

Legacy arsenic (As) contamination from copper smelting presents an ecological threat to aquatic ecosystems and their resident organisms, including Chinese Mystery Snails (CMS). As binds to sediments and accumulates in tissues of resident CMS. Female CMS are viviparous, carrying developing broods in their brood pouch. If CMS females transfer As to their broods before parturition, then broods will accumulate As within the brood pouch. To determine if maternal-brood As transfer occurs, we collected adult CMS from two freshwater lakes, Lake Killarney (LK), which has a littoral sediment As concentration of 213 ug As g<sup>-1</sup> due to legacy smelter contamination, and the reference sample from Trout Lake (TL), 7 ug As g<sup>-1</sup>. We dissected the adult snails and identified the brood pouch as adjacent to the digestive tract. We then measured As concentrations in different tissue compartments of adult CMS using inductively coupled plasma mass spectrometry (ICP-MS). Our results showed that digestive tracts of adult LK CMS had a significantly higher As concentration than other compartments. The brood pouch's close proximity to the digestive tract suggests it is a source of maternal As transfer. We used ICP-MS to measure the As concentration in whole brood snails extracted from gravid LK and TL females. We found that LK broods had a significantly higher arsenic concentration than TL broods, suggesting As accumulation within the brood pouch. This raises questions as to how maternal As transfer occurs, what effects As exposure has on developing broods, and how this exposure affects subsequent generations.