Year Two of Production of Hydrogen Gas from C. reinhardtii: Parameter Analysis for Eventual Implementation

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As I originally chose this project to combine my love for biology, namely photosynthesis, and my concern for environmental issues, I chose a project based on Chlamydomonasreinhardtii, a photosynthetic alga with alternative photosynthetic pathways which can produce hydrogen gas in an anaerobic environment. With my initial year of research proving its ability to produce hydrogen gas, the objective of this year's project was to explore the parameters of this unique capability by putting environment stress such as movement, temperature, illumination, transportation, and the limits of its ability to produce the gas in an anaerobic or aerobic environments to ultimately estimate the feasibility to the alga's implementation of a larger device, such as a pond of a fuel cell. My hypothesis stated that the algae will grow better in environments with slight movement, lukewarm temperature, two thirds of the day in a light period and two thirds of the day in a dark period, transportation using filters, and a maximum of fourteen hours in an aerobic environment. My hypothesis proved correct in that slight movement and lukewarm temperatures were ideal for hydrogen production; however, the algae can be exposed to aerobic environments for longer than fourteen hours and survive, and the maximum production rate of hydrogen gas occurred during a half-light and half-dark period of time. Although this project illuminates properties of the algae not tampered with to catalyze the discovery of a green energy source, some of the listed conclusions should be clarified in future research, ultimately modifying the algae to produce the maximum amount of hydrogen gas to officially implement as an environmentally friendly alternative source of energy from natural origins.

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