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Efficacy of Alum Treatment and Vacuum Packaging in Controlling Crown Rot Disease of Cavendish Banana

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Cavendish is the widely grown banana cultivar in the world today and the most prominent cultivar in the international trade. Crown rot, one of the most drastic postharvest diseases of Cavendish banana can cause severe postharvest loss both in the local and export markets. In the industry, cut crowns of banana are treated with fungicides to control this disease. Due to hazardous effects of fungicides, finding suitable alternatives in the management of crown rot of banana is essential. In this study, effect of alum (potassium aluminium sulphate) in combination with vacuum packaging was investigated in controlling crown rot disease and extending the shelf life of Cavendish banana at cold storage.

Twelve week mature Cavendish banana (*Musa acuminata*, AAA, Grande Naine cultivar) hands were treated with 1% (w/v) alum or distilled water (controlled). Treated and control fruits were packed in Low density polyethylene bags, air inside bags were removed using vacuum and placed in fiber board cartons and stored in a cold room at 12-14 ºC. Each treatment comprised 10 replicate boxes each with 5 hands. In-package gases were analyzed after 14 days of cold storage. Physicochemical properties (pH, TSS, TA and firmness), sensory properties (peel colour, flesh colour, aroma, flavour, taste and overall acceptability) and crown rot disease severity were determined in ripening induced fruits. Test marketing trials were conducted at CIC fruit outlet in Dambulla, Sri Lanka where treated fruits were provided to consumers and staff to obtain feedback on the quality of treated banana.

At the end of 14 days, O_2 in packages remained between 5.0 to 5.8% while CO_2% ranged from 4.9% to 5.8%. Alum in combination with vacuum packaging significantly controlled crown rot disease of Cavendish banana compared to the control. Physicochemical and sensory properties were unaffected by alum + vacuum packaging treatment when compared to control. Treated banana obtained higher score values from the customers and staff of fruit outlets for the sensory properties compared to the control. Therefore, this eco-friendly treatment strategy could be recommended in preparing Cavendish banana for local market as well as commercial scale export to various destinations which require a transit time of two weeks.

***Keywords**: Crown rot, Cavendish banana, vacuum packaging, alum, postharvest*

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