

Detecting Physiological Stress on Arsenic Contaminated Snails

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Puget Sound was home to the ASARCO smelter plant for over 100 years, spewing arsenic, lead and other heavy metal contaminants into the surrounding areas soil and lakes through the deposition zone plume. Arsenic exposure over time causes oxidative stress in living organisms, including the Chinese mystery snail (*Bellamya Chinensis*). The arsenic and metals are absorbed through the soil of plants of base level food chain organisms that are consumed by the snail that then make their way up the food chain. To observe the physiological stress caused by arsenic on Chinese mystery snails, Heat Shock Protein (HSP70) was used because HSP70 is made in response to stress. Plants were obtained from three urban lakes (Killarney, Meridian and Steel) within the ASARCO deposition zone plume, and fed to locally collected snails. To identify the effect of arsenic on Chinese mystery snails, it was hypothesized that if feeding on arsenic exposed plants and microbes from Lake Killarney induces physiological stress, then an increase in HSP70 expression will be detected in the snail gut. To test this hypothesis, a Western blot was performed using the gut region from the center mantle of the snail as well as the gut, head, and foot. The results demonstrated that there was no HSP70 expressed in the gut mantle region sample. It was concluded that much of the sample was from the mantle and not the gut section, which explained why there was no HSP70 expressed. This was supported by no expression found in the foot region. In addition, high HSP70 expression levels were found in the head sample and high levels in the main gut region for Meridian samples. The next steps could be testing different antibiotics on different parts of the snail gut because this could help in gaining a better understanding of microbiota in arsenic-exposed snails.