

STUDY ON ANTIBIOGRAM OF *E. COLI* SPP ISOLATED FROM INFECTED BROILERS IN AND AROUND PRODDATUR REGION

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Abstract: The objective of present study was to determine antimicrobial susceptibility of *E.coli* isolates from different infections of poultry. During a period of five months, samples were collected from birds presented to postmortem at Department of pathology, College of Veterinary Science, Proddatur. During postmortem, samples were collected aseptically, inoculated in to nutrient broth and incubated at 37⁰c for 24 hrs. A loop full of culture was taken and streaked on to Mac Conkey agar, Eosin Methylene blue agar respectively. Pink color colonies on MCA agar, greenish metallic sheen colonies on EMB agar indicative of *E.coli*. Finally *E.coli* isolates were subjected to biochemical tests for confirmation. Finally antimicrobial susceptibility test (Kirby Bauer disc diffusion) was performed on Muller Hinton agar according to CLSI (2014) guidelines. *E.coli* isolates were highly susceptible to ciprofloxacin, ceftriaxone, cefotaxime, followed by gentamicin, and highly resistant towards streptomycin, tetracycline, Bacitracin, chloramphenicol etc.

Introduction

E. coli is a gram-negative, rod shaped facultative anaerobic bacteria belonging to family Enterobacteriaceae. *E. coli* is a commensal of the poultry intestine, and strains of *E.coli* involved in systemic fatal disease are known as avian pathogenic *E. coli* (APEC) [1,2]. *E.coli* is associated with various diseases either as a primary or as a secondary pathogen. *E.coli* infections were manifested as colibacillosis, colisepticemia, coligranuloma, omphalitis, swollen head syndrome, respiratory tract infection, polyserositis and salpingitis etc. colisepticemia is characterized by peritonitis, pericarditis, perihepatitis, airsacculitis and death [3]. Coccidiosis, fungal infections, New castle disease, Infectious bursal disease, immunosuppressive diseases are predisposing factors to *E.coli* infections [4]. *E.coli* excrete through droppings and contaminate the soil, feed, eggs, equipments and water

which can act as source of infection to healthy birds as well as humans [5]. Unhygienic managerial practices and overcrowding are the important risk factors for *E.coli* infections [6]. Avian colibacillosis is one of the transmissible diseases to humans which is consistently associated with food borne illness and food poisoning. Indiscriminate use of antimicrobials leads to emergence of multidrug resistant *E.coli* strains. Meat contaminated with droppings of birds during slaughter is one of the major sources of multidrug resistant *E.coli* to humans. It is an important public health concern, because poultry meat is consumed by majority of the people world wide [7].

Materials and methods

Necropsy examination

Detailed necropsy examination of carcasses was conducted following standard protocol [8] at Dept. Of Veterinary Pathology, College of Veterinary Science-Proddatur & representative sample were collected aseptically.

Isolation and identification

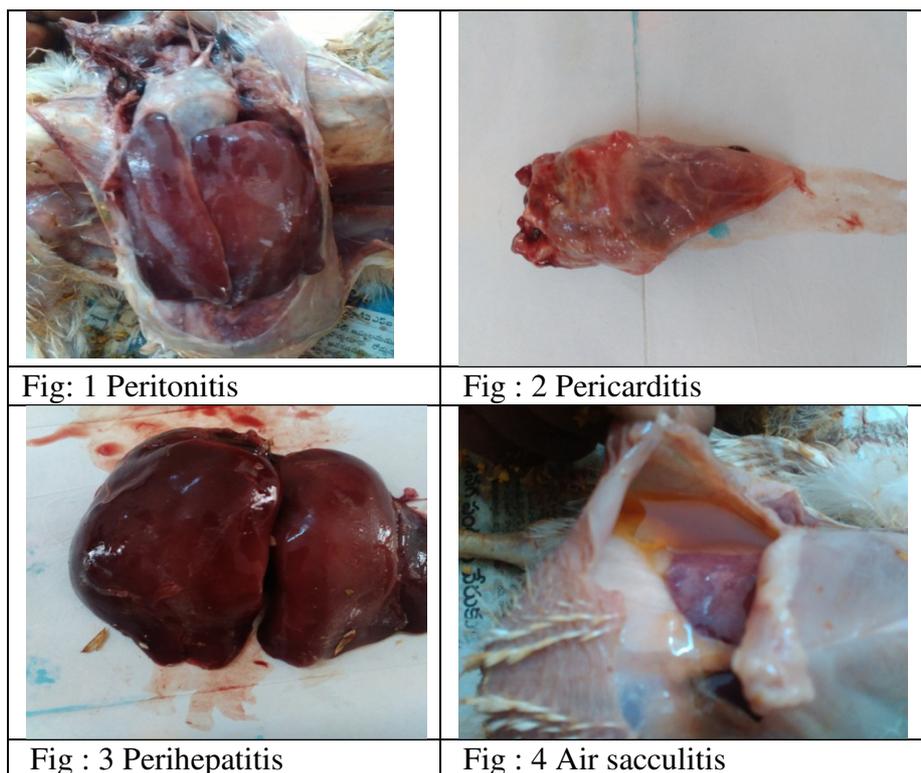
The collected samples were inoculated in to BHI broth and incubated at 37⁰ C for about 24 hrs. Initially gram staining was done to observe their morphology and the reaction on gram staining. A loop full of culture was taken and streaked on to MCA agar and incubated at 37⁰ C for about 24 hrs. Later single colony was picked off and inoculated in to BHI broth, incubated at 37⁰ C for about 24hrs. Initially catalase and oxidase tests were carried out for presumptive identification of enterobacteriaceae members. Later streaked on to EMB agar and biochemical characterization is carried out following standard protocols [9] for further confirmation of *E.coli*.

