

Biodegradation Study of Diethyl Phthalate Using Bacteria Isolated from Plastic Industry Wastewater Discharge Site

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Abstract : Phthalates are among the most common organic pollutant since they have become widespread in the environment and found in sediments, natural waters, soils, plants, landfill leachates, biota including human tissue and aquatic organisms. Diethyl phthalate (DEP) is a low molecular weight phthalate which has wide applications as plasticizer and become a major cause of environmental pollution. Environmental protection agency (EPA) listed DEP as priority pollutant because of its toxicity and they recommended human health ambient water quality criterion for diethyl phthalate (DEP) as 4 mg/l. Therefore, wastes containing phthalates require proper treatment before being discharged into the environment. Biodegradation is attractive and efficient treatment method as it is cost effective and produces non-toxic end products. In the present study, a DEP degrading aerobic bacterium was isolated from soil contaminated with plastic industry wastewater. Morphological and biochemical characteristics of isolate were performed. 16S rRNA sequencing and phylogenetic analysis of isolate was carried out and it was identified as *Empedobacter brevis*. Isolate has been found to tolerate up to 1650 mg/l of DEP. This study will be significant for exploring an application of microbes for remediation of phthalates and development of a suitable bioreactor.

Keywords : diethyl phthalate, plasticizer, pollutant, biodegradation

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