PHENOTYPE, CAROTENOID LEVEL AND GENE EXPRESSION LINKED TO SKIN COLORATION IN RED TILAPIA (*Oreochromis* sp.) AS AFFECTED BY CAROTENOID-RICH DIET

ERVEE P. LANDINGIN

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ABSTRACT

LANDINGIN, ERVEE P., Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines, **JUNE 2019, PHENOTYPE, CAROTENOID LEVEL AND GENE EXPRESSION LINKED TO SKIN COLORATION IN RED TILAPIA (*Oreochromis* sp.) AS AFFECTED BY CAROTENOID-RICH DIET**

Adviser: KHRISTINA G. JUDAN-CRUZ, Ph. D.

Production, marketability and consumer preference of red tilapia often depends upon the intensity of coloration. Hence, color enhancement is now a priority among commercial red tilapia farmers and new approaches to develop coloration are now geared to improve and satisfy market acceptability and sophistication. This study evaluated the effects of carotenoid-rich diets on the skin coloration, carotenoid level and expression of carotenoid-linked genes.

Carotenoids were extracted from dried *Daucus carota* peel, *Ipomoea aquatica* leaves, and *Moringa oleifera* leaves using ethanol. Fish samples in aquaria were fed twice a day for four months using the feeds mixed with carotenoid extracts. The phenotypic effect of the carotenoid extracts was measured in the skin of the red tilapia through a color chart. Carotenoid level was measured through uv-vis spectrophotometer. The expression of csf1ra and Bcdo2 in the skin was done through gene expression analysis using qPCR.

Results on the skin coloration and carotenoid level showed most efficient color enhancement using Daucus carota carotenoid extract. Ipomoea aquatica leaf carotenoid extract also showed significantly higher values in skin coloration and carotenoid level than commercial feeds alone. Expression of carotenoid- and coloration-linked genes as

affected by the extracts showed upregulation in csf1ra and downregulation in Bcdo2b which verifies the observed color enhancement and higher carotenoid level in the skin.

This study highlights the potential of the plant extracts for integration and development of feeds for color enhancement in red tilapia. Given that intense redness in red tilapia increases its market value, this can substantially increase market sophistication, thus, enriching the red tilapia industry.

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