Managing Hyperlipidemia: Algae as Lipase Inhibitors

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Over 3 million people suffer from hyperlipidemia every year in the United States. On the contrary, there is a decreased risk of metabolic diseases in East Asia, where seaweeds are traditionally consumed and commonly available. Algae contain a variety of bioactive compounds that have lipid-lowering functions. Current medications for hyperlipidemia are expensive and synthetic; algae could be a novel and natural way to manage this condition. This experiment tested three different algae varieties—C. vulgaris (Chlorophyta), R. palmata (Rhodophyta), and A. nodosum (Ochrophyta)— in a lipase reaction with milk to determine which alga best inhibits fatty acid production. It was hypothesized that A. nodosum would perform best, due to the presence of phlorotannins in Ochrophyta species. Extracts were made by macerating the alga powders and evaporating the water solvent. Ten trials were conducted for each condition by adding 1 mL of extract to 2.5g of lipase and then incorporating bromothymol blue indicator, 2% sodium carbonate solution, and whole milk. The control used water instead of an extract. The time taken for each solution to change from acidic to basic was recorded. The average time for the control trials was 7.522 minutes, and the R. palmata, A. nodosum, and C. vulgaris trials were 6.198, 10.177, and 7.478 minutes, respectively. The hypothesis was supported among these three variables, but the control defied presuppositions. The biomedical purposes of algae have been overlooked, and their potential to manage metabolic diseases deserves closer investigation.

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