Applied Biological Research 14 (2): 228-230, 2012 **Short Note**

ISOLATION AND ANTIBIOGRAM OF *Escherichia coli* FROM BACKYARD POULTRY IN WEST BENGAL (INDIA)

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Poultry industry is one of the promising industries of West Bengal (India) exhibiting annual growth rate of 15.4% since last 5 years. West Bengal state stands 2nd in relation to poultry population and 1st with respect to human population density in India (FAO, 2008). However, the State stands 5th in egg production due to large number of low yielding fowl population, about 84% of which are produced in backyard farming system (Animal Resources Development Department, 2010). 'Deshi' hens contribute 50% to egg production and the rest is from duck. The average productivity of backyard fowl population in the State is about 99 eggs in a year (Animal Resources Development Department, 2010). Microbial infection present within the flock in any form is one of the major constraints in optimum egg production. *Escherichia coli* is one of the common microbial flora of gastrointestinal tract of poultry and human being but may be pathogenic to both (Jawetz *et al.,* 1984). Besides *E. coli*, colibacillosis in poultry is of great zoonotic importance as poultry meat is the common source of animal protein in India. In addition, the bacterial isolates of poultry or its products are the major source of antimicrobial resistance gene that can be horizontally transferred into other bacteria present in the environment (Guerra *et al.,* 2003). The infection of animals or human with such kind of resistant bacteria makes the treatment difficult. In this background the present investigation was envisaged to know the prevalence of *E. coli* along with their antibiotic resistance pattern in the backyard chickens of West Bengal.

In this study 85 cloacal swabs of poultry were collected randomly from three districts of West Bengal viz., West Midnapore, 24 Parganas (South) and Jalpaiguri. The samples were collected from apparently healthy 'Rode Island Red (RIR)' and 'Deshi' poultry birds of all age and sex which were reared in backyard system from December, 2010 to May, 2011. The district-wise distributions of samples are described in Table 1. The cloacal samples were collected in sterile vials directly from cloacae by sterile cotton swab sticks. All the samples collected were placed on ice in a thermo-flask and were immediately brought to the laboratory for further examination. For the isolation of *Escherichia coli*, the cloacal swabs were kept in nutrient broth (HiMedia, India) and incubated at 37°C for overnight. The bacterial colonies were transferred to MacConkey's agar (HiMedia, India) and again incubated at 37°C for overnight. The rose pink colonies developed were then randomly picked, streaked on EMB agar (HiMedia, India) and incubated overnight at 37°C. The characteristic single colonies with metallic sheen were maintained on nutrient agar (HiMedia, India). The isolates were confirmed by standard biochemical tests like catalase, oxidase, indole, methyl red, Vogas-Proskauer, citrate and urease tests (Quinn *et al.,* 1994). All the *E. coli* isolates were sent National Salmonella and Escherichia Centre, Central Research Institute, Kasuli, Himachal Pradesh (India) for serogrouping. All the isolates were subjected to Congo red binding assay (Ishiguro *et al.*, 1985). The isolates were streaked on trypticase soya agar (HiMedia) to which 0.5% of Congo red dye was added. The plates were incubated at 37°C for 24-72 h. The Congo red binding isolates produced brick red colonies. All the *E. coli* isolates from each district were tested for their sensitivity and resistance to different antibiotics by disc diffusion method (Bauer *et al.,* 1966). The antibiotics used were ciprofloxacin (5 mcg), tetracycline (30 mcg),

levofloxacin (5 mcg), penicillin (10 units), ampicillin (10 mcg), enrofloxacin (5 mcg), bacitracin (8 units), sulfamethizole (30 mcg), colistin (10 mcg) and furazolidone (50 mcg).

In the present study 71 isolates of *E. coli* were obtained from 85 cloacal swabs (83.5%) of backyard poultry collected from the three districts of West Bengal. Maximum number of isolates (31; 43.6%) was detected in West Midnapore district. Serogroup O84 was detected from the maximum number of backyard poultry birds (25.42%) which was followed by serogroup O147 (10.17%), O92 (8.47%) and O78 (5.08%), respectively. In contrast to our study, the earlier workers have reported the occurrence of serogroups O86, O106, O131 (Usha Devi, 1998); O8 (Goswami *et al.*, 2002); O143, O5, O21 (Biswas, 2003); O120, O100 and O81 (Hui and Das, 2000) in higher frequencies among the broiler or layer poultry birds of different regions in West Bengal. A critical perusal of literature has revealed no report about the occurrence of serogroups of *E. coli* isolated from the backyard poultry birds of West Bengal to compare the result. All the 71 isolates were subjected to Congo red binding assay and 26 isolates (36.61%) were found Congo red positive and 45 isolates (63.38%) Congo red negative (Table 1). The Congo red positive isolates belonged to serogroups O84 (10), O147 (4), O92 (3), O109 (2), O68, O78 (2), O3, O138 (2) and O159. Contrarily, earlier works have revealed serogroups O8, O9, O10 and O69 in poultry as Congo red positive in Kashmir valley (Wani *et al.*, 2004). The ability to bind Congo red in agar medium has been demonstrated as a marker for avian pathogen *E. coli* (Corbett *et al.*, 1987). However, the difference in serogroups of Congo red positive isolates with earlier report is probably due to the geographical difference.

Table 1: Distribution of *E. coli* serogroups isolated from backyard poultry in three districts of West Bengal (India)

Name of the district	No of samples collected	Total No. of isolates	Serogroups available (No. of isolates)	Congo red positive serogroups (No. of isolates)
West Midnapore	40	31	O84 (15), O91 (3), O22 (2), O147 (6), O5 (1), O10 (1), Rough (1), UT(2)	O84 (10), O147 (4)
24 Parganas (south)	35	28	O92 (5), O32 (2), O3 (1), O11 (1), O2 (1), O109 (3), O78 (3), O5 (1), O20 (1), O68 (1), O36 (1), O118 (1), O53 (1), UT (4), Rough (2)	O92 (3), O109 (2), O68, O78 (2)
Jalpaiguri	10	12	O3, O25, O138 (3), O159, UT (3), Rough (3)	O3, O138 (2), O159
Total	85	71		

Antibiogram study of *E. coli* isolates from backyard poultry birds is supported by the previous works (Usha Devi, 1998; Goswami *et al.*, 2002; Sharda *et al.*, 2010). Resistance was observed most frequently to penicillin G (100%), bacitracin (100%) and less frequently to Levofloxacin (13.33%), enrofloxacin (53.33%), ciprofloxacin (46.67%) (Usha Devi, 1998). Further, she found penicillin G as most resistant drug for *E. coli* isolates of poultry birds. Hui and Das (2000) detected ampicillin as resistant and ciprofloxacin as one of the most sensitive antimicrobial against *E. coli* isolates from "Khaki Campbell" ducks in West Bengal. Goswami *et al.* (2002) and Sharda *et al.* (2010) found Ciprofloxacin as sensitive antimicrobial against *E. coli* isolates from the dead and ailing birds and raw poultry meat in West Bengal, respectively.

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