

Advancements in Environmental Biotechnology



Dr. Roohi
Dr. Alvina Farooqui
Dr. Aisha Kamal

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Editors

Dr. Roohi

Dr. Alvina Farooqui

Dr. Aisha Kamal

Department of Environmental Science
Integral University, Lucknow (U.P) INDIA



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Dr. Roohi, Dr. Alvina Farooqui and Dr. Aisha Kamal

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CHAPTER 8

MICROBIAL BIODEGRADATION OF POLYMERS

Ramsha Ahrar and Reena Vishvakarma*

Department of Bioengineering, Integral University, Lucknow

*Corresponding author: reena@iul.ac.in

Abstract

Biodegradable polymers are a novel and promising alternative to non-biodegradable plastics that find application in mostly every commodity today due to their strength and malleability. The major concern in using non-biodegradable plastics is their degradation as it is highly demanding process and is not possible to eliminate the polymers completely. This possesses a negative impact on the environment. Biodegradable polymers such as Polyhydroxyalkanoates (PHAs) accumulate in bacteria as insoluble granules of which Poly-3-hydroxybutyrates (PHBs) are the most common. The intra- and extra-cellular degradation of PHBs can be achieved easily through biocatalyst PHB depolymerase enzyme which have reported to be isolated from microorganisms such as bacteria, yeast, and fungus. Some common microorganisms as the source of PHB depolymerase are *Pseudomonas lemoigne*, *Comamonas* sp., *Acidovorax faecalis*, *Aspergillus fumigates*, and *Variovorax paradoxus*, *Alcaligenes faecalis*, *Pseudomonas*, *Pseudomonas strutzeri*. Future studies on finding novel sources of biopolymer degrading enzyme PHB depolymerase will open new arena for efficient polymer degradation. Using enzymes with better catalytic efficiency.

Keywords: Polymers, Polyhydroxyalkanoates, Poly-3-hydroxybutyrate, Poly-3-hydroxybutyrate depolymerase, Biodegradation