EVALUATION OF COMMERCIALLY AVAILABLE YEAST FOR THE DEVELOPMENT OF A BIOLOGICAL FORMULATION TO MANAGE MANGO ANTHRACNOSE

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Mango is an economically and nutritionally important tropical fruit crop worldwide. However, anthracnose disease, mainly caused by *Colletotrichum gloeosporioides* affects both preharvest and postharvest stages, as infections often occur before harvest and become visible during fruit ripening after harvest. The disease causes significant yield and quality losses, while management mainly relies on chemical fungicides. Therefore, sustainable biological control strategies are needed to reduce fungicide dependence. This study evaluated the antagonistic potential of commercial yeast *(Saccharomyces cerevisiae)*, possessing antagonistic properties and established safety for human consumption, against anthracnose-causing fungi and to develop an effective biological control formulation for sustainable disease management. Anthracnose pathogens were isolated from infected mango fruits of the cultivars 'Karthakolomban' and 'Alphonso'. The isolates were identified based on the morphological characteristics and pathogenicity was further confirmed through Koch's postulation. The antagonistic activity of commercial yeast (*Saccharomyces cerevisiae*) was evaluated against *Colletotrichum gloeosporioides* using dual culture assays on potato dextrose agar (PDA) and its effectiveness was compared with a chemical fungicide (mancozeb) and a negative control (distilled water). A yeast-glycerol formulation (4.6×10^7 cells mL^{-1} in 20% glycerol) was tested on mango fruits under laboratory conditions to assess its ability to suppress disease. Results showed that yeast treatment completely inhibited fungal growth in the dual culture assay, recording 100 ± 0.00% inhibition throughout the 7 days of incubation period. In the laboratory fruit assay, yeast-glycerol formulation-treated fruits achieved 61.26 ± 8.23% inhibition of lesion development after 9 days of incubation, exceeding the inhibition achieved by mancozeb (45.12± 12.35%). These findings indicate that commercially available yeast formulations have strong potential as effective and sustainable biological control agents, offering a promising and eco-friendly alternative to chemical fungicides in anthracnose management. Furthermore, the results support the use of commercial yeast for developing reliable biological strategies for managing anthracnose in mango production systems.

Keywords: antagonistic yeast, biological control, dual culture assay, glycerol formulation, postharvest disease, sustainable disease management.