ANTIMICROBIAL RESISTANCE PROFILE OF *Enterococcus* sp. AND *Escherichia coli* ISOLATED FROM SOIL SAMPLES IN SELECTED CARABAO *(Bubalus bubalis)* FARMS IN RIZAL AND GENERAL MAMERTO NATIVIDAD, NUEVA ECIJA

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ABSTRACT

CABOG, ELLYZA MARIE F., Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines, **JUNE 2019, ANTIMICROBIAL RESISTANCE PROFILE OF *Enterococcus* sp. AND *Escherichia coli* ISOLATED FROM SOIL SAMPLES IN SELECTED CARABAO FARMS IN RIZAL AND GENERAL MAMERTO NATIVIDAD, NUEVA ECIJA**

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Enterococcus sp. from the family of Enterococcaceae, is a gram positive cocci, formerly known as group D streptococci. It can be found on the intestinal tract of human, animals and also in soil. Whereas, *Escherichia coli* is a rod shaped, gram negative bacteria under the family Enterobacteriaceae. They are facultative anaerobic that does not require oxygen, but grows better in the presence of oxygen. This study was conducted to determine the antimicrobial resistance profile of *Enterococcus* sp. and *E. coli* from soil samples in selected carabao farms. Different culture media such as Bile Esculin Agar, MacConkey Agar and Eosin Methylene Blue Agar were utilized for the isolation of bacteria and VITEK 2 System was used for the identification and determination of antimicrobial resistance profile. The results revealed that *Enterococcus faecium*, *Enterococcus durans*, and *Enterococcus hirae* isolated in soil samples were sensitive to 13 antibiotics, resistant in three antibiotics and some are intermediate to Erythromycin and Nitrofurantoin. Whereas, all *E. coli* isolates were sensitive towards to 37 different antimicrobial agents used and have a low percentage of resistance to antibiotics.

INTRODUCTION

Background of the Study

Antimicrobial resistance is the ability of microbes to resist the effects of drugs and the growth of bacteria is not stopped. The development of antimicrobial resistance among pathogenic bacteria in the last decades has emerged to public health problem, which has led to the discussion about the use of antimicrobial agents, especially in agriculture, nutrition and veterinary medicine (Caprioli *et al.*, 2000). The World Health Organization recognized the need for an improved and coordinated global effort to prevent antimicrobial resistance. They provided a framework of interventions to slow the emergence and reduce the spread of antimicrobial resistant microorganisms (WHO, 2001). However, the resistance to antimicrobial drugs can emerge either from the acquisition of genes coding for resistance or the new mutations in the bacterial genome. These genetic changes vary the defensive functions of the bacteria by changing the target of the drug, by detoxifying or ejecting the antibiotic, or by routing metabolic pathways around the disrupted point (Witte, 1998).

Moreover, the use and misuse of antimicrobial drugs can accelerate the emergence of drug resistant strains. The poor infection control practices, inappropriate food handling and inadequate sanitary conditions encourage the further prevalence of antimicrobial resistance (WHO, 2015). Currently, the strains of *Enterococcus* sp. have a high-level resistance to antimicrobial drugs such as vancomycin, ampicillin and aminoglycosides (Marothi *et al.*, 2005). While, on the other hand *Escherichia coli* become susceptible to the

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