

BIOACCUMULATION AND TOXICITY OF GADOLINIUM AND
GADOLINUM SULFIDE IN COMBINATION TO
SEAFASS (*DATIS CAUCALICTER*)

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**BIOACCUMULATION AND TOXICITY OF CADMIUM AND COPPER SINGLY
AND IN COMBINATION TO SEABASS (*Lates calcarifer*)**

BY

TAN YING REN

**This project report is submitted in partial fulfillment of the requirements
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ABSTRACT

Experiments had been conducted on seabass (*Lates calcarifer*) to determine the bioaccumulation and toxicity of cadmium and copper singly and in combination. Toxicity tests were conducted with 2 different salinities, 5ppt and 15ppt. Approximately 10 times more acute toxic effect were observed in the toxicity test at lower salinity of 5ppt exposure. At 5ppt salinity, the 96-h LC50 values of cadmium and copper to seabass (*Lates calcarifer*) singly was found to be 1.56 mg L⁻¹ and 2.43 mg L⁻¹. While 15.54 mg L⁻¹ and 24.29 mg L⁻¹ at the 15ppt salinity exposure. Mixtures experiments involving cadmium and copper in combined, fish were exposed to proportions of 96-h LC50 concentrations of each metal sum up to 1.0. More than additive mortality effects caused by cadmium in the mixtures were observed. The bioaccumulation patterns of metals shown by seabass (*Lates calcarifer*) were less complex. Cadmium and copper did not show interactions, however copper tended to accumulated in sea bass (*Lates calcarifer*).

ABSTRAK

Kajian bioaccumulasi dan ketoksikan cadmium dan kuprum secara individu dan kombinasi keatas seabass (*Lates calcarifer*) telah dilaksanakan. Kajian ketoksikan telah dijalankan dalam 2 keadaan saliniti yang berbeza, 5ppt dan 15ppt. Didapati kajian yang dilakukan pada saliniti yang lebih rendah 5ppt menunjukkan kesan ketoksikan yang berlebihan 10 kali berbanding dengan 15ppt. Keputusan 96-h LC50 kepada cadmium dan kuprum dalam saliniti 5ppt adalah 1.56 mg L^{-1} dan 2.43 mg L^{-1} masing-masing. Manakala 15.54 mg L^{-1} dan 24.29 mg L^{-1} telah diperhatikan dalam kajian 15ppt. Dalam eksperimen yang melibatkan cadmium dan kuprum dalam kombinasi, ikan telah didedahkan kepada campuran dua logam kepada jumlah 1.0 unit 96-h LC50 kepekatan. Cadmium menunjukkan kesan ketoksikan lebih daripada kesan tambahan. Dalam kajian bioakumulasi, seabass (*Lates calcarifer*) tidak menunjukkan kesan yang begitu rumit. Tiada interaksi antara cadmium and kuprum, manakala kuprum lebih diakumulasikan dalam seabass (*Lates calcarifer*)