Title Controlled atmosphere storage of guava (*Psidium guajava* L.) fruit

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Abstract

The effects of controlled atmospheres (CA) on respiration, ethylene production, firmness, weight loss, quality, chilling injury, and decay incidence of three commercially important cultivars of guava fruit were studied during storage in atmospheres containing 2.5, 5, 8, and 10 kPa O_2 with 2.5, 5, and 10 kPa CO_2 (balance N_2) at 8 °C, a temperature normally inducing chilling injury. Mature light green fruit of cultivars, 'Lucknow-49', 'Allahabad Safeda' and 'Apple Colour', were stored for 30 days either in CA or normal air, and transferred to ambient conditions (25–28 °C and 60–70% R.H.) for ripening. CA storage delayed and suppressed respiratory and ethylene peaks during ripening. A greater suppression of respiration and ethylene production was observed in fruit stored in low O_2 ($\leq$5 kPa) atmospheres compared to those stored in CA containing 8 or 10 kPa O_2 levels. High CO_2 (>5 kPa) was not beneficial, causing a reduction in ascorbic acid levels. CA storage was effective in reducing weight loss, and maintaining firmness of fruit. The changes in soluble solids content (SSC), titratable acidity (TA), ascorbic acid, and total phenols were retarded by CA, the extent of which was dependent upon cultivar and atmosphere composition. Higher amounts of fermentative metabolites, ethanol and acetaldehyde, accumulated in fruit held in atmospheres containing 2.5 kPa O_2. Chilling injury and decay incidence were reduced during ripening of fruit stored in optimal atmospheres compared to air-stored fruit. In conclusion, guava cultivars, 'Lucknow-49', 'Allahabad Safeda', and 'Apple Colour' may be stored for 30 days at low temperature (8 °C) supplemented with 5 kPa O_2 + 2.5 kPa CO_2, 5 kPa O_2 + 5 kPa CO_2, and 8 kPa O_2 + 5 kPa CO_2, respectively.