

ABSTRACT

Microbial Spoilage of Papayas (*Carica papaya* L.)
Stored Under Controlled Conditions

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Papaya is rapidly becoming an important fruit crop for Caribbean farmers, as exports of this crop are increasing while local consumption, both as fresh fruit and more particularly in the processed form, also appears to be on the rise. Papayas in refrigerated storage are very susceptible to decay, as recent research here has shown. This study attempts to identify the causative agents of such decay and to evaluate methods aimed at reducing their effects.

Papayas were harvested at the colour-break stage or at the first signs of yellowing at the apex. The fruits were subjected to hot-water (48°C for 20 minutes) and fungicidal (52°C for 2 minutes) treatments.

Three trials were conducted. In the first, papayas were immersed in Benlate (1.5 g/L) after the hot-water treatment and stored under ambient conditions (28°C) until they had ripened. Tecto, Benlate and Botran at concentrations of 1.5 g/L were used in the second trial. After the fungicidal treatments, papayas were stored at

16°C for a period of 30 days. In the third trial, papayas were treated with Benlate at varying concentrations (1.0 g/L, 1.5 g/L and 2.0 g/L) and stored at 16°C for 30 days. The fruits were removed at intervals from cold storage and left to ripen under ambient conditions (28°C).

Fungi identified on lesions during ambient storage (Trial #1) were *Colletotrichum gloeosporioides*, *Botryodiplodia theobromae*, an unidentified white fungus and species of *Cladosporium* and *Mucor*. Adequate decay control was achieved with hot-water/fungicide treatments. The shelf life of pre-treated papayas was extended by four days.

In addition to these organisms, fungi identified on papayas showing rots after periods of cold storage were, an unidentified black fungus, an unidentified white fungus and species of *Fusarium*, *Alternaria* and *Curvularia*.

Species of *Cladosporium* and *Pencillium* were also isolated from the skin and flesh of all papayas analysed. These however were opportunistic organisms and did not contribute to the spoilage of the papaya fruit. Total bacteria counts on the skin and flesh of the fruit were negative.

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Benlate was more effective than Tecto and Botran in controlling decay. Benlate at 1.5 g/L, seemed to be the optimum in providing effective control of postharvest decay of papayas for up to 30 days at 16°C plus ripening at room temperature (28°C).

A delay in the rate of ripening as reflected in pH, percent soluble solids, titratable acidity, sugar/acid ratio and colour rating values was reported in pre-treated papayas.

The results indicated the feasibility of employing the hot-water/Benlate (1.5 g/L) treatments for extending the shelf life of papayas.

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