

# NOTICE OF PUBLICATION



AQUAFISH COLLABORATIVE RESEARCH SUPPORT PROGRAM

## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

**Title:** Duration of Appetite Inhibition Predicts Social Dominance in Nile Tilapia, *Oreochromis niloticus* L.

**Authors:** Emmanuel M. Vera Cruz<sup>1</sup>, Madelin B. Valdez<sup>1</sup>, Remedios B. Bolivar<sup>1</sup>, and Russell J. Borski<sup>2</sup>

<sup>1</sup>College of Fisheries and Freshwater Aquaculture Center  
Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines

<sup>2</sup>North Carolina State University, Raleigh, North Carolina 27695, USA

**Date:** May 1, 2012

Publication Number: CRSP Research Report 11-286

The CRSP will not be distributing this publication. Copies may be obtained by writing to the authors.

**Abstract:** This study investigated whether the result of contest for social dominance among individuals in *Oreochromis niloticus* can be predicted by assessing the duration of appetite inhibition (DAI) during the isolation period. Fifty all-male juvenile *O. niloticus* of similar size were isolated for 10 days and were used in a social pair study. The DAI of each fish was observed when fish was transferred to the isolation unit. Body weight of dominant and subordinate individuals was recorded before and after the encounter. Eye color pattern (ECP) was also observed during the social encounter. The study revealed that tilapia with shorter DAI during the isolation had a greater possibility to win the fight for social dominance. Formation of stable dominant-subordinate relationship was observed in 24 of the 25 tested pairs. A total of seventeen fishes (70.93%) out of the 24 fishes that became dominant have shorter DAI compared to that of their conspecifics (Binomial test,  $P = 0.03$ ). This indicates that social dominance can be predicted using the DAI of the fish during isolation. Reduced growth rate of both dominant and subordinate fish and a well-described physiological end result of social stress were observed one day after the social interaction. The significantly greater weight loss ( $P < 0.01$ ) in subordinate fish ( $2.88 \pm 0.21$  g) compared to dominant fish ( $2.11 \pm 0.19$  g) a day after the establishment of social hierarchy was mainly attributed to behavioral differences such as appetite rather than to differences in physical activities. Death, which is the most overwhelming effect of stress, was observed in the subordinate individuals. All subordinate fish died within a week after the social interaction.

This abstract was excerpted from the original paper, which was published in *Better Science, Better Fish, Better Life: Proceedings of the Ninth International Symposium on Tilapia in Aquaculture* (2011) [Edited By: Liu Liping and Kevin Fitzsimmons] pg: 86-94

**CRSP RESEARCH REPORTS** are published as occasional papers by the Management Entity, AquaFish Collaborative Research Support Program, Oregon State University, 418 Snell Hall, Corvallis, Oregon 97331-1643 USA. The AquaFish CRSP is supported by the US Agency for International Development under CRSP Grant No. EPP-A-00-06-00012-00. See the website at <aquafishcrsp.oregonstate.edu>.