Efficacy of Algae Phytoremediation vs. Sand Filtration of Bisphenol-a Solution

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The chemical compound bisphenol-a (BPA, classified as an endocrine-disrupting chemical (EDC) for its ability to mimic the body's hormones and therefore disrupt the naturally-occurring hormonal cascades that occur in humans and other animals, is ubiquitous in the environment and causes a number of deleterious effects in humans and animals. One low-cost method of removing toxins from the environment is phytoremediation, the process of plants accumulating toxins in themselves in quantities much higher than present in their normal environment. Species of algae, specifically Chlorella pyrenoidosa, have been shown to be capable of removing arsenic, nitrogen, and phosphorus from contaminated water and soil. The purpose of this research was to determine if a culture of C. pyrenoidosa could remove BPA from an aqueous solution, and if so, to compare the efficacy of this phytoremediation to sand filtration of the same solution. Analysis of the solutions revealed an algae culture was 86.36% effective at removing BPA from the solution, and the sand filtration method was almost 100% effective. Future research will be necessary to determine the quantity of BPA capable of being absorbed by C. pyrenoidosa and how C. pyrenoidosa can be effectively incorporated as part of a traditional water-treatment process.

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