

Different mercury bioaccumulation caused by ecological factors between habitats within a large deep reservoir

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Reservoir changes mercury (Hg) cycling and bioaccumulation in aquatic ecosystem. The phenomenon of elevated methylmercury (MeHg) concentrations in fish after impoundment has been well documented. However, little research has been conducted to clarify the spatial patterns of Hg bioaccumulation and trophodynamics in the food web within large reservoir. In this study, we intend to address the characters of Hg biomagnification in fish from two types of water bodies (main stream and backwater) within the Three Gorges Reservoir (TGR), a huge cannon-shape reservoir in China. Hg concentrations in fish and food web structures of fish communities are measured for the main stem and backwater area within the TGR. While the Hg concentration of all fish samples shows no significant difference between the two sites, the food web structure changes from one site to the other, indicated by the different values of $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ ranges and a significant shift of stable isotopes for all fish species. The available food source varies spatially, more multiple food resources are found in backwater than those in the main stem. Compared with the reservoirs of United States and Canada, TGR has lower trophic magnification factors (0.05-0.13). However, differences in bioaccumulation values suggest the different trophic pathway of Hg exposure between the sites and habitats within the site. We infer that various hydrological and trophic conditions may lead to spatial difference on exposure pathway within TGR.

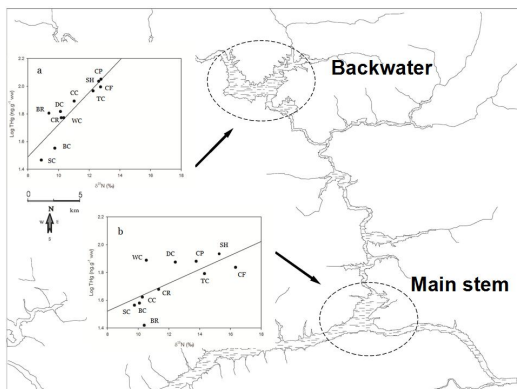


Figure 1: Relationship between mean log-transformed Hg and mean $\delta^{15}\text{N}$ in (a) backwater and (b) main stem