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ABSTRACT

This study was conducted to determine the antibiotic resistance profile of Escherichia coli isolated from apparently healthy domestic livestock viz, cow, goats, and chicken from Akure, Ondo State Nigeria, E. coli was isolated using Eosin methylene Blue Agar (EMB) and identified by conventional microbiology technique. The isolate were tested against 14 antibiotics using the disc diffusion method. A total of 42 different antibiotics resistance profile were observed with each isolate showing resistance to at least four or more drugs tested. Generally the E. coli isolates showed resistance rates of 93.8% to ampicillin, 16.% to chloramphenicol, 57.5% to cloxacillin, 75.5% to Erythromycin, 20% to Gentamicin, 60.5% to penicillin, 19.5% to streptomycin, 25.8% to Ceftazidine, 45.8% to Cefuroxine,22.2% to cefixine 30.6% to Loxacin, 65.9% to augmentin, 26% nitrofurantoin, 29.3% to ciprofloxacin, 70.3% to tetracycline. This study showed that averages number of resistance phenotypes per isolate was significantly higher for goat and cow compared with poultry. A significant public health concern observed in this study is that multi drug resistance commena E. coli strains may constitute a potential reservoir of resistance genes that could be transferred to pathogenic bacteria

CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

ANTIBIOTICS

Antibiotics are naturals substances secreted by bacterial and funji to kill other bacteria that are competing for limited nutrients (Bud, 2007). The term antibiotic was first used in 1942 by Selman Waksman and his collaborators in journal articles to describe substance produced by a microorganism that is cribe substances produced by a microorganism in high dilution. Many antibacterial components are relatively small molecules with a molecular weight of less than 2000 atomic mass units (Dorlands, 2010).

With advances in medicinal chemistry, most of today antibacterial chemically are semi synthetic modifications of various nautral compound (Nussbaum, 2006). These include, for example, the beta-lactam antibacterial, which include the penicillins (produced by fungi in the genus penicillum), the cephalosporins and the carbapenems. In accordance with thus many antibacterial compound are classified on the basis of chemical biosynthetic origin into natural, semisynthetic, and synthetic.

Another classification system is based on biological activity, in this classification, antibacterial are divided into two broad group according to their biological effect micro-organism bactericidal agent that kill bacteria and bacteriostatic agents that slow down or stall bacteria growth (Nussbaum, 2006).

Pencillin, the first natural antibiotics discovered by Alexander fleming in 1928.

Escherichia coli is the head of the bacterial family, entero bacteriaceae, the enteric bacteria, which are facultatively anaerobic aram-negative rods that live in the intestinal tracts of animal in health and disease. The entero bacteriaceae are among the most important bacteria medically. A number of genera (e.g. salmonella, shigella, yersinia). Several others are normal colonists of the human gastro intestinal tract (e.g. Escherichia, Enterobacter, Klebsiella) but the bacteria as well, may occasionally be associated with diseases of humans. (Kubitschek, 1990).

Physiologically, Escherichia coli is versatile and well-adapted to its characteristic habitats. It can grow in media with glucose as the sole organic constituent wild-type Escherichia coli has no growth factor

requirements, and metabiologically it can transform glucose into all of the macromolecular components that make up the cell. The bacterium can grow in the presence or absence of oxygen (O2) under anaerobic conditions it will grow by means of fermentation, producing characteristic “mixed acids and gas” as end product. However, it can grow by means of anaerobic respiration, since it is able to utilize No3, No2 or fumarate as final election acceptors for respiratory election transport processes. In part, E. coli to its intestinal (anaerobic) and its extraintestinal (aerobic or anaerobic habitats) (Kubitschek, 1990). Escherichia coli can respond to environmental signals such as chimerical, pH, temperature, osmolarity etc. in a number of very remarkable ways considering its is a unicellular organism. For example, it can sense the presence or absence of chemicals and gases in its environment and swim towards or away from them. Or it can stop swimming and grow fimbriae that will specifically attach it to a cell or surface receptor. In response to change in temperature and osmolarity, it can vary the pore diameter of its outer membrane porins to accommodate larger molecules (nutrients) or to exclude inhibitory substances. With its complex mechanisms for regulation of metabolism the bacterium can survey the chemical contents in its environment in advance of synthesizing any enzymes that metabolized these compounds. It does not wastefully produce enzymes for degradation of carbon sources unless they are available, and it does not produce enzymes for synthesis of metabolites if they are available as nutrients in the environment (Ishii *et al*., 2009). Escherichia coli is a consistent inhabitant of the human intestinal tract, and it is the predominate facultative organism in the human gastro intestinal tract, however, it makes up a very small proportion of the total bacterial content. The anaerobic bacteriodles species in the bowel out number E. coli by at least 20:1. However the regular presence of E. coli. In the human intestine and faces has led to tracking the bacterium in nature as an indicator offaecal pollution and water contamination. As such, it is taken to mean that, wherever E. coli is found there may be faecal contamination by intestinal parasites of human (Fotadar *et al*. 2005).

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