

Preyada Boonyen 2007: Quantitative Changes of Some Important Biochemical Composition in the Tissues of Mud Crab (*Scylla serrata* Forskål 1775) Having Red Sternum Symptoms. Master of Science (Cell and Molecular Biology), Major Field: Cell and Molecular Biology, Department of General Science. Thesis Advisor: Associate Professor Mingkwan Mingmuang, Ph.D. 74 pages.

Three major biochemical compositions; those involve energy sources (glycogen, glucose, lactate, fatty acid), structural components (glucosamine, *N*-acetylglucosamine, chitin) and pigmentation (total carotenoid, astaxanthin,  $\beta$ -carotene) in several tissues and organs of normal mud crab (*Scylla serrata*) were compared to those having red sternum symptoms. Glycogen was found to decrease 4 times in the muscle of red sternum crabs (from  $0.8609 \pm 0.0912$  to  $0.2097 \pm 0.0122$  mg/g wet weight ) but glucose was increased 6 times in the hepatopancreas (from  $0.0058 \pm 0.5715$  to  $0.0365 \pm 0.0024$  mg/g wet weight), while lactate was also increased 4 times in the gills (from  $0.3510 \pm 0.0695$  to  $1.4612 \pm 0.0689$  mg/g wet weight) suggesting the switch to anaerobic respiration in these crabs. On the other hand, saturated fatty acid (palmitic acid; C16:0) and monounsaturated fatty acid (palmitoleic acid; C16:1 , oleic acid; C18:1) which are responsible for lipid catabolism and polyunsaturated fatty acid (docosahexaenoic acid DHA; C22:6) involving ion permeability of membrane were distinctively increased in the hepatopancreas and haemolymph of red sternum crabs. As for structural components, glucosamine was found to decrease in all tissues and organs of red sternum crabs at low levels but *N*-acetylglucosamine was drastically increased 5 times (from  $0.5712 \pm 0.14$  to  $3.0189 \pm 1.5454$   $\mu$ g/ml) in the haemolymph, while chitin in the carapace of red sternum crabs was decreased from  $9.08 \pm 0.5204$  to  $6.92 \pm 0.2887$  % dry weight which could be the results of chitin degradation and transformed into *N*-acetylglucosamine. It is interesting to find both total carotenoid and  $\beta$ -carotene decreased in most of the tissues of red sternum crabs. Although total carotenoid was only moderately changed,  $\beta$ -carotene in hepatopancreas was clearly decreased (from 6.9562 to 3.6692  $\mu$ g/g wet weight). On the contrary, astaxanthin was mostly increased especially at high levels (from 0.3504 to 3.2466  $\mu$ g/ml) in the haemolymph of red sternum crabs which is probably due to the oxidation of  $\beta$ -carotene itself.

---

Student's signature

---

Thesis Advisor's signature