Rapeeporn Reaksputi 2009: Total Haemocyte Count, Immune Related Enzyme Activities and the Carotenoid Contents in the Molting Cycle of Mud Crab (*Scylla serrata* Forskål 1775). Master of Science (Marine Science), Major Field: Marine Science, Department of Marine Science. Thesis Advisor: Assistant Professor Jintana Salaenoi, Ph.D. 80 pages.

The total haemocyte count, phenoloxidase and superoxide dismutase activities, quantitative and qualitative of carotenoid were determined in different tissues of the mud crab (*Scylla serrata* Forskål 1775) throughout 12 stages in the molting cycle. The total haemocyte counts ranged from 5.02±1.90 to 17.64±9.98 $x10^6$cellml^{-1}. The result showed that haemocyte numbers were higher in the postmolt than in the intermolt and premolt stages (p<0.05). Levels of phenoloxidase activities ranged from 0.65±0.13 to 3.93±2.48, 2.27±0.33 to 7.40±0.85, 0.52±0.29 to 4.89±1.72 and 0.93±0.21 to 3.65±1.80 units mg $proteins^{-1}$, in the hepatopancreas, gill, integument and haemolymph, respectively. Phenoloxidase showed predominant activities in the gill, while variation in activities throughout the molting cycle was observed in hepatopancreas and integument. However, haemolymph was distinctly high at early postmolt. The haemocyte and phenoloxidase play an important role in sclerotization, melanization and immunity system of the crab. On the other hand, activities of superoxide dismutase in the hepatopancreas, gill, integument and haemolymph ranged from 5.25±1.46 to 52.56±17.05, 8.67±1.33 to 29.52±9.53, 2.48±0.49 to 14.14±7.25 and 0.53±0.16 to 1.20±0.37 units mg $proteins^{-1}$, respectively. The highest activities were observed in the hepatopancreas and integument at intermolt, while in the haemolymph and gill the activities were highest at 6 and 24-hour postmolt, respectively. Superoxide dismutase is responsible for eradication of superoxide anions being released from metabolic processes and respiratory burst. As for carotenoids, the highest content was evaluated in intermolt of the integument (11.75±2.64 to 53.43±0.98 μg g wet $weight^{-1}$), followed by the contents in hepatopancreas gill and haemolymph ranging from 1.42±0.16 to 5.30±0.99, 0.53±0.22 to 3.54±1.58 and 0.05±0.02 to 1.31±0.69 μg g wet $weight^{-1}$. The tissues carotenoid analysed by HPLC technique revealed that the integument, gill and haemolymph mainly accumulated astaxanthin, while β-carotene was the major source in the hepatopancreas. This research has demonstrated that haemocyte, enzyme activities and carotenoid were important aspects in relavant to shedding, coloration, metabolism and immune system of the mud crab.

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