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Organic matter source impacts anthropogenic heavy metal accumulations in modern lacustrine sediments

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Heavy metal inputs and their cycling in modern aquatic ecosystems need further investigation under changing environmental conditions. Here we present the spatial distributions of organic matter (OM) and heavy metal accumulations in surficial sediments of a large urbanized and protected wetland (Upper Lake Bhopal) in Central India. Geochemical and stable isotopes (δ13C and δ15N) constraints provide evidence for drastic environmental changes along the lake stretch from the riverine mouth in the western rural area to the urbanized eastern periphery. The riverine supply and lake productivity are major sources of OM, while atmospheric dust supply is the major source of anthropogenic heavy metals such as (Pb and Zn). This study further highlights the spatial coherence between autochthonous OM and airborne Pb and Zn particularly in the urbanized eastern lake portion. Principal component analysis reveals that autochthonous OM rather than any mineral sorbent acts as a major carrier of anthropogenic Pb and Zn accumulated in modern lacustrine sediments.

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