Title Postharvest application of gum arabic and essential oils for controlling anthracnose and quality of banana and papaya during cold storage

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Abstract

Management of anthracnose caused by *Colletotrichum* spp. is the most important issue for the tropical fruit industry because of resulting financial losses. Antifungal effects of gum arabic (GA) (10%), lemongrass oil (LG) (0.05%), cinnamon oil (CM) (0.4%), and their combinations were investigated *in vitro* and *in vivo* for controlling postharvest anthracnose of banana and papaya. LG at 0.05% and 0.4% CM showed fungicidal effects against *Colletotrichum musae* and *Colletotrichum gloeosporioides*, causal organisms of banana and papaya anthracnose, respectively. GA alone did not show any fungicidal effects while the combination of 0.05% LG and 0.4% CM with Ten percent GA alone showed more fungicidal effects. However, potato dextrose agar (PDA) medium modified with 10% GA combined with 0.4% CM showed the most promising results among all treatments against *C. musae* and *C. gloeosporioides* in suppressing the mycelial growth (73.4%) and (70.0%) and spore germination inhibition (88%) and (85%), respectively. *In vivo* studies also revealed that 10% GA combined with 0.4% CM was the optimal concentration in controlling decay (80%) and (71%), showing a synergistic effect in the reduction of *C. musae* and *C. gloeosporioides*, respectively, in artificially inoculated bananas and papayas. The results regarding quality evaluation also confirmed the efficacy of 10% GA combined with 0.4% CM coatings since ripening was significantly delayed, in terms of percentage weight loss, fruit firmness, soluble solids concentration and titratable acidity. The results suggest the possibility of using 10% gum arabic combined with 0.4% cinnamon oil as a biofungicide for controlling postharvest anthracnose in major tropical fruit such as banana and papaya.