Antimicrobial sensitivity test

Individual colonies were from EMB agar were inoculated in to nutrient broth, incubated at 37⁰ C for 6hrs and ABST is performed on MH agar following CLSI guidelines (2014).

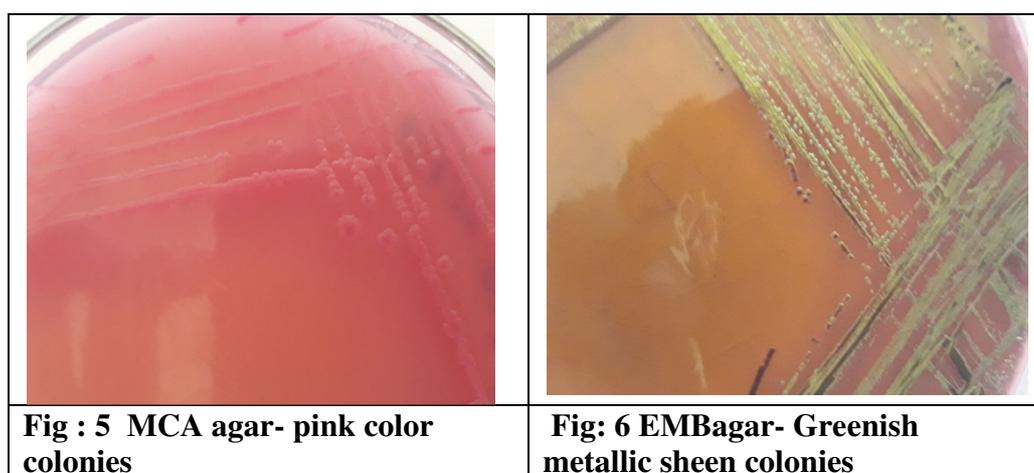
Results

Necropsy examination was conducted and representative samples from affected organs were collected aseptically and immediately inoculated in to BHI broth for isolation and identification.



Isolation and identification

Pink colonies (lactose fermentor) on MacConkey agar and green-metallic sheen colonies on EMB agar were presumptively identified as *E. coli* and were confirmed by Indole test (positive-Red ring), Methyl red (positive – red color), Voges proskeur test (Negative-colorless or yellow color), Citrate test (Negative – No blue color), reaction on TSI slant (Y/Y/H₂S-ve) and urease reaction (negative).



