

SELENIUM-MERCURY RELATIONSHIPS IN STREAM FISH OF THE WESTERN USA

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The ability of selenium (Se) to moderate mercury (Hg) toxicity is well established in the literature. Mercury exposures that might otherwise produce toxic effects are counteracted by Se, particularly when Se:Hg molar ratios approach or exceed 1. We analyzed whole body Se and Hg concentrations in 468 fish representing 40 species from 137 sites across 12 western U.S. states. The fish samples were evaluated relative to a published wildlife protective Hg threshold ($0.1 \mu\text{g Hg g}^{-1}$), the current tissue based methylmercury (MeHg) water quality criterion (WQC) for the protection of humans ($0.3 \mu\text{g Hg g}^{-1}$) and to presumed protections against Hg toxicity when Se:Hg molar ratios are >1 . A large proportion (56%) of our total fish sample exceeded the wildlife Hg threshold while a smaller but significant proportion (12%) exceeded the MeHg WQC. However, 97.5% of the total fish sample contained more Se than Hg (molar ratio >1) leaving only 2.5% with Se:Hg ratios <1 . All but one of the fish with Se:Hg <1 , were of the genus: *Ptychocheilus* (pikeminnow). Scientific literature on Se counteracting Hg toxicity and our finding that 97.5% of the freshwater fish in our survey have sufficient Se to potentially protect them and their consumers against Hg toxicity suggests that Se in fish tissue (Se-Hg molar ratio) must be considered when assessing the potential toxic effects of Hg.

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