

**NUTRITIONAL ANALYSIS OF JACKFRUIT SEED EXTRACT
ENRICHED WITH LECITHIN AND ARTEMIA BIOMASS FED
WITH JACKFRUIT SEED EXTRACT ENRICHED WITH LECITHIN**

NUR AMIRAH BINTI ZAKARIA

**LP
31
PPSMS
1
2014**

**SCHOOL OF MARINE SCIENCE AND ENVIRONMENT
UNIVERSITI MALAYSIA TERENGGANU**

2014

**NUTRITIONAL ANALYSIS OF JACKFRUIT SEED EXTRACT ENRICHED
WITH LECITHIN AND ARTEMIA BIOMASS FED WITH JACKFRUIT SEED
EXTRACT ENRICHED WITH LECITHIN**

By

Nur Amirah Bt Zakaria

**Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Marine Biology)**

**School Of Marine Science and Environment
UNIVERSITI MALAYSIA TERENGGANU**

2014



SCHOOL OF MARINE SCIENCE AND ENVIRONMENT
UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled **Nutritional Analysis Of Jackfruit Seed Extract Enriched With Lecithin And *Artemia* Biomass Fed With Jackfruit Seed Extract Enriched With Lecithin** by **Nur Amirah Bt Zakaria**, Matric No. **UK26657** have been examined and all errors identified have been corrected. This report is submitted to the School of Marine Science and Environment as partial fulfillment towards obtaining the **Degree of Science (Marine Biology)**, School of Marine Science and Environment, Universiti Malaysia Terengganu.

Verified by:

First Supervisor

ASSOCIATE PROF. DR. YEONG YIK SUNG
Lecturer

Name: School of Fisheries and Aquaculture Sciences
Universiti Malaysia Terengganu

Official stamp: 21030 Kuala Terengganu.

Date: 15/6/2014

ACKNOWLEDGEMENT

I am very grateful that finally able to complete this thesis. I would like to thank for my supervisor Dr. Yeong Yik Sung for his spending countless time and guideline to help complete the experiment and thesis writing.

I would also like to thankful for my partnership from the start until the end of this final year project, Khatijah binti Saiful Bahari for always helped through all the hardship to finished this project. I also extend my thanks to Marine Hatchery staff and lab assistant, Pn Faridah from Anatomy and Physiology Laboratory who was always help during running the experiments.

I would like to appreciate my other friends that always helped and give moral support to be able finished the thesis. Last but not least, I like to thanks for all those who names not mentioned here for their support in completing my studies.

ABSTRACT

Based on the previous study, jackfruit seed extract have been potential to become substitution for food source of *Artemia* compared with microalgae. This was due to the culturing of microalgae were labor intensive and expensive. Then, in this study, the improvement from jackfruit seed extract was done to by additional of lecithin (JSB-L+). The proximate composition of jackfruit seed extract enriched with lecithin and proximate of *Artemia* fed with jackfruit seed extract enriched with lecithin as well as *Artemia* fed with *Chlorella* have examined. The result showed that proximate composition of JSB-L+ contained of 28.4% protein, 55.4% carbohydrate, 0.8% lipid, 1.7% fiber, 4.1% ash and 8.7% moisture. Meanwhile, for the *Artemia* fed with JSB-L+ consists of protein (61.0%), lipid (1.6%), ash (8.6%), fiber (5.2%) and carbohydrate (23.5%). Then, for *Artemia* fed with *Chlorella* consists of protein (66.7%), lipid (0.5%), ash (7.9%), fiber (3.8%) and carbohydrate (21.1%). *Artemia* that fed with JSB-L+ have the high proximate composition for carbohydrate compared than *Chlorella* where carbohydrate was one of the major class of compounds in proximate analysis. There also stated that carbohydrate was the most important element in nutritional requirement for brine shrimp. So, JSB-L+ also can be potential for substitute microalgae same as jackfruit (JSB) extract from previous study. Other than that, proximate composition of JSB-L+ was comparable with *Chlorella*.

