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ISOLATION OF *E. COLI* AND *SALMONELLA* FROM CHICKEN SAMPLE FROM MARKET OF PAONTA SAHIB

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Abstract: Chicken is very nutritious and healthy food which is low in fat as compare to other meats. But it is good source of protein. My research conducted to isolate and identify the pathogenic bacteria *Escherichia coli* and *Salmonella* found in chicken sample. A total thirty chicken samples collected from all different shops of Paonta Sahib Market. Samples were propagated nutrient broth followed by culture of selective media – Eosin Methylene Blue Agar, MacConkey Agar, Bismuth Sulfide Agar and Xylose Lysine Deoxycolate Agar. All isolates have their own morphological characteristics. Out of thirty fresh chicken samples seven isolates of *Escherichia coli* (23%) and sixteen isolates of *Salmonella spp.* (53%) were collected. Both species of bacteria are responsible for many food-borne diseases caused by consumption of contaminated food. So it is necessary to minimize the contamination of chicken in market places by proper sanitation.

Keywords: Chicken; *Escherichia coli*; Food-borne diseases; *Salmonella*.



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INTRODUCTION

Chicken is recognized as very important food in all the countries. Many poultry farms are opened in all the countries for good supply of chicken. Chicken is very healthy and tasty food if it is cooked well. It is low in fat and cholesterol as compare to other meat. Chicken can be contaminated by improper handling and during the cooking preparation. Many diseases like Salmonellosis, Collibacillosis, diarrhea, food poisoning occur due to intake of contaminated chicken. These diseases occur due to pathogenic microorganism present in the chicken such as bacteria, fungi, protozoan and viruses. My research conducted to isolate and identify the bacteria *E.coli* and *salmonella spp.* Both bacteria are pathogenic and causing many food-borne diseases. *E.coli* is gram negative, motile by peritrichate flagella, rod shaped and non-spore forming bacteria. Many strains, especially those isolated from pathogenic conditions, are hemolytic on blood agar. In case of *E.coli* glucose, lactose, mannitol, maltose and many other sugars are fermented with the production of acid and gas. *E.coli* gives positive results in the indole and methyl red tests and negative results in the Voges-Proskaur and urease tests. In poultry meat *E.coli* contamination is during undercooked meat and during processing. Pathogenic strains of *E.coli* causing many food-borne diseases like – Collibacillosis, food poisoning and diarrhea. *Salmonella* is of most incriminated pathogenic microorganism of bacterial food poisoning in case intake of contaminated chicken. *Salmonella* is gram negative, rod shaped, motile by peritrichate flagella and non - spore forming bacteria. *Salmonella* ferment glucose, mannitol and maltose, forming acid and gas. *Salmonella* gives positive test in methyl red and citrate and negative results in the Voges-Proskaur and urease tests. Salmonellosis is major disease caused by *Salmonella* isolated from contaminated chicken samples. Diarrhea, fever and abdominal cramps are the major symptoms of Salmonellosis. Twelve to Seventy two hours after infection. Most of people recover without treatment but in case of diarrhea and dehydration may be necessary to go to the hospital.

Research conducted to isolate the two main bacteria *E.coli* and *Salmonella* from the thirty different chicken samples that are collected from Paonta sahib Market. This information is necessary to cure many food borne diseases caused by pathogenic strains of *E.coli* and *Salmonella*.

MATERIAL AND METHODS

1 Sample collection

Thirty fresh chicken samples were collected from Paonta Sahib Market. The samples were collected in sterile polythene bags. Collected fresh chicken samples were transferred immediately to laboratory in the department of microbiology.

2 Processing of sample

Fresh chicken sample cut into smaller pieces using sterile knife. Then sample inoculated into the nutrient broth and give the incubation for 24 hours at 37 °C. After 24 hours of incubation, check the turbidity of the nutrient broth.

