The Removal of Copper (II) Sulfate Water using Saccharomyces cerevisiae through Bioremediation

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There are many ways water can become contaminated with copper sulfate. Copper sulfate is a hazard when in water to animals and humans. Ordinary methods of removal use a chelating agent and other hazardous chemical compounds. The goal of the prototype was to use biotechnology to remove the copper sulfate without creating any new problems and create a design that could be used to cleanse water of various contaminants. The researcher designed and built a prototype resembling a small motorboat that drags a "chum bag" of immobilized saccharomyces cerevisiae behind it. The researcher used a kiddie pool to simulate a pond. PVC piping was attached in a circle around the kiddie pool. The "pond" was contaminated with copper sulfate and the prototype ran for twenty-four hours. The copper, nitrate, ammonia, and pH levels were measured before and after. The results showed a large decrease in the copper level as well as the nitrite level. The results concluded that the yeast cells did remove the copper sulfate from the water and the prototype was successful in circulating the water to expose the copper sulfate to the cells. After the success of the smaller prototype, the researcher built a larger boat that was approximately 5’ in length and ran this prototype in a real pond using two types of beads and dealt with two types of contaminations. Yeast beads were used for copper sulfate contamination and microalgae beads were used for fertilizer contamination. The results from these trails also showed that the prototype was successful in removing the contaminants from the water over a forty-eight hour period. With this design, there is now technology available to cleanse water in an environmentally friendly way if there is a microorganism available that metabolizes the contaminant.

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