ANTIBIOTIC SUSCEPTIBILITY PATTERN OF NON-CLINICAL *Escherichia coli* DISSEMINATING IN ABA METROPOLIS, NIGERIA

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INTRODUCTION : *Escherichia coli* are Gram-negative facultative bacilli which exist singly or in pairs having both non motile or motile strains; with peritriculous flagella (Cheesebrough, 2010; Wiley *et al*., 2013). *E. coli* are usually harmless bacilli present in the gut of warm blooded animals including man, where they play the important role of producing anaerobic environment for the lactobacillus to digest non fermentable residues from diets (O'Hara and Shanahan, 2006). However, *E. coli* are still a cause of worry to man especially when some pathogenic strains (Extraintestinal *E. coli*) are found outside the gut such in clinical: urine, wound, stool; plus in food, animal, water and soil surfaces (Lupundu, 2017).

RESULTS: The overall distribution of the isolates was 55.1% (Figure 1). Isolates were more in the effleunts (71.9%) than in other sources (Figure 2). Resistance were observed more in the Cephalosporins than in other antibiotics.

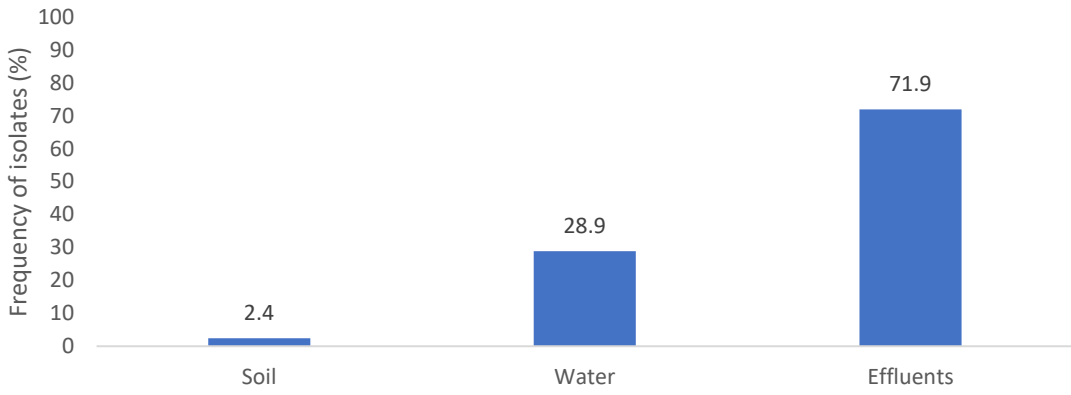

Figure 2: Distribution of *E. coli* isolates on the samples

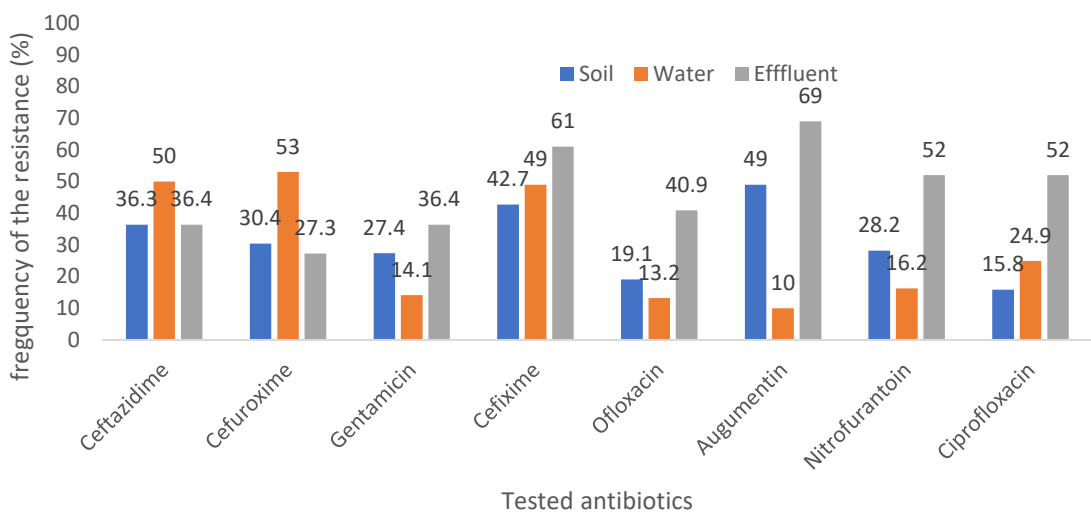

Figure 3: Antibiotic Susceptibility profile of the isolates

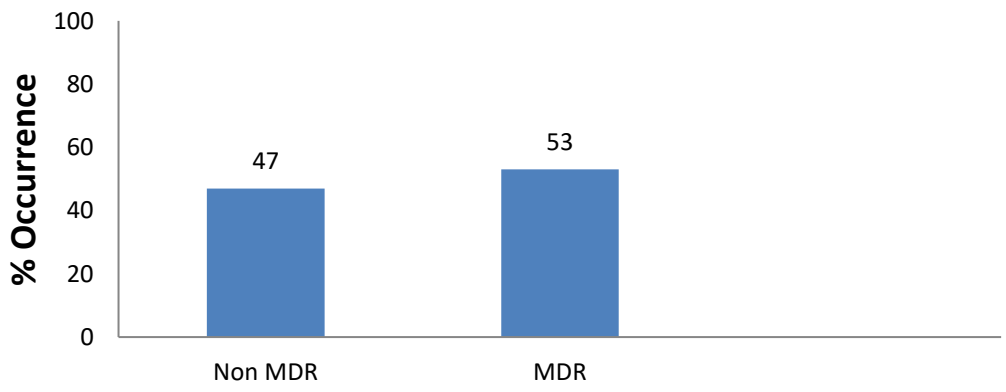

Figure 5: Distribution of MDR isolates

DISCUSSION: *E.coli* is a significant indicator organism of serious medical importance especially when multidrug resistant isolates are recorded in large number in a study. The proliferation of antibiotic resistant bacteria in the environment is blamed on man's activities of usage and dumping of antibiotics through effluents, soil and water. The low resistance to ofloxacin is linked to the mechanism of action of fragmenting the chromosome of the bacteria through the enzymes of gyrase and topoisomerase IV. Multiple Drug Resistance index and the MDR of 53% observed could be attributed to the frequent use of the Cephalosporins and the penicillins nowadays being a ready oral antibiotics in hospitals and chemist shops as first-line therapy drug choice High index of > 0.2 imply high risk of antibiotic abuse and usage in the area through agricultural practices, veterinary usage, human practices and poor policy in the regulation of the antibiotics in the area.

