Title Influence of modified atmosphere packaging and postharvest treatments on quality retention of litchi cv. Mauritius

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Abstract

Sulphur dioxide (SO_2) fumigation is a commonly adopted commercial treatment to retain the postharvest quality of litchi (*Litchi chinensis* Sonn.) fruit. The present investigations aim to overcome the undesirable after-effect of (SO_2) fumigation during long-term storage and distribution. The fruit of litchi cv. Mauritius, harvested during the early season, were dipped for 2 min at 8 °C in postharvest treatment solutions of ethylenediaminetetraacetic acid, calcium disodium salt hydrate (EDTA) (0.1%), phosphoric acid (0.1%) or 4-hexylresorcinol (0.1%). After treatment, fruit were packed in three types of biorientated polypropylene packaging: (1) BOPP-1, (2) BOPP-2 and (3) BOPP-3, heat-sealed to modify the atmosphere around the fruit and placed in commercial cardboard cartons. After treatment, fruit were held at 2 °C, 95% RH for 34 days to simulate refrigerated sea shipment conditions and thereafter, at market shelf conditions of 14 °C for 2 days. Standard commercial SO_2 fumigation was included as a comparative control. Weight loss, firmness, pericarp browning, severity of decay, Hunter colour values, titratable acidity and soluble solids concentrations were determined after cold storage followed by simulated market shelf conditions. The modified atmosphere created (17.0% O_2 and 6.0% CO_2) inside the BOPP-3 and the high RH around the fruit minimised the rate of transpiration, preventing weight loss and deterioration of fruit quality. Sensory analysis was carried out to determine pericarp and aril colour, firmness, flavour qualities, taste, odour and juiciness. Multivariate canonical variate analysis (CVA) of the results indicated that fruit packed in BOPP-3 retained colour and excellent eating qualities during long-term storage. The BOPP-3 packaging can be recommended as a safe, cost-effective alternative for extending the storage life of litchi cv. Mauritius during sea shipment.