

AMIN SAFWAN BIN ADNAN

MASTER OF SCIENCE

2016

**EFFECT OF WATER SALINITY ON  
OVARIAN MATURATION STAGES AND 17  $\beta$ -  
ESTRADIOL LEVELS ON FEMALE ORANGE  
MUD CRAB, *Scylla olivacea* (HERBST, 1796) IN  
CAPTIVITY**

AMIN SAFWAN BIN ADNAN

MASTER OF SCIENCE  
UNIVERSITI MALAYSIA TERENGGANU

2016



**EFFECT OF WATER SALINITY ON OVARIAN MATURATION STAGES AND  
17  $\beta$ -ESTRADIOL LEVELS ON FEMALE ORANGE MUD CRAB, *Scylla olivacea*  
(HERBST, 1796) IN CAPTIVITY**

**AMIN SAFWAN BIN ADNAN**

**Thesis Submitted in Fulfillment of the Requirement for the Master Degree of  
Science in the Institute of Tropical Aquaculture  
Universiti Malaysia Terengganu**

**October 2016**

## DEDICATION

*I dedicate this thesis to my beloved mother, father, grandmother and my siblings for all their supports and encouragement throughout my studies and also to all my beloved friends for all of their helps and support.*

*Thank you*

Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfillment of the requirement for the degree of Master of Science.

**EFFECT OF WATER SALINITY ON OVARIAN MATURATION STAGES AND 17  $\beta$ -ESTRADIOL LEVELS ON FEMALE ORANGE MUD CRAB, *Scylla olivacea* (HERBST, 1796) IN CAPTIVITY**

**AMIN SAFWAN BIN ADNAN**

**October 2016**

**Main Supervisor : Professor Mhd. Ikhwanuddin bin Abdullah, Ph.D.**  
**Co-Supervisor : Nadirah binti Musa, Ph.D.**  
**Institute : Institute of Tropical Aquaculture**

The present study was designed to focus on the effect of water salinity (10 ppt, 20 ppt and 30 ppt) on ovarian maturation stages and 17  $\beta$ -estradiol levels on female orange mud crab, *Scylla olivacea* in captivity. *Scylla olivacea* were sampled from Setiu Wetlands, Terengganu on the East Coast of Peninsular Malaysia (5°31'23.1"N 102°55'56.1"E) from July to September 2015. Ovarian maturation stages were determined through colouration, Gonad Somatic Index (GSI), oocyte diameter and oocyte structure, all collected for analyzation at every 15 days throughout 60 days of culture period (Individual aquarium: 36cm x 22cm x 21 cm; Salinity: 10 ppt, 20 ppt, 30 ppt; Temperature: 27-29°C; Light intensity: ambient; Diet intake: *Selaroides leptolepis* at 10% body weight, every days, twice daily, at 0900 hrs and 1700 hrs), while the reproductive hormone levels 17  $\beta$ -estradiol in the hemolymph were measured through Enzyme-Linked ImmunoSorbent

Assay (ELISA). Morphologically, as the ovary develop, the colour start to change from translucent or whitish in colour and sometimes creamy to pale yellow, followed by light orange and lastly reddish orange. GSI of *S. olivacea* remained low at Stage 1 and 2 and began to increase starting at Stage 3. The oocyte size also increase as the ovary matured. Stage 4 ovary was highest observed in salinity 20 ppt followed by 10 ppt and lastly 30 ppt. As for reproductive hormone levels of 17  $\beta$ -estradiol, the highest peak were recorded at early culture period day (Day 15) but decreased as the ovary crab matured thus signifies the uses of this hormone to produce matured ovaries. Statistical analysis showed that, there were significant differences for GSI ( $\rho=0.045$ ;  $\rho<0.05$ ) and oocyte sizes ( $\rho=0.000$ ;  $\rho<0.05$ ), meanwhile there was no significant difference ( $\rho=0.571$ ;  $\rho>0.05$ ) for 17  $\beta$ -estradiol levels with the salinity that being sampled at every 15 days toward 60 days culture period. However, there was a negative correlation with a significant different between GSI ( $\rho=0.014$ ;  $\rho<0.05$ ) and oocyte diameter size ( $\rho=0.001$ ;  $\rho<0.01$ ) with 17  $\beta$ -estradiol levels. Treatment 2 (20 ppt) was identified as the best salinity in the present study followed by Treatment 1 (10 ppt) and lastly Treatment 3 (30 ppt). Hence, this present study proved that salinity does affect the ovarian maturation, however there was no proof to determine the importance of salinity on 17  $\beta$ -estradiol regulation for ovarian maturation in *S. olivacea* in the present study.