic browning, and therefore the usefulness of an edible coating with antioxidant activity and modified atmosphere packaging (MA) has been investigated. Persimmon pieces were dipped in a coating composed by soy protein isolate, citric acid and calcium chloride, or in water as a control. Fruit samples were then packed in trays with air or two gas mixtures (MA-A: 15% CO₂ + 5% O₂ + 80% N₂; MA-B: 80% O₂ + 20% N₂), covered with polypropylene films and stored at 5°C for 10 days. In samples packed with air, a control treatment was also performed by macro perforating the polypropylene film to ensure no gas modification in the package. Changes in atmosphere composition, color (CIEL*a*b*), visual quality, and texture were evaluated. Coated samples had lower a* values than uncoated samples. Enzymatic browning was further reduced, as indicated by high L* values, when samples were stored under MA-A. However, MA-B damaged the tissue of the fruit, resulting in decreasing L* and increasing a* values. These results correlated with the visual evaluation. Coated samples under MA-A were evaluated as above the limit of commercialization during all the storage time by the judges. Fruit texture was not influenced by the application of either MA or coating. During storage, the gas composition of the samples stored under ambient atmosphere with non-perforated film and in samples stored under MA-B showed a sharp increase and decrease on CO₂ and O₂, respectively. While in the other treatments (macro-perforated films and MA-A) gases were only slightly modified during storage. The results indicate that even when soy protein-based coatings showed a good effectiveness by itself, the combined use of MA-A with the soy protein-based coatings presents a synergic effect in reducing browning of fresh-cut persimmon.