-Biodegradation Ability and Catabolic Genes of Petroleum Degrading Sphingomonas koreensis Strain ASU-06 Isolated from Egyptian Oily Soil

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Abstract:

Polycyclic aromatic hydrocarbons (PAHs) are serious pollutants and health hazards. In this study, 15 PAHs-degrading bacteria were isolated from Egyptian oily soil. Among them, one Gram-negative strain (ASU-06) was selected and biodegradation ability and initial catabolic genes of petroleum compounds were investigated. Comparison of 16S rRNA gene sequence of strain ASU-06 to published sequences in GenBank database as well as phylogenetic analysis identified ASU-06 as Sphingomonas koreensis. Strain ASU-06 degraded 100, 99, 98, and 92.7% of 100mg/L naphthalene, phenanthrene, anthracene, and pyrene within 15 days, respectively. When these PAHs present in a mixed form, the enhancement phenomenon appeared, particularly in the degradation of pyrene, whereas the degradation rate was 98.6% within the period. This is the first report showing the degradation of different PAHs by this species. PCR experiments with specific primers for catabolic genes alkB, alkB1, nahAc, C12O, and C23O suggested that ASU-06 might possess genes for aliphatic and PAHs degradation, while PAH-RHD

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