UNIVERSITI TEKNOLOGI MARA

HEAVY METAL CONTAMINATION IN COCKLES AND ITS POTENTIAL HEALTH RISK TO HUMAN

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DECLARTION BY STUDENT

Project entitled “Heavy Metal Contamination in Cockles and Its Potential Health Risk to Human” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Mr. Nasaruddin Abd Rahman. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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In the name of Allah, the Most Merciful and the Most Compassionate.

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ABSTRACT

Heavy metals can be essential to human or may deteriorate human health depending on the amount consumed. Heavy metal discharged mainly from the industries into the aquatic environment may eventually accumulate in the water, sediment and also in the aquatic organisms such as fish and shellfish. Heavy metal in cockle (shellfish) has becoming a major concern to the country as consumption of this contaminated cockle is one of the source of protein to the people. Thus, the cockle can be used to assess the heavy metal content as it is able to accumulate the pollutant in its soft tissue which made it a good biological indicator. For this study, a cross sectional study was used in order to determine the heavy metals in the *Anadara granosa* soft tissue. The sampling was made randomly (n=30) at two different locations, which were at Kuala Sepetang, Perak and Kuala Selangor, Selangor. Dry ashing method was used in order to digest the samples before analyzed the digested samples using Graphite Furnace Atomic Absorption Spectrophotometer (GFAAS) to extract the heavy metal in each samples. The heavy metal parameter focused in this study is cadmium, copper, lead and zinc. Mann-Whitney U test was used to compare the heavy metal result from both locations. Based on the analyzed data, the ranking order according to the heavy metal parameter concentration for Kuala Sepetang, Perak were Zn (56.247 mg/kg)> Cu (23.860 mg/kg)> Pb (5.860mg/kg)> Cd (0.133 mg/kg) while for Kuala Selangor, Selangor were Zn (56.227 mg/kg)> Cu (5.233 mg/kg)> Pb (3.447 mg/kg)> Cd (not detected). There were significant difference between the two locations for parameter of cadmium and copper. For the health risk assessment conducted, the result show no non-carcinogenic risk towards all population groups but there was a probability of carcinogenic risk towards adults as the result were not within the acceptable carcinogenic range which was from 10-4 to 10-6. In conclusion, this study indicated that there were presence of heavy metals in the cokcle's soft tissue. Based on the mean concentration result, lead concentration in cockle exceeded both the national (Malaysian Food Act (1983) and Food Regulations (1985)) and international standard (WHO/FAO) for both locations while for cadmium concentration for cockle originating from Kuala Sepetang, it slightly exceeded the international standard. In conclusion, the cockle collected from both location can be consumed but it should be taken in the correct amount.

Keywords: Anadara granosa, shellfish, heavy metal, health risk assessment, Kuala Sepetang, Kuala Selangor.