ABSTRAK

Dalam kajian sebelum ini, larutan biji nangka mempunyai potensi untuk menjadi makan gantian sebagai sumber makanan untuk *Artemia* berbanding dengan mikroalga. Ini disebabkan oleh pengkulturan microalga yang memerlukan tenaga buruh yang ramai dan mahal. Jadi, dalam kajian ini, penambahbaikan daripada larutan biji nangka telah digunakan dengan penambahan lesitin (JSB-L+). Komposisi proximat daripada larutan biji nangka yang diperkaya dengan lesitin dan proximat untuk *Artemia* yang diberi makan dengan larutan biji nangka yang diperkaya dengan lesitin serta *Artemia* yang diberi makan *Chlorella* telah dikaji. Keputusan menunjukkan komposisi proximat bagi JSB-L+ mengandungi 28.4% protein, 55.4% karbohidrat, 0.8% lemak, 1.7% serabut, 4.1% abu and 8.7% lembapan. Manakala, untuk *Artemia* yang diberi makan dengan larutan biji nangka yang diperkaya dengan lesitin mengandungi protein (61.0%), lemak (1.6%), abu (8.6%), serabut (5.2%) and karbohidrat (23.5%). Kemudian, untuk *Artemia* yang diberi makan *Chlorella*, terdapat protein (66.7%), lemak (0.5%), abu (7.9%), serabut (3.8%) and karbohidrat (21.1%). *Artemia* yang diberi makan JSB-L+ mempunyai komposisi proximate yang tinggi dalam karbohidrat jika dibandingkan dengan *Chlorella* di mana karbohidrat merupakan salah satu kelas utama sebatian di dalam analisis proximat. Karbohidrat juga merupakan elemen keperluan makanan yang paling penting untuk *Artemia*. Jadi, JSB-L+ juga berpotensi untuk menggantikan mikroalga sama seperti larutan biji nangka (JSB) daripada kajian sebelum ini. Selain daripada itu, komposisi proximat untuk JSB-L+ adalah standing dengan *Chlorella*.

LIST OF TABLES

TABLE	TITLE	PAGE
Table 4.1	Proximate composition of JSB-L+ and JSB extract	19
Table 4.2	Proximate composition of Artemia fed with JSB-L+ and JSB extract	20
Table 4.3	Proximate composition of Artemia fed with JSB-L+ and Chlorella	21

LIST OF ABBREVIATION

AOAC	- Association of Analytical Communities
μm	- Micrometer
JSB	- Jackfruit seed extract
JSB-L+	- Jackfruit seed extract enriched with lecithin
$^{\circ}\text{C}$	- Temperature
Ppt	- Part per thousands
Kg	- Kilogram
g	- Gram
HUFA	- High Unsaturated Fatty Acid
NaOH	- Sodium Hydroxide
%	- Percentage

TABLE OF CONTENTS

ACKNOWLEDGEMENT	i
ABSTRACT	i
LIST OF TABLES	iv
LIST OF ABBREVIATION	v
TABLE OF CONTENT	vi-vii
LIST OF APPENDICES	ix
CHAPTER 1: INTRODUCTION	
1.1 Introduction	1
1.2 Objectives	3
CHAPTER 2: LITERATURE REVIEW	
2.1 Artemia	4
2.2 Food for artemia	4
2.2.1 Microalgae	6
2.2.2 Artificial food	8
2.2.3 Jackfruit seed	9
2.3 Lecithin	10
2.4 Proximate composition	12

CHAPTER 3: METHODOLOGY

3.1 Jackfruit seed preparation

3.1.1	Moisture	13
3.1.2	Ash	14
3.1.3	Fiber	15
3.1.4	Lipid	16
3.1.5	Protein	17
3.1.6	Carbohydrate	18

CHAPTER 4: RESULTS

4.1	Results	19
-----	---------	----

CHAPTER 5: DISCUSSION 23

CHAPTER 6: CONCLUSION 27

REFERENCES 28

CURRICULUM VITAE 32