BIOACCUMULATION OF HEAVY METAL IN FISH IN THE KERTEH-PAKA RIVER SYSTEM

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By

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DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

Bioaccumulation of Heavy Metal in Fish in the Kerteh- Paka River System by **Nik Mohd Mazwan Shazri Bin Safie** Matric No. **UK17581** have been examined and all errors identified have been corrected. This report submitted to the Department of Marine Science and as a partial fulfillment toward obtaining the Degree of Marine Science, Faculty of Maritime Study and Marine Science, University Malaysia Terengganu, Terengganu, Malaysia.

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ABSTRACT

The objective of the present study is to determine the bioaccumulation of heavy metals in various organs. Fish living in polluted waters tend to accumulate heavy metals in their tissues. Generally, accumulation depends on metal concentration, time of exposure, way of metal uptake, environmental conditions and intrinsic factors (fish age, feeding habits). Various metals show different affinity to fish tissues. Most of them accumulate mainly in stomach, liver, flesh and gills. Fish flesh, comparing to the other tissues, usually contain the lowest levels of metals. Metal distribution in various organs is time-related. Accumulation of metals in various organs of fish may cause structural lesions and functional disturbances.

The result of many field studies of metal accumulation in fish living in polluted water show that considerable amounts of various metals may be deposited in fish tissues without causing mortality. Various metals are accumulated in fish body in different amounts. These different results from the different affinity of metals to tissues, different uptake, deposition and excretion rates. Metal levels in live fish usually follow the ranking : $Zn > Fe > Pb > Cu > Cd$. Liver accumulated the highest concentration of Fe, Cd, Pb, Zn and Cu compare to stomach, flesh and gill. This probably due to high fat content in this tissue. Body fat contributes the accumulation of heavy metal because the heavy metal usually deposit in body fat (Bryan, G.W. 1976).

ABSTRAK

Matlamat dari kajian ini adalah untuk menentukan logam berat dalam pelbagai organ. Ikan yang hidup di perairan tercemar cenderung untuk mengumpul logam berat dalam tisunya. Secara umum, pengumpulan logam bergantung pada kepekatan, waktu pendedahan, cara serapan logam, keadaan persekitaran dan faktor intrinsik (umur ikan, kebiasaan makan). Berbagai kepekatan logam berat berbeza dalam organ ikan. Kebanyakan dari logam berat terkumpul terutama di perut, hati, dan insang. daging ikan, berbanding dengan organ lain, biasanya mengandung peringkat terendah logam. Logam taburan di pelbagai organ adalah waktu-berkaitan. Pengumpulan logam dalam pelbagai organ ikan boleh menyebabkan gangguan lesi struktur dan fungsi.

Keputusan kajian lapangan banyak dari pengumpulan logam pada ikan hidup di air tercemar menunjukkan bahawa jumlah yang cukup dari pelbagai logam boleh disimpan dalam rangkaian ikan tanpa menyebabkan kematian. Berbagai logam terkumpul dalam tubuh ikan dalam jumlah yang berbeza. Ini berbeza dengan hasil dari afiniti logam yang berbeza dalam organ,penyerapan yang berbeza, kandungan dan tahap ekskresi. Tahap logam berat dalam ikan hidup biasanya mengikuti peringkat: $Zn > Fe > Pb > Cu > Cd$. Pengumpulan logam berat di bahagian hati berkepekatan tertinggi Fe, Cd, Pb, Zn dan Cu berbanding dengan perut, daging dan insang. Hal ini mungkin kerana kadar lemak tinggi dalam rangkaian ini. Lemak tubuh menyumbang pengumpulan logam berat kerana logam berat biasanya deposit dalam lemak tubuh (Bryan, GW 1976).

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