Title:	Assessment of Organic Matter Source of a Freshwater Lake in the Himalayas
Authors:	C, Anugrah
Keywords:	Organic Matter Microplastics water
Issue Date:	May-2024
Publisher:	IISER Mohali
Abstract:	A freshwater lake serves as a repository of natural and anthropogenic activities. The natural sources comprise both autochthonous and allochthonous organic matter. Meanwhile, the increased use of synthetic organic products, such as plastics, leads to the generation of Microplastics (MPs) through physical and chemical degradation processes. It's not just MPs; various other contaminants associated with MPs, like Phthalic Acid Esters (PAE) and Heavy metals, threaten the ecological food web. In this study, we quantified the abundance of microplastics in surface water samples and throughout the vertical water column of the lake. The abundance of microplastics ranges from 45-120 particles/L for the surface water samples and from 46 to 600 particles for the vertical water column. Based on the morphological characterisation of these samples, the majority were Pellet granule beads, constituting a total microplastic abundance of 82.2%. These are likely derived from cosmetic products used for scrubbing or exfoliating, while other morphologies were Fibres, Films and Foams, with an abundance of less than 18%. Additionally, the study examined the source-specific characterization of natural organic matter using lipid biomarkers such as n-alkanes. Their distribution varied from n-C 17 to n-C 31 , indicative of different sources. Variation in the lipid biomarker is associated with the change in vegetation in the lake's catchment. The relative abundance of n-alkane in the surface sediments of lakes varied between 1.1 to 7.5µg/g. Various n-alkanes indices like Average Chain Length (ACL) and P aq were used to further confirm the source of OM. Moving from the shoreline to the deeper part of the lake, a significant decrease in the higher chain alkane and an increase in the middle chain concentration indicated contributions from terrestrial vegetation and submerged aquatic plants, respectively. Upon analysing the grain size of sediment samples of the lake, no significant correlation was found between the concentration of organic matter (n-alkane). However, microplastic abundance in the vertical profile of the water sample is inversely correlated with the concentration of heavy metals, suggesting an influence on the density of MPs and heavy metals.
Description:	Under Embargo Period
URI:	http://hdl.handle.net/123456789/5713
Appears in Collections:	MS-19

Files in This Item:

File	Description	Size	Format	
embargo period.pdf		6.04 kB	Adobe PDF	View/Open

Show full item record