

Heavy Metal Contents in Cockles (*Anadara granosa*) From The Nakhon Si Thammarat Bay of Thailand

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Abstract: The objective of this research was to study the contents of lead, chromium and cadmium in cockles (*Anadara granosa*) from Nakhon Si Thammarat bay by the inductively coupled plasma atomic emission technique (ICP-AES). The samples were collected from twenty stations around the Nakhon Si Thammarat bay in amphoe Tasala, amphoe Mueng and amphoe Pakpanang, Nakhon Si Thammarat Province. Twenty samples were collected in December of 2009 and in February, April, June and August of 2010. Lead, chromium and cadmium were all found in the cockle tissues. The average contents were 0.750 ± 0.052 , 0.454 ± 0.101 and 2.622 ± 0.096 $\mu\text{g}/\text{kg}$, respectively. Cadmium was highest because wastewater of nielloware factory from municipal area Nakhon Si Thammarat province flow to Nakhon Si Thammarat bay. However, it is indicated that the concentrations of the three heavy metals, lead, chromium and cadmium found in the cockles collected from Nakhon Si Thammarat bay did not exceed the food compliance limits set by the Ministry of Public Health, Thailand (B.C 2529).

Introduction: Lead, chromium and cadmium are heavy metal that can harm the human's body systems such as nerve system, digestive system and skeleton system. The human body can intake heavy metal by breathing or swallowing lead dust or paint chips containing heavy metal. The source of heavy metals released to the nature included heavy metal smelters and battery factory. Many ways to remove heavy metal exist; for example, precipitation, electrolysis and ion exchange, but these are expensive methods.

Methodology : Incubate the cockle samples in 60 °C then cool in dessicator. Take 4 gm samples, add 5 ml conc. HNO_3 10 ml conc. H_2SO_4 and glass bead. Evaporate on a hot plate until dense white fumes of SO_3 just appear. If solution does not clear, add 10 ml conc. HNO_3 and repeat evaporation to fumes of SO_3 . Heat to remove all HNO_3 before containing treatment. All HNO_3 will be removed when the solution is clear and no brownish fumes are evident. Do not let sample dry during digestion. Cool and dilute to about 50 ml with deionized water. Heat to almost boiling to dissolve slowly soluble salts. Filter if necessary, then add deionized water to make 100 ml sample and pack it in polyethylene bottle. Analysed sample with ICP-OES. Prepare sample and treat it from 1 to 20 again. Prepare the blank (without sample) and treat it from 1 to 20.

Results, Discussion and Conclusions : Lead , Chromium and cadmium were all found in the cockle tissues. The average contents were were 0.750 ± 0.052 , 0.454 ± 0.101 and 2.622 ± 0.096 $\mu\text{g}/\text{kg}$, wet weight respectively. The maximum average of the chromium in the cockle tissues found in April 2010. Whereas the maximum average of the lead and cadmium found in August 2010. The change of winter, summer and rainy seasons have some effects on the amount of the accumulation of the three heavy metals in the cockle tissues; its significant difference was at 0.05 level. However, it is indicated that the concentrations of the three heavy metals, lead, cadmium and chromium found in the cockles collected from the Nakhon Si Thammarat bay did not exceed the food compliance limits set by the Ministry of Public Health , Thailand (B.C.2529).



Figure 1. Sampling Station



Fig. 2 cockles (*Anadara granosa*) from Nakhon Si Thammarat bay

Acknowledgments : This work was financially supported by Nakhon Si Thammarat Rajabhat University.

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Keywords : Cockles (*Anadara granosa*) , Lead, Chromium, Cadmium, Nakhon Si Thammarat bay