

Biodegradation of polystyrene by various bacteria from landfill soils

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Polystyrene (PS), a major plastic waste, is difficult to biodegrade due to its unique structure that comprises phenyl moieties attached to long linear alkanes. Thus, the biodegradation or chemical modification of PS is a rare natural occurrence. In this study, we investigated the biodegradation of PS by bacterial cultures obtained from landfill soils. The new strains *Pseudomonas* sp. JNU01 and *Acinetobacter* sp. JNU01 were more specifically enriched in non-carbonaceous nutrient medium when exposed to PS as the only source of carbon. Their growth after culturing in basal media, which was confirmed by measuring optical densities (OD₆₀₀), increased by more than 3-fold in the presence of PS. Fourier transform infrared spectroscopy (FT-IR) analysis, used to confirm the formation of hydroxyl (-OH) groups and potential double bond groups (C=X; X might be O, N, or C), showed that the amount of oxidized PS samples increased with the improvement in the strength of chemically oxidative treatments. These results provide significant insights into the discovery of novel functions of *Pseudomonas* sp. and *Acinetobacter* sp. and their potential as PS decomposers.