



Concentrations of Polychlorinated Biphenyls (PCB) in Water of the Southern Part of Tigris River-Iraq

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ABSTRACT

Polychlorinated Biphenyls (PCB) contamination has spread throughout the world due to its high stability and tendency to accumulate in the bodies of living organisms resulting in serious health effects on organisms. Water samples were collected from four stations along the southern part of the Tigris River during the period from autumn (2022) to summer (2023) to determine the concentrations of PCB compounds. Twelve compounds of PCBs were identified in the study areas; namely, PCB153, PCB149, PCB141, PCB138, PCB101, PCB52, PCB44, PCB31, PCB28, PCB18, PCB194, PCB189 one dioxin-like PCB compound appeared (PCB189). The concentrations of total PCBs in water samples ranged from (1.2ng/L) during the winter to (18.8ug/L) during the autumn season; these compounds recorded the highest level in the upper station compared to the lower stations. This may be due to human activities, household wastes and neighboring agricultural lands that use fertilizers and pesticides as sources of PCB compounds.

INTRODUCTION

Environmental pollution is one of the serious problems facing communities around the world since ancient times, especially in poor communities; this problem forms a direct threat in terms of its impact on human health and the resources (Al-Hejuje *et al.*, 2015). Components that transition from useful elements to harmful pollutants lose much of their natural role in ecosystems (Saadoun, 2018). Water pollution is a major problem that is increasingly complicated by the release of pollutants directly or indirectly from domestic, industrial and agricultural waste water, production, refining and transportation of crude oil (Al-Hejuje, 2014). Certain pollutants exhibit high chemical stability, resisting decomposition or breakdown. This characteristic contributes to their widespread and complex dissemination (WHO/IPCS, 1993).

The term PCBs refers to the group of chlorinated organic compounds known as polychlorinated biphenyls. These are synthetic aromatic compounds formed by replacing hydrogen atoms on a biphenyl molecule (two benzene rings bonded together by a single