

Effect of Selected Essential Oils on Colletotrichum musae Causing Anthracnose in Banana (Musa spp L.CV. Seeni Kesel Banana)

Abstract Body

Banana (*Musa* spp L.CV. Seeni Kesel) has high nutritional and economical value. Postharvest disease anthracnose is one of the most distributed and devastating diseases of banana, especially at ripening stage. The application of synthetic fungicides is a common practice for controlling postharvest disease. However synthetic fungicides application badly affect human health because those fungicides have a lot of chemical residues. Therefore, search for alternative measures for the control of anthracnose are essential. To determine the causative agent, fungal isolation was done from symptomatic fruits, and fungi were identified by morphological features comparing with available literature. Cinnamon leaf oil, Nutmeg oil, Black pepper oils were used as essential oils in *in vitro* fungicidal assay to assess their ability to control the pathogen. The mycelial growth inhibitory capacity of five concentrations (1200 $\mu\text{L}/\text{mL}$ -1, 1400 $\mu\text{L}/\text{mL}$ -1, / 1600 $\mu\text{L}/\text{mL}$ -1, 1800 ml-1/ μL , 2000 $\mu\text{L}/\text{mL}$ -1) of black pepper oil, six concentrations (400 $\mu\text{L}/\text{mL}$ -1, 600 $\mu\text{L}/\text{mL}$ -1, 800 $\mu\text{L}/\text{mL}$ -1, 1000 $\mu\text{L}/\text{mL}$ -1, 1200 $\mu\text{L}/\text{mL}$ -1, 1400 $\mu\text{L}/\text{mL}$ -1) of cinnamon leaf oil and six concentrations (200 $\mu\text{L}/\text{mL}$ -1, 400 $\mu\text{L}/\text{mL}$ -1, 600 $\mu\text{L}/\text{mL}$ -1, 800 $\mu\text{L}/\text{mL}$ -1, 1000 $\mu\text{L}/\text{mL}$ -1, 1200 $\mu\text{L}/\text{mL}$ -1) of nutmeg oils were assessed using *in vitro* disc volatilization method. The identified causative agent was *Colletotrichum musae*. Cinnamon leaf oil (1400 $\mu\text{L}/\text{mL}$ -1) and Nutmeg oil (1200 $\mu\text{L}/\text{mL}$ -1) concentration showed 92.592% and 92.592% inhibition of radial mycelia growth against the pathogen which is significantly ($p < 0.05$) different from other concentrations tested. Black pepper oil ranges from 1400 - 2000 $\mu\text{L}/\text{mL}$ -1 concentrations did not showed no significant difference ($p > 0.05$) compared negative control treatment. These results suggest that there is a potential to use cinnamon leaf (1400 $\mu\text{L}/\text{mL}$ -1), nutmeg (1200 $\mu\text{L}/\text{mL}$ -1) and black pepper oil (2000 $\mu\text{L}/\text{mL}$ -1) concentrations as alternatives to control banana anthracnose in *in vivo* conditions to control anthracnose in banana.

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