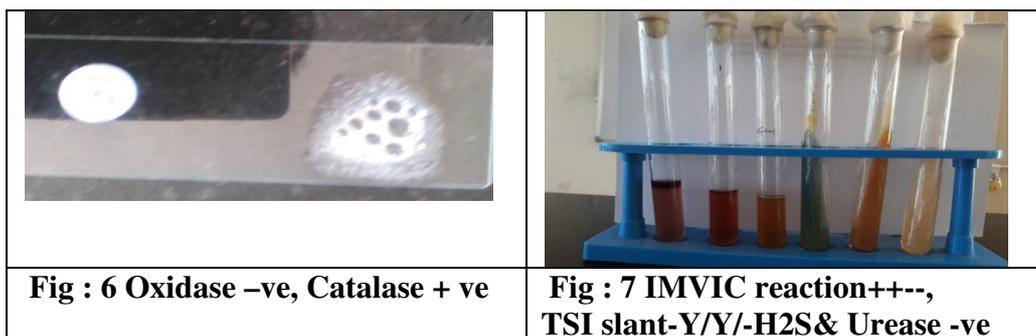
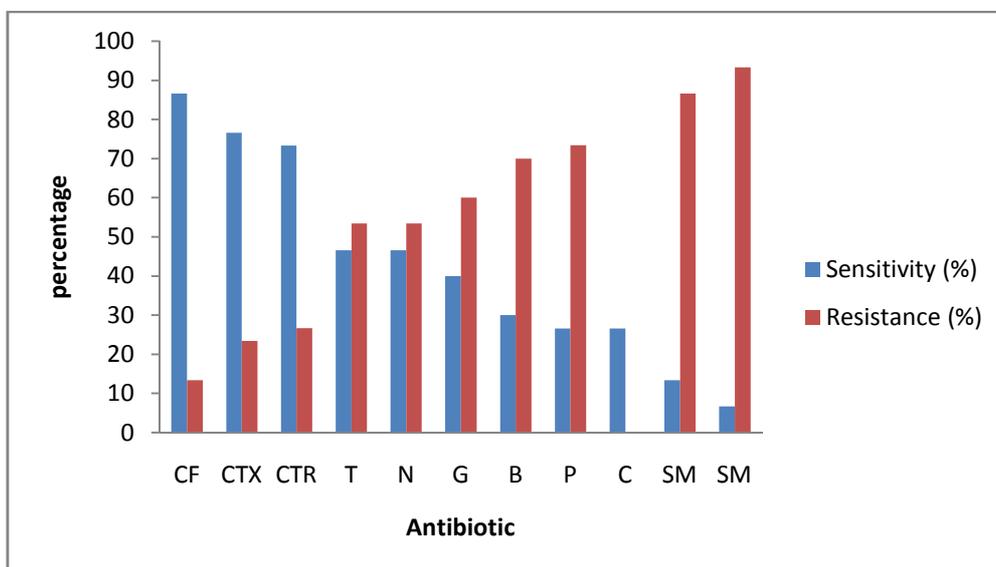


Fig : 6 Oxidase –ve, Catalase + ve

**Fig : 7 IMVIC reaction+++,
TSI slant-Y/Y/-H2S& Urease -ve**

Antimicrobial sensitivity test

On ABST *E.coli* isolates of avian origin were highly susceptible to ciprofloxacin (86.6%), ceftriaxone (76.6%) & Cefotaxime (73.3%) followed by tetracycline (46.6%), Neomycin (46.6%) gentamycin (40%) and Bacitracin (30%).



Discussion

Growth on MCA agar, catalase positive and oxidase negative indicates it is a Enterobacteriaceae member. Pink color colonies on MCA agar indicate that it is lactose fermenter. greenish metallic sheen colonies on EMB agar, IMVIC reaction (+++-) and TSI reaction with negative for H₂S production indicated that *E.coli* is involved in different diseases of poultry either as a primary or secondary pathogen which is in accordance with earlier reports [3]. In present study *E.coli* organisms were found to be highly resistant towards many antibiotic especially sulfadiazine (93.3%), Sulfamethazole (86.6%) and penicillin-G (74%) followed by chloramphenicol (74%), Polymyxin (71.0%), gentamycin [60%], tetracyclines [53.4%] and neomycin [53.4%] etc which were correlated with previous

studies [12]. In the present study *E.coli* organisms also showed resistance towards ciprofloxacin (13.5%), cefotaxime (23.4.0%), Ceftriaxone (26.7.0%), Bacitracin (70.0%) and Resistance towards B-lactam group of antibiotics was reported in present study which was correlated to previous reports [12,13& 14] and concerns the existence of ESBLs among *E.coli* of avian origin [11]. In the present study *E.coli* isolates of avian origin were highly susceptible to ciprofloxacin, cefotaxime, ceftriaxone followed by tetracyclines, Neomycin and gentamycin etc

Conclusion

E.coli infections are one of the major bacterial diseases affecting poultry industry in terms of mortality and loss of production. It also possess impact on public health. Thus hygiene managemental practices should be strictly implemented to control *E.coli* infections and food borne illness in humans.

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