Characterization of Bacteria Degrading Petroleum Derivatives Isolated from Contaminated Soil and Water

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Abstract

Due to widespread use of petroleum products, the number of petroleum-contaminated sites has abounded. Natural attenuation, which relies on in situ biodegradation of pollutants, has received a large amount of attention, especially for petroleum contamination. Therefore in this research two types of samples, natural and enriched, from two different sources, soil and water were chosen and oil degrading microorganisms were isolated using different gasoline containing mineral media supplemented with yeast extract and or glucose. Fifty-five isolated strains were selected according to their simultaneous good growth on mineral medium with oil and nutrient agar. Several micromorphological and biochemical characteristics of isolated oil-degrading strains were determined. 73% of them were gram negative, 42.5% oxidase negative, 40.7% catalase positive, 59% showed oxidative glucose metabolism. The dominant portion of the strains could possibly belong to the family Pseudomonadaceae, while another dominant group was members of the Coryneform taxa. By checking the biodegradative ability of our selected oil-degrading strains on individual hydrocarbon derivatives we showed that 10% of our strains could decompose n-dodecane easily and very fast. The utilization of 1-dodecene, naphtalene, benzol, and cyclohexane, respectively seems to be characteristic for always less and less strains. The speed of growth of 1-dodecene was lower than other compounds.

Keywords: Oil-degrading bacteria; Petroleum derivatives; Enrichment culture; Isolation and purification

Introduction

Oil pollution has been one of the most important environmental problems in the last 60 years. Explosion of oil tanks by rockets or other war equipments, using old tankers for oil transport, damaging of oil pipes and other catastrophic events could together lead to disastrous oil distribution into natural environment [3]. This inevitably has hazardous effects on human life and safety. Many studies have been planed to either prevent

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