Fueling the Future: Isolation of Chlorella vulgaris Biomass From Novel Media Structure

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Chlorella vulgaris is a species of unicellular green algae celebrated for its many uses in industry and agriculture. Its potential in the aerospace industry as a multifunctional material is a priority. Biofuel companies have also explored Chlorella lipid content as a viable option for sustainable biofuel production. Current systems of cultivation face challenges associated with growth and harvesting efficiency. A novel solid-media agarose culture was developed, tested, and patented by the author to solve issues stemming from liquid-media culture in zero-gravity conditions. This medium has potential terrestrial utility and can accelerate carbon dioxide sequestration. The hypothesis is that this solid media method of algal growth will evenly distribute light, heat, and nutrients to C. vulgaris, allowing the medium to match the growth of algae in liquid medium. In addition, biomass isolation from the agarose medium will have comparable results to liquid medium. Results support the viability of the solid media system in increasing C. vulgaris population density. Analysis of spectrophotometer data displays consistent growth cycles for both solid and liquid media algae, with solid media outperforming liquid media by an average 33.02%. Moreover, biomass dry weight results support the feasibility of extraction for both medium types. Future research could focus on the many applications of algae growth in solid medium. In the aerospace industry, a new method of micronutrient solidification could create a reliable method for algae cultivation in astronaut supplementation. Use of the agarose medium on other algae species or even other plant species could revolutionize agricultural practices.