



MICROPLASTIC CONTAMINATION AND RISK ASSESSMENT IN KUBANNI RESERVOIR

Maria Onma Onaji^a, David S. Abolude^b, Shuaibu Akpai Abdullahi^b, Joselline Molozzi^a, and Mathias Ahii Chia^c,

^aPostgraduate Programme in Ecology and Conservation, State University of Paraíba, Campina Grande, PB, Brazil

^bDepartment of Biology, Ahmadu Bello University, Zaria, Nigeria

^cDepartment of Ecology, University of São Paulo, SP, 05508-090. São Paulo, Brazil

E-mail: onaji2505@gmail.com

Microplastics rank among the most widespread environmental contaminants. Assessing the ecological risks of microplastics is fundamental to understanding the environmental impacts and potential hazards. This study assessed the abundance of microplastics, their characteristics, and ecological risk in surface waters of Kubanni Reservoir, Nigeria, integrating Water Quality Index (WQI) with polymer hazard metrics. Samples were collected across three stations and analyzed for physicochemical parameters, microplastic morphology, and polymer composition using FTIR. The ecological risk was evaluated using the Polymer Hazard Index (PHI) and Pollution Load Index (PLI). A total of 122 microplastics were recorded, with mean monthly abundance ranging from 1.70 to 4.45 items m⁻³ and no significant temporal variation ($p > 0.05$), although higher values occurred during the dry season. Fibers dominated, followed by fragments, indicating secondary sources. Identified polymers included polypropylene, polyethylene terephthalate, polyethylene, polyvinyl chloride, polycarbonate, and polystyrene. The PHI (1388.82) indicated high hazard, largely driven by polyvinyl chloride, while PLI values (1.43) reflected moderate contamination. WQI values (58.24–62.50) indicated moderate water quality. These findings indicated that the pollution risk is driven by polymer toxicity rather than abundance, and microplastics accumulate more during the dry-season conditions in reservoir systems.

Keywords: freshwater pollution; polymer toxicity; aquatic contamination; environmental monitoring; plastic pollution