3 Direct plating for culture

Inoculated sample streaked on the differential or selective media. All the equipments are sterilized. Eosin Methylene Blue Agar, MacConkey Agar, Bismuth Sulfide Agar and Xylose Lysine Deoxycolate Agar media was used for the isolation of bacteria from chicken sample. Methods which include pour plating and streaking. All the used equipments are sterilized. Prepare the media and pour into sterilized petriplates. After solidifying the media culture streak on the selective media plates. After 24 hours at 37 °C incubation is given to the plates and next day check the growth of bacteria.

4 Colony morphology

Morphological characteristics of recovered isolates viz, colony morphology (color, shape, margin, arrangement and gram staining) were studied.

4.1 Color of bacteria

Different bacteria give different color on the selective media. *E.coli* gives metallic green color colonies on EMB agar and pink color colonies on MacConkey agar plates. *Salmonella* gives black with metallic sheen on Bismuth sulfide agar and red with black center on XLD agar.

4.2 Gram staining

Bacterial colonies were picked and thin smear was made on a clean glass slide and further dried, heat fixed and stained by gram staining. The slide was examined under microscope. Bacterial cells found to be gram negative rod shaped.

RESULTS AND DISCUSSION

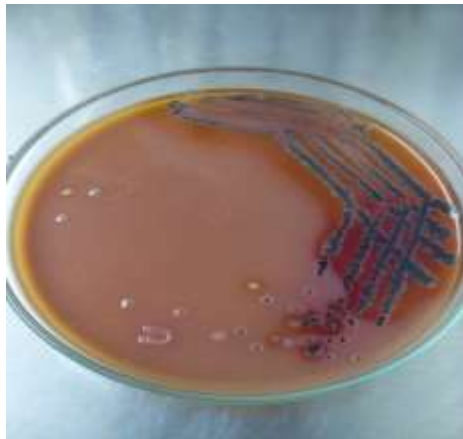
A total number of thirty fresh chicken samples of Paonta Sahib Market were examined for the pathogenic bacteria *E.coli* and *Salmonella spp.* The thirty samples were collected from different shops of Paonta Sahib Market. Predominant bacterial pathogen isolated was *Salmonella spp.* (53%) followed by *E.coli* (23%).

| Chicken Samples | <i>E.coli</i> | <i>Salmonella</i> |
|-----------------|---------------|-------------------|
| | | |
| CS-1 | - | - |
| CS-2 | - | - |
| CS-3 | - | - |
| CS-4 | - | + |
| CS-5 | - | - |
| CS-6 | - | - |
| CS-7 | + | - |
| CS-8 | - | - |
| CS-9 | - | + |
| CS-10 | - | - |
| CS-11 | - | - |
| CS-12 | + | - |
| CS-13 | - | - |
| CS-14 | - | - |
| CS-15 | - | + |
| CS-16 | - | - |
| CS-17 | - | + |
| CS-18 | - | + |
| CS-19 | - | - |
| CS-20 | - | + |
| CS-21 | - | + |

| | | |
|-------|---|---|
| CS-22 | - | + |
| CS-23 | - | + |
| CS-24 | - | + |
| CS-25 | + | + |
| CS-26 | - | + |
| CS-27 | + | + |
| CS-28 | + | + |
| CS-29 | + | + |
| CS-30 | + | + |

Table 1 Showing Chicken Profile.

1 Identification of *Bacteria*:



Salmonella on XLD



E.coli on EMB



Salmonella on BSA



E.coli on MacConkey

CONCLUSION

It is found that out of thirty samples sixteen samples were contaminated with *Salmonella* and seven samples were contaminated with *E.coli*. This shows that poultry meat in Paonta Sahib Market is of poor hygiene quality. Chicken is contaminated in higher rate with *Salmonella sp.* as compare to *E.coli*. In conclusion contamination of chicken with *Salmonella and E.coli* indicates bad microbiological quality of raw chicken of Paonta sahib market. It may be due to contamination occurring during processing or distribution. So training should be given to chicken handlers regarding food safety practice.

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