

Title Occurrence of chilling injury in fresh-cut 'Kent' mangoes
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Abstract

For best visual quality retention of fresh-cut fruits, the preferred storage temperature is never higher than 5 °C, which is considered a chilling temperature for chilling sensitive tropical fruit like mango. Changes in visual and compositional attributes, aroma volatile production, respiration rate, and electrolyte leakage were evaluated in whole and fresh-cut partially ripe 'Kent' mangoes stored for 10 d at chilling (5 °C) and non-chilling (12 °C) temperatures in order to determine if fresh-cut mangoes are subject to chilling injury at their typical handling temperature. The experiment was conducted twice during two Florida mango seasons, with fruit from two different sources. Results from the two harvests were significantly different and therefore were analyzed separately. Visual quality degradation was faster at 12 °C than at 5 °C, and limited the shelf-life of the fresh-cut mangoes to 3–4 d at 12 °C versus 5–6 d at 5 °C. Soluble solids content did not differ among whole fruit or fresh-cut slices stored at either chilling or non-chilling temperatures, but respiration rate, pH, and total ascorbic acid were all lower and titratable acidity was higher in both the fresh-cut slices and whole fruit stored at 5 °C compared with storage at 12 °C. Subjective evaluation indicated that aroma intensity declined more during storage of fresh-cut slices at 5 °C than at 12 °C, and the aroma volatiles acetaldehyde, ethyl acetate, and ethyl butyrate were found to be significantly reduced in the slices stored at 5 °C, but only in the second harvest; production of alcohols (methanol and ethanol) was also lower in samples stored at 5 °C. Although electrolyte leakage was higher in fresh-cut slices than in whole fruit, no conclusion could be made regarding the effect of storage temperature. It is unclear whether the storage duration at 5 °C was sufficiently long to cause chilling injury in fresh-cut mango slices since no visual symptoms developed in whole fruit. However, lower ascorbic acid content, higher titratable acidity, reduction of volatiles, and increased softening of whole fruit at 5 °C versus 12 °C, which are all indicative of CI, suggest that the fresh-cut mango slices did experience chilling stress.