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# "Molecular identification of virulence genes of pathogenic Escherichia coli isolated from broiler Chicken"

**Thesis presented**

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**AMR** : The antimicrobial resistance

**APEC** : Avian pathogenic *E. coli*

**APPCR** : Arbitrarily primed Polymerase Chain Reaction

**ATB** : Antibiotic

**CFU** : Colony forming unit

**CLDT** : Cyto-lethal distending toxin

**CLSI** : Clinical and Laboratory Standards Institute

**CLT** : Chick lethal toxin

**CRA** : Congo red agar

**CRD** : Chronic respiratory disease

**ECE** **:** Embryo chicken egg

**EHEC** **:** Enterohemorrhagic *E. coli*

**EIEC** **:** Enteroinvasive *E. coli*

**ELISA** : Enzyme-Linked Immunosorbent Assay

**EMB** : Eosine methylene blue agar

**EPEC** : Enteropathogenic *E. coli*

**EPS** : Extracellular polymeric substances

**ERIC** : Repetitive intergenic consensus

***ESBL*** *:* Encoding broad-spectrum *B*-lactamase

**ETEC** : Enterotoxigenic *E. coli*

**ExPEC** : Extraintestinal pathogenic Escherichia *coli*

**GIT** **:** Gastrointestinal tract

**IBV** : Infectious bronchitis virus

**IMViC** : Indole test; Methyl red test; Voges-Proskauer test; Citrate test

**IROMPs** : Iron regulated outer membrane proteins

**IroN** : Iron acquisition systems

**Iss** : Increased serum survival

**KDa** : Kilodalton

**LPS** : lipopolysaccharide

**MBC** : Minimum Bactericidal Concentration

**MDR** : Multi drug resistance

**MIC** **:** Minimum inhibitory concentration

**NDV** : Newcastle disease virus

**NMEC** : Neonatal meningitis *E. coli*

**PAIs** **:** pathogenicity islands

**PCR** : Polymerase Chain Reaction

**PFGE** : pulsed-field gel electrophoresis

**PU** : palindromic unit

**QAC** **:** Quaternary ammonium compounds

**QREC** : Quinolone-Resistant Escherichia coli

**RAPD** : Random Amplificatioz of Polymorphic DNA

**RDC** **:** respiratory disease complex

**REP** : repetitive extragenic palindrome

**SHS** : Swollen head syndrome

**SPF** : Specific pathogen free

**SPS** : Salpingoperitonitis

**TBE** : Tris borate EDTA

**TRTV** : Turkey rhinotracheitis virus

***Tsh*** : Temperature-sensitive haemagglutinin

**TSI** : Triple Sugar Iron

**UPEC** **:** Urinary pathogenic *E. coli*

**UTI** **:** Urinary tract infection

**VTEC** : Verotoxigenic *E. coli*

# VI. SUMMARY AND CONCLUSION

APEC is a worldwide and major cause of economic losses in the poultry industry due to morbidity, mortality and lost production, putting at risk one of the world's cheapest sources of high-quality protein.

Our results revealed that over all isolation incidences according to morphology and biochemical characteristics was 38 suspected E. coli isolates out of 120 examined samples with a percentage 31.7%.

Serotyping is the basic method for typing of E. coli strains. In the present study the results showed that 11 serotypes from a total 38 E. coli isolates that have been serotyped. Among the typeable isolates, O78 (8 isolates), followed by O91:H21 (6 isolates), O1:H7 & O128: H2 (5isolates), O2: H6 (4isolates), O146:H21 (3isolates), O55:H7 &O26 &H11. (2isolates), O127:H6, O159& O17:H18.(1 isolate of each).

The results for antibiotic sensitivity showed that most of the isolates were multidrug resistant as they resist at least two antibiotics.

*E. coli* strains were highly tolerant to disinfectants, with a higher distribution of disinfectant resistance genes, Incorrect and excessive use of disinfectants has imposed selective pressure on strains, resulting in the high level of resistance to disinfectants and the wide distribution of resistant genes. The *E. coli* isolates in our study revealed association between phenotypic biocide tolerance and antibiotic resistance, So Bacteria that are co resistant to disinfectants and antibiotics would pose a significant health risk.

The use of the embryo lethality assay by poultry diagnostic laboratories will enable them to identify pathogenic E. coli by a relatively simple and inexpensive test and eliminate the use of the chicken model.

In conclusion, biofilm formation can be seen as an indication of virulence and drug resistance of pathogenic bacteria isolates and biofilm formation has strong correlation with these virulence properties.

Before making any therapeutic decision, antibiotic/disinfectant susceptibility testing is carried out, so as to use the effective antibiotic/ disinfectant