

Arsenic Bioaccumulation in Chinese Mystery Snail (CMS) Tissues

Arsenic (As) is a legacy contaminant that was released by the American Smelting and Refining Company (ASARCO) smelter in Ruston, WA throughout its operation, which spanned almost a hundred years. The pollutant was distributed to many lakes in the Puget Sound region which causes concern about As entering the food chain in these lakes. Chinese mystery snails (CMS) are a primary consumer in these lakes and have been shown to bioaccumulate substantial amounts of As. We hypothesized that more As would bioaccumulate in CMS gut collected from Lake Killarney (20 ppb As in water) than in CMS collected from Trout Lake (less than 1 ppb As in water). Field-collected snails from Lake Killarney and Trout Lake were dissected into different tissue groups (head/foot, mantle, gut, and visceral tissue). These tissue samples were acid-digested, and inductively coupled plasma mass spectroscopy (ICP-MS) was performed on the sample tissues to get the total As concentrations. The results showed significant bioaccumulation of As in the gut compared to other tissue groups from Lake Killarney. The ICP-MS results also showed that visceral tissue had significantly higher As bioaccumulation for Trout Lake. All tissue groups (except for the mantle) had significantly higher concentrations of As in Lake Killarney than in Trout Lake. Future research on quantification of As species that are bioaccumulating in the CMS tissues may give insight into biotransformation processes that affect toxicity.