



## Screening and batch treatment of wastewater containing floating oil using oil-degrading bacteria

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### ABSTRACT

Oil pollution is one of the important environmental problems in the world. In order to degrade floating crude oil in the wastewater, two soil samples were taken from the oil-contaminated soils in Ahwaz (Iran) and an oil refinery complex in Tehran (Iran). Fourteen strains of bacteria isolated from these samples. Among these bacteria a strain marked as A-14 could treat 91% of total petroleum hydrocarbons and 83% of aromatic compounds in the floating crude oil after 10 d. Also the optimum time to reach the maximum removal percent (90%) was found to be 7 d. A-14 was identified to be *Pseudomonas aeruginosa*. All isolated bacteria in this study were able to produce biosurfactant. A-12 resulted in the best emulsification index that was about 36%. However, this strain could remove only 46% and 37% of the total petroleum hydrocarbons and aromatic compound, respectively. Most of the isolated microorganisms in this study had higher efficiency for the degradation of total petroleum hydrocarbons (TPH) than aromatic compounds. In most of the previous studies, only dissolved or tiny droplet of crude oil were degraded but the pure culture of *P. aeruginosa* that we isolated them from the oil contaminated soils could degrade floating crude oil with high removal efficiency (90%).

*Keywords:* Biodegradation; Floating oil; Oil pollution; *Pseudomonas aeruginosa* bacteria; Biosurfactant

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