How Does the Species of Microalgae Reduce the Effects of Carbon Dioxide in Seawater on Calcium Carbonate

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The effect of the different species of microalgae on the mass of the calcium carbonate chalk in carbonated modified seawater was studied to identify the ability of the microalgae on reducing the detrimental effect of increased acidity resulting from elevated carbon dioxide concentrations. Based on literature research, it was hypothesized that if calcium carbonate chalk were left in four different jars of carbonated modified seawater containing Spirulina, Chlorella vulgaris, Scenedesmus quadricauda, and no microalgae for a period of 7 days, then the average percentage change in mass of the chalk will be the least after being submerged in the presence of Scenedesmus quadricauda. Calcium carbonate chalk was submerged in jars of seawater from the Atlantic Ocean that were carbonated using antacid tablets. A 10 mL sample of Spirulina, Chlorella vulgaris, and Scenedesmus quadricauda was added to each jar, and the mass of the chalk was measured before and after a period of 7 days. The least final average percentage decrease in mass of 3.37% occurred for the calcium carbonate chalk in the presence of the Spirulina microalgae, while the calcium carbonate chalk in the control group experienced the greatest final average percentage decrease in mass of 9.96%. Further experimentation on the effect of the concentration of Spirulina on the mass of the calcium carbonate showed that there was an inverse relationship between the concentration of Spirulina and percentage mass decrease. These results can be implemented in ocean acidification mitigation strategies and in further research in utilization of photosynthetic organisms to reduce the negative effects of carbon dioxide on calcium carbonate structures.

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