Toxin Capturing Algae and the Effect on the Mitotic Index of Allium cepa Root Tip of Tsaile Lake, Navajo Nation

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The purpose of this research was to test the effect of the Tsaile Lake Water (Lake outside Tsaile) on the Mitotic Index of Allium cepa root tip. The hypothesis is if the Tsaile Lake water and riverbed samples have poor water quality, then samples will contain slower growth, contain cellular aberrations and a lower mitotic index in the Allium cepa root tip and bulbs. This study has two distinct parts. The first part was to show that algae from Tsaile Lake absorbed heavy metal and metalloid toxins. The second part was to show that the Mitotic Index of Allium Cepa Root Tips was affected by these toxins. Firstly, gather water samples from Tsaile Lake River. Using seven 250 mL beakers, label three beakers with three trials for the Tsaile Lake Water, label three beakers for the Tsaile Lake Waterbed Soil, and one for the Distill Water control. Measure the water samples to the 200 mL mark then insert 2 onions into each beaker after the water is poured in. Observe this for 2 weeks, then after 2 weeks, observe the cells microscopically to observe phases of mitosis in the onion root tip, then use a scalpel to cut the tip of the root and create a slide with a top cover. Take pictures of the cell and count all the cells that go through mitosis and calculate the Mitotic Index. The hypothesis was accepted, the Tsaile Lake Water is heavily contaminated, which affected the Mitotic Index of Allium cepa. Cellular aberrations were observed because not only was there 0% mitotic index, but the cells were also elongated, longer and they have thicker cell walls.

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