

Distribution of Total Petroleum Hydrocarbons (TPHs) in Sediments of Southern Iraqi Rivers

Duha S. Kareem^{*1}, Salah M. Saleh², Fadel Jabar², Ibtihal Sh. Abdullah³, Hamid T. Alsaad².

¹⁻ College of Science, Department of Geology, University of Basrah

²⁻ College of Marine Science, University of Basrah, Iraq.

³⁻ College of Arts Department of Geography and Information Systems, University of Basrah, Iraq.

*E-mail: duha.saleh@uobasrah.edu.iq

Received: 18 February 2023

Accepted: 8 March 2023

Abstract

Although the Tigris, Euphrates, and Shatt Al-Arab rivers are important parts of Iraq, pollution has a series effect on these rivers. The aim of this study is to determine the origins and sources of Total Petroleum hydrocarbons in sediment samples collected from 15 stations in 2022. The concentration of the total petroleum hydrocarbons was determined using a spectrofluorometer. The study found that Station 12, located at Shatt Al-Arab rivers, had the highest concentration at 28.76 µg/g dry weight, while Station 1 had the lowest concentration at 3.41 µg/g dry weight. There are several facilities that may contribute to the rise in total petroleum hydrocarbons, which may be attributed to the emissions of power stations and oil fields, such as West Qurna, Majnoon, Siba, and Rumaila. In addition to the pollution of fishing boats, which use oil as fuel, sewage pipes also dump their waste.

Keywords: Total petroleum hydrocarbons, sediments, Tigris, Euphrates, Shatt Al-Arab, Southern Iraq.

Introduction

Petroleum is an intricate blend of hydrocarbons that exhibit distinct chemical compositions and unique physical traits. These attributes are contingent upon the geographical and geological sources of crude oil as well as the method of cracking applied during the refining process. The issue surrounding petroleum hydrocarbons in the environment stems from their potential to inflict severe health repercussions on both humans and animals (Nuhad *et al.*, 2014).

Total Petroleum Hydrocarbons (TPH) are complex chemical compounds originating

from crude oil, encompassing a vast array of substances primarily composed of carbon and hydrogen. These include but are not limited to alkanes, cycloalkanes, alkenes, and aromatic hydrocarbons such as arenes (Todd *et al.*, 1999). Various processes can release hydrocarbons into the environment, such as burning solid waste, seepage, and accidental spillage during transportation of petroleum products. Oil spills in aquatic environments, whether in seas or rivers, can lead to widespread contamination (Liu *et al.* 2009). Additionally, these compounds can be transported to sediments through adsorption onto particles or suspended