ACUTE TOXICITY AND INTERACTION OF NICKEL AND CHROMIUM TO SEABASS (*Lates calcarifer*, Bloch) FINGERLINGS

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By

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This project report is submitted
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PREFACE

Monongkotohuod zou kumaa KINOINGAN sabab nohdo balakat tosima kumaa doid dogo do nakaanu zou popotuhuk diti kalaja.

Au ku nogi hivan kumaa di koduvo-duvo zapa om zinaku

Quak Bak Khoon @Bartholomew Aguol om *Addaline Mabel Chan*

Om nogi kumaa di tobinaiku

Grace Yvonne Aguol

Do minanak dogo doh sokodung om koginavaan ie togiot kopizo

Sophis, Epistreme, Enoia und Arete

Kennedy Aaron Aguol

Especially dedicated to my beloved parents

for all their love,encouragement, patience and sacrifice,

without which non of these would have existed

Kennedy Aaron Aguol

IT IS WISE TO LEARN;

IT IS GOD-LIKE TO CREATE.

Muscle Media

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ABSTRACT

The median lethal concentrations, LC_{50} of nickel and chromium were determined for sea bass (*Lates calcarifer*. Bloch) fingerlings at salinity 5, 15 and 30 ppt. The toxicity of nickel and chromium in various combinations, all summing up to one (1) toxic unit were also investigated. The bioaccumulation of these two metals in fish tissue applied singly and in combination were also determined.

The 96h LC_{50} value for nickel in the range finding test at salinities 5,15 and 30ppt were 31.9767 (21 – 48.72), 24.72 (13.52 – 45.84) and 21.75(14.13 – 33.634)mgL^{-1} respectively while in the acute toxicity test the LC_{50} value for 48 hours at 5 ppt was 32.58 (23.51-45.16) mgL^{-1}.

The 96h LC_{50} value for chromium in range finding test at salinities 5, 15 and 30 ppt were 28.87 (23.79 – 35.04), 20.2 (15.13 – 26.95) and 20.2 (15.13 – n.a) mgL^{-1} respectively. The LC_{50} value for 48 hours at 5 ppt was 17.1 (6.80-46.05) mgL^{-1}.

The study on the bioaccumulation of nickel and chromium singly indicated that higher amounts were accumulated at lower salinity relating well with current theory. The mortality of fish in the combined metal test indicated that both metals were acting independantly of each other.

ABSTRAK

Nilai maut median LC_{50} bagi logam nickel dan kromium telah ditentukan bagi anak ikan siakap (*Lates calcarifer*. Bloch) pada kemasinan air 5, 15 dan 30 bpr. Ketoksikan nickel dan kromium dalam beberapa campuran yang membawa kepada nilaian satu unit toksik telah disiasat. Bioakumulasi kedua-dua logam dalam tisu ikan yang didedahkan secara berasingan dan bercampur juga telah dijalankan.

Nilai LC_{50} 96 jam bagi logam nickel dalam ujian pempastian ranj pada kemasinan air 5, 15 dan 30 bpr masing-masing ialah 31.9767 (21 – 48.72), 24.72 (13.52 – 45.84) dan 21.75 (14.13 – 33.634) mgL^{-1}. Nilai LC_{50} 48 jam pada kemasinan air 5 bpr ialah 32.58 (23.51 – 45.16) mgL^{-1}.

Nilai LC_{50} 96 jam bagi logam kromium dalam ujian pempastian ranj pada kemasinan air 5, 15 dan 30 bpr masing-masing ialah 28.87 (23.79 – 35.04), 20.2 (15.13 – 26.95) dan 20.2 (15.13 – n.a) mgL^{-1}. Nilai 48 jam pada kemasinan air 5 bpr ialah 17.1 (6.80 – 46.05) mgL^{-1}.

Kajian terhadap bioakumulasi logam nickel dan kromium secara berasingan menunjukkan lebih banyak logam terkumpul pada paras kemasinan yang lebih rendah. Kematian anak ikan dalam campuran logam menunjukan kesan keracunan kedua-dua logam adalah bertindak secara bersendirian.