

## Effects of lacto-fermented agricultural by-products as a natural disinfectant against post-harvest diseases of Mango (*Mangifera indica* L.)

### ABSTRACT

Background: the antagonism activity of lactic acid bacteria metabolites has the potential to prevent fungal growth on mango. Methods: the potential of developing natural disinfectant while using watermelon rinds (WR), pineapple (PP), orange peels (OP), palm kernel cake (PKC), and rice bran (RB), via lacto-fermentation was investigated. The obtained lactic acid bacteria (LAB) metabolites were then employed and the in vitro antifungal activity toward five spoilage fungi of mango was tested through liquid and solid systems. Besides, the effect of the produced disinfectant on the fungal growth inhibition and quality of mango was investigated. Results: the strains *Lactobacillus plantarum* ATCC8014 and *Lactobacillus fermentum* ATCC9338 growing in the substrates PKC and PP exhibited significantly higher in vitro antifungal activity against *Colletotrichum gloeosporioides* and *Botryodiplodia theobromae* as compared to other tested LAB strains and substrates. The in-situ results demonstrated that mango samples that were treated with the disinfectant produced from PKC fermented with *L. plantarum* and *L. fermentum* had the lowest disease incidence and disease severity index after 16 days shelf life, as well as the lowest conidial concentration. Furthermore, PKC that was fermented by *L. fermentum* highly maintained the quality of the mango. Conclusions: lactic acid fermentation of PKC by *L. fermentum* demonstrated a high potential for use as a natural disinfectant to control *C. gloeosporioides* and *B. theobromae* on mango.

**Keyword:** Lactic acid fermentation; Agricultural by-products; Antifungal activity; Mango; Postharvest spoilage; Quality