



Phenol Biodegradation Using Native and Granulated Microorganisms Adapted from Petroleum Wastewater

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Toxic phenolic wastewater has become a significant environmental issue due to the overuse of phenol-containing products and their uncontrolled discharge. The aim of the present study is to determine the viability, resistance, and potential application of native and granulated microorganisms in an efficient phenol biodegradation process. The screening was carried out by providing phenol concentrations between 100 to 2000 mgL⁻¹, which are increased progressively. pH, biomass, COD, oil materials, NH₄⁺, NO₃, chlorides, sulphates, phosphates, and phenol tolerance were all analyzed. Microorganism resistance decreased dramatically as phenol concentration increased. When all the sample strains were used in combination, the results were better. *Citrobacter* sp., *Raoultella* sp., *Leclerciasp.*, and two species of yeasts were adapted from oil refinery effluent and synthetic water. The study examines the adaptation, granulation, and characterization of native and granulated microorganisms from petroleum wastewater for the biodegradation of high phenol concentration and its potential as an alternative for the phenol bioremediation method.

Keywords: Biodegradation, Phenol degradation, Wastewater.