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Microplastics and Their Impact on Moss Ecosystem Functions: A Comprehensive Review Prosper Onochie¹, Elohor-Oghene Amarie² National Research Tomsk State University^{1,2}

INTRODUCTION & AIM

Microplastic pollution is a growing global environmental concern affecting both terrestrial and aquatic ecosystems. This review aims to examine the role of microplastics in altering moss ecosystem functions and explore the potential of mosses as bioindicators for microplastic pollution **Objectives:**

- To investigate how microplastics interact with mosses
- To assess the impact of microplastics on moss ecosystem functions
- To evaluate the potential of mosses as bioindicators for monitoring microplastic pollution in terrestrial ecosystems.

(a) 800 - Abundance 700 - 600 - 500 - 400 - 300 -

METHOD

- 1. Sphagnum sampling
- 2. Sphagnum identification
- 3. Sample preparation
- 4. Microplastic Extraction
- 5. Characterisation and Quantification

Shift from Petroleum-Based Macroplastics & microplastics Infrastructure development Polymers Plastic waste Beauty products Clothing Microflakes Microbeads Microfibers Plastic waste Ocean-bound **Road runoff** plastic Circular Distribution collection bioeconomy Improper waste Upcycling into marine management Product environments Wastewater development pathways **Ocean plastic** collection Societal and environmental impacts Food and health Pollution Economic costs

Figure 1. An overview of the sources of microplastics, their implications and migration pathways







Figure 4. The abundance of microplastics in peatland areas. Letters indicate the significant difference of each particle size (*p* < 0.05).

CONCLUSION

RESULTS & DISCUSSION



Figure 2. Examples of microplastic types identified by FT–IR in peatlands (a) fiber, (b) fragment, (c) foam, and (d) film.

Film

Foam

The research demonstrates that microplastics alter moss ecosystem functions and highlights mosses' potential as bioindicators for monitoring pollution. This study emphasizes the environmental threat posed by microplastics and the need for continued research to mitigate their impact.

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