

UNIVERSITI TEKNOLOGI MARA

**ASSESSMENT OF POTENTIAL HEALTH RISK
ASSOCIATION WITH INGESTING HEAVY METALS
IN *OREOCHROMIS NILOTICUS* COLLECTED FROM
SELECTED AREA IN KEPONG, KUALA LUMPUR**

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**Project paper submitted in partial fulfillment of the requirements
for the degree of
Bachelor in Environmental Health and Safety (Hons.)**

Faculty of Health Sciences

JULY 2012

Declaration by Student

Project entitled "Assessment of Potential Health Risk Association with Ingesting Heavy Metals in *Oreochromis niloticus* Collected from Selected Area in Kepong, Kuala Lumpur" is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Mr. Ahmad Razali Ishak as Project Supervisor and Mr. Nasaruddin Abd Rahman as Co-supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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2009515725

881018-10-5031

Date: 20/7/2012

ACKNOWLEDGEMENT

Alhamdulillah thanks to the Almighty Allah S.W.T for His consent that I am able to complete the research as well as finishing this research on time in a successful manner with various helps and support from others.

First of all, I would like to express my appreciation to my supportive supervisor, Mr. Ahmad Razali Ishak for his guideline and support in completing this research project. Thousand thanks for his advices and supervision to finish up this research project.

I would also like to thank my co-supervisor, Mr. Nasaruddin AbdRahman and all lecturers for their advices and suggestions in this study. I am grateful for their cooperation and willingness to assist me in this matter.

Other than that, I would also thanks to my family for their continuous support and positive critics that give me strength to completing this research.

Lastly, I also want to express my thanks to my friends, staff and everyone who helped me directly and indirectly in this research. Only God can pay for their undivided attention, cooperation and support throughout this research. I really appreciate their kindness.

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Abstract

Assessment of Potential Health Risk Association with Ingesting Heavy Metals in *Oreochromis niloticus* Collected from Selected Area in Kepong, Kuala Lumpur

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Recently, heavy metal pollutions in aquatic ecosystem are becoming critical issues. Bioaccumulation of heavy metals in aquatic animals causes serious threat to the human health when they are consumed. This study was conducted to determine the concentration of heavy metals (Pb and Cd) in muscle tissues, gills and bones of *Oreochromis niloticus* (black tilapia) which was collected from two selected location around Kepong area, Kuala Lumpur and its potential human health risk. The sites included a Sri Murni Pond and Kepong Metropolitan Lake, that nearby with Taman Beringin ex-landfill. Metals concentration in fish organs were measured using dry ashing-acid digestion method and be analyzed by atomic absorption spectrophotometer (AAS) AA 800 model Perkin Elmer. The results obtained shows that the highest concentrations for lead (Pb) were detected in the gill followed by bones and the least in muscle tissues. Based on the post hoc test, it has been proved that there is a lead (Pb) significant between the organs where there is a mean different between "Muscle and Gills" and "Muscle and Bones" pairs since ($p < 0.05$). For Cadmium (Cd), most metal is accumulated in the bone compared to gill and muscle tissues. Besides, only "Bones and Gills" and "Bones and Muscle" pairs are significantly different by post-hoc test Scheffe's procedures ($p < 0.05$). Heavy metals concentration in fish organ collected from both sites were within the maximum allowable limits when compared to the Fourteenth Schedule of the Malaysian Food Regulations 1985. For the potential health risk, the Hazard Index (HI) for both heavy metals only focused on the muscle tissue rather than gill and bone. Since the HI are less than 1 ($HI < 1$), it means a consumption of muscle tissue may not pose as a threat to human health and are completely known to be safe to be consumed by humans.

Keywords: Heavy metal, fish organs, dry ashing, health risk assessment.