# Isolation and Identification of Bacteria and Antimicrobial Susceptibility from Bovine Mastitis in Kurnool, A.P

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***Abstract-*** *Mastitis in dairy cattle is the persistent, inflammatory reaction of the udder tissue. Mastitis, a potentially fatal mammary gland infection, is the most common disease. Bovine mastitis is one of the devastating diseases inflicting immense loss to the farm industry worldwide. The present paper investigated the present standing of clinical and subclinical mastitis among farm kine in Kurnool, A.P. The prevalence of mastitis was carried by surf field mastitis test (SFMT), measure of hydrogen ion concentration and conjointly primarily based on the results of bacteriological analysis of milk samples. A total of 185 isolates were recovered from 120 milk samples. The major pathogens isolated from the milk samples were E.coli, S.aureus, Coagulase negative staphylococci (CNS), Bacillus subtillis, Streptococcus species, Serratia marcesens and other Bacillus species. Antibiogram studies were also conducted for the isolates by using fourteen antibiotics like cloxacillin, ampicillin, penicillin-G, carbencillin, kanamycin, rifampicin, tetracycline, trimethoprim, polymyxin-B, chloram-phenicol, cephalothin, streptomycin, gentamicin and amikacin which were used frequently in this area for the treatment of mastitis. Tetracycline was found to be more effective antibiotic among all the tested antibiotics.*

***Keywords***- Bovine mastitis, Prevalence, Antibiogram, Inflammation and Subclinical

## I. INTRODUCTION

The physical, chemical and bacteriological changes in milk and glandular tissue cause Mastitis which is nothing but an inflammation of the mammary gland of the cattle's accompanied. Bovine mastitis, inflammation of the udder of a cow resulting from injury or more commonly from bacterial infection, is one of the devastating diseases causing huge loss to the dairy industry worldwide. The costs associated with mastitis are innumerous and include antibiotic treatment, reduced milk yield, reduced milk quality, the public health is affected and increased culling rate as a result of infections caused by consumption of mastitis afflicted milk, bacteria have long been recognized as an vital causal agent in bovine inflammation and can also transmit to humans through horizontal infection. Milk drawn from an infected cow will transmit pathogenic microorganism [7] to humans through food chain which is dangerous to the public health. Earlier it had been discovered that tin can transmit tuberculosis, brucellosis, diphtheria, scarlet fever to humans. However, these diseases can be controlled by a sterilization technique, but a selection of microorganism still contribute to illness and diseases occurrence. The milk from an infected animal is the main supply of pathogenic microorganism [7] and some microorganism toxins made within the milk can't be destroyed by heating or drying (National mastitis council, 1996). Therefore, the present research was undertaken to evaluate the microbiological and medicine side of the treatment of bovine mastitis

## II. MATERIALS & METHODS

### A. Sources of milk

The lactating cows of the farm farms of the Kurnool, A.P. Region has been examined from dairy herds in completely different little and huge scale farms. A total of 150 animals were considered in the study that embrace dairy cattle Holstein, Jersey and indigenous cows. Milk samples were collected aseptically for bacteriological studies as steered by Honkanen-Buzalski [3]. Prior to sampling, the first streams of milk were discarded, and teat ends were disinfected with cotton swabs soaked in 70% alcohol and allowed to dry.

### B. Milk Timings

Milking was done at 4pm from the above cows from various privately organized dairy farms. The milk samples were collected in sterile polypropylene containers for further analysis.

**C. Categorization of mastitis**

Mastitis was categorized into two types i.e sub clinical & clinical. In sub clinical where no symptoms are visible and clinical mastitis in which symptoms like redness, swelling, hardness and rise in temperature**.**

**D. Analysis of milk samples**

To detect the bovine mastitis by surf field mastitis test [6] totally 150 milk samples were screened. For screening of bovine mastitis the formation of gel was used. In this study pH was used as one of the important parameter as the indicator of mastitis where the normal milk pH is 6.6 – 6.7 where as milk with higher pH indicates the positive test for mastitis [10]. In this paper bacteriological examination was carried out for the detection of mastitis in which from each sample, 0.01 ml of milk was cultured on nutrient agar and incubated for 48 hours at 38°C. The plates were examined for growth, colony morphology and haemolytic characteristics on blood agar medium.

**E. Analysis of milk samples**

Antibiotic susceptibility screening was done as per the tips of National Committee for Clinical Laboratory Standards (NCCLS). Kirby- Bauer's disc diffusion technique was adapted for antibiogram. The plates were prepared as per the manufacturer's directions and checked for sterility by incubating the plates overnight at 37°C. The antibiotics discs were kept at area temperature for 1 hour before use.

