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# Statistical optimization of operating parameters towards improved Polyethylene terephthalate degradation by novel rhizospheric consortium

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## Abstract

The current study prioritizes the polymer degradation potential of the rhizobacteria consortium of *Bacillus* species screened from the polluted plastic sites for polyethylene terephthalate (PET) powder. The screening of rhizobacterial isolates was carried out, and degradation abilities were studied for 18 days for PET powder. The three isolates that showed the highest degradation percentage were combined to study the degradation efficiency. The combination demonstrated the highest weight reduction percentage for PET, which was selected for further degradation study at various parameters. The biodegradation end products post 18 days were studied by FTIR, HPLC, and SEM. The isolates were characterized by 16S rRNA sequencing. The highest percentage of weight reduction for PET powder treated with consortium was determined to be 73.4% at pH 7 and 30°C temperature compared with other varying values. The study suggested that this novel rhizobacterial consortium can be scaled up as potential inoculums for the enhanced biodegradation of PET plastic waste.

**Keywords:** Novel rhizobacterial consortia, PET plastic, Biodegradation, Response Surface Methodology

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