

## Original Article

# Total petroleum hydrocarbons in water, sediment, and Redbelly tilapia, *Coptodon zillii* in Shatt Al-Basrah Canal, Iraq

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**Abstract:** Water pollution is one of the most common global problems resulting from increased industrial and agricultural activities. Petroleum hydrocarbons have extremely dangerous to the aquatic environment. The total petroleum hydrocarbon (TPHs) was investigated in water, sediment, and muscles of *Coptodon zillii* at Abu Sakhir and Al-Zubair Bridge stations seasonally in the Shatt al-Basra Canal. The results showed a variation in the TPHs levels in the studied stations. In addition, a significant difference in the TPHs was recorded during the seasons in the water, and sediments between stations. The results showed significant differences in the TPHs in the muscles in the spring but no significant in other seasons between the two stations. The results of the lipid contents of fish revealed significant differences between the two studied stations in the fall, spring, and summer seasons but not significant in winter.

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## Introduction

Water contamination is a crucial global problem resulting from expanding industrial and agricultural activities (Wang et al., 2019). Many pollutants enter the aquatic environments directly or indirectly due to human activities, affecting aquatic organisms (Li et al., 2019). One of the main environmental pollutants worldwide is crude oil-based hydrocarbons (Ławniczak et al., 2020). Petroleum hydrocarbon pollution is a significant environmental issue that threatens the aquatic environment, whether from benzene or other toxic organic materials (Abha and Singh, 2012). Increased urbanization and intensive industrial activities have led to an increase in the consumption of oil and its products worldwide (Liu et al., 2019).

There are many ways to enter oil contaminants in the aquatic environment e.g. discharged through oil spill accidents or by-products for individual or commercial uses (Cai, 2021). Furthermore, navigation, transporting oil, washing loading docks,

balance water, and export ports are the main sources of pollution of aquatic ecosystems that have been reported as approximately 6 million tons annually (Chougule et al., 2009). In addition, there are other sources of hydrocarbon pollution, such as domestic, agricultural, and power plant releases (Frena et al., 2017). Therefore, when petroleum hydrocarbons are discharged into aquatic ecosystems, they cause harm to living organisms, with toxic effects ranging from acute to chronic depending on the metabolism and photo-oxidation process (Kuppusamy et al., 2020). This damage may appear direct or indirect after a long period (Rodrigues et al., 2010).

Releasing large quantities of petroleum hydrocarbons into rivers and coastal areas during oil production and transportation negatively impacts the environment and human health (Ihunwo et al., 2021). It would be affected water in its dissolved particles, organisms, and sediments phase (Raja et al., 2022). Because of their hydrophobic nature, hydrocarbons tend to bind to organic particles in aquatic

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