

HEAVY METAL CONTENT IN POLYMESODA EXPANSA AT KAMPUNG WESTON AND KAMPUNG BANGKALALAK, BEAUFORT

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ABSTRACT

Mangrove is one of a habitat for bivalve such as *Polymesoda expansa* or also known as lokan. Lokan are potentially acted as biomonitoring for water quality assessment. Therefore, this study was conducted to study heavy metal concentration which are cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb) and zinc (Zn) in lokan species in Kg. Weston and Kg. Bangkalalak, Beaufort. Heavy metal was analysed by using Coupled Plasma Optical Emission Spectrophotometer (ICP-OES) after it's been digested using nitric acid (HNO₃). The result showed that ranges concentration in Kg. Weston for Cd, Cr, Cu, Pb and Zn are 0.1972-7.53, 0.2371-1.688, 2.207-32.28, 1.56-26.75 and 47.25-391.91 mg/kg respectively. It found that the mean concentration of Cd, Pb and Zn has exceeded the permissible level set by Peraturan Makanan 1985. The mean concentration for Kg. Bangkalalak are 0.2355-3.515, 0.1978-0.843, 1.346-13.15, 1.298-14.65 and 33.15-152.38 mg/kg respectively. It was only Cd and Pb that exceed the permissible level. As Cr limit has no recorded set by Peraturan Makanan 1985, the lokan from both site was not exceed the permissible level set by the International Atomic Energy Agency (IAEA-407). The result indicated that a small size lokan contained higher heavy metal concentration. Relationship correlation between heavy metal of Cd, Cr, Cu, Pb, and Zn is significant.

CONTENTS OF HEAVY METAL IN THE SEASHELL IN SALUT SABAH AND RISK CONSUMPTION OF HEAVY METALS AMONG CUSTOMERS

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ABSTRACT

The increases in consumption of seafood such as bivalve in community have raised concerns about the heavy metal pollution intake through food. Clam is one animal that could potentially gather content bivalvia metals in the tissues to be able to carry heavy metal poisoning consumers. Therefore, a study was carried out on absorption of the content certain types of heavy metals in tissues of seashell by size small, medium and large. Estimated Daily Intake (EDI) and the Target Hazard Ultrasound (THQ) for metal content results in each size seashell will be determined. Distribution of questionnaires is also done to assist this research, especially finding a weight average population places the study to calculate the EDI user acquisition and assessment. In this research has found that absorption correlation between metals Cd, Cu and Cr is positive, but the third absorption relationship of metal acts with negative metal Zn and Fe. Relationship between the absorption of Fe and Zn is positive, while Pb only shows the negative relationship with metal Cr. For the absorption of differences between sizes, the absorption of Cd, Cr, Cu and Pb shows no differences in each size, whereas absorption of Fe and Zn absorption show the different on each size small, medium and large. As a whole to risk analysis heavy metal intake, THQ for metal in the on-site review seashell less than the value 1 and no potential risk of negative impacts of heavy metals to health.

WATER QUALITY ANALYSIS AND HEAVY METAL MEASUREMENTS OF TOR DOURONENESIS SP AT KADAMAIAN RIVER AND TUARAN RIVER

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ABSTRACT

Kadamaian river flowing in Kota Belud district serves as the main source of water supply other than the water resources provided by the state government. The river also provides food resources such as fish. This study was conducted to assess the water quality of Kadamaian river by comparison with Tuaran river which is located closest to the Kadamaian river on the west coast. The water quality was assessed by the number of faecal coliform bacteria and E. Coli together with the measurement of heavy metals (Cd, Pb, Fe, Cr, Cu, Zn) in fish tissue samples collected from the BOMBON area in that place. Gills and muscle tissue samples from a species of freshwater fish (*Tor douronensis*) were analyzed by (Inductively Coupled Plasma Atomic Emission Spectroscopy) ICP-OES to measure the concentrations of heavy metals such as Iron (Fe), Cadmium (Cd) Plumbum (Pb), Chromium (Cr), Copper (Cu) and Zinc (Zn). Results shows that the number of colonies of faecal coliform and E. coli was higher at Tuaran river compared to Kadamaian river, while the highest concentration of heavy metals in fish was Zn followed by Fe, Cd, Cr, Cu and Pb in both rivers and tissues. In conclusion, the water quality in Kadamaian river is better than Tuaran river and international standard confirms that the two rivers are at a good level. On the other hand, the concentration of heavy metals in some fish sampels in Kadamaian river and Tuaran river has exceeded the allowable limit by WHO (World Health Organization). Therefore, water quality assessment is very important to evaluate the possible risk of fish consumption as fish constitute an important part of community diet.

HEAVY METALS DISTRIBUTION IN WATER AND SEDIMENT OF LIWAGU RIVER AND MANSAHABAN RIVER AT RANAU, SABAH

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ABSTRACT

The Liwagu River is one of the most reliable river system in Ranau which had experienced a mudflows event due to massive landslide of Mount Kinabalu. The aim of this study is to assess and compare the level of heavy metals in water and sediment of the Liwagu and a non-impacted mudflows of Mansahaban River. Water and sediment were collected from four sampling station on each river. Water samples were filtered with 0.45 µm membrane filter and acidified to Ph<2 and conducted by means of ICPOES while AAS was used for sediment analysis prior to aqua regia digestion method for the determination of five heavy metals (Cd, Cr, Cu, Pb and Zn). The result obtained were then compared with Interim National Water Quality Standards (INWQS) and United Nation Food and Agriculture Organization (UNFAO) irrigation water standards, and for sediment analysis, the Provincial Sediment Quality Guidelines (PSQG) and Environmental Protection Agency (EPA). From the result obtained, it shows that Liwagu River comprised of higher heavy metals concentration except for Cd (0.0003 mg/L) and Cr (58.20 mg/kg to 169.7 mg/kg) for both parameter compared to Mansahaban River. Water analysis indicated that all elements in both rivers are in compliance with INWQS and UNFAO irrigation water standards. For sediment analysis, Cu in Liwagu River shows a non-compliance of both PSQG and EPA at (36.18 mg/kg to 330.5 mg/kg) whereby Cr (58.20 mg/kg to 169.7 mg/kg) exceeded the EPA limit. While Cr (69.10mg/kg-146.9 mg/kg) at Mansahaban River as well exceeded both PSQG and EPA. The quality of water from both river are fairly the same however, further in depth investigation are needed to identify a wider perspective towards the behaviour of heavy metals prior to mudflows event.