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# ABSTRACT

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## Abstract

**Name:** Hager Rabea Mohamed Ali

**Title of thesis:** Evaluation of petroleum contamination in the Suez Gulf with special emphasis on polynuclear aromatic hydrocarbons

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The present study deals with environmental assessment of petroleum contaminants, in Gulf of Suez and its main sources of contamination, Suez Canal and Tamsah Lake. The first step includes the magnitude and concentration of oil content. Environmental samples (water, sediment and fish) were collected and analyzed using gas chromatography to identify the origin (petrogenic or biogenic), sources of hydrocarbons contaminants (crude oil, fuel oil, lubricating oil, tank ballast water, etc) and weathering degrees (fresh, weathered, highly weathered). Also high performance liquid chromatography is used to identify levels and the distribution of 16 polynuclear aromatic hydrocarbons listed by US-EPA which is used as a marker to identify the sources of PAHs (petrogenic or pyrogenic).

Hydrochemical analysis of the collected water samples were carried out in the study area (Total dissolved solids, Frequency distribution of major ions, ion ratios, hypothetical ion combinations, hydrochemical facies and genetic classifications) in order to detect the mineralization sources in the analyzed water sample.

A comparative evaluation study of biostimulation and bioaugmentation for bioremediation were applied on three representative models of contaminated sediment samples. Biostimulation treatment shows the best results in biotreatment techniques of oil polluted sediments regardless to the type of hydrocarbon and its concentration, indicating that biostimulation treatment accelerated the biodegradation process, as compared to *Staphylococcus gallinarum* NSH37 and bioaugmentation treatments. Results obtained from bioremediation study shows that, it can be used as a polishing step after conventional mechanical clean up options have been applied.