

# Effect of PLA nanocomposite films containing bergamot essential oil, TiO<sub>2</sub> nanoparticles, and Ag nanoparticles on shelf life of mangoes

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## Abstract

The effects of polylactic acid (PLA) film, PLA/bergamot essential oils (BEO) film, and PLA nanocomposite film (PLA/BEO/nano-TiO<sub>2</sub> film and PLA/BEO/nano-TiO<sub>2</sub>+nano-Ag film) on the physicochemical and microbial quality of mangoes stored at room temperature for 15 days was evaluated. The measured properties of mangoes included weight loss, fruit firmness, color, total soluble solids content, total acidity, vitamin C, microbial property, and sensory quality. The weight loss of mangoes packed by PLA nanocomposite films was significantly ( $p < 0.05$ ) lower than that for PLA and PLA/BEO groups from day 9 to day 12. The PLA nanocomposite films could effectively delay the loss of mango firmness during the entire storage period. The PLA nanocomposite films could also retard the harmful changes in color, total acidity, vitamin C, and microbial property when compared with PLA and PLA/BEO films. The overall acceptability of mangoes packed by the PLA nanocomposite films was still higher than 5 scores and within limit of marketability at the end of storage period. The result indicated that the PLA nanocomposite films could be used to maintain the quality of fresh mango and extend its postharvest life to 15 days.