

Title Physiological and quality attributes of mangosteens (*Garcinia mangostana* L.) as affected by modified atmosphere packaging

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Citation Abstracts of 27th International Horticultural Congress & Exhibition (IHC 2006), August 13-19, 2006, COEX (Convention & Exhibition), Seoul, Korea. 494 pages.

Keywords mangosteen; modified atmosphere packaging; physiology; quality

Abstract

Changes in physiology and quality of mangosteens stored under modified atmosphere packaging (MAP) at commercial scale for exportation were investigated. Mangosteens at ripeness stage 1 were packed in linear low-density polyethylene bags under MAP with 3 conditions of initial gas composition including 6%O₂:15% CO₂, 4%O₂:10%CO₂ (% by volume) and 21% O₂ (air). Fruit were then stored at 13°C for 7, 14, 21, 28 and 32 days. In-package O₂ concentrations of all treatments drastically decreased due to high bulk density of the mangosteens inside the bags, whereas ethylene concentrations slightly increased and subsequently became quite stable during storage. Fruit stored under 21%O₂, 4%O₂:10%CO₂ and 6%O₂:15%CO₂ progressively developed to ripeness stage 2 after 21, 28 and 28 days, respectively. Coincidence with the increase of total soluble solids, titratable acidity of fruit in the 21%O₂-treatment tended to decrease during storage, while these two quality attributes of other treatments remained constant. The pH of fruit in all treatments was quite stable, and pericarp and flesh firmness continuously decreased during storage. After 32 days storage, more symptoms of pericarp hardening and calyx browning was found in fruit with 21%O₂-MAP, compared with other treatments. Growth of mold was detected in MAP with 21%O₂, 4%O₂:10%CO₂ after 21 and 28 days, respectively. In contrast, MAP with 6%O₂:15%CO₂ effectively inhibited mold growth throughout 32 day-storage. Sensory evaluation of fruits transferred from MAP to air storage at 25°C to ripen indicated that fruit in all treatments had acceptable eating quality after 28 days of MAP storage.