

OPTIMIZATION OF FERTILIZATION CULTURE MEDIUM  
FOR *IN-VITRO* FERTILIZATION TECHNIQUE OF BANANA  
SHRIMP, *Fenneropenaeus merguensis*

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**OPTIMIZATION OF FERTILIZATION CULTURE MEDIUM FOR IN- VITRO  
FERTILIZATION TECHNIQUE OF BANANA SHRIMP (*Fenneropaneus  
merguiensis*)**

**By  
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**Research Report submitted in partial fulfillment of  
the requirements for the degree of  
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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT  
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**DECLARATION AND VERIFICATION REPORT**  
**FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled **Optimization of Fertilization Culture Medium for *In-vitro* Fertilization Technique of Banana Shrimp, *Fenneropenaeus merguensis***, Matric No. **UK25673** 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.

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## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	ii
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>ABSTRACT</b>	ix
<b>ABSTRAK</b>	x
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Background of Study	1
1.2 Problem statement	2
1.3 Significant of Study	3
1.4 Objectives	3
<b>CHAPTER 2: LITERATURE REVIEW</b>	
2.1 Banana Shrimp, <i>Fenneropenaeus merguensis</i>	4
2.1.1 Taxonomy classification of <i>F. merguensis</i>	5
2.1.2 Morphology of banana shrimp	6
2.1.3 Habitat and feeding habit of <i>F. merguensis</i>	7
2.2 Male Reproductive Biology of Penaeid Shrimp	
2.2.1 Male reproductive system	8
2.2.2 Spermatophore of mature male	9
2.3 Female Reproductive Biology of Penaeid Shrimp	
2.3.1 Female reproductive system	10

2.3.2 Ovarian development stage	11
2.4 Oocyte Activation	13
2.5 Manipulation of <i>In-vitro</i> Fertilization	14

### **CHAPTER 3: METHODOLOGY**

3.1 Shrimp Sampling	15
3.2 Shrimp Handling and Gamete Collection for Natural Spawning	16
3.3 Preparation of <i>In-vitro</i> Fertilization Media	16
3.4 <i>In-vitro</i> Model for Primary Binding	18
3.5 Data Analysis	19

### **CHAPTER 4: RESULTS**

4.1 Egg Activation sequence of <i>Fenneropenaeus merguensis</i> from natural spawning	20
4.2 Egg Activation of In Vitro Fertilization Using Different Mediums	22
4.3 The Fertilization and Hatching Rate of the Eggs for Every Mediums	25

### **CHAPTER 5: DISCUSSION**

5.1 Egg Activation of <i>F. Merguensis</i> from Natural Spawning	
5.1.1 Cortical rods protrusion	26
5.1.2 Jelly coat formation	27
5.1.3 Formation of the hatching envelope	27
5.2 Egg Activation of <i>F. merguensis</i> from <i>In-vitro</i> Fertilization	29
5.3 Hatching and Fertilization Rate	30

<b>CHAPTER 6: CONCLUSION</b>	31
<b>REFERENCES</b>	32
<b>CURRICULUM VITAE</b>	37



## LIST OF TABLES

<b>Table</b>	<b>Page</b>
3.1 The major dissolved constituents of seawater	17
4.1 The sequence of egg activation showed by stereozoom microscope of <i>F.merguiensis</i>	21
4.2 Light micrography showing the sequence of egg activation from 15-30 min post-spawning of three different fertilization mediums	23
4.2 Light micrography showing the sequence of egg activation from 45-60 min post-spawning of three different fertilization mediums	24
4.3 Fertilization and hatching rate of <i>F. merguiensis</i> eggs for every medium	25

## LIST OF FIGURES

Figure	Page
2.1 Taxonomy of banana shrimp, <i>F. merguensis</i>	5
2.2 Anatomy of penaeid shrimp	6
2.3 Ventral surface of mature <i>F. merguensis</i> male	8
2.4 Diagram of male reproductive system	9
2.5 Ventral surface of cephalothorax of <i>F. merguensis</i> female	10
2.6 Ovarian maturation stage of female, <i>F. merguensis</i>	11
3.1 Coastal water of Kedah, Peninsular Malaysia	15

## LIST OF ABBREVIATIONS

$\text{g l}^{-1}$	-	Gram per litter
Ca- F saline	-	Calcium free saline
ASW	-	Artificial seawater
NSW	-	Natural seawater

## ABSTRACT

This study was design to develop an appropriate basis for the optimization of the fertilization culture medium for *In-vitro* fertilization of banana shrimp, *Fenneropenaeus merguensis*. Three culture mediums were examined which are natural seawater (NSW) as control medium, artificial seawater (ASW) and calcium free saline (Ca- F saline). Natural spawning of *F. merguensis* eggs were studied as well to compare the differences in timing and sequence of egg activation event with the *In-vitro* fertilization technique. The mean fertilization rate for *In-vitro* fertilization using Ca-F saline solution was  $4.33\pm 4.04\%$ , lower than the fertilization rate recorded for ASW solution which is  $8.67\pm 4.04\%$ . Ca-F saline and ASW solution induce a slow egg activation contradict with the sequence of event for natural spawning of *F. merguensis*.

**PENGOPTIMUMAN KE ATAS KULTUR MEDIUM PERSENYAWAAN  
UNTUK TEKNIK PERSENYAWAAN IN VITRO UDANG KAKI MERAH,  
*Fenneropenaeus merguensis***

**ABSTRAK**

Kajian ini bertujuan untuk membina asas yang sesuai bagi pengoptimuman ke atas kultur medium persenyawaan untuk teknik pembiakan in vitro udang kaki merah, *Fenneropenaeus merguensis*. Tiga kultur medium telah dikaji iaitu air laut semula jadi sebagai medium kawalan, air laut tiruan dan larutan bebas kalsium. Pembiakan semula jadi bagi spesis udang ini juga dikaji untuk membandingkan perbezaan dari segi masa dan urutan perkembangan telur udang dengan teknik persenyawaan in vitro. Kadar persenyawaan purata bagi pembiakan in vitro dengan menggunakan larutan bebas kalsium sebagai kultur medium adalah  $4.33 \pm 4.04\%$ , lebih rendah daripada kadar persenyawaan yang dicatatkan dalam air laut tiruan iaitu  $8.67 \pm 4.04\%$ . Larutan bebas kalsium dan air laut tiruan menunjukkan perkembangan dan pengaktifan telur yang perlahan berbanding dengan pembiakan secara semulajadi bagi spesis udang ini.