

CONCENTRATION OF HEAVY METALS IN MOLLUSCS
FROM SABAK BERNAM, SELANGOR

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CONCENTRATION OF HEAVY METALS IN MOLLUSCS FROM
SABAK BERNAM, SELANGOR

By

Woo Mun Yee

Research Report submitted in partial fulfillment of
the requirement for the degree of
Bachelor of Science (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:

Concentration of Heavy Metals in Molluscs from Sabak Bernam, Selangor

by **Woo Mun Yee**, Matric No. **UK 20097** 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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List of symbols

Cu	Copper
Zn	Zinc
Mn	Manganese
Fe	Iron
Cd	Cadmium
Pb	Lead
mg/kg	Milligram per Kilogram = ppm
±	Approximate
N	North
E	East
GPS	Global Positioning System
°C	Degree Celsius
HNO₃	Nitric acid
NO₂	Nitrite
µm	Micrometer
ml	Milliliter
A	Heavy metal concentration estimate from standard curve
V	Volume of dilution
W	Dry weight of sample
SD	Standard deviation
NS	Not significant different
S	Significant different

Abstract

A study was carried out to determine the concentration of heavy metals (Cu, Zn, Mn, Fe, Cd, Pb) in the molluscs tissues and sediment collected from three stations at Sabak Bernam, Selangor. There are three stations which are located at river, estuary and beach. 5 species of molluscs is collected which is *Nerita lineata*, *Cronia margariticola*, *Cerithidea obtusa*, *Batillaria zonalis* and *Anadara granosa*. The concentration of heavy metals is analysis by using Flame Atomic Absorption Spectrometry (AAS). From the studies, it is known that obviously high concentration of Fe (34220.00 ± 226.27 mg/kg) and Pb (7.83 ± 0.87 mg/kg) in the sediments compare with gastropod tissues. While high mean concentration of Cu (116.15 ± 1.061 mg/kg) and Zn (175.35 ± 7.30 mg/kg) found in the gastropods tissues than sediments. There are high concentration of heavy metals contain in *Cerithidea obtusa* which is one of the edible gastropods especially Cu (116.15 ± 1.061 mg/kg), Zn (103.12 ± 9.09 mg/kg) and Mn (1417.00 ± 80.61 mg/kg). *Anadara granosa* is collected from restaurant and factory near by the cockles farming area. It shown that mean concentration of heavy metals in decrease order is Fe>Mn>Zn>Cu>Pb>Cd. There are no significant different between the mean concentration of heavy metals of *Anadara granosa* from restaurant and *Anadara granosa* from factory Some of the gastropods have exceed the safety limits by Malaysian Food Regulation 1985 such as *Cerithidea obtusa* and *Cronia margariticola*. Even though concentration of heavy metals of cockles still in the safety level given, but it also contain quite high of heavy metals that nearly reaches the safety limit, thus consumer still need to pay concern on this.

Kepekatan logam berat dalam mollusks dari Sabak Bernam, Selangor.

Abstrak

Kajian ini dijalankan bertujuan untuk menentukan kepekatan logam berat (Cu, Zn, Mn, Fe, Cd, Pb) di dalam mollusks dan sedimen dari Sabak Bernam, Selangor. Terdapat tiga tempat penempelan dimana terletak di sungai, muara sungai dan pantai. 5 jenis spesies mollusks telah dikumpul iaitu *Nerita lineata*, *Cronia margariticola*, *Cerithidea obtusa*, *Batillaria zonalis* dan *Anadara granosa*. Kepekatan logam berat dianalisa dengan menggunakan Flam Atomic Absorption Spectrometry (AAS). Melalui kajian ini, didapati dengan ketara sedimen mengandungi min kepekatan Fe (34220.00 ± 226.27 mg/kg) dan Pb (7.83 ± 0.87 mg/kg) yang tinggi berbanding dengan tisu gastropoda. Manakala min kepekatan Cu (116.15 ± 1.061 mg/kg) dan Zn (175.35 ± 7.30 mg/kg) yang amat tinggi di dalam tisu gastropoda berbanding dengan sedimen. *Cerithidea obtuse* merupakan salah satu gastropod yang dimakan orang ramai, mengandungi kepekatan logam berat yang tinggi terutamanya Cu (116.15 ± 1.061 mg/kg), Zn (103.12 ± 9.09 mg/kg) dan Mn (1417.00 ± 80.61 mg/kg). Min kepekatan logam berat terkandung dalam kerang, *Anadara granosa* dengan kadar menurun ialah Fe>Mn>Zn>Cu>Pb>Cd. Didapati tiada bebezuan yang ketara di antara *Anadara granosa* yang dikumpul dari restaurant dan kilang kerang. Sebahagian gastropoda telah melebihi had logam berat yang dibenarkan oleh Peraturan Permakanan Malaysia 1985 seperti *Cerithidea obtusa* dan *Cronia margariticola*. Walaupun kepekatan logam berat yang terdapat dalam kerang tidak melebihi had keselamatan yang diberi, tetapi ia masih perlu dibimbangkan oleh pengguna kerana ia masih mengandungi kepekatan logam berat yang amat tinggi.