CONCLUSION: This study showed that *E. coli* could be easily disseminated from the environment Preponderance of the isolates to be resistant to the five classes of the antibiotics used in this study could be current usage of these drugs of choice in the treatment of bacterial infections. Multidrug resistant *E. coli* were more in circulation with high MAR index which implied high usage of antibiotics in the location where the work was carried out.

MATERIALS AND METHOD: The study was carried out within Aba metropolis in Abia State, Nigeria. Aba is a commercial city which is located at longitude of 7.9°E and at latitude of 5.0°N. Samples numbering 150 from environmental sources (soil, water, abattoir effluents) were collected. Samples were serially diluted appropriately and inoculated using pour plate and spread plate methods onto Eosin Methylene Blue agar. They were incubated and further sub cultured into stock for identification (Cheesebrough, 2010; Akanbi *et al*., 2013; CLSI, 2018). Colonial appearance of green metallic sheen on EMB agar were suspected to be *E. coli* isolates and subjected to further identification processes (Cheesebrough, 2010; Akanbi *et al*., 2016; Tesfaye *et al*., 2019). Biochemical identification carried out on the isolates were indole test, citrate utilization, methyl red test and voges prokauer test. The standard boiling method was employed for bacterial DNA extraction. The pure isolate was boiled in 100µL of molecular grade water for 5minutes and centrifuged at 10,000g/min for 5minutes. The bacterial DNA which was suspended in the supernatant was separated from used as DNA template for the PCR (Engler and Kelley). *E. coli* specific 16s rRNA gene fragments Ec16primer was used in the amplification of the DNA. Antibiotic Susceptibility Testing was carried out using Kirby-Bauer disc diffusion method.

