

DETERMINATION OF HEAVY METAL IN FISH AND FISH
IDENTIFICATION IN MANGROVE, SUNGAI PAKA,
TERENGGANU

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Determination of Heavy Metal in Fish and Fish
Identification in Mangrove, Sungai Paka, Terengganu.

By
Lee Su Yim

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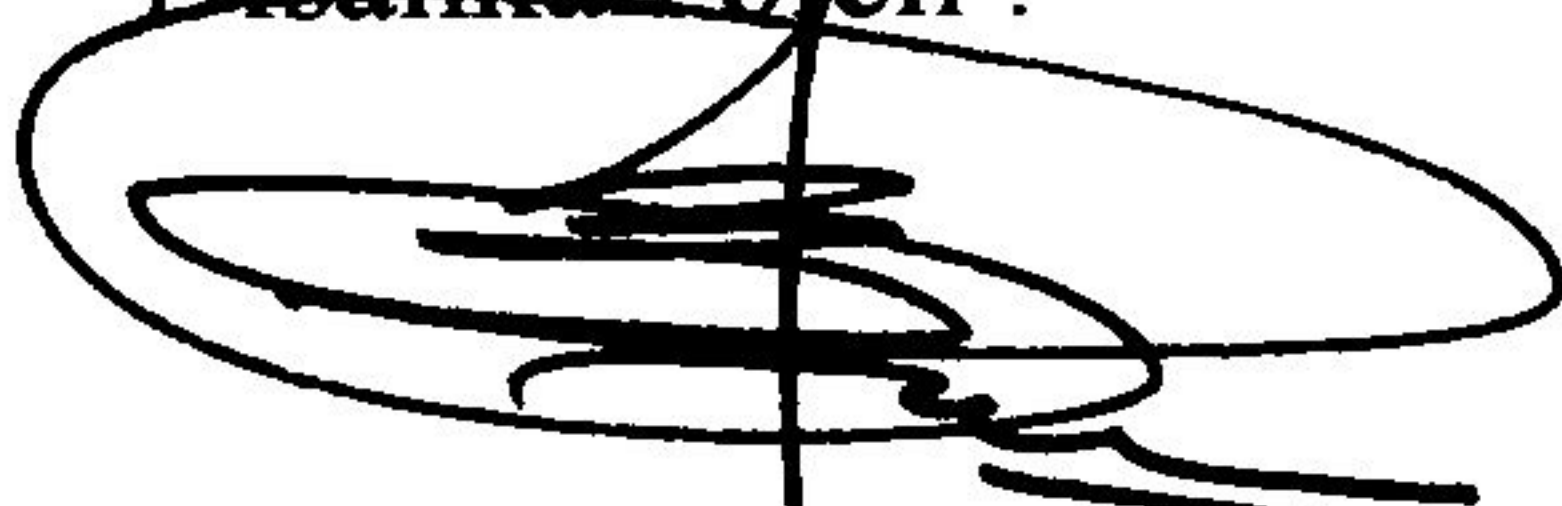
Borang Pengesahan dan Kelulusan Laporan Akhir Projek

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PENGAKUAN DAN PENGESAHAN LAPORAN
PENYELIDIKAN ILMIAH TAHUN AKHIR

Adalah ini diakui dan disahkan bahawa laporan penyelidikan ilmiah tahun akhir bertajuk Determination of Heavy Metal In Fish And Fish Identification in Mangrove, Sungai Paka, Terengganu. Oleh Lee Su Yim, no matrik UK 4468 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi ijazah Sarjana Muda Sains (Pemuliharaan dan Pengurusan Biodiversiti), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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ABSTRACT

