Utilization of Spirulina for Phytoremediation of Cadmium Pollution in Waterways

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Cadmium pollution is a very serious problem in waterways located near farmland due to the presence of cadmium in fertilizers. The purpose of this project is to identify cadmium levels in the Salinas River caused by runoff from farmland and utilize phytoremediation with Arthrospira platensis (Spirulina) as a solution to remove cadmium pollution in waterways. The hypothesis for this project is if water contaminated with cadmium is presented with Spirulina, then phytoremediation will lower the level of cadmium in the water and increase the cell count of the algae. During experimentation, water samples were collected from three different locations on the Salinas River (North watershed) and tested for cadmium. Four samples that contained the same amounts of cadmium with different concentrations of Spirulina were then tested for cadmium levels and cell count over a period of 10 days. After analyzing the samples from the Salinas River, Locations 1, 2, and 3 had 20 ppb, 20 ppb, and 30 ppb of cadmium respectively. The results of experimentation with Spirulina found that there was a 95% cadmium removal and a 59% increase in the cell count of the sample with the most Spirulina. To apply the results, a biofilter was created with Spirulina and tested with water containing cadmium. Using a 10 day period of filtering, the cadmium level was reduced by 90%. Further experiments will clarify any environmental impacts that this process has and test it in a real waterway.

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