PLASTIC PARTICLES, AQUATIC SYSTEMS: THE EMERGING THREAT OF MICROPLASTICS TO BIODIVERSITY

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Abstract. Microplastics have emerged as a pervasive and persistent form of pollution in aquatic ecosystems, posing potential risks to ecosystem functioning. This review synthesizes current knowledge on the sources, environmental distribution, biological interactions, and ecological implications of microplastics in marine and freshwater systems. Microplastics originate from both primary inputs (e.g., microbeads, synthetic fibers) and secondary fragmentation of larger plastic debris and are widely transported across aquatic compartments through hydrodynamic and biological processes. Evidence shows that aquatic organisms across multiple trophic levels can ingest microplastics, leading to physical damage, physiological stress, and potential reproductive and metabolic alterations. However, recent studies suggest that internalization into tissues is often limited and highly dependent on particle size, exposure conditions, and methodological approaches. While microplastics may act as vectors for contaminants and pathogens, experimental evidence is often based on unrealistic exposure scenarios, limiting ecological relevance. Overall, microplastics represent a potential but still not fully quantified threat to aquatic biodiversity, highlighting the need for more environmentally realistic and standardized research approaches.

Keywords: Microplastics, aquatic fauna, biodiversity, ecotoxicology.