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Bioactive extracts from endophytic fungi associated with Cardiospermum halicacabum

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Background: Endophytic fungi are capable of colonizing, in living plant tissues. They are known to produce vast number of compounds that are used in pharmaceutical and agricultural industries.

Objective: This study investigated the bioactivity of secondary metabolites produced by endophytic fungi, associated with *Cardiospermum halicacabum*.

Methods: Surface sterilized plant segments were incubated at room temperature on Potato Dextrose Agar plates. The pure fungal strains of the emerged fungi were cultured in Potato Dextrose Broth medium, and incubated at room temperature for 21 days. After completion, the broth was filtered and extracted with ethyl acetate (EtOAc). The mycelia were extracted with EtOAc and methanol (MeOH). The crude extracts were screened for antioxidant activity against DPPH (2,2'-diphenyl-1- picrylhydrazyl), phytotoxic activity against lettuce seed germination, antifungal activity against *Cladosporium cladosporioides*, cytotoxic activity against *Artemia salina* and α -amylase enzyme inhibitory activity.

Results: Four different fungi were isolated and labelled as US/CH/B, US/CH/E, US/CH/H, and US/CH/L. All broth extracts showed antioxidant activity where, lowest and highest activity (IC₅₀) were shown by US/CH/H (742.34 mg L⁻¹) and US/CH/E (113.18 mg L⁻¹) respectively. EtOAc extracts of mycelia US/CH/B (509.02 mg L⁻¹), US/CH/E (101.70 mg L⁻¹), US/CH/L (4.03 mg L⁻¹) and mycelium MeOH extract of US/CH/L (417.73 mg L⁻¹) also showed antioxidant activity. Broth extracts of US/CH/E, US/CH/L and US/CH/H showed phytotoxicity, whereas highest root and shoot inhibitions (98.8% and 95.3%) were shown by US/CH/L and US/CH/E extracts (1000 ppm) respectively. Broth extracts (US/CH/B, US/CH/H and US/CH/L) showed 100% cytotoxicity at 1000 ppm. Only US/CH/B mycelium EtOAc and MeOH extracts showed antifungal activity. None of the extracts showed α-amylase enzyme inhibitory activity. Molecular identification of fungi and isolation of pure compounds from the crude extracts are in progress.

Conclusion: Endophytic fungi associated with *Cardiospermum halicacabum* can be used to isolate bioactive compounds.

Keywords: Cardiospermum halicacabum, Cytotoxicity, Endophytic fungi, Phytotoxicity, Secondary metabolites