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Comparative Bioaccumulation of Heavy Metals (Fe, Zn, Cu, Cd, Cr, Pb) in Different Edible Mollusk Collected from the Estuary Area of Sarawak River

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Abstract

The tissue of mollusk such as *Polymesoda expansa*, *Meretrix meretrix* and *Solen regularis* are being relatively eaten by the local people as other marine organisms along the estuary of Sarawak River. The tissue samples and sediment samples were analyzed for heavy metals by using Atomic Absorption Spectrophotometer (AAS). The mean concentration of the heavy metals zinc (Zn) and copper (Cu) in selected mollusk species were below the permissible limit when compared with the Malaysian Food Act 1983 except for cadmium (Cd). The cadmium (Cd) concentration was exceeded the permissible limit. The bioaccumulation factor (BAFs) of Cd, Cu, Fe, Cr, Pb and Zn in whole tissue of *Polymesoda expansa*, *Meretrix meretrix* and *Solen regularis* in relative to mean metal concentrations in sediments was measured. The bioaccumulation factor (BAFs) results revealed the following descending order: Zn > Fe > Pb > Cr > Cd > Cu, (*Polymesoda expansa*), Fe > Cd > Cu > Pb > Zn > Cr (*Meretrix meretrix*) and Cu > Cr > Pb > Cd > Fe > Zn (*Solen regularis*).

Introduction

Marine and estuarine animals such as mollusk tend to accumulate heavy metals in their body tissue from food, water and ingestion of particulate matter then transferred the heavy metals through the food chain [10,16]. Mollusk are widely reported use to detect the environment pollution especially heavy metal pollution due to its sedentary, have long life span abundance and tolerant to varying environmental factors such as salinity and pH [11,14]. Heavy metals are one of the most serious pollutants in the environment due to their toxicity, persistence and ability to concentrate along the food chain [3]. Estuarine environment is the most productive habitat which serves as primary habitat or as spawning ground for most marine species. Due to rapid growth in human population, intensive agriculture activities and industrial activities eventually lead to increase amount of pollutants especially heavy metals and threatened the estuaries environment [5]. Most living organism need small amount of essential metals such as iron (Fe), manganese (Mn), copper (Cu), and Zinc (Zn) as for essential processes such as for growth [5,6]. However, all this metals will give harmful effects when exceeded the certain limits [3]. The non-