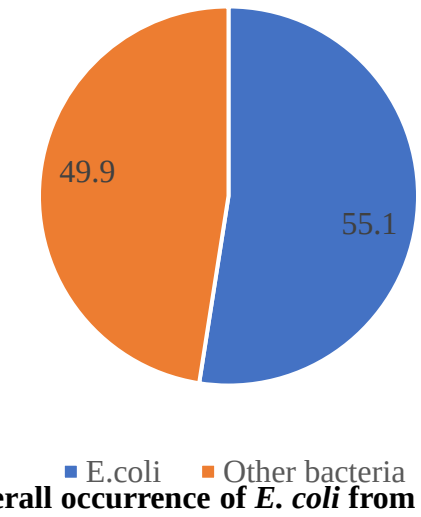

Figure 1: Overall occurrence of *E. coli* from the environment

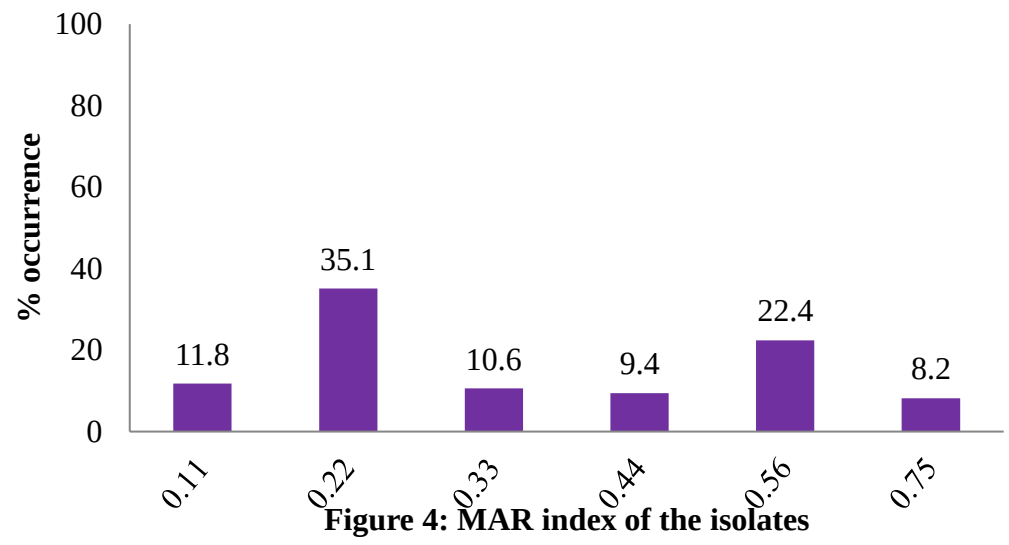

Figure 4: MAR index of the isolates

Table 2: Antibiogram of the isolates

S/N	ANTIBIOGRAM	NO OF ORGANISMS	No of Drug Classes
1.	ACX-AUG-CTX-CXM-IMP-NF	5	4
2.	AUG-CTX-CXM-IMP-OFX-ZEM	1	4
3.	ACX-AUG-CTX-CXM-IMP-NA-NF-ZEM	5	5
4.	ACX-AUG-CRO-CTX-CXM-IMP-ZEM	1	3
5.	ACX-AUG-CTX-CXM-IMP-ZEM	7	3
6.	ACX-AUG-CTX-CXM-NF-ZEM	1	3
7.	ACX-AUG-CTX-CXM-IMP-NF-ZEM	6	4
8.	ACX-CTX-CXM-IMP-ZEM	1	3
9.	ACX-CTX-CXM-IMP	4	3
10.	ACX-AUG-CTX-IMP	1	3
11.	ACX-AUG-CTX-CXM-ZEM	2	2
12.	ACX-AUG-CRO-CTX-CXM-NA-NF-ZEM	6	4
13.	ACX-CRO-CTX-CXM-NA-NF-ZEM	1	4
14.	ACX-AUG-CTX-CXM-IMP-NA-ZEM	3	4
15.	ACX-AUG-CTX-CXM-IMP	10	3
16.	ACX-AUG-CTX-IMP-ZEM	1	3
18.	ACX-AUG-CRO-CTX-GN-IMP-NA-ZEM	6	5
19.	ACX-AUG-CRO-CTX-CXM-IMP-NA-NF-ZEM	23	5

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