Antifungal Activity of Endophytic Fungal Species Isolated from Apple *(Malus domestica)*

M.A. Naseefa', A.G.A.W. Alakolanga[2]
'Department of Science and Technology, Uva Wellassa University, Badulla, Sri Lanka
'Department of Export Agriculture, Uva Wellassa University, Badulla, Sri Lanka

Novel natural metabolites with a microbial origin are one of the most interested areas in Natural Product Chemistry. This study was aimed to investigate the antifungal activity of endophytic fungal species isolated from apple *(Malus domestica)*. Endophytes, which have a microbial origin, reside inside tissue without causing apparent disease to host. Fresh apple samples from local supermarket, Badulla, were first surface sterilized to limit epiphytic fungi. Potato Dextrose Agar (PDA), supplemented with chloramphenicol (100 mg mL^{-1}) was used to isolate a *Penicilium* sp. and a *Chrysosporium* sp. at pH 5.6. Isolated endophytes were cultured in potato dextrose broth for 14 days and extracted with hexane and ethyl acetate successively. Diluted (10 %) diethyl sulfoxide was used to prepare solutions of extracts and inhibition of fungal growth was determined using disc diffusion method at five different concentrations (1000, 2000, 3000, 4000 and 5000 ppm) against *Alternaria* sp. and *Aspergillus* sp. with 100 mg mL^{-1} flucanazole as positive control. Effective concentrations ($EC_{,,,}$ and EC_{90}) were calculated for mean inhibition percentage. *Aspergillus* sp. growth was highly inhibited compared to *Alternaria* sp. by *Penicllium* extract. EtOAc extract of *Penicllium* showed high inhibition against (Minimum Inhibitory Concentration < 1000 ppm) *Alternaria* sp. than *Crysosporium* extracts (MIC 4572.2 ppm). Brine Srimp Lethality Assay (BSLA) was also carried out with 48h old naupali. Results were noted after 24 h. *Penicllium* sp. extract showed a high lethal toxicity (LC50 402.078 ppm) as they may produce excess of metabolites than *Crysosporium* sp. The observation of different antifungal activity of the two types of endophytic fungal extracts revealed the variations in chances and rates of producing secondary metabolites. With these results, it can be concluded that, apple endophytic fungal extracts can be used to control selected phytopathogenic fungal species, but the toxicity of extracts should be considered in case of food commodity.

Keywords: Endophytic fungi, Fungal extract, Bioactivities, *Malus domestica*, Antifungal compounds