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TITLE:
EXPLORING THE POTENTIAL OF *SPIRULINA PLATENSIS* CULTIVATED IN FISH FARM WASTEWATER AS A BIOFERTILIZER

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AUTHOR'S DECLARATION

" I hereby declare that this report is the result my own work except for quotations and summaries which have been duly acknowledged."

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ABSTRACT

Increasing environmental concerns regarding aquaculture wastewater disposal and the excessive use of chemical fertilizers in agriculture have underscored the need for sustainable alternatives. This study evaluates the feasibility of cultivating *Spirulina platensis* in fish farm wastewater as a potential biofertilizer. The growth performance of *Spirulina platensis* was compared between fish farm wastewater and synthetic media by examining growth profile, growth kinetics and elemental composition of dried biomass. Results indicate that *Spirulina platensis* cultivated in 100% fish farm wastewater achieved a high biomass productivity of 3.625 ± 0.894 g/L, attributable to its efficient absorption and assimilation of nitrogen and phosphorus. Although the wastewater culture exhibited a prolonged lag phase compared to that in synthetic media, the extended exponential phase ultimately resulted in a superior overall biomass yield. Furthermore, elemental analysis confirmed that the biomass is nutrient rich particularly in nitrogen, making it suitable for agricultural applications, including the production of leafy vegetables, legumes, and fruit crops. These findings underscore the potential of fish farm wastewater as a sustainable substrate for *Spirulina platensis* cultivation, thereby promoting effective aquaculture wastewater management and reducing reliance on chemical fertilizers. Future research should focus on optimizing growth conditions and evaluating the long-term sustainability of Spirulina-based biofertilizers.

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