

**UNIVERSITI TEKNOLOGI MARA**

**HEAVY METAL CONCENTRATION OF  
FRESHWATER FISH ON AQUACULTURE  
ACTIVITY AT PAHANG RIVER AND ITS  
POTENTIAL HEALTH RISK**

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

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## DECLARATION BY STUDENT

Project entitled “Heavy Metal Concentration of Freshwater Fish on Aquaculture Activity at Pahang River and Its Potential Health” 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, Mr. Nasaruddin Abd Rahman. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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## ACKNOWLEDGEMENT

*In the name of Allah, The Most Gracious, The Most Merciful*

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# TABLE OF CONTENTS

<b>TITLE</b>	
<b>DECLARATION BY STUDENT</b>	ii
<b>INTELLECTUAL PROPERTIES</b>	iii
<b>APPROVAL BY SUPERVISOR</b>	v
<b>ACKNOWLEDGEMENT</b>	vi
<b>TABLE OF CONTENTS</b>	vii
<b>LIST OF TABLES</b>	xi
<b>LIST OF FIGURES</b>	xii
<b>LIST OF EQUATIONS</b>	xiii
<b>LIST OF ABBREVIATIONS</b>	xiv
<b>ABSTRACT</b>	xv
<b>ABSTRAK</b>	xvi
<b>CHAPTER 1: INTRODUCTION</b>	<b>1</b>
1.1 Background information	1
1.2 Problem statement	4
1.3 Research objectives	5
1.3.1 General Objective	5
1.3.2 Specific Objectives	5
1.4 Research Hypothesis	5
1.5 Study Justification	6
1.6 Conceptual Framework	7

## ABSTRACT

Heavy metal in fish is one of the concern in food safety especially on aquaculture activity of freshwater fish as it may lead to a lot of adverse health effect to human. *Pangasius hypophthalmus* or Patin fish is a popular fish among people as being trademark for Temerloh District. This study aims to determine the concentration of lead (Pb), cadmium (Cd), zinc (Zn) and copper (Cu) in water and fish and the physicochemical parameters for water sample including pH, temperature, dissolve oxygen (DO) and turbidity were measured. A cross-sectional study was carried out involving thirty samples of fish and nine samples of water were taken at three sampling locations (Cage 1=Kg. Bangau Tanjung, Cage 2=Kg. Tengah and Cage 3=Kg. Lompat). Samples were analyzed by using Graphite Furnace Atomic Absorption Spectrophotometer (GFAAS) and One-way ANOVA test was used to determine the mean difference between fish in three sampling locations. The order of the heavy metal content that was found is  $Zn > Pb > Cd > Cu$  in fish while  $Pb > Zn > Cu > Cd$  was also observed in water which Kg. Lompat shows the highest concentration of heavy metals for both samples. All fish samples were below the permissible limit by Malaysian Food Act 1983 (Food Regulation 1985) and FAO/WHO while all water samples were below the recommended values by INWQS, 2008 respectively. Mean concentration of heavy metal in fish slightly higher than in water that called bioaccumulation process. The health risk assessment was conducted showed that Target Hazard Quotient (THQ) value for all fish were below 1 indicating no potential adverse health effect and Carcinogenic Risk (CR) for Pb, within the range of  $10^{-4}$  to  $10^{-6}$  as shows no risk of developing cancer to human due to consumption of Patin fish. Hence, the consumption of freshwater fish, *Pangasius hypophthalmus* from Temerloh, Pahang are safe to eat and not pose any serious threat to human.

Keywords: *Aquaculture, Heavy Metals, Pangasius hypophthalmus, Kg. Bangau Tanjung, Kg. Tengah, Kg. Lompat*