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Understanding the Impact of Polycyclic Aromatic Hydrocarbons (PAHs) on Aquatic Organisms: A Comprehensive Toxicological Investigation through Bioaccumulation in the Food Web

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Abstract

Polycyclic aromatic hydrocarbons (PAHs) are pervasive environmental pollutants known for their persistence and potential toxicity in aquatic ecosystems. This abstract reviews the comprehensive toxicological investigation of PAHs, focusing on their bioaccumulation through the aquatic food web. PAHs enter water bodies through sources such as industrial discharges, urban runoff, and oil spills, where they are absorbed by aquatic organisms. Bioaccumulation occurs as PAHs transfer through trophic levels, concentrating in lipid-rich tissues of organisms and magnifying in top predators. Ecological consequences include disruption of physiological processes, reproductive impairments, and altered behavior in aquatic fauna. Human health risks arise from PAH-contaminated seafood consumption, with some compounds recognized as carcinogenic. Regulatory measures and mitigation strategies aim to control PAH emissions, remediate contaminated sites, and monitor environmental levels. Continued research is essential to understand and mitigate the complex impacts of PAHs on aquatic ecosystems and human health.

