

THE EFFECTS OF ROTENONE-CONTAINING DERRIS PLANT EXTRACTS  
ON THE MORTALITY OF SOME PREDATOR FISHES OF POND-  
CULTURED PRAWNS UNDER DIFFERENT WATER TEM-  
PERATURE-SALINITY COMBINATIONS

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A Thesis

Presented to

the Faculty of the Graduate School  
University of San Carlos

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science in Biology

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By

MARCELINO I. TUMANDA, JR.

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## Abstract

Laboratory tests were conducted to determine lethal concentrations of the rotenone-containing derris plant extracts on some predator fish species of prawns under different water temperature and salinity conditions. Results obtained from the laboratory were applied in the field by conducting eradication tests in prawn rearing ponds infested with predator fishes.

Series of pre-test bioassay using 30.0-ppm concentration of the piscicide were conducted to determine the most hardy predator fish to serve as "indicator species" in the study and to determine the effects of salinity and water temperature on the mortality of the most hardy predator fish. The results of the laboratory tests had identified Tukugobius philippinus Herre, a goby fish, as the most hardy predator fish. Salinity had no significant effects while water temperature was highly significant in determining the duration of mortality of T. philippinus Herre.

Bioassay on T. philippinus Herre using three concentration levels of the piscicide at three water temperature levels showed that the test animals were killed at a later time at lower concentration-water temperature combination and earlier at higher piscicide concentration-water temperature levels. The interaction effects were also found to be highly significant indicating the interdependence of piscicide concentration and water temperature in determining the mortality time of the predator fish.

The effects of the three piscicide concentrations at different water temperature levels on the two prawn species, Penaeus monodon Fab. and P. indicus H Milne Edwards, were evaluated and showed that both animals could safely tolerate the lowest piscicide concentration (10.0 ppm) even when exposed to the highest water temperature level (35.0°C) selected in the study. The 10.0-ppm concentration of the piscicide was therefore selected in the field eradication tests.

Results of the eradication tests conducted in two experimental rearing ponds showed massive kill of predatory and non-predatory fishes in both ponds but left the stocked P. monodon Fab. and P. indicus H Milne Edwards including other crustaceans unaffected by the piscicide. About 14 fish species killed during the eradication tests were collected

and identified. A total of 768 dead fish in one pond and 344 in the other was counted a day after the field eradication tests.

The findings of the present study has identified the potentials of dried derris root powder as a possible solution to the problem of controlling predator fishes in prawn rearing ponds during the culture period. The results of the analysis of the rotenone content of the derris root powder used in the laboratory and during the field tests are also presented.

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