

ACCUMULATION OF LEAD IN LAMPAM
JAWA (*Puntius gonionotus*, Blk)

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/ Rohani Ibrahim.



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ACCUMULATION OF LEAD IN LAMPAM
JAWA, Puntius gonionotus.

BY

ROHANI BINTI IBRAHIM

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May God's love shine on you today
to bless you with special gifts
of happiness.

Just to let you know
how much you are loved
today and always.

for,
Bapa and Mak,
Khalil, Hanim & Zamzamiah.

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ACCUMULATION OF LEAD IN LAMPAM JAWA,

Puntius gonionotus

by

ROHANI BINTI IBRAHIM

A Project Report submitted in partial Fullfilment of
the requirement for the Degree of Bachelor of Science
(Fisheries).

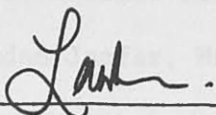
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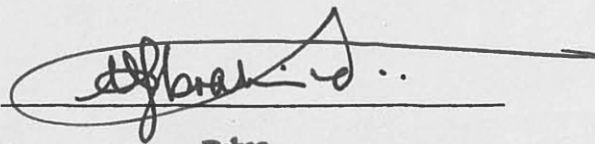
FAKULTI PERIKANAN DAN SAINS SAMUDRA

The undersigned certify that they have read, and he commend to the Faculty of Fisheries and Marine Science, for the acceptance, a research project entitled "Accumulation of Lead In Lampam Jawa, Puntius gonionotus". Submitted by Rohani binti Ibrahim in partial fulfilment of the requirement for the degree of Bachelor of Science (Fisheries).



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Member of the Research Committee.

Date: 1/4/83

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May God bless us all.

20th. March, 1983.

5 Jamadil akhir, 1403.

ROHANI BINTI IBRAHIM

Abstract

The accumulation of lead in various organs of Lampam Jawa (Puntius gonionotus) was studied as a function of different lead concentrations. Aquarium tanks of 70 liters capacity were used in holding the fishes with 20 fishes in each tank. The average lead concentration in the control, Tank 1, Tank 2 and Tank 3 were 0.005 ppm, 0.01 ppm, 0.03 ppm and 0.14 ppm respectively. The pH, D.O, alkalinity and temperature of the water in the tanks were monitored routinely throughout the study period. The pH of all tanks lie within the range of 5.16 to 7.99, alkalinity 0.8 to 2.0 meq l^{-1} , D.O between 4.2 to 8.5 mg l^{-1} and temperature between 23.5 $^{\circ}C$ to 25.5 $^{\circ}C$.

The analysis of lead content in muscles, liver and gills were done every week during the 5 weeks exposure period using the Double Beam Atomic Absorption Spectrophotometer.

With respect to the time of exposure, there is no trend of increasing lead content in the various organs with time, in any of tanks. However, in the distribution of lead in various tissue organs, liver and gills seems to have the greatest amount of lead content with muscles the least. The mean values of lead content in the muscles were 0.58, 1.74, 2.97 and 2.14 ppm; liver 4.93, 11.27, 12.91 and 25.57 ppm; and gills 5.37, 9.89, 14.77 and 38.48 ppm in the control, Tank 1, Tank 2 and Tank 3 respectively.

A clear response of rate of accumulation of lead in the liver and gills with respect to the concentration of lead in the water was observed. The initial rate of accumulation in the lower lead concentration are almost the same for both gills and liver but at higher concentration, the accumulation rate in the gills is much higher than in the liver. For the muscle, no clear response was observed.

Base on the permissible limit of 3000 μg lead/wk, the amount of flesh of Lampam Jawa from the polluted water of 0.14 ppm lead, that can be taken is not more than 3.8 kg/wk.

Abstrak

Pengumpulan plumbum di dalam organ-organ tertentu dari ikan Lampam Jawa (Puntius gonionotus) telah dikaji sebagai fungsi kepekatan plumbum di dalam air. Tangki-tangki akuarium yang mempunyai kapasiti air sebanyak 70 liter digunakan untuk memelihara ikan-ikan tersebut. Tiap-tiap satu tangki mengandungi 20 ekor ikan. Nilai purata kepekatan plumbum di dalam tangki-tangki tersebut adalah 0.005 ppm bagi tangki kawalan, 0.01 ppm bagi Tangki 1, 0.03 ppm Tangki 2 dan 0.14 ppm Tangki 3. pH, oksigen terlarut, alkaliniti dan suhu air di dalam tiap-tiap tangki dikawal sepanjang kajian dilakukan. Kesemua tangki mempunyai nilai pH di antara 5.16 hingga 7.99, alkaliniti 0.8 hingga 2.0 meq l^{-1} , oksigen terlarut 4.2 hingga 8.5 mg l^{-1} dan suhu di antara 23.5°C hingga 25.5°C .

Penganalisaan kandungan plumbum di dalam isi ikan, limpa dan insang dilakukan tiap-tiap minggu selama 5 minggu dengan menggunakan "Double Beam Atomic Absorption Spectrophotometer."

Sepanjang kajian ini dijalankan, didapati tidak ada arah peningkatan kandungan plumbum di dalam tisu-tisu organ yang dianalisa, mengikut masa di dalam mana-mana tangkipun. Walau bagaimanapun, di dalam agihan plumbum pada berbagai-bagai jenis tisu organ, limpa dan insang menunjukkan kandungan kepekatan yang tinggi sementara kepekatan yang paling rendah didapati pada isi ikan tersebut. Bagi tangki kawalan nilai purata kandungan plumbum pada ikan ikan ialah 0.58, limpa 4.93

dan insang 5.37 ppm. Di dalam Tangki 1 nilainya ialah 1.74 pada isi, 11.27 ^{hati} limpa dan 9.89 ppm bagi insang. Sementara di dalam Tangki 2 nilai purata kandungan plumbum pada isi 2.97, ^{otot} limpa 12.91 dan insang 14.77 ppm. Akhirnya di Tangki 3 nilai pada isi ialah 3.14, limpa 25.57 dan insang ialah 38.48 ppm.

Satu gerak-balas yang jelas telah didapati dari kadar pengumpulan plumbum di dalam limpa dan insang berbanding dengan kepekatan plumbum di dalam air. Kadar pengumpulan plumbum pada kepekatan air yang rendah, bagi kedua-dua limpa dan insang adalah lebih kurang sama, tetapi apabila kepekatannya meningkat, kadar pengumpulan bagi insang didapati lebih tinggi berbanding dengan limpa. Namun begitu, tidak terdapat gerak-balas yang nyata pada isi ikan tersebut.

Berdasarkan nilai kepekatan yang dibenarkan sebanyak 3000 μg plumbum seminggu (Bryan, 1976), banyaknya isi ikan Lampam Jawa yang boleh diambil dari air yang tercemar pada kepekatan 0.14 ppm plumbum mestilah tidak boleh melebihi 3.8 kg seminggu.