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Isolation and Identification of Bacterial Pathogens from Respiratory Tract of Goats

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Abstract

A total of 170 samples were examined for bacterial pathogens after staining with Wright's stain. These included oral swabs, nasal swabs, blood samples, impression smears and tissues from different parts of respiratory tract showing pulmonary lesions. Out of these, only 36 samples (21.17%) collected from clinically ill animals or morbid tissues were showing respiratory tract infection suggestive of respiratory tract infection of bacterial origin which were further processed for microbiological examinations. Pasteurella *multocida* and *E.coli* were isolated from 7(19.44%) and 11 samples (30.55%) out of 36 samples respectively in pure culture. The remaining samples did not reveal any bacterial growth.

Key Words: Isolation, *E.coli*, *Pasteurella Multocida*.

Introduction

Goats are important part of rural economy, particularly in the arid, semi-arid and mountainous regions of the country. As compared to large ruminants sheep and goats often show a greater resistance towards pathogens. However, respiratory difficulties in goats often get complicated by organisms like *Pasteurella* leading to death (Brogden *et al*., 1998). Pasteurellosis is one of the most common diseases of cattle, sheep and goats throughout the world. Outbreaks usually lead to high mortality and great economic loss to the ruminant industry.

Pasteurella multocida and *Mannheimia haemolytica* are commonly found in the upper respiratory tract of healthy goats. They are small, non-motile, Gram-negative coccobacilli of the family pasteurellaceae. Pneumonia caused by *P. multocida* and *M. haemolytica*can lead to significantly decreased growth performance. These two pathogens cause outbreaks of acute pneumonia in goats of all ages (Falade, 2002). The present study was carried out to isolate pathogens from respiratory tract of goats.

Materials and Methods

Oral swabs, nasal swabs and blood samples were collected aseptically from clinically ill animals and immediately placed in sterile test tube containing Brain heart infusion (BHI) broth. Tissues of respiratory tracts were also aseptically collected from goats immediately after slaughter in 0.9% sterile normal saline for microbial isolation. Brain heart infusion broth containing oro-nasal swabs

and tissues from respiratory tracts were incubated for 24 hours at 37°C. A total of 170 samples were processed out of which 36 suspected for bacterial infection are processed for bacterial isolation.

Blood agar (BA) and MacConkey's agar (MCA) were used as primary culture media for preliminary isolation of organisms from the samples as per the methods described by Quinn *et al.* (1994) followed by biochemical test as described by Barrow and Feltham (1993). The growth on MacConkey's agar was further inoculated on EMB agar and incubated at 37°C for 24-48 hours. Well isolated single bacterial colonies on EMB agar were stained by Gram's staining method and subsequently subcultured on neutrient agar slant.

Results and Discussion

Out of total 170 samples, only 36 samples (21.17%) collected from clinically ill animals or morbid tissues showed respiratory tract infection of bacterial origin. *Pasteurella multocida* and *E. coli* were isolated from 7 (19.44%) and 11 samples (30.55%) out of 36 samples, respectively in pure culture. The remaining samples did not reveal any bacterial growth.

On blood agar, the colonies of *Pasteurella multocida* were small, pin point, grey, translucent, dew drop like and non- haemolytic. *Pasteurella multocida* did not grew on MacConkey's agar. On Gram's staining *Pasteurella multocida* was seen as Gram- negative, short or coccobacillary rods. On the basis of colonial characteristics and morphology the bacterial growth suspected to be *Pasteurella multocida*, which was further confirmed on the basis of biochemical tests like oxidase, catalase, indole production, citrate utilization and nitrate reduction. Similar findings were reported by Chawak *et al*. (2000), Ugochukwu (2008).

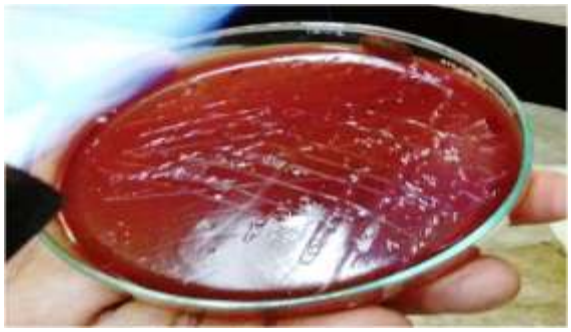

Plate 1: Colonies of **Pasteurella multocida** on blood agar

Plate 2: Colonies of **E.coli** on EMB agar

Eleven samples produced lactose fermenting colonies on MacConkey agar. When single isolated colonies were subcultured on EMB agar, these samples produced purple colonies with black center and greenish metallic sheen suggestive of *E.coli.*

A distinct well defined colony, suggestive of *E.coli* growth, was stained by Gram's method, and if the slide showed Gram negative rods, subsequently were inoculated on sterile nutrient agar slant and then confirmed on the basis of biochemical tests

All the isolates of *E.coli* in the present study also produced similar colonies thus confirmed the previous observations (Zinnah *et al*., 2007, Rashid *et al*., 2013).

The biochemical behaviour of*E.coli* isolates revealed that they all were positive for catalase, methyl red, indole production, nitrate reduction and negative for oxidase, Voges-proskauer and H_2S production. Isolates were weakly positive for urease. Such atypical strains of *E.coli* had also been reported by Dubey and Sharda (2001) and Arya *et al*. (2008).

Conflict of Interest: All authors declare no conflict of interest.

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