## III. RESULTS

**A. Milk analysis**

The results of the present paper shows that existence of clinical and sub-clinical inflammation as 8 and 72% severally and 20% as healthy animals. A total of 150 milk samples were screened for mastitis by pH test and surf field mastitis test (SFMT) , out of which 120 milk samples showed positive for mastitis.

Table I. Prevalence of clinical and subclinical mastitis

| Cases | Infection Percentage | Number of isolates |
|---|---|---|
| Healthy | 20 | - |
| Clinical | 8 | 56 |
| Sub clinical | 72 | 129 |

**B. Bacteriological analysis**

The bacteriological analysis of the study showed that 185 microorganism were recovered from 120 milk samples. The predominant species were Staphylococcus aureus 28.10% followed by E.coli 21.08%, coagulate negative staphylococci 18.91%, Streptococcal species 15.13%, Bacillus species 7.56%, Serratia marcesens 5.94% and eubacteria subtillis 3.24%.

Table II Bacteriological analysis

| S. No | Bacterial species | No of isolates | | Total Percentage |
|---|---|---|---|---|
| | | Subclinical | Clinical | |
| 1 | Staphylococcus aureus | 42 | 10 | 28.1 |
| 2 | E.coli | 16 | 23 | 21.08 |
| 3 | Coagulase negative staphylococcus | 27 | 8 | 18.91 |
| 4 | Streptococcal species | 21 | 7 | 15.13 |
| 5 | serratia marcesens | 9 | 2 | 5.94 |
| 6 | Bacillus subtillis | 6 | 0 | 3.24 |
| 7 | Other bacillus species | 8 | 6 | 7.56 |

**C. Antibacterial check**

The antibacterial check for different isolates are given in the below Table III

Table III Antibacterial check for different isolates

| Bacterial isolates | Antibiotics used | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | K | CX | R | A | P | CB | C | CH | T | TR | PB | s | G | Ak |
| S.aureus | 52 | 48.07 | 21.15 | 53.84 | 15.38 | 1.92 | 48.07 | 73.07 | 63.46 | 76.92 | 63.46 | 7.69 | 67.30 | 42.3 | 40.38 |
| E.coli coagulase | 39 | 74.35 | 71.79 | 48.71 | 51.28 | 38.46 | 46.15 | 66.66 | 76.92 | 76.92 | 71.79 | 46.15 | 74.35 | 69.23 | 66.66 |
| Negative staphylococcus | 35 | 80 | 34.28 | 25.71 | 51.42 | 5.71 | 17.14 | 65.71 | 34.28 | 74.28 | 25.71 | 14.28 | 51.42 | 48.57 | 17.14 |
| Streptococcal species | 28 | 89.28 | 42.85 | 39.28 | 71.42 | 25 | 25 | 100 | 39.28 | 100 | 35.71 | 14.28 | 42.85 | 57.14 | 17.85 |
| Serratia marcesens | 11 | 72.72 | 45.45 | 72.72 | 81.81 | 27.27 | 27.27 | 54.54 | 36.36 | 72.72 | 36.36 | 27.27 | 54.54 | 45.45 | 45.45 |
| Bacillus subtillis | 6 | 83.33 | 50 | 33.33 | 83.33 | 66.66 | 0 | 66.66 | 33.33 | 83.33 | 16.66 | 16.66 | 66.66 | 50 | 50 |
| Other bacillus species | 14 | 85.71 | 35.71 | 64.28 | 71.42 | 14.28 | 14.28 | 42.85 | 21.42 | 64.28 | 21.42 | 14.28 | 42.85 | 35.71 | 35.71 |
| **Mean (%)** | | **76.2** | **75.30** | **48.26** | **60.86** | **25.61** | **25.41** | **67.07** | **43.57** | **78.35** | **38.73** | **20.08** | **57.13** | **49.77** | **39.02** |

## IV. CONCLUSION

The development of antibiotic resistance among bacteria that affects animal health is of growing concern in veterinary medicine. Antibiotic resistant bacteria in animals have also become a potential health risk for humans, as they are able to cause direct or indirect transmission of the infection. Therefore, establishing an antibiogram of pathogens is very important from the clinical and economic points of view. Therefore, the findings of the present study showed that tetracycline is the most effective antibiotic which can be used for control of bovine mastitis of holstein friesian, jersey and indigenous cows in the area of research. The chemotherapy of bovine mastitis is only one important aspect in the control of mastitis. It is well planed mastitis control program which includes an accurate diagnosis segregation of infected cows; preventive bacteriological testing and correct milking practice may be made to reduce the development of resistance in the bacteria. Further, the infection should be treated as early as possible by massive dosage, therapy should not be prolonged beyond the necessary, mixed infection can be treated by broad spectrum A antibiotics like tetracycline to cure mastitis.

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