

# Isolation, AntibioGram and Pathogenicity of *E. Coli* Associated with Calf Diarrhoea

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**Abstract:** Total one hundred and twenty five fecal samples were collected from diarrhoeic calves under 3-6 month of age and 110 *E. coli* isolates were recovered. *E. coli* was found to be highly sensitive for Gentamicin and least sensitive against Cloxacillin. A total 110 isolates of *E. coli* were examined for congo red binding ability for studying the enteropathogenicity. Amongst 110 *E. coli* isolates tested, only 67 isolates (60.90 per cent) showed good congo red binding and were considered as enteropathogenic while, 43 isolates (39.09 per cent) were found to be negative i.e. non enterotoxigenic as no color was revealed by their colonies on congo red medium.

**Keywords:** *E. coli* *Escherichia coli*.

## 1. Introduction

Calf diarrhoea has been a major cause of calf mortality and is responsible for major economic losses in the livestock production. *E. coli* is the major bacteria associated with calf diarrhoea (Sojka, 1971; Barrandeguy *et al.*, 1989). Certain serotypes particularly O157:H7 of *E. coli* emerged as an important food born pathogens for which the cattle is proofed to be a single major reservoir and major source of human infections (Chapman *et al.*, 1993). The present study was carried out to find out the association of *E. coli* with the cases of calf diarrhoea and their characterization

## 2. Material and Methods

Total one hundred and twenty five fecal samples were collected from 3-6 month old diarrhoeic bovine calves and processed for the isolation of *E. coli* as per the method described by Cruickshank *et al.*, (1975). Mc Conkey's Lactose agar (MLA) with crystal violet and Eosin Methylene blue agar (Hi media) were used for isolation. The isolates were identified on the basis of cultural, morphological and biochemical characteristic as per described by Edwards and Ewing (1972). The isolates identified as *E. coli* on the basis of biochemical characters and sugar fermentation reactions were serotyped at National Salmonella and Escherichia center, Central Research Institute, Kasauli (Himanchal Pradesh). The antibiotic sensitivity of these isolates was tested against seven antibiotics viz. Gentamicin (30mcg), Tetracycline (30 mcg), Ampicillin (25 mcg), Chloramphenicol (30 mcg), Streptomycin (25 mcg), Cloxacillin (1 mcg) and Ciprofloxacin (5 mcg) using disc diffusion method described by Bauer *et al.*, (1966). Congo red binding test was done to study the pathogenicity of the *E. coli* isolates as per method described by Dubey *et al.*, (2000).

## 3. Result and Discussion

Overall 110 isolates of *E. coli* recovered that belonged to serogroup O157. O49, O15, O12 and O75 similar serogroups except O49 were isolated earlier by Wani *et al.*, (2004) from the cases of calf diarrhoea while O49 has been reported by Joon and Kaura (1993). The results of antibiotic sensitivity revealed that 105 (95.45 per cent) to isolates were sensitivity to Gentamicin followed by 87 (79.09 per cent), for Tetracycline, 67 (60.90 per cent) for Streptomycin, 30 (27.27 per cent) for Chloramphenicol, 22 (20 per cent) for Ampicillin and 9 (8.18 per cent) isolates were sensitivity to Ciprofloxacin. Least sensitivity was recorded for Cloxacillin were only 2 (1.81 per cent) isolates were found sensitive (Borah and Das, 1996; Madhu babu *et al.*, 1998). Higher sensitivity to Gentamicin was also recorded earlier. However. There are reports of high resistance of *E. coli* strains for Tetracycline (Borah and Das, 1996; Ahmed and Bhattacharya, 2005). These differences in their frequency of use of the antibiotics for treatment and / or as a growth promoter (Kumar, 2005).

The *E. coli* isolates were further tested to established the pathogenicity. Amongst 110 *E. coli* isolates tested, only 67 isolates (60.90 per cent) showed good congo red binding ability within 24 h. and were considered as enteropathogenic while, 43 isolates (39.09 per cent) were found to be negative i.e. non enterotoxigenic as no color was revealed by their colonies (Berkhoff and Vinal, 1986); Soni *et al.*, 1991; Singh and Gupta, 1996). Among 67 isolates of *E. coli* tested positive for congo red binding, fifteen isolates (22.39 per cent) showed intense red colonies at 24 hr post inoculation. While, maximum twenty-seven numbers of isolates (40.29 per cent) were seen to be positive at 36 h post inoculation, fourteen isolates (20.89 per cent) showed red color at 48 h post inoculation. Remaining eleven isolates (16.42 per cent) exhibited Congo red binding at 72 h post inoculation (Gjessing and Berkhoff, 1989; Kumar and Soman, 2001).

**Table 1:** Antibiogram pattern of E.coli (110 isolates)

Chemotherapeutic agent	Concentration per disc (mcg)	Sensitivity	Intermediate sensitivity	Resistant
Ampicillin	25	5 (4.55)	17 (15.45)	88 (80.00)
Chloramphenicol	30	20 (18.18)	10 (9.09)	80 (72.72)
Cloxacillin	1	1 (0.90)	1 (0.09)	108 (98.18)
Ciprofloxacin	5	2 (1.82)	7 (6.36)	101 (91.81)
Gentamicin	30	82 (74.55)	23 (20.90)	5 (4.55)
Streptomycin	25	08 (7.27)	59 (53.63)	43 (39.09)
Tetracycline	30	57 (51.81)	30 (27.27)	23 (20.90)

**Table 2:** Cong Red Binding

Sl. No.	Hours post inoculation	No. of isolates found to be positive	Percentage of positive isolates
1	24	15	22.39
2	36	27	40.29
3	48	14	20.89
4	72	11	16.42

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