

**UNIVERSITI TEKNOLOGI MARA**

**ASSESSMENT OF HEAVY METALS IN  
DIFFERENT PARTS OF TILAPIA FISH  
(*Oreochromis niloticus*) AND THEIR POTENTIAL  
HEALTH RISK**

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

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## DECLARATION BY STUDENT

Project entitled “Assessment of Heavy Metals in Different Parts of Tilapia Fish (*Oreochromis niloticus*) and Their Potential Health Risk” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Rodziah Ismail (Assoc. Prof.). It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor of Environmental Health and Safety (Hons).

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## ABSTRACT

This study was conducted to ascertain the levels of heavy metals, namely lead, cadmium, zinc and copper in liver, gills and muscle tissues of Tilapia fish (*Oreochromis niloticus*) collected from Pasar Pasir Penambang, Kuala Selangor. They were dissected and dried before the digestion process. Atomic Absorption Spectrometer (AAS) was used for the detection of heavy metals. The results showed that lead, cadmium and zinc accumulate more in the gills part followed by the liver and muscle. On the contrary, copper showed highest accumulation in the liver compared to the other parts. There were significant differences in the concentration of lead, zinc and copper between tissues of the studied fish ( $P < 0.05$ ), while cadmium showed no significant difference in accumulation between selected tissues. Nevertheless, the findings from this study revealed that lead and zinc concentrations in the edible parts on the investigated fish were higher than the permissible limit as recommended by The Malaysian Food Regulation and FAO/WHO Guideline. The potential health risk has been identified by calculating the hazard index (HI). The result is less than 1, indicating no significant health risk to consumers. Continuous monitoring for heavy metals in fish sold to the consumers is necessary to ensure not only food safety and quality but also protect public health.

Keywords: *Heavy metals, Oreochromis niloticus, Bioaccumulation, Health risk assessment*