Trace elements (As, Hg, V, Sb) and stable isotope ratios in aquatic organisms from Yellow River Estuary and Laizhou Bay, North China

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Studies on trace elements contamination in organisms are meaningful since it is closely related to environmental quality and human health. To understand the concentration and mobility behavior of trace elements in aquatic organisms, we collected 365 samples, including twelve species of fish, one species of shrimp, two species of crab, and three species of shellfish, from Yellow River Estuary and Laizhou Bay, North China, and analyzed As, Hg, V, Sb and stable isotope ratios ($\delta^{15}N$ and $\delta^{13}C$) in those samples. The results show that among fish, shrimp, crab and shellfish, shellfish has the highest concentrations of As, V and Sb, and the highest concentration of Hg was observed in shrimp. Concentrations of Hg, As and V in fish from Yellow River Estuary were higher than those from Laizhou Bay, while the opposite was revealed for $\delta^{15}N$. Positive correlation between $\delta^{15}N$ and Hg was observed in organisms, indicating biomagnifications of Hg through the food web. Arsenic and V were found richer than assessment guidelines in this study, which is possibly related to the nonferrous metal smelting and petroleum industry around the Yellow River Estuary and Laizhou Bay. This study reported the trace elements concentration in representative organisms in the estuary areas with potential industrial contamination, and suggested that the biomagnifications and sources of trace elements in organisms varied with element types, organism species, and sample locations.