

## Bioaugmentation of polyethylene succinate contaminated soil with *Pseudomonas* sp AKS2 results in increased microbial activity and better polymer remediation

Prosun Tribedi

University of Calcutta, India

**P***Pseudomonas* sp AKS2 isolated from soil degrades polyethylene succinate (PES) efficiently in laboratory. However, this isolated organism may not be able to degrade PES with similar efficiency in a natural soil environment. Since in situ remediation is preferred for the effective removal of recalcitrant materials like plastic, in this current study bioaugmentation strategy of this organism was investigated in this contaminated soil.

To investigate the potential of AKS2 strain to bioaugment the PES-contaminated soil, a microcosm-based study was performed wherein naturally attenuated, biostimulated and AKS2 inoculated (bioaugmented) soil samples were tested for their ability to degrade PES. The results showed a better remediation of PES by bioaugmented soil than other microcosms studied. Consistent with it, higher number of PES-degrading organisms were found in bioaugmented microcosm. The bioaugmented microcosm also exhibited higher level of average well-color development in BiOLOG-ECO plate assay than the other two microcosms tested. The corresponding Shannon-Weaver index and Gini co-efficient also revealed a higher soil microbial diversity of bioaugmented microcosm than the others two. This was further supported by community level physiological profile (CLPP) of three different microcosms wherein we have observed better utilization of different carbon sources by bioaugmented microcosms. Collectively these results demonstrate that bioaugmentation of PES contaminated soil with AKS2 not only enhances polymer remediation but also increases soil microbial activity.

Bioaugmentation of soil with AKS2 enhances PES remediation without causing a damage to soil ecology. Thus *Pseudomonas* sp AKS2 has the potential to be implemented as a useful tool for in situ bioremediation of PES in soil.

### Biography

I, Prosun Tribedi have completed my M.Sc from the University of Calcutta and qualified several competitive examinations like GATE, CSIR NET (JRF). I am pursuing my Ph.D at the department of Microbiology, University of Calcutta on bioremediation of synthetic polymers for the last 4 years. During this tenure, I have published two original research articles in internationally reputed journals. I have also presented several posters, oral talk in different national and international seminars and conferences.

tribedi.prosun@gmail.com