UNIVERSITI TEKNOLOGI MARA

DETERMINATION THE CONCENTRATION OF HEAVY METAL (CD, CU, AND PB) IN THE WILD SHRIMP AND AQUACULTURE SHRIMP ALONG WITH HEALTH RISK ESTIMATION ON CONSUMER.

MOHD NOR SHUKRI BIN YAHYA

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

Faculty of Health Sciences

MAY 2011

Declaration by student

Project entitled "Determination the Concentration of Heavy Metal (Cd, Cu, and Pb) In the Wild Shrimp and Aquaculture Shrimp Along With Health Risk Estimation on Consumer" 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 Mdm. Nadiatul Syima Bt Mohd Shahid as Project Supervisor and Mr.Nasaruddin B Abd Rahman as co-supervisor. It has been submitted to the Faculty of Health sciences in partial fulfilment of the requirement of Degree of Bachelor in Environmental Health and Safety (Hons).

Student's Signature:

.....

Mohd Nor Shukri B Yahya

2007287964

880424435269

Date: 30.5.2011

ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim. In the name of Allah, all Praise is due to Him, the Sustainer of the Heavens and Earth and all that is within it and may His Blessings be upon the Prophet Muhammad SAW, peace be upon him.

I would like to express my sincere appreciation to my supervisor, Pn. Nadiatul Syima Mohd Shahid for her inspiring guidance, opinion, tolerance, encouragement and support to all my activities and in the preparation of this project. Without her cooperation, my efforts would not have been as successful as it has been. Her moral support was inspirational to me. May Allah bless you.

I would also like to register my appreciation to En. Nasaruddin Abd. Rahman for his kind assistance and critical comments during my study. Besides, he gives invaluable opinion and suggestions too. I would like to express my special thanks to En Ahmad Razali Ishak who was always willing to discuss the problems that I encountered during my research and his kindness in reviewing my thesis. Thanks are also due to Mr. K. Subramaniam who helped me with the statistical analysis.

Special thanks also to En. Mohd shafie B Md. Latef who helped me sharing and solving my problems during my laboratory work. Many thanks go to En. Muhamad Azwat B Abdullah for his kindness and patience in training me on the use of various instruments especially on the use of the Atomic Absorption Spectrophotometer (AAS) and also for his valuable help especially during method development when running the AAS program. He was also a friend who was ever willing to share his knowledge and experience in research. I gratefully thank to all my friends who have given their encouragement.

Last but not least, my deepest appreciation is extended to my father Tn. Hj. Yahya Hashim and my mother Sukaimah Kamari who always understanding and pray for me. Finally, great appreciations to all my sisters for the loving support.

TABLE OF CONTENTS

Abstract

DETERMINATION THE CONCENTRATION OF HEAVY METAL (CD, CU, AND PB) IN THE WILD SHRIMP AND AQUACULTURE SHRIMP ALONG WITH HEALTH RISK ESTIMATION ON CONSUMER.

Mohd Nor Shukri Yahya

Introduction: Heavy metal refers to metals and metal compounds that negatively affect people's health and is toxic or poisonous at low concentrations. West coast of Malaysia is interesting area for investigation of heavy metal trace since the area is likely receive impact of anthropogenic activity. Marine living like *P. merguiensis* would definitely expose to heavy metal have the ability to accumulate and biomagnified the contaminants. White shrimp which contaminated by heavy metal could cause danger if it is taken frequently and effect human health or can cause cancer.

Methodology: The study was conducted in Kuala Selangor, Selangor. The study design of this study is cross-sectional study. Sampling data collection using Atomic absorption spectrum (AAS) for trace heavy metal in shrimp, modified Food Frequency Questionnaires (FFQ) and oral interview. A statistical analysis that is Microsoft Excel 2007 and statistical package for the social science (SPSS) version 17.0 was used in this study.

Results: The study was found that Cd and Pb detection range of heavy metal concentration in wild shrimp (0.011 to 0.032 mg/kg, and 0.182 to 0.374 mg/kg) was slightly higher than aquaculture shrimp (0.000 to 0.022 mg/kg, and 0.066 to 0.294 mg/kg). While for Cu, the detection range of heavy metal concentration in aquaculture shrimp (0.751 to 1.416 mg/kg) was higher than wild shrimp (0.534 to 0.874 mg/kg). There was significantly different between wild shrimp and aquaculture shrimp ($p < 0.001$). Risk Assessment (RA) were calculating for both gender of consumer (male and female) and there was no hazard index value more than 1 (HI<1).

Conclusion: In conclusion, Aquaculture shrimp was the main accumulation site for Cu while Cd and Pb were recorded higher in wild shrimp. This study revealed that Cd, Pb, and Cu concentrations in the shrimp were lower than the maximum permissible limit as recommended by the Malaysian Food Regulation 1985, Maximum Limit set by JECFA and FAO. After risk exposure were calculate, the result found that shrimp from Kuala Selangor area were deemed save for human consumption.

Keywords: Heavy Metal, Risk Assessment