Application of potentially probiotic fruit-derived lactic acid bacteria loaded into sodium alginate coatings to control anthracnose development in guava and mango during storage

Karina Felix Dias Fernandes, Kataryne Árabe Rimá de Oliveira and Evandro Leite de Souza

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Abstract

This study evaluated the efficacy of potentially probiotic fruit-derived lactic acid bacteria (LAB) strains loaded into sodium alginate (SA) coatings to control the anthracnose development in guava cv. Paluma and mango cv. Palmer caused by distinct pathogenic *Colletotrichum* species (*C. asianum*, *C. fructicola*, *C. tropicale*, *C. siamense*, *C. karstii*, and *C. gloeosporioides*) during 15 days of room temperature storage (25 ± 0.5 °C). The effects of the formulated coatings on physicochemical parameters indicative of overall postharvest quality of guava and mango were evaluated. The eight examined LAB strains caused strong inhibition on the mycelial growth of all target *Colletotrichum* species in vitro. LAB strains with the highest inhibitory effects (*Levilactobacillus brevis* 59, *Lactiplantibacillus pentosus* 129, and *Limosilactobacillus fermentum* 263) on the target *Colletotrichum* species were incorporated into SA coatings. These strains had viable counts of > 6 log CFU/mL in SA coatings during 15 days of room temperature storage. Application of coatings with SA + *L. brevis* 59, SA + *L. pentosus* 129, and SA + *L. fermentum* 263 delayed the development and decreased the severity of anthracnose lesions in guava and mango artificially contaminated with either of the tested *Colletotrichum* species. These coatings impacted positively on some physicochemical parameters indicative of postharvest quality and more prolonged storability of guava and mango. The formulated SA coatings loaded with tested fruit-derived potentially probiotic LAB strains could be innovative and effective strategies to control postharvest anthracnose and extend the storability of guava and mango.