

**STRESS RESPONSE OF NILE TILAPIA (*Oreochromis niloticus* L.)  
IN DIFFERENT WATER TEMPERATURES**

by

**MARK JOSEPH DUMALE DELA CRUZ**

An Undergraduate Thesis submitted to the faculty of the College of Fisheries in partial  
fulfilment of the requirements of the degree of

**BACHELOR OF SCIENCE IN FISHERIES**

**Department of Aquaculture  
COLLEGE OF FISHERIES  
CENTRAL LUZON STATE UNIVERSITY  
Science City of Muñoz, Nueva Ecija  
Philippines**

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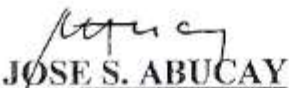
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# STRESS RESPONSE OF NILE TILAPIA (*Oreochromis niloticus* L.) IN DIFFERENT WATER TEMPERATURES<sup>1/</sup>

## ABSTRACT

This study was conducted to assess the effect of different water temperatures (29-30°C; 33-34°C; 36-37°C; and 39-40°C) on the stress response of Nile tilapia (*Oreochromis niloticus* L.). To achieve this objective, 80 Nile tilapia were conditioned for 7 days and five fish were distributed in each aquarium. The four treatments were replicated three times.

Feeding behavior of fish was observed and scored for 15 days using a scoring guide ranging from 0-3 points (0 point - fish did not react or ate the feed; 1 point - fish ate only pellets that were directly put in front of it and did not move to eat the feed; 2 points - fish moved to eat the feed; 3 points - fish ate all feed items continuously). Dominant fish in all treatments had the feeding response score (FRS) of 3 points while subordinate fish in all treatments had an FRS score of 2 during the first 5 days, and 1 during the 6th to 10th day.

Eye color pattern (ECP), ventilation rate (VR) and skin color of the fish were monitored 0, 30 min, 1, 2, 6, 12, 24, 48, 72, 96 and 120 h after introduction to high temperature environment. The numbers of attacks in 10 minutes were observed daily.

Subordinate fish in Treatment 3 (36-37°C) had a mean ECP of  $5.54 \pm 0.12$  followed by subordinate fish in Treatment 1 (29-30°C) with  $5.36 \pm 0.61$  and then by subordinate fish in Treatment 2 (33-34°C) with  $5.31 \pm 0.13$ , but all of them were statistically comparable. Treatment 4 (39-40°C) had the significantly lowest ( $P < 0.05$ ) mean ECP of  $3.06 \pm 0.23$  in subordinate fish but was significantly higher compared to those in all dominant fish. Dominant in Treatment 3 (36-37°C) had a mean of  $1.70 \pm 0.21$  which was comparable to that in Treatment 2 (33-34°C) with  $1.45 \pm 0.42$  followed by Treatment 4 (39-40°C)  $0.90 \pm 0.17$  which was also comparable to that of Treatment 1 (29-30°C) with  $0.85 \pm 0.38$ .

On VR, subordinate fish in Treatment 3 had the significantly highest mean of  $2.06 \pm 0.13$  buccal movements/sec but was comparable to those in subordinate fish in Treatment 4 ( $1.95 \pm 0.06$  buccal movements/sec), subordinate fish in Treatment 2 ( $1.89 \pm 0.03$  buccal movements/sec), dominant fish in Treatment 3 ( $1.83 \pm 0.02$  buccal movements/sec) and subordinate fish in Treatment 1 ( $1.72 \pm 0.02$  buccal movements/sec). These mean VRs were followed by mean VR of dominant fish in Treatment 2 ( $1.56 \pm 0.02$

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