

ABSTRACT

NAME OF INSTITUTION: De La Salle University-Dasmariñas

ADDRESS: Bagong Bayan, Dasmariñas, Cavite

TITLE: Survey of Coliforms and Other Gram-Negative Rods as Indicators of
Pollution in Open Sewerage of De La Salle University-Dasmariñas

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DATE STARTED: October, 1996 **DATE COMPLETED:** December, 1997

OBJECTIVES OF THE STUDY:

A. GENERAL:

This study was conducted to be able to survey the coliform species and other gram-negative rods as indicators of pollution in open sewerage of De La Salle University-Dasmariñas.

B. SPECIFIC:

This study aimed to determine whether the open sewerage of De La Salle University-Dasmariñas is polluted. It was also conducted to ascertain which among the sampling stations had the highest extent of microbial pollution.

SCOPE AND COVERAGE:

The presence of *Escherichia coli* and other coliforms was determined to indicate whether the open sewerage of De La Salle University-Dasmariñas is polluted. The total population of bacteria was measured to ascertain which among the sampling stations had the highest extent of pollution. A survey was also conducted to identify the coliforms and other gram-negative rods included within the sampling areas.

METHODOLOGY:

This investigative study is a descriptive type devoid of statistics. Water samples were taken from the open sewerage of De La Salle University-Dasmariñas last July 1, 1997 at 8:00 am. Three sampling stations were randomly chosen: in front of College of Arts and Sciences (Station 1), in front of Small Business Center Canteen (Station 2) and in front of Aklatang Emilio Aguinaldo (Station 3).

Standard protocols from National Institute of Molecular Biology and Biotechnology at the University of the Philippines, Los Baños were utilized. The researcher used the presumptive, confirmatory and completed tests in determining the presence of coliforms. A Most Probable Number (MPN) index with 95% confidence limits was used to determine their population. Total microbial count was administered to determine what specific station occurred to be the most polluted

one. Identification of gram-negative rods employed an Analytical Profile Index (API) 20 E identification system.

MAJOR FINDINGS:

In the presumptive and confirmatory tests for coliforms, all Stations exhibited positive growth with gas production with a most probable number of $\geq 2.4 \times 10^2$ MPN/mL.

A total microbial population of 2.45×10^4 cfu/mL was present in Station 1 while 1.7×10^3 cfu/mL was at Station 2 and 8.5×10^2 cfu/mL was at Station 3.

This investigative study successfully identified a total of 17 gram-negative, facultatively anaerobic rods in which eight were distinct and belonged to two families: Enterobacteriaceae and Vibrionaceae. These identified species were: *Escherichia coli* 1, *Escherichia coli* 2, *Salmonella arizonae*, *Aeromonas sobria*, *Enterobacter cloacae*, *Enterobacter amnigenus*, *Aeromonas hydrophila* and *Plesiomonas shigelloides*.

CONCLUSIONS:

After extensive analysis of the study, the following conclusions were drawn:

1. The open sewerage of De La Salle University-Dasmariñas is polluted.
2. Station 1, College of Arts and Sciences, was found to be the most polluted sampling site followed by Station 2 (Small Business Center

Canteen) and Station 3 (Aklatang Emilio Aguinaldo) as revealed by the total microbial count.

3. Seventeen (17) gram-negative, facultatively anaerobic rods were successfully identified, eight of which were distinct.

RECOMMENDATIONS:

Based from the conclusion, the researcher recommends the following:

1. To use a standard colony counter to provide accuracy with the results in total microbial count;
2. To classify the identified species whether they are potentially pathogenic, pathogenic or not;
3. To determine the effect of these bacteria on milkfish present in the artificial lake;
4. To conduct a comparative study of microbes present during wet and dry seasons;
5. To conduct treatment of waste water for industrial and domestic purposes, thus conserving water and preventing the probable source of diseases.