

Title Antioxidant phytochemical and fruit quality changes in mango (*Mangifera indica* L.) following hot water immersion and controlled atmosphere storage

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Abstract

Tropical fruits such as mangoes destined for import into the United States are commonly required to have a thermal treatment against invasive pests, which could be combined with controlled atmosphere (CA) storage to prolong shelf life and preserve fruit quality. Changes in antioxidant phytochemicals and resultant quality during storage and ripening were investigated in fresh mangoes, as influenced by application of CA in combination with a hot water immersion quarantine treatment (46 °C for 75 min). Mature-green mangoes with or without a hot water treatment, were held in air, 3% O₂ + 97% N₂, or 3% O₂ + 10% CO₂ + 87% N₂ and evaluated for external quality and phytochemical differences after storage for 2 weeks at 10 °C and after subsequent ripening in air at 25 °C. Visible appearance of anthracnose during ripening was effectively inhibited by the hot water treatments combined with CA. Concentrations of gallic acid and numerous hydrolysable tannins and their resultant antioxidant capacity were unaffected by the hot water treatment, while total polyphenolics naturally decreased throughout fruit ripening, regardless of hot water treatment or storage atmosphere. However, the overall decline in polyphenolic concentration was inhibited by the CA treatments, as a result of delayed ripening. Quality parameters such as flesh colour and titratable acidity provided supporting evidence that the CA conditions helped to delay fruit ripening.