# 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

**2017**

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**APPROVED:**

**EMMANUEL M. VERA CRUZ** — 01/23/17
Adviser — Date

**JOSE S. ABUCAY** — 01/23/17
Critic — Date

**NOTED:**

**KARL MARX A. QUIAZON** — 01/23/17
Department Chair — Date

**RECORDED:**

**REMEDIOS B. BOLIVAR**
College Research Coordinator
01/25/17
Date

**ACCEPTED:**

**RAVELINA R. VELASCO**
Dean
01/23/17
Date

# BIOGRAPHICAL DATA

**Personal Data**

| | |
|---|---|
| Name | Mark Joseph Dumale Dela Cruz |
| Birthday | April 5, 1995 |
| Birth Place | Brgy. Calabalabaan, Science City of Muñoz, Nueva Ecija |
| Address | Brgy. Calabalabaan, Science City of Muñoz, Nueva Ecija |
| Parents | Antonino Santos Dela Cruz and Adora Dumale Dela Cruz |

**Educational Attainment**

| | |
|---|---|
| Elementary | Muñoz Central School<br>Science City of Muñoz, Nueva Ecija |
| Secondary | Muñoz NationalHigh School<br>Science City of Muñoz, Nueva Ecija |
| Tertiary | Central Luzon State University<br>Science City of Muñoz, Nueva Ecija |

## ACKNOWLEDGEMENTS

First of all, to our Almighty God for his everlasting love, for all the blessings and for providing strength, faith and power in everyday of his life.

The author also desire to express his warm and sincere thanks to his parents, Mr. Antonino S. Dela Cruz and Mrs. Adora D. Dela Cruz and to his siblings, Ate Ivy, Kuya Anthony, Marie, Mj and to his niece, Irish for the inspiration, love, care and providing all his needs and for being supportive in his life.

To his adviser, Dr. Emmanuel M. Vera Cruz, for the untiring support, kindness, advices and patience to finish this paper. Sir, thank you.

To his critic, Dr. Jose S. Abucay, for his support, understanding, kindness and patience;

To Dr. Remedios B. Bolivar, the College Research Coordinator, a sincere thanks for her kindness and patience in editing to improve this paper;

To Ma'am Juliet Holasca for her support and pieces of advice and for her encouragement and also to Kuya Roel for helping him during the conduct of this study;

To all the faculty of the College of Fisheries, Dr. Tereso Abella, Dr. Karl Marx Quiazon, Dr. Apolinario Yambot, Sir Alvin Reyes, Prof. Rodora Bartolome, Prof. Janet Saturno, Dr. Ravelina Velasco, Ma'am Claire Samatha Juanico and Ma'am Rea Templonuevo for providing the knowledge of the world of fisheries and for their support;

To all the author's close friends and classmates, Tessa Jane De Sena, Joymee Mercado, Lea May Roque, Jenica Garcia, Princess Santacera, Jacquiline Osalbo, Jonnel Osoteo, Gilbert Callo, Vincent Aguimatang, Marvin Enriquez, Jan Emerson Manuzon,

Enard Saul and special thanks to June Ailene Alejo and Ricardo Del Pilar for the assistance in the statistical analysis of data. Thank you very much for your help during the conduct of the thesis and also for the precious moments, moral support, laughters and for the great time you've shared.

**MARK JOSEPH DUMALE DELA CRUZ**

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# STRESS RESPONSE OF NILE TILAPIA (*Oreochromis niloticus* L.) IN DIFFERENT WATER TEMPERATURES[1/]

## 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 trice.

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±0.12 followed by subordinate fish in Treatment 1 (29-30°C) with 5.36±0.61 and then by subordinate fish in Treatment 2 (33-34°C) with 5.31±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±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±0.21 which was comparable to that in Treatment 2 (33-34°C) with 1.45±0.42 followed by Treatment 4 (39-40°C) 0.90±0.17 which was also comparable to that of Treatment 1 (29-30°C) with 0.85±0.38.

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

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[1/] Undergraduate thesis presented to the faculty of College of Fisheries, Central Luzon State University as a partial fulfilment of the requirements for the degree of Bachelor of Science in Fisheries. Prepared at the Department of Aquaculture under the supervision of Dr. Emmanuel M. Vera Cruz.

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