

Resistance in *E.coli* to Antibiotics

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Abstract

The major problems facing today are that many of the disease causing bacteria have become resistant to the effects of different antibiotics. *E.coli* is one of the most studied bacteria. The *E.coli* MTCC No.443 was revived and cultured in nutrient broth. The antibiotic sensitivity tests were performed to all the antibiotics such as Ofloxacin, Norfloxacin, Ampicloxacillin, Amoxicillin, Ampicillin, Penicillin, Metronidazole, and Erythromycin. It was found that that the Standard organism showed sensitivity to Ofloxacin, Norfloxacin, and Erythromycin. The *E.coli* was isolated from an infected patient sample and was confirmed by the biochemical tests. The antibacterial activity tests were done with the same antibiotics mentioned above and showed that the organism showed resistance to all the antibiotics. The Plasmid DNA of the *E. coli* Sample was isolated and was run on the Agarose gel electrophoresis, and assumption was made that the plasmid DNA could be of a larger molecular weight

Introduction

Bacteria exists nearly every surface and within a variety of living and non-living things. They exist in a symbiotic condition in which they function as partners with other organisms. Although life would not be the same without bacteria, they also have a bad side. These bad or pathogenic bacteria cause diseases and other unwanted infections. To fight these bacteria we use antibiotics; a natural defense used by other organisms that humans have adopted. *E.coli* is one of the most studied bacteria. *E.coli* are essential for producing vitamins K and B complex. Our bodies are dependent on *E.coli* for the production of these vitamins, our only source. Although we depend on these helpful strains of *E.coli* there are some harmful strains of *E.coli* like the 0157:47 strain that have been associated with a wide variety of diseases and infections, including menigeal predominantly in the newborn gastro intestinal, urinary tract, wound and bacterium infections in all age

groups. These categories of diarrheogenic *E.coli* also cause numerous types of diarrhea illness.

One of the major problems facing today is that many of the disease causing bacteria have become resistant to the effects of different antibiotics. This occurs when a bacteria population genetically acquires the ability to destroy the antibiotics. This occurs when a bacteria population genetically acquires the ability to destroy the antibiotic. This one resistant cell will divide and produce a population that is now no longer harmed by that particular antibiotic. This is a great concern because certain strains of disease causing bacteria now have only few antibiotics remaining, which will kill them. Due to this concern there are tremendous efforts in finding new natural sources of antibiotics and or make completely synthetic ones in the laboratory. One of the reasons for the cause of this problem is because of prior indiscriminate use of antibiotics in humans.

Materials and Methods

Determination of Antimicrobial Sensitivity

Materials

Bacterial strain inoculum

Antibiotic dilutions

Microfuge tubes

Micropipettes

Sterile

Cotton swabs

MHA plates

Gel puncher

Procedure

Dissolve the ingredients and pour about 20ml of melted MHA into the sterile petriplates in sterile conditions.

Inoculums of the 24 hours nutrient broth cultures were taken and with the help of a sterile cotton swab the culture is spread all over the plate to get an even lawn of growth of the organisms

Wells were punched on each plate using a gel puncher.

20ml of antibiotic dilutions were added to each well in the newly seeded bacterial lawns and the plates were incubated at 37°C for 24 hours.

Results

Antimicrobial Sensitivity Tests

E.coli MTCC NO: 443

Ofloxacin:					
1000µg	750µg	500µg	250µg	100µg	50µg
26 mm	24mm	22mm	20mm	19mm	17mm
Ampicloxacin:					
1000µg	750µg	500µg	250µg	100µg	50µg
14 mm	13mm	12mm	11mm	8mm	6mm
Amoxycillin:					
1000µg	750µg	500µg	250µg	100µg	50µg
11mm	10mm	9mm	8mm	7mm	5mm
Erythromycin:					
1000µg	750µg	500µg	250µg	100µg	50µg
17 mm	16mm	15mm	13mm	12mm	10mm
Norfloxacin:					
1000µg	750µg	500µg	250µg	100µg	50µg
24 mm	21mm	20mm	19mm	16mm	13mm
Ampicillin:					
1000µg	750µg	500µg	250µg	100µg	50µg
15 mm	12mm	11mm	7mm	5mm	-
Penicillin:					
1000µg	750µg	500µg	250µg	100µg	50µg
12 mm	11mm	10mm	9mm	8mm	7mm

Metronidazole

No Zones of inhibition.

Antimicrobial Sensitivity Test:

E.coli Isolates:

1. Ofloxacin:

1000µg	750µg	500µg	250µg	100µg	50µg
11 mm	9mm	-	-	-	-

The antibiotic Ofloxacin showed very small zones of inhibition of 11 mm at high concentrations. This inferred that the *E.coli*, which was isolated, had gained resistance to the antibiotic Ofloxacin.

Ampicloxacin	- No zones of Inhibition
Amoxycillin	- No zones of Inhibition
Erythromycin	- No zones of Inhibition
Norfloxacin	- No zones of Inhibition
Ampicillin	- No zones of Inhibition
Penicillin	- No zones of Inhibition
Metronidazole	- No zones of Inhibition

Discussion

The results for the standard MTCC culture of *E. coli* was found to be sensitive to many of the drugs except metrinidazole, however the isolate was found to be resistant to most of the antibiotics.

Conclusion

The *E. coli* was isolated and by performing the antibacterial tests it has been inferred that the organism had gained resistance to all the antibiotics mentioned above. This is a great concern as certain strains of bacteria have only few antibiotics remaining, which will kill them. Due to this concern there are tremendous efforts in finding new natural sources of antibiotics, and or make completely synthetic ones in the laboratory by changing the drug target site. This might prevent the organism in getting used to that antibiotic and become resistant.

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