

Using mercury isotopes to understand the bioaccumulation of Hg in a subtropical estuary

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Coastal and estuarine regions are important areas of mercury pollution. Therefore, it is important to properly characterize the sources and bioaccumulation processes of mercury in these regions. Here, we present mercury stable isotopic compositions in 18 species of wild marine fish collected from the Pearl River Estuary (PRE), south China. Our results showed variations in mass-independent fractionation ($\Delta^{199}\text{Hg}$: $+0.05 \pm 0.10\text{‰}$ to $+0.59 \pm 0.30\text{‰}$) with a $\Delta^{199}\text{Hg}/\Delta^{201}\text{Hg}$ of ~ 1.26 , suggesting that aqueous MeHg underwent photo-degradation prior to incorporation into the food chain. For the results, we discovered small but significant differences of $\Delta^{199}\text{Hg}$ values among herbivorous, demersal, and carnivorous fish, indicating that different feeding guilds of fish may have incorporated MeHg with various degrees of photo-demethylation. The consistent mercury isotope compositions between fish feeding habitat and mercury sources in the estuary provide potentially important findings on the transformation and bioaccumulation of this toxic metal in subtropical coastal environments.