

Postharvest high Carbon Dioxide and Hot Water Treatments for Maintaining Quality of Ewase Mango Fruits

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Abstract: Postharvest quality of Ewase mangoes (*Mangifera indica* L) is vital to ensure proper ripening and good quality. The effect of postharvest applications of modified atmosphere and hot water treatments were applied to Ewase mango fruits at the two seasons of 2012 and 2013. Mature Ewase fruits were subjected to modified atmosphere (MA) at 2% or 7% CO₂. Other mangoes were also subjected to hot water dipping (HWD) at 48 or 52°C for 10 min. All treated and control fruits were stored at 10°C with 85-90% relative humidity for 4 weeks. Responses of fruit quality characteristics as physical and chemical properties to MA and HWD throughout storage period were studied. Fruit quality characteristics i.e. weight losses, decay percentage, CO₂ production (respiration rate), skin color (hue angle), fruit firmness, total soluble solids content (TSS), titratable acidity (TA), and ascorbic acid (VC) content, were evaluated periodically after 7 days of storage for 4 weeks. Among different treatments, weight loss percentage was lower in fruit treated with HWD treatments than untreated ones (4.09%). Meanwhile, there were inversely relation between CO₂ concentrations and mango fruit weight loss percentage. All treatments (MA and HWD) did not have any discarded fruits until two weeks of storage period, while control fruits exhibited the highest percent of decay (33%). Treated fruits with high carbon dioxide 7% gave the least CO₂ production (25 mgkg⁻¹hr⁻¹) with the same pattern after hot water dipping. The highest value of CO₂ production (33.5 mg kg⁻¹hr⁻¹) recorded by HWT at 48°C compared control fruits (37 mg kg⁻¹ hr⁻¹). Ewase Mango peel color change from green to yellow progressed rapidly in untreated fruits from the initial time (114.80) to (74.14) at the end of storage at 10°C for 4 weeks. HWD treatments showed maximum color value (84.13) at 52°C followed by (82.21) at 48°C for 10 min. The highest hue angle values (93.10 and 89.12) in MA treatments recorded by 7% CO₂ and 2% CO₂ respectively. Treated fruits with CO₂ at 7% gave the highest firmer fruit (11.87) followed by CO₂ at 2% (11.70) compared with untreated fruit (8.70). A similar decline in fruit firmness was found in mangoes stored at 10°C after dipping in hot water (HWD) at 48 and 52°C for 10 min with less value. Fruits treated with MA concentrations gave the highest SSC and VC content with lower titratable acidity. Meanwhile, HWD applications had less TSS and VC content with higher TA percent in both conditions throughout storage period.

Keywords: Ewase mango, Modified atmosphere, Carbon dioxide, Hot water, Fruit quality.