Chlorella vulgaris Culturing as a Method of Bioremediation for Waste Water Treatment to Control Entropic Eutrophication

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Eutrophication is the result of an increment of nutrients in bodies of water. This produces an explosive growth of natural organic matter (NOM). As a result, the concentration of oxygen diminishes when the NOM eventually dies and decays. Also, the concentrations of trihalomethanes increase in potable water, which also increases the risk cancer development. One of the major causes of eutrophication, is the discharge of wastewaters with high nutrient concentrations. The culture of Chlorella vulgaris has the potential of becoming a method of bioremediation since it utilizes phosphates and nitrates to carry out its growth. A cultivation method in wastewaters is proposed to reduce the concentration of this nutrients. Three samples of wastewaters were obtained in different stages of the treatment process. Sample A was the influent stage, sample B was the sedimentation stage, and sample C was the effluent stage. Each sample was inserted in a bioreactor that allowed the growth of the microalgae. The culture lasted 12 days and data was taken using a water quality analysis kit. A 75% reduction of nitrates was observed in samples A and B, and 88% in sample C. A 75% reduction of phosphates in sample A, 100% in B, and 50% in C were observed. As a result of the significant decrease in phosphates and nitrates, it can be concluded that the growth of Chlorella vulgaris is an efficient method to remove nutrients and therefore control eutrophication. This can be implemented in wastewaters treatment plants or as an in-situ treatment method.

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