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CONTAMINATION BY HEAVY METALS IN COCKLES (*Anadara granosa*) FROM SELECTED WET MARKETS IN THE KLANG VALLEY

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In the name of Allah, The Most Gracious, The Most Merciful

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Abstract

Red blood cockle, *Anadara granosa* were collected from eleven different wet markets in the Klang Valley. The samples were analyzed for zinc (Zn), cadmium (Cd), antimony (Sb), lead (Pb), mercury (Hg) and arsenic (As). The metal concentrations (mg/kg wet weight) in the cockles ranged from 6.63 to 13.45 for Zn, 0.004 to 0.91 for Cd, 0.43 to 2.36 for Sb, 1.32 to 25.22 for Pb, 0.01 to 0.48 for Hg and 0.02 to 0.38 for As. These metal concentrations were below the maximum permissible levels set by the Malaysian Food Regulations (1985) and Food Standards Australia and New Zealand except for lead and antimony. Potential health risk was measured based on the Hazard Index. Hazard Index of the metals in the cockles in this present study showed that the consumption of cockles was not risky and any risk is dependent on the amount of cockles consumed by the study population.

CHAPTER ONE

INTRODUCTION

1.1   Background

Red blood cockle, *Anadara granosa* [Order: Arcoida; Family:Arcidae] is a filter feeding bivalve that lives in muddy intertidal areas feeding on phytoplankton and zooplanktons (Yap *et al*, 2007). This means that cockle is also called as filter feeders. Filter feeders pass water through their bodies and filter their food from this water. This can cause the accumulation of pollution and germs in the cockle (Food Standard Agencies, 2008).

Fish and shellfish are good sources for a variety of vitamins and minerals (Food Standard Agency, 2010), and it has been the main supply of protein to a large percentage of the worlds population including Malaysians. However, due to environmental pollution, especially marine pollution, fish and shellfish have been contaminated by chemicals. Shellfish such as scallop, mussel, oyster, and cockle can accumulate chemical contaminants, including metals in their tissue. Metals include chromium, manganese, cobalt, nickel, copper, zinc, arsenic, selenium, silver, cadmium, mercury and lead (Fisheries Research Service, 2006).

The routes for metals to transport to the aquatic environment are from natural weathering processes on the land, atmospheric deposition (for example, through rainfall) and from waste streams to receiving waters. Metals generally adsorb onto particulate material and are transported to sediments in coastal waters (Fisheries Research Service, 2006).