

THE EFFECTS OF SUBLETHAL CONCENTRATIONS OF LEAD ON
DELTA-AMINOLEVULINIC ACID DEHYDRATASE ACTIVITY AND
HAEMATOLOGICAL PARAMETERS IN THE JAVANESE CARP,
Puntius gonionotus (Bleeker).

SUZANNA BINTI ALIAS

FACULTY OF FISHERIES AND MARINE SCIENCE
UNIVERSITI PERTANIAN MALAYSIA
SERDANG, SELANGOR

1996

UNIVERSITI PERTANIAN MALAYSIA
FAKULTI PERIKANAN DAN SAINS SAMUDERA

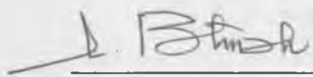
PSF 499
PROJEK DAN SEMINAR

BORANG PENGESAHAN DAN KELULUSAN LAPORAN AKHIR PROJEK

Nama : Suzanna binti Alias
No. Matrik : 35648
Penyelia : Dr. Patimah binti Ismail
Tajuk Projek: The Effects Of Sublethal Concentrations Of Lead On Delta -
Aminolevulinic Acid Dehydratase Activity And Haematological
Parameters In Javanese Carp, *Puntius gonionotus* (Bleeker)

Dengan ini disahkan bahawa saya telah menyemak laporan akhir projek ini dan

- i) semua pembetulan yang disarankan oleh pemeriksa-pemeriksa telah dibuat dan
- ii) laporan ini telah mengikut format yang diberikan dalam Panduan PSF 499 - Projek dan Seminar, 1991, Fakulti Perikanan dan Sains Samudera, Universiti Pertanian Malaysia.


Dr. Patimah Ismail

4/5/96
Tarikh

**THE EFFECTS OF SUBLETHAL CONCENTRATIONS OF LEAD ON
DELTA - AMINOLEVULINIC ACID DEHYDRATASE ACTIVITY AND
HAEMATOLOGICAL PARAMETERS IN THE JAVANESE CARP,
Puntius gonionotus (Bleeker).**

BY

SUZANNA BINTI ALIAS

A project report submitted in partial fulfilment to the Faculty of Fisheries and Marine Science of the requirement for the Degree of Bachelor of Science (Fisheries).

**FACULTY OF FISHERIES AND MARINE SCIENCE
UNIVERSITI PERTANIAN MALAYSIA**

1995 / 1996

ACKNOWLEDGEMENTS

I am extremely grateful to Dr. Patimah Ismail, my supervisor, for the encouragement, guidance and tolerance from the beginning of this project until completion. I also wish to express my sincere and grateful acknowledgement to Prof. Dr. Mohd. Shariff Mohd. Din, for giving me the permission of using the facilities at the Fish Disease complex.

I am indebted to Encik Saberi bin Omar, who have helped me in obtaining and preparing the required laboratory equipments and chemicals and not forgetting Encik Abd. Gani Mohd, for all the helping hand during the exposure experiments took place. I also wish to express my special gratitude to all of the staff of the Faculty of Fisheries and Marine Science for all the cooperation that was extended towards me during this entire project.

Last but not least, I am gratified to acknowledge to all my course-mate especially to Kelani and Mohd. Hatta, for helping me with this project.

ABSTRACT

The activity of the erythrocyte delta-aminolevulinic acid dehydratase (ALA-D) of carp, *Puntius gonionotus* was measured under a variety of lead exposure conditions. A four-week exposure of carp to lead concentrations of 10ppb - 300ppb strongly inhibited their ALA-D activities with increasing lead concentrations. When carp were exposed to lead concentration of 300 ppb, depressed activity of ALA-D became visible after only 2 days, and this activity became less with increasing exposure periods. The ALA-D inhibition seemed to persist in the lead-exposed fish even after a recovery period of seven weeks (55 days) in lead-free water. Therefore, these characteristics indicate that this enzyme can be useful as a short-term indicator of lead pollution. Results for the haematological studies; when the fish is exposed for 30 days to the highest lead concentration (300 ppb), it suffered from anemia, where the content and hematocrit value decrease. There is no significant ($P>0.05$) interaction between lead concentration with lactate level and blood glucose.

ABSTRAK

Aktiviti delta asid aminolevulinik dehidratase (ALA-D) dalam eritrosit ikan lampan jawa, *Puntius gonionotus* ditentukan setelah ikan didedahkan pada kepekatan plumbum (Pb) yang berbeza. Pendedahan selama 4 minggu pada kepekatan 10, 75 dan 300 ppb telah merencatkan aktiviti ALA-D dengan bertambahnya kepekatan. Ikan yang didedahkan pada kepekatan yang tertinggi (300 ppb) telah mengalami perencatan aktiviti ALA-D yang nyata walaupun hanya terdedah selama 2 hari dan aktiviti ini menjadi semakin berkurangan dengan bertingkatnya masa pendedahan. Didapati perencatan aktiviti ALA - D berlanjutan walaupun ikan diletakkan dalam air yang bebas daripada pencemaran plumbum selama 7 minggu (55 hari). Oleh itu, ciri sedemikian membolehkan enzim ini dijadikan sebagai penunjuk untuk jangka masa yang singkat bagi pencemaran plumbum. Keputusan daripada kajian hematologi yang dilakukan pada ikan yang terdedah pada kepekatan tertinggi (300 ppb) selama 30 hari juga menunjukkan ikan mengalami anemia, dimana kandungan hemoglobin serta nilai hematokrit menurun. Walau bagaimanapun, tiada perbezaan bererti, ($P > 0.05$) diperolehi diantara perkaitan kepekatan plumbum dengan paras laktik serta glukos darah.