The objectives of this study were to determine the heavy metals in fishes and to identify the fish species from mangroves in Sungai Paka, Terengganu. There were 192 fishes caught from Sungai Paka which were from 24 species. Most of the fishes come from class Osteichthyes / Teleostomi. All the fishes were classified into six orders and 18 families. Most of the fishes found were identified as marine fish, and only a small number of the samples collected were fresh water fish. The determination of heavy metals (Co, Zn, Pb and Cu) was conducted on ten selected species using ICP-MS. The result showed that Zn exhibited the highest concentration in all the fish tissues (liver = 36.49 $\mu\text{g/g}$ wet wt, stomach = 34.91 $\mu\text{g/g}$ wet wt and gill = 35.97 $\mu\text{g/g}$ wet wt). Cu is the second highest in concentration found in all the tissues (liver = 9.45 $\mu\text{g/g}$ wet wt, stomach = 9.44 $\mu\text{g/g}$ wet wt and gill 3.30 $\mu\text{g/g}$ wet wt). Co and Pb have the lowest concentration with less than 0.05 $\mu\text{g/g}$ wet wt and 0.3 $\mu\text{g/g}$ wet wt respectively for all the tissues. Liver exhibited higher concentration than gill and stomach among the metals. Two species of fishes that showed high concentration of Zn in gill (*Sillago sihama* and *Arius caelatus* (ikan duri merah)). *Notopterus notopterus*, *Toxeres jaculator* (ikan sumpit) are the fishes showed highest concentration of Zn in stomach tissue. *Arius caelatus* (ikan duri merah) and *Sillago sihama* showed the highest Zn concentration in liver. *Notopterus notopterus* showed the highest Cu in stomach, while *Sillago sihama* is the species show high concentration of Cu in gill and *Apogon hyalosoma* show highest Cu in liver. All of ten species have the lowest concentration of Co and Pb. Generally, the concentrations of heavy metals are low in all the fish species found.

ABSTRAK

Tujuan kajian adalah untuk mengetahui jenis species ikan yang terdapat di sungai Paka dan menentukan logam berat dalam ikan. Dalam kajian, terdapat 194 ikan yang ditangkap dan dibahagi kepada 24 spesies. Kebanyakan ikan adalah dalam kelas Osteichthyes/ Teleostomi. Dalam jumlah 192 ikan dikelaskan kepada enam order dan 18 famili. Kebanyakan ikan yang ditangkap adalah ikan air masin, hanya jumlah kecil adalah ikan air tawar. Kajian terhadap logam berat dalam insang, peraru dan perut telah dijalankan mengikut spesies. Analisis terhadap Co, Zn, Pb dan Cu ke atas ikan dengan menggunakan ICP-MS dalam sepuluh species. Zn menunjukkan kepekatan yang paling tinggi dalam semua tisu ikan. (peraru = 36.49 $\mu\text{g/g}$ berat basah, perut = 34.91 $\mu\text{g/g}$ berat basah and insang = 35.97 $\mu\text{g/g}$ berat basah). Cu adalah kedua tinggi yang dipaati dalam semua tisu (peraru = 9.45 $\mu\text{g/g}$ berat basah, perut = 9.44 $\mu\text{g/g}$ berat basah and insang = 3.30 $\mu\text{g/g}$ berat basah). Co dan Pb menunjukkan pekekatan yang paling rendah, iaitu kurang daripada 0.05 $\mu\text{g/g}$ berat basah dan 0.3 $\mu\text{g/g}$ berat basah masing-masing. Terdapat dua species ikan ynant menunjukkan Zn yang tinggi dalam insang iaitu *Sillago sihama* dan *Arius caelatus* (ikan duri merah). Manakala *Notopterus notopterus* dan *Toxeres jaculator* (ikan sumpit) mengandungi kepekatan Zn tertinggi dalam tisu perut. *Arius caelatus* (ikan duri merah) and *Sillago sihama* adalah dua species yang kepekatan Zn tertinggi dalam peraru ikan. *Notopterus notopterus* adalah species mepunyai kepekatan tertinggi Cu dalam tisu perut, manakala *Sillago sihama* mencatat nilai tertinggi Cu dalam insang dan *Apogon hyalosoma* mencatat nilai Cu tertinggi dalam peraru. Daripada sepuluh species ikan, semua menunjukkan nilai Co and Pb yang rendah. Secara kesuruhannya, kepekatan logam berat adalah rendah dalam semua ikan.