

## Eco-friendly Management of Banana Anthracnose (*Colletotrichum musae*) Using Bio-Rationals

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Banana anthracnose caused by *Colletotrichum musae* (Berk. & M.A.Curtis) Arx is the most serious postharvest disease of immature and mature banana fruits, causing a loss of 30-40% of marketable fruits in Asia. The aim of this study was to determine *in-vitro* antifungal activity of aqueous leaf extracts of selected plant species and to test the antagonistic potential of *Trichoderma viride* against *C. musae*. Aqueous leaf extracts were obtained from *Lantana camera*, *Piper betle*, *Azadiracta indica* and *Cinnamomum zeylanicum* and antifungal activity was determined using poison food technique at 5%, 10%, 15% and 20% concentration in potato dextrose agar under *in-vitro* conditions with three replicates. The results revealed that five days of post-inoculation, all four plant species showed stronger antifungal activity against *C. musae* as opposed to the control. Within the selected concentration, 20% aqueous leaf extracts of *L. camera*, *P. betle*, *A. indica*, *C. zeylanicum* showed excellent inhibitory activity against *C. musae*. Complete mycelial growth inhibition of *C. musae* was observed in leaf extracts of *C. zeylanicum* (100%), *P. betle* (100%) followed by *L. camera* (60%). In addition, *T. viride* gave promising results in controlling the growth of *C. musae* in dual culture under *in-vitro* condition (91%). Based on the results, the selected plant aqueous leaf extracts at 20% concentration could be developed and used as an effective bio-rational to manage the post-harvest anthracnose disease in banana. In future *in-vivo* studies are needed to test the efficacy of these bio-rationals under the field conditions.

**Keywords:** Anthracnose, Bio-agents, Botanicals, *Colletotrichum musae*, *Trichoderma viride*