



**MONITORING OF ORGANOPHOSPHORUS PESTIVIDES AND REMEDIATION
TECHNOLOGIES OF THE FREQUENTLY DETECTED (CHLORPYRIFOS) IN DRINKING
WATER**

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ABSTRACT



studies on the currently used organophosphorus insecticides with respect to their environmental levels and effective remediation technologies for their residues in water have been considered as a source of major concern. This study was carried out to monitor the presence of organophosphorus in drinking water plants (Kafr-El-Shiekh, Ebshan, Elhamoul, Mehalt Aboali, Fowa, Balteem and Metobess) in Kafr-El-Shiekh Governorate, Egypt. Furthermore, it was carried out to evaluate the efficiency of different remediation technologies (advanced oxidation processes and bioremediation) for removing chlorpyrifos in drinking water. The results showed the presence of several organophosphorus pesticides in water sampling sites. Chlorpyrifos was detected with high frequency relative to other compounds in drinking water. Nano photo-Fenton like reagent ($\text{Fe}_2\text{O}_3(\text{nano})/\text{H}_2\text{O}_2/\text{UV}$) was the most effective treatment for chlorpyrifos removal in drinking water followed by $\text{ZnO}(\text{nano})/\text{H}_2\text{O}_2/\text{UV}$, $\text{Fe}^{3+}/\text{H}_2\text{O}_2/\text{UV}$ and $\text{ZnO}/\text{H}_2\text{O}_2/\text{UV}$, respectively. Bioremediation of chlorpyrifos by effective microorganisms (EMs) removed 100% of the chlorpyrifos initial concentration after 23 days of treatment. There is no remaining toxicity in chlorpyrifos contaminated-water after remediation on treated rats with respect to cholinesterase activity and histological changes in kidney and liver relative to control. Advanced oxidation processes especially with nanomaterials and bioremediation with effective microorganisms can be regarded as safe and effective remediation technologies for chlorpyrifos in drinking water.