

***In vitro* antifungal activity of *Senna alata*, *Syzygium cumini*, and *Aloe vera* extracts against *Colletotrichum gloeosporioides* causing mango anthracnose**

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Solvent-partitioned fractions from leaves of *Senna alata*, seeds of *Syzygium cumini*, and outer peels of *Aloe vera* were evaluated for antifungal activity against *Colletotrichum gloeosporioides*, the causal agent of mango anthracnose, as eco-friendly alternatives to conventional synthetic fungicides. Powdered plant materials were subjected to cold maceration in 70% ethanol (1:10 w/v, 142 rpm, 25 ± 2 °C, 24 h) and fractionated by sequential solvent-solvent partitioning using hexane, ethyl acetate, and n-butanol. Antifungal efficacy was assessed using an in vitro spore germination inhibition assay at concentrations of 50, 125, 250, and 500 µg/mL, with Mancozeb as the positive control. Data were analysed using a General Linear Model (GLM) with Tukey's post-hoc test ($p < 0.05$). Antifungal activity was significantly influenced by both solvent polarity and extract concentration ($p < 0.001$). Ethyl acetate fractions demonstrated the highest spore germination inhibition across all three botanical sources. *Syzygium cumini* achieved near-complete inhibition of $99.12 \pm 1.48\%$ at 500 µg/mL, statistically comparable to Mancozeb, followed by *Senna alata* ($98.23 \pm 1.55\%$) and *Aloe vera* ($95.58 \pm 1.58\%$). Hexane fractions exhibited the weakest activity relative to ethyl acetate, with inhibition of $82.30 \pm 3.07\%$, $44.25 \pm 2.65\%$, and $55.75 \pm 3.07\%$ at 500 µg/mL for *Senna alata*, *Syzygium cumini*, and *Aloe vera*,

respectively, indicating that non-polar constituents contribute minimally to overall antifungal efficacy. n-Butanol fractions showed moderate inhibition for *Syzygium cumini* and *Aloe vera*. In contrast, their inhibitory efficacy was notably lower for *Senna alata*, suggesting species-dependent variation in the distribution of potentially active compounds. These results indicate that medium-polar phytochemical fractions, particularly from *Syzygium cumini*, harbour potent antifungal constituents capable of suppressing *Colletotrichum gloeosporioides* spore germination at levels comparable to synthetic fungicide standards. Accordingly, ethyl acetate fractions from the evaluated Sri Lankan botanicals represent promising candidates for developing eco-friendly postharvest anthracnose management strategies.

Keywords:

Colletotrichum gloeosporioides, mango anthracnose, plant extracts, solvent fractionation

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