HEAVY METALS CONTAMINATION IN COMMERCIALLY AVAILABLE FISH SPECIES IN KERTEH RIVER, TERENGGANU

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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT
UNIVERSITI MALAYSIA TERENGGANU

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Lihat Sebelah

HEAVY METALS CONTAMINATION IN COMMERCIALLY AVAILABLE FISH SPECIES IN KERTEH RIVER, TERENGGANU.

By

Muhammad Farhan Bin Mat Akhir

Research Report submitted in partial fulfilment of

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DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled Heavy Metals Contamination in Commercially Available Fish Species in Kerteh River, Terengganu by Muhammad Farhan Bin Mat Akhir, Matric No. UK25241 have been examined and all errors identified have been corrected. This report is submitted to the School of Marine Science and Environment as partial fulfillment towards obtaining the Degree of Bachelor of Science (Marine Biology), School of Marine Science and Environment, Universiti Malaysia Terengganu.

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cm	-	centimetre
mm	-	millimetre
g	-	gram
mL	-	millilitre
kg	-	kilogram
^0C	-	degree Celsius
$\mu g\ g^{-1}$	-	micro gram per gram
SD	-	Standard deviation
Cr	-	chromium
Pb	-	lead
Zn	-	zinc
Cd	-	cadmium
ICP-MS	-	Inductively Coupled Plasma Mass Spectrometry
PTWI	-	Provisional Tolerable Weekly Intake
PTDI	-	Provisional Tolerable Daily Intake

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ABSTRACT

Heavy metals (Cr, Pb, Zn, and Cd) concentrations in muscles, stomach, livers and gills of *Plicofollis nella* and *Plicofollis argyopleuron* were analysed using the Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Total of 12 individuals samples were collected from Kerteh River, Terengganu in the eastern coastal waters of Peninsular Malaysia. The average concentration of the heavy metals in the muscle, stomach, liver and gills are Cr (60.3; 62.0; 48.8; 63.0), Pb (5.0; 12.4; 17.7; 16.4), Zn (432.7; 10208.3; 4083.3; 2385.0) and Cd (0.5; 3.4; 6.8; 0.6) $\mu g\ g^{-1}$ dry weight, respectively. Zinc concentration was found to be the highest among the tested metals in all organs. The correlation of fish's length and heavy metals concentration in the muscle show a positive correlation, however for stomach, liver and gills show negative correlation. The significant value was set at $P<0.05$ for all heavy metals. Most heavy metals concentration exceeded the permitted limit set by the Malaysian Food Regulation, (1985). The estimation for human consumption of the fish's metals concentration was assessed according to Provisional Tolerable Weekly Intake (PTWI) and Provisional Tolerable Daily Intake (PTDI). It was found that the estimated weekly and daily intakes for the studied metals were higher than the PTWI and PTDI limits.

PENCEMARAN LOGAM BERAT DI DALAM SPESIS IKAN KOMERSIL YANG BOLEH DIDAPATI DI DALAM SUNGAI KERTEH, TERENGGANU.

ABSTRAK

Kepekatan logam berat (Cr, Pb, Zn dan Cd) di dalam tisu otot, perut, hati dan insang ikan *Plicofollis nella* and *Plicofollis argyopleuron* telah dianalisis dengan menggunakan *Inductively Coupled Plasma Mass Spectrometry* (ICP-MS). Sampel sejumlah 12 ekor ikan telah diperolehi daripada Sungai Kerteh, Terengganu yang terletak di pesisiran pantai timur Semenanjung Malaysia. Purata kepekatan logam berat di dalam tisu otot, perut, hati dan insang masing-masing adalah Cr (60.3; 62.0; 48.8; 63.0), Pb (5.0; 12.4; 17.7; 16.4), Zn (432.7; 10208.3; 4083.3; 2385.0) and Cd (0.5; 3.4; 6.8; 0.6) $\mu g\ g^{-1}$ berat kering. Kepekatan zink didapati paling tinggi di kalangan logam yang diuji dalam semua organ. Korelasi diantara panjang ikan dan kepekatan logam berat dalam otot menunjukkan korelasi yang positif, walaubagaimanapun untuk perut, hati dan insang menunjukkan kolerasi yang negatif. Nilai signifikan telah ditetapkan pada nilai $P<0.05$ untuk kesemua logam. Kepekatan kebanyakan logam berat adalah melebihi had yang dibenarkan yang telah ditetapkan oleh Peraturan Makanan Malaysia, (1985). Anggaran untuk pengambilan bagi manusia keatas kepekatan logam dalam ikan telah diperolehi dengan mengikut kepada *Provisional Tolerable Weekly Intake* (PTWI) dan *Provisional Tolerable Daily Intake* (PTDI). Didapati bahawa anggaran pengambilan mingguan dan harian untuk logam dikaji adalah di bawah had yang ditetapkan oleh PTWI dan PTDI.