Assessing Arsenic Accumulation by Periphyton Bacteria from Lake Killarney

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The purpose of this study is to measure the uptake of arsenic from isolated arsenic-resistant bacteria and mixed cultures derived from periphyton that were collected from a local lake with high arsenic concentrations. Periphyton is a complex community of microorganisms, plants, algae, and debris that is found attached to sediments, plants, and other surfaces of most aquatic environments. Our colleagues discovered that periphyton collected from Lake Killarney captures arsenic present in the contaminated lake waters. Studying arsenic-resistant organisms can help researchers understand their interaction with arsenic and their possible uses for bioremediation since arsenic contamination in aquatic environments is a worldwide problem. We hypothesized that bacterial members of the periphyton collected from Lake Killarney are responsible for arsenic uptake. Therefore, our study aimed to isolate arsenic-resistant bacteria from the periphyton collected and test their arsenic uptake capacity from the growth medium. After isolating and growing these arsenic-resistant bacteria and mixed cultures with different nutrient conditions, growth periods, and arsenic concentrations, results showed low arsenic concentrations in all the samples. This might indicate that these microorganisms are not responsible for arsenic uptake, but may only be able to tolerate high levels of arsenic. These findings suggest that the isolated bacteria and mixed cultures we tested might not be the organisms that are responsible for arsenic uptake in contaminated water. Therefore, our future research will focus on expanding the taxonomic diversity of periphyton bacteria cultured and tested for arsenic uptake. For example, we can culture *Cyanobacteria*, a group of photosynthetic bacteria that are abundant in periphyton and were not included in our previous studies. We anticipate different results from *Cyanobacteria* because of their unique energy requirements and may ultimately be responsible for the heavy arsenic uptake discovered in periphyton.