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Antimicrobial Susceptibility of Bacterial Isolates from Sheep Colostrum in Tamil Nadu State (India)

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Abstract: Hence aim of present investigation was to assess the possible bacterial contaminants in sheep colostrum. Colostrum samples collected from hundred randomly selected ewes in six villages were analysed for their bacterial status and their antibiotic sensitivity pattern. A total of five different species of bacteria were isolated. Coagulase negative *Staphylococci pyogenes* (13.3%) was the most frequently isolated bacteria, followed by *Streptococcus faecalis* (3.3%), *Proteus vulgaris*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* (1.6% each). All the isolates were sensitive to chloromphenicol, gentamicin and enrofloxacin while being resistant to oxytetracycline.

Key words: Sheep colostrums, bacterial isolates, antimicrobial susceptibility, India

INTRODUCTION

Successful sheep farming chiefly depends on the health of lambs. Colostrum plays an important role in the neo- and post-natal health and survival of lambs through passive transfer of immunoglobulins. Colostrum received from the dam should be devoid of any microbial contamination. However, under most farming conditions in developing countries, bacteria gain access to the colostrum from internal and external sources (Fecteau *et al.*, 2002). Earlier studies on the microbial status of bovine and canine colostrum show that a wide range of bacteria could be isolated from them (Dakshinkar *et al.*, 2001; Fecteau *et al.*, 2002). Contaminated colostrum feeding has been related to neonatal calf morbidity and mortality. There are few reports on the microbial status of sheep colostrum in India. Hence the aim of this study was to assess the bacterial load of freshly collected sheep colostrum.

MATERIALS AND METHODS

Fresh colostrum samples were collected directly from teats of hundred randomly selected ewes in six villages located in different parts of Tamilnadu state, India. The samples were collected in sterile test tubes and transported immediately to the laboratory on ice. Primary inoculation was done in nutrient broth and incubated at 37°C for 24 h. Turbid cultures were then streaked on nutrient agar and Mac Conkey agar plates and incubated at 37°C for 24 h. Sub-culturing was done until pure colonies were isolated. The isolates were identified based on the staining, cultural and biochemical characteristics as per the standard methods (Cowan and Steel, 1974).

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Table 1: Antibiotic sensitivity pattern of bacteria isolated

Organisms isolated	No. of isolates	Highly sensitive	Sensitive	Resistant
<i>Staphylococcus pyogenes</i>	8	Chloramphenicol	Gentamicin Enrofloxacin Co-trimoxazole	Oxytetracycline
<i>Streptococcus faecalis</i>	2	-	Gentamicin Enrofloxacin Chloramphenicol	Oxytetracycline Co-trimoxazole
<i>Proteus vulgaris</i>	1	-	Chloramphenicol Gentamicin Enrofloxacin Co-trimoxazole	Oxytetracycline
<i>Pseudomonas aeruginosa</i>	1	Chloramphenicol Enrofloxacin	Gentamicin Co-trimoxazole	Oxytetracycline
<i>Klebsiella pneumoniae</i>	1	-	Chloramphenicol Gentamicin Enrofloxacin	Oxytetracycline Co-trimoxazole

Antibiotic sensitivity of the bacterial isolates was assessed by standardized single disc diffusion method (Bauer *et al.*, 1996). The antibiotic discs (Himedia, India) used were Co-Trimoxazole (25 mcg), Enrofloxacin (5 mcg), Gentamicin (30 mcg), Oxytetracycline (30 mcg) and Chloramphenicol (30 mcg). The diameter of the zone of inhibition around the discs were measured and interpreted as per the manufacturer's instructions.

RESULTS

Five different species of bacteria were isolated during the present study. Coagulase negative *Staphylococci pyogenes* (13.3%) was the most frequently isolated bacteria, followed by *Streptococcus faecalis* (3.3%), *Proteus vulgaris*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* (1.6% each). Antibiotics sensitivity test for isolates showed that all the bacterial isolates were sensitive to chloramphenicol, gentamicin and enrofloxacin while being resistant to oxytetracycline (Table 1). Co-trimoxazole was effective in three out of the five bacterial species isolated.

DISCUSSION

While there are many reports on the microbial status of colostrum and milk from cattle, similar studies in sheep are few. During lamb management it is important to assess the degree of bacterial contamination in the colostrum fed to them. Various factors including farm management practices, season of birth, sex of calves and source of contamination are likely to levels of bacterial contamination of colostrum (Fecteau *et al.*, 2002). Most common sources of contaminants in milk have been attributed to normal inhabitants of the skin, environmental contaminants, faecal contaminants and mammary pathogens (Fecteau *et al.*, 2002). There are several instances of transmission of pathogenic bacteria from dams to off-springs through colostrum and milk in many species of animals (Farquhar and Wodonga, 1994; Dakshinkar *et al.*, 2001). However the results of the present study indicated the absence of bacteria of pathological significance to the lambs in the selected flocks. This correlates well with the absence of any illness of infectious origin in the lambs from all the five flocks. Hence it is possible that the source of these organisms may be the commensals on skin and bacterial contaminants from adhering faecal matter over it (Buxton and Frazer, 1977; Fecteau *et al.*, 2002).

Antibiotic sensitivity testing of these isolates may not be significant as they are considered to be non-pathogenic commensals under most circumstances. However it provides an indication of the frequent use of some antibiotics such as oxytetracycline and co-trimoxazole for therapeutic purposes and development of antibiotic resistant strains of these organisms over the years.

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