Sanitary Survey of Microbial Population in Relation to Physico-chemical Factors and Aquatic Lifeform in De La Salle University-Dasmariñas Lake

A Master's Thesis

Presented to

The Faculty of the Graduate School of Education,

Arts and Sciences

De La Salle University-Dasmariñas

Dasmariñas, Cavite

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Biology

HADRIAN JOSEPH FLORES NATIVIDAD

May 1999

ABSTRACT

Name of Institution : De La Salle University-Dasmariñas

Address : Bagong Bayan, Cavite

TITLE : Sanitary Survey of Microbial Population in Relation to Physico-Chemical Factors and Aquatic Lifeform in De La Salle University-Dasmariñas Lake

AUTHOR : Hadrian Joseph Flores Natividad

DATE STARTED : November 1998

DATE COMPLETED : May 1999

OBJECTIVES OF THE STUDY :

A. GENERAL:

Survey of the sanitary quality of the De La Salle University – Dasmariñas Lake using coliforms and microbial population as 'indicators" in relation to the physico-chemical properties and aquatic lifeform (*Tilapia nilotica*) of the lake.

B. SPECIFIC:

1 To determine the population density pattern of total and fecal

coliforms, and heterotrophic density of both bacteria and fungi in DLSU-D Lake.

2. To determine the density of heterotrophic bacteria present in a selected parts of Tilapia.

3. To evaluate which of the sampling stations exhibit the highest extent of microbial density.

4. To determine the physical properties of the DLSU-D Lake in terms of water temperature and water transparency.

5. To determine the chemical properties of the DLSU-D Lake in terms of its pH, dissolved oxygen (DO), salinity and alkalinity.

6. To determine if significant correlation exist between microbial density and the physico-chemical properties.

7. To determine if significant correlation exist between microbial density and aquatic lifeform.

The sanitary quality of the lake water of DLSU-D was evaluated in a 6-month survey. Total and Fecal coliform test were employed to assess possible fecal contamination. The heterotrophic plate count was also used to determine the extent of the microbial contamination.

All stations with major inlet point of waste runoff contained a significantly high total coliform (>2.40E+03 MPN/100 ml), fecal coliform (>2.40E+03) and HPC ($10^5 - 10^6$ cfu/ml). Bacterial density in sampled fish intestine revealed $10^3 - 10^5$ cfu/20 grams. Of the 32 bacterial species isolated and identified, 87.5 % belonged to *Enterobacteriaceae* group, and notably, with wide distribution of *Escherichia coli* (41%) was observed.

Physico-chemical properties of the lake in terms of its water temperature, transparency, pH, dissolved oxygen, salinity and alkalinity were periodically tested and found in congruence with the Class C water quality criteria. The calculated correlation between microbial density and physico-chemical factors; and fish bacterial density by Pearson r failed to establish a significant correlation at 5 % level of significance. However, heterotrophic plate count of bacteria posed a negative correlation with pH of water.

Shoreline survey of the actual and potential source of pollution was recommended together with strict review of waste disposal management of the DLSU-D Lake.

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