

A STUDY ON PAHs CONTAMINATION LEVEL IN FISH
AT KERTEH RIVER, TERENGGANU

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A Study on PAHs Contamination Level in Fish at Kerteh River, Terengganu

By

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the requirements for the degree of
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**DEPARTMENT OF MARINE SCIENCE
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**DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT**

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

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ABBREVIATIONS

L	-	Litre
°C	-	Degree of Celsius
DCM	-	Dichloromethane
mL	-	Millilitre
μL	-	Microlitre
kg	-	Kilogram
g	-	Gram
nm	-	Nanometer
ppm	-	Part per million
ppb	-	Part per billion
wt	-	Weight
°C.min ⁻¹	-	Degree of Celsius per Minute
cm	-	Centimetre
mg.g ⁻¹	-	Milligram per Gram
μg.g ⁻¹	-	Microgram per Gram
ng.g ⁻¹	-	Nanogram per Gram

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A Study on PAHs Contamination Level in Fish at Kerteh River,

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ABSTRACT

Polycyclic Aromatic Hydrocarbons (PAHs) have been study widely due to its carcinogenic and mutagenic characteristic. The 16 target PAHs compounds were listed by US Environmental Protection Agency (EPA) as priority pollutants which are: acenaphthene, acenaphthylene, anthracene, benzene(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Diben(a,h)anthracene, Fluoranthene, Fluorene, Indenol(1,2,3-c,d)pyrene, Naphthalene, Phenanthrene and Pyrene. The objectives of this study were to determine the seafood (selected) exposure and contaminated by petroleum hydrocarbon and to monitor the hazardous properties and risk of contaminating level of petroleum hydrocarbon in seafood at Kerteh River Estuary. Sampling trips was conducted during April 2010 and October 2010 at Kerteh, Terengganu. Method for this project has 3 stages, saponification extraction process, packed column separation and gas chromatography analysis. Saponification extraction was used to extract hydrocarbons from fish samples respectively. The saponification methods of hydrocarbon extraction in fish were followed the method of Okay (1999). Polycyclic Aromatic Hydrocarbons (PAHs) were separating using the Normal Phase Column Chromatography. The hydrocarbons compounds were identify and quantify using Gas Chromatography – Flame Ionizer Detector (GC-FID).

Based on the BaP equivalent, *Arius Macrulatus*, *Euristhmus microceps*, *Toxotes jaculator*, *Epinephelus coioides* and *Megalops cyprinoides* are safe for human consumption exceeding 16 meals per months. However, *Lutjanus argntimaculatus* are not encourage to be consume exceeding 16 meals per months because the value of BaP(eqv) is 0.41 ng.g-1 recommended quantity which is 16 meals per months Based on 227 g fish/day for a person 70 kg (binelli and Provini, 2004).

Kajian Untuk Membuat Penilaian Terhadap Paras Pencemaran PAHs Dalam Ikan Di Sungai Kerteh, Terengganu

ABSTRAK

Polikitar Hidrokarbon Aromatik (PAHs) adalah jenis bagi hidrokarbon yang adalah terkenal dengan cirri-ciri karsinogenik dan mutagennya. Kini, terdapat 16 komposisi PAHs yang disenaraikan oleh US Environmental Protection Agency (EPA) sebagai bahan pencemar utama iaitu acenaphthene, acenaphthylene, anthracene, benzene(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indenol(1,2,3-c,d)pyrene, Naphthalene, Phenanthrene dan Pyrene. Tujuan kajian ini adalah untuk menentukan hidupan sungai (ikan) yang terdedah kepada pencemaran PAHS dan membuat pemerhatian terhadap cirri yang berbahaya berserta risiko tahap pencemaran hidrokarbon petroleum dalam makanan laut di kawasa Sungai Kerteh. Kajian penyampelan telah dijalankan pada April 2010 dan Oktober 2010. Kepekatan jumlah hidrokarbon dalam ikan telah ditentukan dengan menggunakan Gas Chromatography – Flame Ionizor Detector (GC-FID). Ia mempunyai tiga langkag penting dalam prosedur untuk kajian ini, iaitu proses saponifikasi, pemisahan kolum mampat dan analisis GC-FID.

Berdasarkan equivalen Bap, *Arius Macrulatus*, *Euristhmus microceps*, *Toxotes jaculator*, *Epinephelus coioides* dan *Megalops cyprinoides* adalah selamat untuk pemakanan penduduk di sekitar Sungai Kerteh. Akan tetapi, *Lutjanus argrntimaculatus* tidak digalakkan untuk diambil melebihi 16 hidangan bagi satu bulan, ini kerana nilai equivalen BaP bagi *Lutjanus argrntimaculatus* ialah 0.41 ng.g⁻¹.