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Detection and characterization of extended spectrum β-lactamase producing from poultry of eastern India

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Extended spectrum β-lactamase (ESBL) producing *Escherichia coli* has become a major concern globally for their association with critical hospital borne infections and emergence as a serious challenge for therapy and public health. Recent reports have indicated colonization of these pathogens in food producing animals including poultry birds which not only complicates the therapeutic measures against animal diseases but also contributes for environmental contamination and dissemination. Rampant and inadvertent use of antimicrobials in poultry birds is a real concern in the face of increasing reports of therapeutic failure due to antimicrobial resistance and thus it necessitated the present study to screen these pathogens among poultry birds from eastern India. In total, two hundred and seventy (270) cloacal swab samples were collected from poultry birds covering three states of eastern India viz., West Bengal, Odisha and Jharkhand. Samples were processed for isolation and confirmation of *E. coli* using standard biochemical tests. Further the confirmed *E. coli* isolates were subjected to phenotypic screening: Disk synergy assay, combination disk test and ESBL E-test. Altogether twenty two (22) isolates were found to be ESBL producers in phenotypic tests. Furthermore, PCR based screening revealed that the ESBL producing isolates carried β-lactamase genes like blaCTX-M, blaSHV, blaTEM and blaAmpC. Few isolates also possessed plasmid mediated quinolone resistance (PMQR) genes and virulence markers for uropathogenic (UPEC) or extra-intestinal pathogenic (ExPEC) *E. coli*. All the ESBL producers exhibited resistance to various β-lactam drugs and were characterized by ERIC (enterobacterial repetitive intergenic consensus) and REP (repetitive extragenic palindrome) PCR. The study showed that poultry birds may be important reservoirs for ESBL producing *E. coli* and consumption of contaminated poultry meat may lead to human infection as well.

Biography

Samiran Bandyopadhyay has joined as scientist in National Research Centre on Yak, Dirang in 2005. After completion of PhD in 2012, he joined Eastern Regional Station of IVRI, Kolkata. He has published 35 international and 48 national papers in reputed journals. His current area of research is to explore the molecular mechanism of drug resistance in communicable and food-borne pathogens.

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