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ISOLATION AND IDENTIFICATION OF BACTERIA AND
FUNGI FROM PHARMACEUTICAL WASTEWATER

THESIS

GINA LORENA CRUZATE
MORENA PARRA

College of Arts and Sciences
CAVITE STATE UNIVERSITY
Indang, Cavite

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**ISOLATION AND IDENTIFICATION OF BACTERIA AND FUNGI FROM
PHARMACEUTICAL WASTEWATER**

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*Isolation and identification of bacteria
and fungi from pharmaceutical wastewater
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**GINA LORENA CRUZATE
MORENA PARRA
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ABSTRACT

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This study was conducted to characterize wastewater samples, and isolate and identify different bacteria and fungi from wastewater.

The samples were taken from wastewater from two pharmaceutical companies, namely EUROMED and BAXTER. These samples exhibited whitish to yellow color with gray or black precipitates. The pH was neutral ranging from 6.96 to 7.01. Direct-EUROMED gave the highest bacterial count while River-BAXTER gave the highest fungal count. It was noted that the pH of the samples did not affect the growth of bacteria and fungi.

Bacterial isolates were identified as *Micrococcus*, *Staphylococcus*, *Streptococcus*, *Bacillus*, *Arthrobacter*, *Kurthia*, *Brevibacterium*, *Microbacterium*, *Cellulomonas*, *Alcaligenes*, *Xanthomonas*, *Acetobacter*, *Flavobacterium*, *Escherichia*, *Shigella* and *Salmonella*. Among these, *Micrococcus*, *Flavobacterium* and *Xanthomonas* were the most predominant being present in most of the samples taken. One Actinomycete was also isolated.

Mold isolates belonged to the genera, *Penicillium*, *Cladosporium*, *Helminthosporium* and *Aspergillus*. Meanwhile, majority of the yeast isolates were

identified as *Saccharomyces* while the rest were *Hansenula*, *Debaryomyces*, *Torulaspora* and *Pichia*.

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**GINA LORENA PEREZ CRUZATE
MORENA LANDICHO PARRA**

An undergraduate thesis submitted to the faculty of Biological Science Department, College of Arts and Sciences, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Biology major in Microbiology with Contribution No. _____. Prepared under the supervision of Dr. Yolanda A. Ilagan.

INTRODUCTION

Wastewater is the used water supply of a community and consists of domestic waterborne waste, industrial waterborne wastes and ground, surface and atmospheric wastes that enter the sewage system. Sewage system is the one that collects and carries the used water from the source to its ultimate point of the treatment and disposal.

Domestic wastewater consists of approximately 99.9 percent wastes, 0.02 to 0.03 percent suspended solids and other soluble organic and inorganic substances (Pelczar, 1993). Since the composition of wastewater varies, it is expected that the types and numbers of organisms fluctuate. Wastewater may contain millions of bacteria per milliliter including the coliforms, streptococci, anaerobic spore-forming bacilli, the *Proteus* group and other types originating from intestinal tract of human. It may also be a potential source of pathogenic fungi, protozoa, bacteria and viruses (Jensen et al., 1997).

Water pollution is one of the major problems of the economy, nowadays, due to the continuous economic and social activities of man. It is a difficult problem particularly