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THE RELATIONSHIP BETWEEN THE
NATURAL DIETS AND DIGESTIVE
ENZYME WITH HEPATOPANCREAS AND
OVARIAN MATURATION OF MUD CRAB,
Scylla olivacea (HERBST, 1796)

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**Thesis Submitted in Fulfillment of the Requirement for the Degree of Master of
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Dedication

I would like to dedicate my thesis to my beloved parents, Sabariah Osman and Ariffin Hassan, the reason what I had become today. Thanks for your great support and continuous care. You both have been my inspiration. This thesis also is dedicated to the memory of my best friend's father, Mohd Amran bin Misni. May Allah grant him Jannah.

ABSTRACT

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

THE RELATIONSHIP BETWEEN THE NATURAL DIETS AND DIGESTIVE ENZYME WITH HEPATOPANCREAS AND OVARIAN MATURATION OF MUD CRAB, *Scylla olivacea* (HERBST, 1796)

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Institute : Institute of Tropical Aquaculture

Recently, there has been a growing interest on ovarian maturation study of mud crab, however study on any different factors that related with ovarian maturation of mud crab is still lacking. Therefore, this study covers the factors such as natural diet, digestive enzyme and hepatopancreas related to ovarian maturation of *Scylla olivacea*. Sixty of female adult *S. olivacea* were collected from Setiu Wetlands. Foregut was collected to study its fullness and content. Hepatopancreas was collected to study its digestive enzyme activity, B-cell and R-cell. The foregut fullness result showed moderate foregut fullness for ovary Stage 3 (20.00%) and ovary Stage 4 (24.17%) were decrease significantly compared to ovary Stage 1

(38.00%). Increase of active foregut fullness was observed during ovary Stage 4 (18.33%) compared to ovary Stage 1 (8.00%) and ovary Stage 3 (6.67%). Gorged foregut fullness were increase significantly during ovary Stage 3 (31.11%) and ovary Stage 4 (24.17%) compared to ovary Stage 1 (16.00%). Overall, the increment of diet feeding as increasing ovary stages was observed. Foregut content stated that ovary Stage 3 consisted of high animal based diet percentage occurrence (mollucs: 50.0%, crustacean: 27.8%) compared to ovary Stage 1 (mollucs: 50.0%, crustacean: 18.8%) and ovary Stage 4 (mollucs: 24.6%, crustacean: 30.2%). Enzyme activity revealed that ovary Stage 1, (amylase: 0.112 ± 0.03 U/mg, cellulase: 0.00082 ± 0.00 U/mg, lipase: 0.220 ± 0.053 U/mg and trypsin: 0.845 ± 0.17 U/mg) and ovary Stage 4 (amylase: 0.247 ± 0.03 U/mg, cellulase 0.00074 ± 0.00 U/mg, lipase 0.229 ± 0.021 U/mg, and trypsin: 0.953 ± 0.12 U/mg) was significantly lower compared to ovary Stage 3 (amylase: 0.405 ± 0.06 U/mg, cellulase: 0.0013 ± 0.00 U/mg, lipase: 0.404 ± 0.04 U/mg and trypsin: 2.16 ± 0.14 U/mg). Regarding hepatopancreas histology reported increment abruptly of B-cell during ovary Stage 3 (3.87 ± 0.26 cells per tubule) compared to ovary Stage 1 (0.07 ± 0.03 cells per tubule) and remain similar in ovary Stage 4 (4.58 ± 0.27 cells per tubule). Total of R-cell was the highest during ovary Stage 3 (295.37 ± 6.01 cells per tubule) compared to ovary Stage 1 (121.49 ± 4.42 cells per tubule) and ovary Stage 4 (211.29 ± 4.97 cells per tubule). Present study concluded that vitellogenesis mainly occurred during ovary Stage 3 based of evidence of increment diet feeding which predominantly consist of animal based diet, increment digestive enzymes activity, B-cell and R-cell.