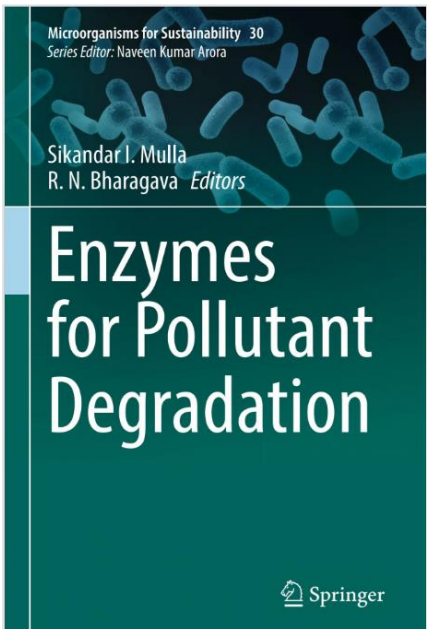

Plastic degradation and utilization by microbes

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Plastic degradation and utilization by microbes: Challenges and scope

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ABSTRACT
After the discovery of plastics in 1950, it has been used expeditiously throughout the world, which leads to its overaccumulation in the ecosystem. Microplastics are widely affecting the life of terrestrials and marine ecosystems. Natural depolymerization of plastics is very slow and progression takes a long time. Physical and chemical methods are quite worthwhile, but the biological plastics degradation has gained an interest in recent decades. In the biological degradation of plastics, the microorganisms attach to the surface of the plastics and the enzymes convert long chain of polymers into non- or less toxic forms. This review summarizes progressive data on microorganisms degrading plastics, physical and chemical methods, mechanisms for biofilm formation onto plastic materials, enhancement of microbial depolymerization by enzymatic catalysis, the engineering of enzymes, pathways modification, and microbiome's role in plastic depolymerization.

KEYWORD
Microbial depolymerization; Biofilms; Biodegradation; Depolymerases; Free radicals