



Development of Crude Extract-Based Edible Coatings for Shelf Life Extension and Control of Crown Rot Disease Caused by *Fusarium spp.* in Namwa Banana (*Musa sapientum*)

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Abstract

This study aimed to evaluate the effectiveness of an edible coating made from gum arabic, chitosan, and herbal extracts in controlling *Fusarium spp.*, the main cause of crown rot disease in Namwa bananas, and to investigate its effects on postharvest fruit quality. The fungal pathogen was isolated from infected bananas and identified based on its morphological characteristics. Clove and sweet flag extracts were prepared using 99% ethanol and tested for antifungal activity on potato dextrose agar (PDA) at concentrations of 1%, 5%, and 10%. The results showed that 10% clove extract provided the highest inhibition of fungal growth compared with the other concentrations and the sweet flag extract. Therefore, it was selected as the active ingredient for the coating formulation. Chitosan concentrations of 1%, 2%, and 3% were also evaluated, and 2% chitosan showed the best balance between antifungal effectiveness and coating performance. The developed edible coating was then applied to Namwa bananas and compared with an untreated control. The coated bananas showed reduced fungal growth on the crown, lower weight loss, delayed peel color change, and a slower increase in total soluble solids (%TSS). These findings indicate that the edible coating containing gum arabic, 2% chitosan, and 10% clove extract is an effective and environmentally friendly method for controlling *Fusarium spp.* and extending the postharvest shelf life of Namwa bananas.

Keywords: Namwa Banana, *Fusarium spp.*, Crown rot disease, Edible coating