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BIOACTIVITY STUDIES OF ENDOPHYTIC FUNGI *Phyllosticta capitalensis* ISOLATED FROM *Syngonium angustatum* LEAVES

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Endophytes represent an intricate collection of microorganisms which inhibit asymptomatically internal tissues of higher plants. Endophytes directly produce bioactive secondary metabolites that increase the robustness of their host plant by defending them against pathogens. Moreover, endophytes can biosynthesise phytochemicals which were previously thought to be produced exclusively by their host plants. The objective of this study was to identify bioactive substances including antioxidants, enzyme inhibitors, phytotoxic and cytotoxic substances from the endophytic fungi, *Phyllosticta capitalensis.* It was isolated from leaves of the medicinal and phytoremediation plant, *Syngonium angustatum* based on the sequence of ITS region of rDNA and microscopic examination. Ethyl acetate extract of fungal strain was subjected to *in vitro* bioassays including DPPH radical scavenging activity, FRAP assay, *α*-glucosidase enzyme inhibitory assay, acetylcholinesterase enzyme inhibitory assay, brine shrimp (*Artemia salina*) lethality assay and lettuce (*Lactuca sativa*) seed germination inhibition assay. Ethyl acetate extract showed weak antioxidant activity in DPPH radical scavenging (IC_{50} 476.43±34.72 mg L^{-1}) when compared with the positive control ascorbic acid (IC_{50} 7.90±0.10 mg L^{-1}) and 3-tert-butyl-4-hydroxy-anisol (IC_{50} 10.03±0.31 mg L^{-1}). Similarly, the FRAP value of the crude extract (0.56±0.01 mmol Fe^{2+} g^{-1}) also indicated weak antioxidant activity contrast to the FRAP value of Trolox (1.26±0.01 mmol Fe^{2+} g^{-1}). Furthermore, the fungal extract showed lower percentage inhibition (27.68±2.12)% of acetylcholinesterase enzyme than the donepezil hydrochloride (99.29±0.04)% in 1000 mg L^{-1}. The inhibitory percentage of *α*-glucosidase enzyme (87.87±1.92)% in 1000 mg L^{-1} was equivalent to that of acarbose (88.97±0.22)% at the same concentration indicating the strong potential of crude extract to inhibit *α*-glucosidase enzyme. The LC_{50} value of the extract (624.85±46.77 mg L^{-1}) was significantly higher compared to that of the positive control $K_2Cr_2O_7$ (7.97±0.97 mg L^{-1}), indicating weak cytotoxicity. Phytotoxicity studies revealed that the MIC value for root and shoot inhibition of > 500 mg L^{-1} was greater than that of ascorbic acid (> 5 mg L^{-1}). These findings imply that ethyl acetate extract of the fungal strain has significantly high activity in *α*-glucosidase enzyme inhibitory assay, and further investigation is required to explore possible applications in pharmaceutical industries.

Keywords: Acetylcholinesterase, Bioactive substances, *Phyllosticta capitalensis, Syngonium angustatum*