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Title: Characterization of PAH's Degrading Bacteria in Coastal Sediments

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Objectives/Hypothesis

Little is known about the degrading flora present during the bioremediation process for treatment of polycyclic aromatic hydrocarbons (PAHs). The characterization of bacteria present would greatly enhance ongoing studies which are underway at Rice University. The goal of the proposed research was to quantify and characterize microorganisms in sediment samples contaminated with PAHs (Fluorene or phenathrene). Specific research objectives were:

- enumerate the micro flora (Bacteria) of the contaminated sediments, collected by Rice University (Houston) capable of degrading PAH's compounds: phenanthrene, fluorene, and naphthalene.
- isolate the bacteria degrading PAH's.
- identify and characterize the isolates.
- evaluate the isolates for the ability to degrade PAH's compounds.

Approach

The isolated organisms were evaluated for their ability to degrade PAHs compounds (fluorene or phenathrene). The results will support current research at Rice University (Houston), e.g. isolates can be applied *in situ* bioremediation experiments.

Results

The goal of the project was to quantify and characterize microorganisms in sediment samples contaminated with polycyclic aromatic hydrocarbons (PAHs: phenathrene, fluorene, and naphthalene). The isolated organisms were evaluated for their ability to degrade PAHs compounds. The results indicated that the total number of recovered heterotrophic colony forming units was higher than some forming units produced by the PAHs compounds. There was relationship was between the biomass of the bacteria recovered from the sediment and the degradation of the compounds. This indicated the utilization of the compounds by the bacteria as carbon source. Two bacterial species were isolated from the contaminated sediments and identified as *Pseudomonas* sp, and *Ochrobactrum* sp.

Supplemental Keywords

Bioremediation, microorganisms, and phenathrene

Publications and Presentations

Tadros, M.G. and J.B. Hughes, "Degradation of Aromatic Hydrocarbons (PAHs) by Indigenous Mixed and Pure Cultures Isolated from Coastal Sediments", *Appl. Biochem. Biotechnol.*, 1997, Vol. 63-65, pp. 865-870.

Tadros, M, "Characterization of PAH's Degrading Bacteria in Coastal Sediments", Poster presented at WERC/HSRC Joint Conference on the Environment, Albuquerque, NM, April 22-24, 1997.

Tadros, M. and J. Hughes, "Characterization of PAH Degrading Bacteria in Coastal Studies", Final Project Submitted to the South and Southwest Hazardous Substance Research Center, June 1997.