

Microplastics and Their Impact on Moss Ecosystem Functions: A Comprehensive Review

Microplastic pollution has become a global environmental concern due to its pervasive presence in terrestrial and aquatic ecosystems. While the impact of microplastics on larger organisms is increasingly understood, their potential consequences for lower trophic levels, such as mosses, have garnered less attention. This review examines the current state of knowledge regarding the role of microplastics in altering moss ecosystem functions, shedding light on this understudied aspect of microplastic pollution. Mosses, as ubiquitous components of many ecosystems, play critical roles in nutrient cycling, carbon sequestration, and habitat provision. Microplastics, which are small plastic particles less than 5mm in size, have been documented in moss tissues and surrounding environments. We explore the mechanisms of microplastic-moss interactions, including uptake, accumulation, and potential adverse effects. Evidence suggests that microplastics can disrupt moss physiology, affecting photosynthesis, nutrient uptake, and water retention capabilities. The review also discusses how alterations in moss ecosystem functions can have cascading effects on higher trophic levels and overall ecosystem health. Furthermore, we highlight the potential for mosses to act as bioindicators for microplastic pollution, offering a valuable tool for monitoring and assessing the extent of contamination in various ecosystems. In conclusion, this review underscores the need for a deeper understanding of the intricate relationship between microplastics and moss ecosystem functions. It emphasizes the ecological significance of mosses and the importance of considering lower trophic levels in the context of microplastic pollution, ultimately contributing to the development of more holistic strategies for mitigating the impact of microplastics on terrestrial ecosystems.

Keywords: Microplastics; Moss; Ecosystem Functions; Pollution; Bioindicators; Terrestrial Ecosystems