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BIODEGRADABILITY OF LOW DENSITY POLYETHYLENE BY SOIL FUNGUS *Talaromyces purpureogenus* ISOLATE SJP-GF085

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Low-density polyethylene (LDPE) is globally the most common single use plastic ingredient. The LDPE waste accumulation is considered as an adverse environmental issue threatening both terrestrial and aquatic ecosystems. Therefore, accelerating the biodegradation process is a potential eco-friendly alternative to manage persisting LDPE waste. The present study focused on isolation and screening of LDPE degrading fungi from selected urban dump-sites in Sri Lanka. Soil samples with partially degraded polyethylene were collected from Karadiyana, Meethotamulla and Kaduwela. Fungi with different morphological features were isolated from enriched samples and pure cultures were maintained. Primary screening tests were conducted in potato dextrose broth (PDB) which contained pre-sterilized LDPE pellets inoculated with fungus. Samples were incubated at 28 °C for 60 days and controls were maintained without inoculation of fungi. At 60 days of incubation, LDPE pellets were recovered and percentages weight loss (WL %) was calculated. Further analyses were carried out on potato dextrose agar (PDA) contained in a 5 × 5 cm^2 LDPE film inoculated with fungal isolates at 28 °C for 90 days. Treated LDPE films were then analyzed with Fourier-transform infrared spectroscopy (FTIR). Fungi were identified based on morphology and DNA sequence data. In total, 30 morphologically different fungi were assessed in this study. Among them, only 15 isolates indicated more than 3% of WL in primary screening. Among them, the LDPE tested with fungal isolate SJP-GF085 showed 6 ± 0.5% WL at 60 days of incubation in PDB and 15 ± 1.5% WL after 90 days of incubation on PDA. The isolate SJP-GF085 was identified as *Talaromyces purpureogenus* based on DNA sequence of nuclear ribosomal internal transcribed spacer region (ITS: GenBank MT756246). Minor shifts of FTIR spectrum of treated samples compared to the control LPDE indicated the initiation of biodegradation. This study highlights the potential of using *T. purpureogenus* isolate SJP-GF085 as a potential biological agent which can be used to enhance the LDPE waste degradation.

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