A Solid State: Growing Chlorella vulgaris in Different Media

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Algae has shown promise in multiple industries. Recent investigations explore its use in aerospace photobioreactors to produce oxygen and water, remove carbon dioxide, and act as a food source during space travel. While there has been some success, constraints such as uneven lighting and heating have prevented the technology from being utilized to its full potential. The project's hypothesis is that Chlorella vulgaris is able to grow when suspended in solid agarose media. This is tested by using different growth media with a focus on solid matrices for Chlorella vulgaris. Four distributions of the algae in culture media are tested, including algae beads in solid agarose, algae culture in solid agarose, algae beads in liquid medium, and algae culture in liquid medium. The population density of algae over time is measured by image analysis using ImageJ software, as well as spectrophotometry. Results show that all cultures of Chlorella vulgaris displayed growth over the course of fourteen days, with comparable growth in both solid and liquid media. Optimal growth is noted in algae culture suspended in a solid agarose media, where algae growth surpasses all other forms and is sustainable through two weeks. Further research to explore system variations and optimize growth conditions can expand the application of algae in industrial settings. Transportation of algae in solid state may prove more efficacious than in liquid state. As aerospace travel becomes more prevalent, this technology has the potential of sustaining life for extended periods of time away from Earth.

Awards Won:

Fourth Award of $500