HEAVY METAL IN BIVALVE AND SEDIMENT AT COASTAL TERENGGANU

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FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

2011

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Heavy metal in bivalve and sediment at coastal Terengganu / Chew Cher Shin.

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This project report should be cited as:

Chew, C. S., 2011. Heavy Metal in Bivalve and Sediment at Coastal Terengganu. Undergraduate Thesis, Bachelor of Science (Marine Science), Faculty of Maritime Study and Marine Science, University Malaysia Terengganu, Terengganu, 62 p.

DEPARTMENT OF MARINE SCIENCE
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DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:
Heavy Metal in Bivalve and Sediment at Coastal Terengganu by Chew Cher Shin, Matric No. 17624 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Bachelor of Science (Marine Science), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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ACKNOWLEDGEMENTS

First of all, I would like to wish my sincerest gratitude and deepest thanks to Dr. Hing Lee Siang for sharing her knowledge, guidance and advices to finish this project. I would never able be complete within the given time without her valuable guidance.

Other than that, I would like to thank to all the lecturers, science officers and lab assistants from Faculty of Maritime Study and Marine Science in University Malaysia Terengganu for all the help and advices that given to me. Special thank to Pok Din and Pok Mat for their help during collect the samples.

Also not forget my friends and coursemates who help me and support me whenever I needed them, especially Chua Chia Yee, Poh Ban Tat and Ooi Ying Cheing. Last but not least, I would like take the opportunity to thank my family for their moral and financial support in this project. Thank you so much.

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%	-	percentage
µg/g	-	microgram per gram
µg/L	-	microgram per liter
AAS	-	Atomic Absorption Spectrophotometer
AQUATROP	-	Institute Aquaculture Tropical
Ba	-	Barium
Cd	-	Cadmium
cm	-	Centimeter
Cr	-	Chromium
Cu	-	Copper
EDTA	-	Ethylenediaminetetraacetic acid
Fe	-	Iron / Ferum
g	-	gram
GPS	-	Global Positioning System
HCl	-	Hydrochloric acid
HF	-	Hydrofluoric acid
HNO_3	-	Nitric acid
mg/kg	-	milligram per kilogram
mg/L	-	milligram per liter
Mili-Q water	-	deionized water
mL	-	milliliter

Mn	-	Manganese
°C	-	Degree Celsius
Pb	-	Lead
ppm	-	part per million
SD	-	Standard deviation
Sr	-	Serenium
SRM	-	Standard Reference Material
TORT-2	-	Lobster Hepatopancreas
UMT	-	University Malaysia Terengganu
Zn	-	Zinc

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ABSTRACT

The study on the content of heavy metal in tissue bivalve and sediment collected from coastal Terengganu include Kerteh River (2 stations), Marang River (5 stations) and Setiu Wetland (5 stations) was conducted during April and May 2010. The study on the depuration of heavy metal by bivalve *Crassostrea sp.* was also conducted. The elements of heavy metal analyzed were Cadmium (Cd), Copper (Cu), Iron (Fe), Lead (Pb) and Zinc (Zn). The concentration of Cd, Cu, Zn, Pb and Fe in tissue ranged from 0.199 – 0.718 mg/kg dry weight, 1.988 – 22.133 mg/kg dry weight, 43.645 – 239.115 mg/kg dry weight, 0.733 – 3.471 mg/kg dry weight and 5.538 – 46.263 % dry weight respectively at all stations. While for sediment, the concentration (mg/kg dry weight) ranged from 0.053 – 0.359 for Cd, 0.479 – 8.481 for Cu, 3.321 – 94.878 for Zn, 0.466 – 3.203 for Pb and 30.038 – 231.394 % dry weight for Fe at all stations in coastal Terengganu. Setiu Wetland showed higher content of metals compare to Marang River and Kerteh River. For heavy metal depuration experiment, the results showed that *Crassosstrea sp.* was able to depurate heavy metal more effectively. The concentration of Cd in oyster has decreased 32.58% from day 0 to day 7, Cu decreased 36.91%, Pb decreased 66.95% and Fe decrease 54.79%. However, the concentration of Zn increase 18.45% from day 0 to 7.

Kajian Kandungan Logam Berat di dalam Bivalvia dan Sedimen di Kawasan Persisiran Pantai Terengganu

ABSTRAK

Kajian kandungan logam berat dalam tisu bivalvia dan sedimen diambil dari kawasan pantai Terengganu termasuklah Sungai Kerteh (2 stesen), Sungai Marang (5 stesen) dan Setiu Wetland (5 stesen) telah dijalankan pada bulan April dan Mei 2010. Kajian depuration logam berat oleh bivalvia *Crassostrea sp.* juga dijalankan. Elemen – elemen logam berat yang dianalisiskan adalah Kadmium (Cd), Kuprum (Cu), Besi (Fe), Plumbum (Pb) dan Zink (Zn). Kepekatan bagi Cd, Cu, Zn, Pb and Fe dalam tisu bivalvia adalah dalam lingkungan dari 0.199 – 0.718 mg/kg berat kering, 1.988 – 22.133 mg/kg berat kering, 43.645 – 239.115 mg/kg berat kering, 0.733 – 3.471 berat kering and 5.538 – 46.263 % berat kering bagi semua stesen di kawasan kajian. Bagi sedimen pula, purata kepekatan(mg/kg berat kering) adalah 0.053 – 0.359 bagi Cd, 0.479 – 8.481 bagi Cu, 3.321 – 94.878 bagi Zn, 0.466 – 3.203 bagi Pb and 30.038 – 231.394 % berat kering bagi Fe di semua stesen di kawasan kajian. Setiu Wetland menunjukkan kandungan logam berat yang paling tinggi dibandingkan dengan Sungai Marang dan Sungai Kerteh. Untuk depuration eksperimen, secara keseluruhannya keputusan menunjukkan *Crassostrea sp.* boleh depurate logam berat. Kepekatan bagi Cd dalam tiram telah turun sebanyak 32.58% dari hari 0 hinggan hari ke-7, 36.91% bagi Cu, 66.95% bagi Pb dan 54.79% bagi Fe. Manakala bagi Zn pula, kepekatan Zn bertambah sebanyak 18.45%.