

Arsenic Toxicity in Lake Ecosystems

In the Puget Sound region, some lakes' ecosystems have been contaminated with metals from ASARCO copper smelting. Although the century-long operation ended in 1985, effects of the heavy metal toxin, arsenic, on the lakes are currently unknown. Lake Killarney contains the highest level of arsenic contamination and Steel Lake contains an intermediate level of arsenic, while Trout Lake is a reference with minimal levels of arsenic. Periphyton is the growth of algae and microorganisms, and holds the highest accumulation of arsenic compared to varying species in each lake. Utilizing a ubiquitous freshwater snail species that feeds on periphyton, the Chinese Mystery Snail (CMS), this research tested the hypothesis that bioaccumulation of arsenic will be higher in CMS gut tissue, and biotransformation genes will be prevalent in periphyton due to its high accumulation of arsenic. ICP-MS was used to measure total arsenic concentration in field-collected samples from Trout Lake and Lake Killarney of varying CMS tissues. The Lake Killarney CMS gut tissue contained the highest amount of arsenic among all samples. With PCR testing of periphyton from Trout Lake, Steel Lake, and Lake Killarney it was revealed that the *arsM* gene, which encodes for arsenite methylation, is present. Altogether, periphyton biotransformation may impact arsenic accumulation in snail gut tissue. Future research aims to examine *arsM* expression and its effect on tissue-specific accumulation in snails.