UNIVERSITI TEKNOLOGI MARA
Cawangan Terengganu
Kampus Bukit Besi

TITLE:

Production of Biomass and Protein of Freshwater Microalgae Cultured in Fish Farm Wastewater

SUPERVISOR:

MADAM NORAZILA BINTI MOHAMAD

SCHOOL OF CHEMICAL ENGINEERING
COLLEGE OF ENGINEERING

2023

AUTHOR'S DECLARATION

"Turning challenges into opportunities, this project explores innovative solutions for sustainable growth and Microalgae"

Green For Life

Name of Student	:	SITI AISYATUL HUMAIRAH BINTI ABDULLAH
Student I.D. No.	:	2022677748
Programme	:	Diploma in+ Chemical Engineering
College/School	:	College of Engineering/School of Chemical Engineering
Signature of Student	:	
Date	:	21/1/2025

ABSTRACT

By follow the Final Year Project Programme, our groups which consists by 4 members decided with supervisor to choose Cultivation of Microalgae as our FYP research. Based on my research, our purpose in this report to talk about result that we produce of biomass and protein of microalgae cultured in fish farm wastewater. We applied fish farm wastewater as media replaced regular media to cultivate microalgaes. Follow sustainable development program, our research related to make sure our product and application doesn't affect to environment give benefits to biodiversity. As a future engineer, I take responsible to make sure how I can produce a product saving cost and environmentally friendly. We use 4 main components, which is Fish farm wastewater, 3 types of microalgae, Chlorella Vulgaris, Spirulina, and Nannochloropsis, and commercial media(Urea and NPK) We use several methods, example like HACH method for method analysis, and method cultivation microalgae that we regular found in journalists, based on discussion we decided to make ratio 100% Fish farm Wastewater , 50% FF 50% Commercial Media, and 100% CM. We use several equipment like TTS, Oven, centrifuge machine, CHNS Elemental Analyzer, colorimeter and moisturizer. Examples apparatus that we used are bottle bioreactor, shrimp, centrifuge tube, conical flask, pipet, measuring cylinder, and beaker. We combined our 4 main components in different cultured and our different discussed ratios. We put the cultured components in bottle bioreactor and under lighting for 24 hours with pump conditioning that working 24 hours. I make assumption that the best cultivation method is under 50 % Fish Farm Wastewater 50% Commercial Media.

TABLE OF CONTENTS

BACKGROUND

1.1 Introduction

Microalgae has a pivotal role in our real life and the other life. Microalgae plays a vital role in the metabolism and being the sources of food, presents the nutrients to plankton basically, and other benefits that we can get with this life. Algae is frequently prescribed for microorganism plants and involved Photosynthesis process. During my final year group project, we have studied about Production of Biomass and Protein of Freshwater Microalgae which is Chlorella Vulgaris, Spirulina, and Nannochloropsis cultured in Fish Farm Wastewater. We had cultivated these 3 types of microalgae in fish farm wastewater and make the combination with the other culture which used (fish farm wastewater + Urea +NPK). We found the different of growth profile, Biomass productivity and growth kinetic. The topic is important to provide a sustainable product which is effective cost. We found that they have several issues, especially about the costs, financial raw material, media to provide a nutrient substance, so we offer a product that can settle down these problems which use microalgae, media, and much natural substance

During our purposed work, we analysed fish farm wastewater as media use natural raw material produce media. We study, how much percentage and nutrients our product produced compare the commercialize product. We want to study that our product is most reliable, sustainable touch and effective than compared the regular product to make sure our project successful.

1.2 Literature Review

1.2.1 *Chlorella Vulgaris, Spirulina, and Nannochloropsis* -Characteristics and Potential

Chlorella is microalgal species with high lipid accumulation (50–70% of dry cell weight) generally have a slow growth rate. It is possible to find examples of microalgae that are fast growing and have a high lipid accumulation, e.g.