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Degradation of Disposable Diaper Using Consortium of Isolated Soil Microbes

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Disposable diapers are popular consumer products. But they do have several dangerous environmental drawbacks. Due to their mixed organic-inorganic composition, they are usually perceived as a problematic non-biodegradable waste. The use of poly (sodium acrylate) (PSA) is increasing day by day and its degradation is becoming a great challenge. In this study, the biodegradability of poly (sodium acrylate) (PSA) using a consortium of microorganisms was investigated. We had identified and isolated microorganisms which have the capability of degrading poly sodium acrylate (PSA) form the soil. The degradation of poly sodium acrylate was confirmed by change in pH, spectral analysis of the digest and also by RPHPLC analysis. The biochemical studies and morphological characterization of the selected sodium polyacrylate degrading organisms presented that Proteus and Pseudomonas are the microorganisms responsible for this degradation. Comparative analysis pointed out that Proteus is more potent in PSA degradation than Pseudomonas. The compatibility test showed that both organisms are compatible and can be used as a consortium for degrading the sodium polyacrylate. The organism which exhibits more activity was analyzed using molecular methods. Identification of isolated strain was confirmed by 16 S rDNA and was confirmed as *Proteus mirabilis* by BLAST analysis. The identification and isolation of these organisms points towards the efficient disposal of diapers and sanitary napkins in an eco-friendly approach.

Keywords: Bacteria, Diaper, PSA-Poly sodium acrylate degradation, Proteus, Pseudomonas