

Screening of Fungi with Low-Density Polyethylene Degrading Capacity from Solid Waste

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Low-density polyethylene (LDPE) undergoes extremely slow natural degradation, leading to its accumulation in nature and causing serious ecological problems. Therefore, investigating environmentally friendly strategies to accelerate LDPE degradation is essential to mitigate these ecological issues. This study aims to isolate soil fungi strains with the ability to degrade LDPE. Soil samples were collected from the Manampitiya landfill and Rajarata University premises, and fungal strains were isolated using the spread plate technique. Ten fungal strains isolated from soil samples, along with an additional ten isolates obtained from the Rajarata University Fungal Culture Collection, were subjected to LDPE degradation assays. The physical changes of the LDPE strips were observed under a scanning electron microscope (SEM). All 20 fungal strains were also screened for fungal enzymes; laccase and esterase, which are typically involved in plastic biodegradation. Among the 20 strains, RM16 exhibited the ability to produce the laccase enzyme, while RM18 showed the ability to produce the esterase enzyme. SEM analysis revealed the formation of cracks in the LDPE strips by the fungal isolate RM18, confirming its biodegradation capability. Molecular and morphological characterization of RM18 isolate was identified as *Aspergillus* species.

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