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METAL TOLERANCE AND ANTIBIOTIC RESISTANCE
PATTERNS OF BACTERIA ISOLATED FROM
SELECTED RIVERS OF CAVITE

THESIS

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**METAL TOLERANCE AND ANTIBIOTIC RESISTANCE
PATTERNS OF BACTERIA ISOLATED FROM
SELECTED RIVERS OF CAVITE**

**Undergraduate Thesis
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ABSTRACT

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One hundred and one bacterial isolates from selected rivers of Cavite were subjected to different antibiotics and metals with varying concentrations. Isolates exhibited growth decline as the concentration of heavy metals increases. They also showed highest resistance to Lead (800ppm). Majority of the isolates exhibited tri-tolerance and bi-tolerance or tolerance to three and two kinds of metals, respectively. Iron-Lead-Zinc tolerance is the most observed tri-tolerance pattern.

Bacteria are most resistant to Ampicillin-supplemented medium. Bi- and tri-resistance were the most common patterns of antibiotic resistance exhibited by the isolates. Ampicillin-Kanamycin-Clindamycin and Ampicillin-Oxytetracycline resistance patterns are the most observed tri-resistance and bi-resistance patterns, respectively.

Clindamycin-Lead and Erythromycin-Lead resistance have the highest percentage of Antibiotic Resistance and Metal Tolerance (%AMR). This implies that lead tolerant bacteria have also developed resistance to clindamycin and erythromycin.

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INTRODUCTION

Rivers have played an important part in the community since the start of civilization. However, community factors, such as overcrowding, inadequate sanitation, indiscriminate waste disposal, and even some agricultural practices have contributed to the deterioration of rivers.

One of the leading causes of river pollution is the presence of the heavy metals , which are extremely toxic and create conditions that promote resistance build up on microorganisms. Among these organisms, bacteria are of particular concern because they are widespread and possess the ability to adapt readily through mutation and selection. Bacterial tolerance patterns can be used to indicate whether certain metals and other contaminants are present or have been present in a particular environment.

Another implication of heavy metal tolerance in the environment is that it may contribute to the maintenance of antibiotic resistance genes. Resistance genes to antibiotics and heavy metals may be located closely together on the same plasmid in