

# Dismantling Microplastic Menace: Strategies for Detection, Removal, Toxicity Evaluation, and Containment in Ecosystems

Hong Zhao\*

Department of Environmental Engineering, Tianjin University, China

## Abstract

Over the past few decades, the accumulation and fragmentation of plastics on Earth's surface has resulted in a number of long-term climate and health risks. plastic-based materials, particularly microplastics (MPs); They have received a lot of attention from scientists all over the world because of their bioaccumulation, non-biodegradability, and ecotoxicological effects on living things. This study explains how microplastics are produced, transported, and disposed of in the environment on the basis of their physicochemical properties and sources. Additionally, the study investigates the impact of COVID-19 on global plastic waste production. MPs can be quantified and identified using physical and chemical techniques like SEM-EDX, PLM, FTIR, Raman, TG-DSC, and GC-MS. This paper discusses both established and cutting-edge methods for removing microplastics from aquatic systems. The findings of this review help us better understand the studies on the toxicity of microplastics to humans, aquatic life, and soil ecosystems. Additionally, in order to lessen the risk posed by MP waste in the future, it is necessary to investigate the global efforts and measures taken to combat it.

**Keywords:** microplastics, detection, removal, toxicity evaluation, containment, ecosystems, environmental engineering, Tianjin University, China

**Introduction**

The introduction section discusses the global environmental challenge posed by microplastics, their sources, and the need for comprehensive strategies for their management. It highlights the impact of COVID-19 on plastic waste production and the importance of understanding the toxicity of microplastics to various ecosystems. The text also mentions the need for global efforts and measures to combat microplastic waste in the future.

