

Title : Biological Control of Anthracnose in Mango and Banana Using Metabolites from Endophytic Fungi

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ABSTRACT

Anthracnose is a plant disease that significantly reduces the yield and quality of economically important crops. The primary causal agents are fungi in the genus *Colletotrichum*, which cause severe postharvest losses. While chemical fungicides are commonly used to control *Colletotrichum* spp., their application can result in pesticide residues. As an alternative, biological control using microorganisms such as bacteria and endophytic fungi has gained attention. This study aimed to evaluate the antifungal potential of metabolites derived from endophytic fungi against *Colletotrichum* spp. isolated from anthracnose lesions. Pathogenic fungi were obtained from symptomatic ripe mangoes and bananas and confirmed through pathogenicity tests. Four *Colletotrichum* species were identified; two from mangoes and two from bananas. Endophytic fungal strains were isolated from various healthy plant tissues, cultivated in liquid medium for metabolite production, and assessed for antifungal activity using the agar diffusion method. The results demonstrated that three endophytic isolates; LC10-12, LC47-2, and RM22-6 effectively inhibited the growth of all four *Colletotrichum* spp. These isolates will be further scaled up for metabolite production and subjected to IC₅₀ determination. The most potent extract will be tested for its efficacy in reducing anthracnose lesions on mangoes and bananas. These findings highlight the potential of endophytic fungi as sustainable biological control agents against anthracnose, contributing to safer disease management strategies for economically important fruit crops.

Keywords: Anthracnose, Biological control, *Colletotrichum*, Endophytic fungi, Postharvest management