

**CULTURE OF *SCHIZOCHYTRIUM SP. DZAM* (ORDER THRAUSTOCHYTRIALES  
DIVISION CHROMISTA) UNDER DIFFERENT SPECTRAL  
PHOTO-EMISSIONS AND QUANTITATIVE ANALYSIS  
OF OMEGA-3 ALIPHATIC ACID**

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A Master's Thesis

Presented to the Graduate Faculty of the

College of Arts and Sciences

University of San Carlos

Cebu City, Philippines

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In Partial Fulfillment

Of the Requirements for the Degree

MASTER OF SCIENCE IN BIOLOGY

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by

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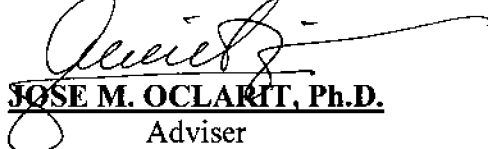
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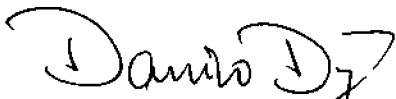
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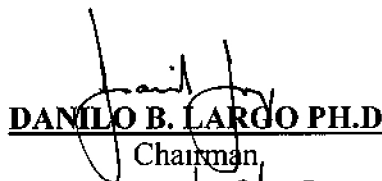
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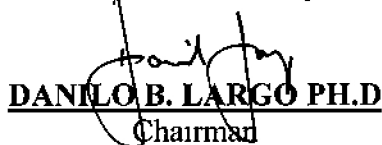
  
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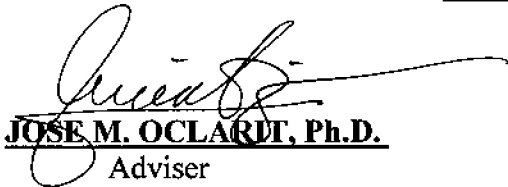
  
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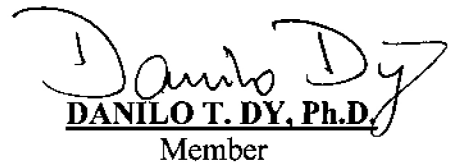
  
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*This paper is heartily dedicated to*

OUR OMNIPOTENT HEAVENLY FATHER

*My Tatay and Nanay  
My siblings: John Mark, Kerstin Sherish and Erinne Iris*

*My Future Family*

*And to the memory of all who have succumbed for the improvement of  
Biotechnology in the Philippines.*

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ABOVE ALL, I bring back the glory and honor to our **ALMIGHTY GOD** for revealing to me the light of wisdom in understanding and experiencing the intricate complexities of the real world.

## ABSTRACT

This study was conducted to solve the lack of continuous supply of some essential fatty acids like docosahexaenoic acid (DHA). Thraustochytrids, a microheterotrophic heterokont chromist, is one such alternative source because of its high DHA content.

The study covers the Philippine Thraustochytrids of Northern and Eastern Mindanao and this work presents 23 isolates, 16 were under genus *Schizochytrium* and the rest were under *Thraustochytrium*. Out of these, only one strain was used. The main aim of the study was to analyze any changes in the percentage fatty acids (particularly DHA and carotenoid content) after incubating the isolates under different spectral photo-emissions. The isolate was identified as belonging to the genus *Schizochytrium* first designated as GUI14S and later coded as DZAM. The normal value of its DHA content was 30.7% (GUI14S strain) prior to experimentation. After growing them in optimized conditions and subjected to spectral photo-emissions (UV, fluorescent, yellow, red, and blue LED lights), the DHA content increased ranging from 33.66 - 37.44% DHA out of its total fatty acid. However there was no significant difference in their DHA levels among all treatments. the control group has 35.44%, UV exposed group 33.66%, Fluorescent group 37.44%, Yellow LED group 35.70%, blue LED group 35.12%, and red LED group 35.42%. But these values were definitely higher than the background DHA content which is 30.7%, therefore there was a rise of DHA levels in the treated isolate.

On the pigment analysis, astaxanthin values were as follows 34.5 mg/g (red LED lights treated isolate), 31.80 mg/g (fluorescent-treated isolate). These values were about half the content compared to the control group which was 72.29 mg/g. The color of the colony also changed from turbid white to red orange under UV light, pale orange under fluorescent light, and

reddish under blue LED light. The colony color was not changed under yellow LED lights. Over-all, the effects of spectral emissions showed promising results in changing the pigment contents of the strain used. Biomass production of DZAM strain was generally low regardless of the light treatments. Under blue LED lights, the biomass was 0.40 g/culture plate followed by yellow LED lights at 0.38 g/culture plate. Under Red LED lights the biomass was 0.37 g/culture plate and lastly, under UV lights the biomass was 0.32 g/culture plate



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