

A combination of cinnamaldehyde and citral greatly alleviates postharvest occurrence of sour rot in citrus fruits without compromising the fruit quality

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Abstract

One of the most troublesome postharvest diseases of citrus fruits is sour rot, caused by *Geotrichum citri-aurantii*. Sour rot reduces the shelf life of the fruits leading to massive economic losses. This study investigated the potential for a combination of cinnamaldehyde and citral (CC; 1: 2, v/v) at reducing the incidence of sour rot postharvest and its possible effect on fruit quality. Our findings show that CC could totally inhibit germination of *G. citri-aurantii* spores, with the minimum inhibitory concentration (MIC) and minimum fungicidal concentration (MFC) both being 0.80 mL L⁻¹. The combination (CC) acted against *G. citri-aurantii* by targeting the chitin content of the cell wall. Wax + CC (WCC; 1 × MFC) treatment also showed high efficiency in reducing the incidence of sour rot, which was 40% lower than in the control group by day 8 when all the fruits in the latter were rotten. Apart from vitamin c (Vc) content which was higher in the test group than in the control group, WCC treatment did not have any significant effect on the quality of the citrus fruits, the examined fruit quality parameters being weight loss rate, coloration index, firmness, pH, total soluble solid (TSS) content, Vc content, as well as solid acid ratio. These results indicate that the combination of cinnamaldehyde and citral (CC, 1: 2, v/v) can be used as a natural preservative to alleviate the progress of sour rot in citrus fruits postharvest.