Title Integrated disease control strategies for storage life lengthening of papaya (*Carica papaya* L.) "RED LADY" and "RATHNA" varieties

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Abstract

Anthracnose *(Colletotrichum gloeosporioides),* stem-end rot *(Phomopsis caricae papayae* and *Lasiodipoldia theobromae),* Phomopsis rot of papaya are major post-harvest diseases resulting in relatively high post harvest loss (up to 45%) in Sri Lanka. The current consumer preference for tropical fruits is free of agrochemicals. The objective, of the present investigation were to identify in vitro efficacy of basil oil (*Ocimum basillicum*) and alum (sodium aluminium sulphate) on papaya fruit fungal pathogens and develop a relatively safe, *in vivo* integrated disease control strategy. Alum (1 % (w/v)) and basil oil (0.12%- 0.16% (v/v)) in a liquid bioassay, indicated fungistatic and fungicidal efficacy on *Colletotrichum gloeosporioides, Lasiodipoldia theobromae* and *Phomopsis caricae papaya* isolated from Red Lady and Rathna varieties of papaya. *In vivo* investigation of fruits of both papaya varieties harvested from fruit estates in Sri Lanka at 25% maturity level indicated that papaya washed in 1% (w/v) alum and subsequently sprayed with an emulsion solution of 0.16% (v/v) basil oil or 1% (w/v) alum only and enclosed in Styrofoam sleeves could be stored for a period of 14 days at 12-14^{o}C The Visual Quality rating (VQR) was high (1-3), shriveling was low with no "green islands" on fruits and zero disease severity where results were statistically similar to Bavistin 500 mg/L (systemic fungicide) treatment. Physicochemical properties assessed were unaffected by the treatments and were comparable to the control (washed only in water). The overall acceptability of treated fruits was slightly low compared to the control. This integrated treatment strategy of papaya could be adapted for sea shipment and temperature-regulated supermarket storage.