

Effectiveness of Cinnamon Bark Oil under *In-vitro* Conditions to Control *Phomopsis* sp. Isolated from Guava (*Psidium guajava*)

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Phomopsis rot in guava is a common postharvest disease found in Sri Lanka that cause major economic problems and need alternative treatments for fungicides. Also cinnamon has proven significant control over some postharvest pathogens. This experiment was conducted to identify the effective concentrations of cinnamon bark oil to control *Phomopsis* sp. isolated from guava fruits collected from the dry zone of Sri Lanka. Effect of selected concentrations (500, 600, 700, 800, 900 and 1000 μl^{-1}) of cinnamon bark oil was evaluated using poisoned food bioassay on potato dextrose agar medium (PDA). A minimum inhibitory (fungistatic) and minimum lethal (fungicidal) concentrations were identified with the regrowth ability in fresh PDA medium. Radial mycelial growth, growth rate and inhibition percentage were recorded on daily basis. The experiment was conducted as completely randomized design with three replicates per treatment. Analysis of variance (ANOVA) was used with the statistical software SPSS 20.0 to analyze the experimental data. Radial mycelial growth was significantly different ($p < 0.05$) among the treatments where no growth was observed in 700, 800, 900 and 1000 μl^{-1} concentrations of the cinnamon bark oil. By 3rd day of incubation, mycelia covered the PDA media completely in control plates whereas the radial growth of mycelia were 5.50 ± 1.56 and 4.75 ± 0.66 in 500 and 600 μl^{-1} concentrations, respectively. The highest growth rate (17.75 ± 1.00 mm per day) was observed in control samples at the 2nd day after inoculation to PDA medium. Lowest growth rate was observed in 600 μl^{-1} from the concentrations where mycelium growth was observed. Inhibition percentages on 500 μl^{-1} and 600 μl^{-1} concentrations were 86.50% and 88.34%, respectively, at the 3rd day after inoculation where it was 100% in all other concentrations. Minimum inhibitory concentration was 700 μl^{-1} and the minimum lethal concentration was 900 μl^{-1} for *Phomopsis* sp. isolated from guava fruits. It can be concluded that cinnamon bark oil contains phytochemicals which can be used to control *Phomopsis* sp. isolated from guava fruits under *in-vitro* conditions. Further *in vivo* trials with the most effective concentrations of cinnamon bark oil are necessary to find out their applicability as a postharvest treatment for guava fruits.

Keywords: Essential oils, Fruit rot, Fungicides, Postharvest loss, Postharvest diseases