

ABSTRACT

Quality assessment and postharvest storage of miniature golden apple (*Spondias cytherea* Sonn.) and chili plum (*Spondias purpurea* L.) fruits

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Quality changes during the growth and development of the miniature golden apple (*Spondias cytherea*) and postharvest storage of miniature golden apples and chili plums (*Spondias purpurea*), two under-utilized fruits with great potential for increased utilization in the Caribbean region, were investigated.

Miniature golden apple fruits exhibited a single sigmoidal growth curve based on increases in length, diameter and fresh weights, with fruits attaining physiological maturity or the mature-green stage approximately 21 weeks after fruit-set. Skin colour was identified as the best non-destructive maturity index. During storage at 20-22°C turning and mature-green fruits ripened fully, after about 3 and 5 days respectively while at 30-32°C turning and mature-green fruits ripened fully, after about 2 and 4 days respectively. Fruits were found to be climacteric and had a shelf-life of only 7 days under ambient conditions. Fruits were chilling sensitive, however, sensitivity was less in fruits of increased maturity as chilling injury symptoms were observed after 4, 8 and 11 days for immature, mature-green and turning fruits during storage at 8-10°C. Heat treatment of golden apples at $46 \pm 0.1^\circ\text{C}$ proved ineffective in the alleviation of chilling injury in fruits stored at 5°C and 10°C.

Chili plums ripened within 5 days during storage at 20-21°C and 30-31°C. Fruits demonstrated a climacteric ripening pattern with significant increases in carbon dioxide and ethylene production rates. Fruits were highly susceptible to chilling injury when stored at 5°C and 10°C. Heat treatment at $45 \pm 0.1^\circ\text{C}$ for 20 minutes was found to destroy both the eggs and larvae of the Caribbean fruit-fly (*Anastrepha* spp.) in infested fruits.

Generally, storage of both fruits at 12.5°C reduced the rate of metabolism and prevented ripening thereby lowering the rate of quality deterioration. However, whereas the chili plums were stored successfully at this temperature for up to 14 days, the miniature golden apple was stored successfully for 21 days. Subsequent storage at 30-32°C resulted in the former remaining marketable for an additional 4 days while the latter remained marketable for up to 7 days.

Therefore for both fruits, it was concluded that shelf-life can be extended considerably if stored at 12.5°C.

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