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Management of Postharvest Fruit Softening and Quality of Peach by Calcium Chloride

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Abstract

Application of calcium chloride ($CaCl^2$) has been reported to delay ripening of fruit. Hence, a study was conducted to examine the effects of postharvest CaCl2 application on peach fruit (*Prunus persica* L. Batsch. cv. 'Flordaking') softening and quality characteristics during shelf life and cold storage. The fruit after harvest were dipped for 5 min in aqueous solutions containing different concentration of $CaCl^2$ viz. 0, 2 %, 4 % or 6 % + Tween 20® (1 g L^{-1}). The treated fruit were kept at ambient conditions (25 ± 2 °C; RH 60–65 %), under cold storage (0 ± 1 °C; RH 80–85 %) and at ripening following by cold storage. The fruit were evaluated for physiological (ethylene production, respiration rate, weight loss, fruit firmness); biochemical fruit quality characteristics;, fruit firmness, activities of cell wall hydrolyzing enzymes and antioxidative during ripening, under cold storage and at ripening followed by cold storage as well. Postharvest application of 6 % $CaCl_2$ significantly reduced ethylene production and respiration rate during ripening, at ambient and following cold storage. Reduced fruit softening and activities of fruit softening enzymes including PE, EGase, endo-PG and exo-PG were exhibited by 6 % $CaCl_2$-treated fruit as compared with untreated fruit. Lowest fruit weight loss, SSC, and highest fruit firmness were observed in 6 % $CaCl_2$-treated peach fruit than untreated fruit during ripening, after storage and at ripening following cold storage. Application of 6 % $CaCl_2$ significantly enhanced the antioxidant scavenging activity (ASA), total phenolic contents (TPC) and activities of antioxidative enzymes including CAT, POD and SOD than untreated peach fruit during ripening, under cold storage and at ripening followed by cold storage. Although application of 6 % $CaCl_2$ significantly reduced ethylene production, fruit softening, fruit softening enzymes activities and increased anti-oxidative activity, peach fruit treated with higher concentration of $CaCl_2$ (6 %) exhibited skin discolouration and superficial pitting during shelf life ripening following by cold storage. Keeping the above deleterious effects of higher dose, 4 % $CaCl_2$ was more preferable to maintain fruit softening and quality of peach fruit during ripening and cold storage.

Keywords: Antioxidants, fruit ripening, low temperature storage

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