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Effect of Chitosan on *Colletotricum musae* and *Lasiodiploida theobromae* – *in vitro* Analysis

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Embul banana (*Musa accuminata* AAB) is one of the most popular dessert fruit varieties in Sri Lanka. It has a great potential in the European market due to its small size and characteristic flavor. The short storage life of banana is the major drawback in exporting this commodity. Crown rot is one of the major postharvest fungal disease complexes in banana, caused by *Colletotricum musae, Lasiodiploida theobromae* and *Fusarium proliferatum.* Traditionally, postharvest fungal diseases are controlled by fungicides, which lead to create hazardous impacts in the environment. The use of edible coatings of antimicrobial compounds is an alternative approach in this regard. Chitosan, the deacetylated product of chitin, is one such natural coating derived from the outer shell of crustaceans. The objectives of the present study were to determine the minimum inhibitory concentration (MIC) and minimum lethal concentration (MLC) of chitosan against *Colletotricum musae* and *Lasiodiplodia theobromae* using liquid bioassay method.

Colletotricum musae and *Lasiodiplodia theobromae* were isolated from crown rot infected "embul" banana tissues, and their pure cultures were maintained on PDA plates. The mycelial discs cut from the periphery of 7 day old cultures were transferred into flasks containing a series of chitosan concentrations (0.1 - 1.5%) (w/v) in a semi-synthetic liquid medium SMKY. Flasks were inoculated under prevailing conditions for 7 days. Sterile water and 1% acetic acid served as controls. Five replicates of each treatment and controls were arranged according to the completely randomized design (CRD). Mean mycelial growth, MIC and MLC were determined after incubation. Where the growth was completely inhibited by chitosan treatments, fungal discs were transferred onto fresh PDA plates and the survival of the pathogen was determined.

Chitosan treatment showed significant inhibition of mycelial growth of *C. musae* and *L. theobromae* compared to controls, sterile water and acetic acid. The mean mycelial weights of test pathogens decreased with increasing concentration of chitosan. The inhibition of both fungi increased with increasing concentration of chitosan. Complete inhibitions of both the pathogens were observed at chitosan concentrations of 0.8% and above. The pathogens showed a fungi-static effect in this concentration as the mycelia discs were transferred to fresh PDA plates and incubated for 7 days. MIC of *C. musae* and *L. theobromae* was considered as 0.8%. Fungicidal effect of both pathogens was observed with no mycelial growth in the revival test at concentration of 1.0% and above. MLC of test pathogens was taken as 1.0%. The results show the potential of chitosan to be used as an antifungal agent to reduce crown rot disease on banana var. embul.