

Exploitation of Phyllospheric and Rhizospheric Microorganisms as Biological Control Agents against *Colletotrichum gloeosporioides* Causing Anthracnose Disease of Mango

G.D.N. Menike* and R.M.R.N.K. Ratnayake

National Institute of Post Harvest Management, Anuradhapura, Sri Lanka

*dilrukshiwijerathne@gmail.com

Postharvest decay in harvested fruits and vegetables causes considerable economic losses. Synthetic chemicals are the primary means to control these losses. With the rising concerns on food security and food safety, chemical applications for the control of postharvest diseases are now being questioned. Biological control has become an effective and promising alternative to overcome and environmentally friendly alternative for those adverse effects caused by synthetic chemicals. Therefore, this study was conducted to explore the potential biological control agents in the mango bio-system mainly targeting the phyllosphere and rhizosphere. Leaves, stem parts, inflorescence, and fruits of mango from different locations in Anuradhapura District and soils from organically maintained orchards and home gardens were used for the isolation of microorganisms to be tested for potential antagonism against *Colletotrichum gloeosporioides* (Cg) causing anthracnose disease in mango. Potato Dextrose Agar (PDA), Nutrient Agar (NA), King's B, Yeast Mannitol Agar with Congo Red (YEPD) and Liquid Glucose Medium have been used for the isolations. Identification of the isolates was done observing colony and spore morphologies and bioassays. So far, bacteria (28), fungi (14) and yeasts (08) were found and all the isolates were tested against *C. gloeosporioides* for the biocontrol efficacy using dual culture technique. Cell suspensions of bacterial isolates and spore suspensions of fungal isolates at a concentration of 10^6 CFU/mL as a dip application were used for *in-vivo* experiments. Six treatments including T₁ (Cg + yeast iso 02), T₂ (Cg+ fungi iso 07), T₃ (Cg+fungi iso 12), T₄ (Cg+ bacteria iso 03), T₅ (Cg+ bacteria iso 05) and T₆ (control treatment with sterile distilled water) with three replicates to each treatment were used in *in-vivo* studies. From the isolates, one yeast, two fungal and two bacterial isolates showed potential antagonism against *C. gloeosporioides in-vitro* but none of them showed significant control over *C. gloeosporioides* in *in-vivo* experiments in variety Karaththakolomban. Percentage inhibition (PI) of the 06 treatments in *in-vivo* experiment is 2.17 ± 0.15^a for T₁, 2.57 ± 0.40^a for T₂, 2.55 ± 0.07^a for T₃, 2.43 ± 0.12^a for T₄, 2.53 ± 0.06^a for T₅ and 2.60 ± 0.35^a for T₆.

Keywords: Anthracnose, Biological control, *Colletotrichum gloeosporioides*, Mango, Postharvest decay