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Isolation and characterization of mangrove endophytic fungi

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Endophytes are ubiquitous in most plants and they are by definition, the microorganisms that reside in the plant tissues, colonizing locally as well as systemically without causing harm to the particular plant. As different plant parts represent different cytological environments, it is believed that diverse microbial flora might reside in these plant tissues. Considering the scarcity of records regarding mangrove endophytic fungi in Sri Lanka, a preliminary study for leaf endophytic fungi was carried out. Present study was conducted to isolate fungal leaf endophytes from mangrove leaves and to determine their beneficial characteristics. Endophytic fungi were isolated from the inner tissues of leaves of four true mangrove species namely *Avicennia marina*, *Brugeira gymnorhiza*, *Lumnitzera racemosa* and *Rhizophora mucronata*. Twelve different fungal isolates were obtained according to the morphological differences visible through plate culture and slide culture technique. Each isolate was separately tested for extracellular enzyme production (amylase, pectinase, cellulase, chitosanase, laccase), antimicrobial compound production (Test organisms – *Staphylococcus aureus*, *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Candida albicans*) and phosphate solubilization. From the total of 12 isolates, AMF1, AMF2 were able to produce laccase. All the isolates except for LRF1 were able to produce chitosanase. For amylase, pectinase and cellulase production, Enzyme Index (EI) was determined and isolates LRF3, BGF2 and AMF2 showed highest EI for amylase, pectinase and cellulase enzymes accordingly. For bioactive compound production, isolated endophytic fungi had the ability to produce antibiotics and antifungals. Nine isolates were able to demonstrate moderate or higher inhibition against at least one test organism. AMF2, BGF1 were able to demonstrate phosphate solubilization. In overall, each fungal isolate was able to demonstrate its ability for at least one character they were experimented for. With the results of the study, it was clear that the isolated fungi had many beneficial abilities and that they should be further experimented to be used in the industrial processes.

Keywords – leaf endophytes, mangrove, fungi, enzymes, antimicrobials

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