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Antibiotic sensitivity profiling of mastitis affected sheep and goat in organized farms of Tamil Nadu

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Abstract

The 150 numbers of milk samples were collected from 3-4 years old recently kidded female sheep and goats of an organized sheep and goat farms of Tamil Nadu for the period from 2021-2022. The suspected animals were clinically examined showed of sudden swelling of both quarter of udder and unable to feed kids and some of them are hyperthermia and anorectic. The clinical examination revealed that the mammary gland is hard, swollen, and reddish in color some of the affected goats doesn't have any clinical symptoms. It may also be hot and sensitive to touch. Milk secretions are watery and yellowish in color. The body temperature remain elevated and the animal was very dull and depressed some of them showed diarrhoea and metritis. The milk samples were collected from suspected goats and culture isolation and identification were performed. The antibiotic sensitivity patterns were analysed. The *E. coli*, *Staphylococcus*, *Pseudomonas*, *Klebsiella*, *Aspergillus* were isolated and the antibiotic sensitivity patterns shows sensitivity towards ciprofloxacin, gentamicin, enrofloxacin and resistance towards erythromycin, ampicillin, amoxycillin

Keywords: goat mastitis- *staphylococcus*, *E. coli*, *Pseudomonas*, CMT, ABST

Introduction

Mastitis is an inflammation of mammary gland or udder. Mastitis is common in dairy breeds and meat breeds of goat raised in intensive and semi intensive system of rearing. Mastitis also associated with viral, bacterial, mycoplasma and fungi and their toxins. The stressful condition like high temperature, environmental changes, sudden changes of diet, malnutrition and unhygienic maintenance, pregnancy are predisposing factor for mastitis (Merck *et al.*, 2008) [7]. The *Staphylococcus aureus*, *Streptococcus agalactiae*, *Streptococcus dysgalactiae*, *Escherichia coli*, *Pseudomonas* are the common bacteria causing mastitis in goat. (Sela *et al.*, 2007) [12]. The caprine arthritis encephalitis virus causing mastitis in goat and some of the yeast infection also causes mastitis due to the frequent use of penicillin, along with the prolonged and repetitive use of systemic and intra-mammary infusions (Berri *et al.*, 2007) [1].

Materials and Methods

The milk samples were collected from suspected animals in organised farms of Tamil Nadu in sterile container (fig 1). The BHI, Mac Conkey, SDA, Hichrome agar, EMP agar were used for isolation of different types of bacteria and both cultural isolation and identification, catalase oxidase test, biochemical test and antibiotic sensitivity test were performed by using the isolated organism. The direct microscopic examination of mastitis milk shows yeast bodies in methylene blue staining. The isolated bacteria were biochemically characterized and confirmed by gram's staining and PCR. The antibiotic sensitivity patterns were performed with 15 different types of antibiotics by disc diffusion method by using Muller Hinton Agar.

Results and Discussion

The microorganism was identified based on colony morphology and biochemical character. Some of the milk samples showed metallic shine colony and gram staining showed gram negative rods, rods, *E. coli* (N=67) and some sample showed *Staphylococcus* (N=24), few of

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the showed Streptococcus (N=12), Pseudomonas (N=8), Klebsiella (N=18), Candida species (N=22) and Aspergillus (N=4). (table 1 and fig 2,3,4)

The affected animal milk sample showed resistance against erythromycin, ampicillin, amoxycillin and sensitive towards ciprofloxacin, ceftriazone chloramphenicol and cefataxime, gentamicin, enrofloxacin and gatifloxacin in ABST in case of staphylococcus. The streptococcus showed sensitivity towards ciprofloxacin, gentamicin, enrofloxacin and chloramphenicol, resistance towards cefataxime, oxytetracycline, sulphadiazine, ceftriazone. The isolated Pseudomonas showed sensitivity towards sulphadiazine, ceftriazone, ciprofloxacin, gentamicin, enrofloxacin and Klebsiella showed sensitivity towards chloramphenicol, gentamicin, erythromycin, gatifloxacin, endrofloxacin and resistance towards sulphadiazine, cefotaxime, ceftriazone (table. 2 & fig 5)

The clinically affected animals were treated with antibiotic and anti inflammatory. The treatment for mastitis based on the results of the microbiologic culture obtained from milk samples. Dry off the affected gland and application of intramammary infusion of 2 percent chlorhexidine solution into affected udder twice at 24-hour intervals. Drugs should be administered for a period of 5 to 10 days to allow efficacy of the product. The use of antibiotics or corticosteroids are recommended in some cases. Antibiotics always selected based on ABST results. Treatment during the dry-off period is an efficient method for the cure of subclinical mastitis and for control of somatic cell counting (Schweiz *et al.*,2007) ^[11].

Mastitis is an inflammation of the mammary gland causes a chemical and physical reaction in milk produced by sheep and goats. Mastitis more common in dairy and meat goats raised under intensive and semi-intensive system of rearing and causes economic loss to the sheep and goat farmers. The mastitis in sheep and goat was generally associated with poor management practices and injuries of mammary tissue or teats due to traumas, nursing, fly bites or other wounds to the mammary gland that provide an important barrier to infection. Some of the stressful conditions such as extreme temperatures, muddy and wet living conditions or a sudden change in diet, poor nutrition and pregnancy stress leads to immune deficiency and has a difficult time fighting off the invasion of foreign bodies that cause diseases like mastitis. Another important predisposing factor is the abnormal anatomy of the udder and teat. Mostly the infection occurs when infectious agents reach the mammary gland and the infectious agent enters through the milk canal and interacts with the mammary tissue cells and multiplies and produce infection and some of the microbial microorganisms release toxins leads to systemic infection. The mammary tissue reacts to these toxins leads to inflammation of udder (Moroni *et al.*, 2004&2005) ^[9, 8]. The Coagulase-negative staphylococci species like *Staphylococcus aureus*, *Streptococcus agalactiae*, *S. uberis*, *S. dysgalactiae*, and *S. caprae* *Mycoplasma capricolum*, Enterobacteria such as *Escherichia coli* coliforms, *Pseudomonas aeruginosa*, and *Clostridium spp.* are the most common causes of mastitis in sheep and goat (Kyozaire *et al.*,2005) ^[6] The virus like caprine arthritis-encephalitis virus (CAEV) causes mastitis in goats (Hötzel *et al.*,2001) ^[4]. The mastitis can also caused by yeast and mould infection mainly associated with the frequent use of penicillin along with the prolonged and repetitive use of systemic and intra-mammary infusions which predispose the fungal mastitis. The acute systemic form of mastitis shows elevated

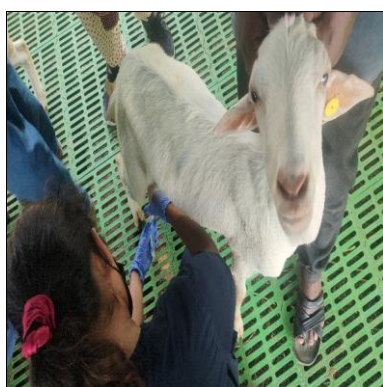
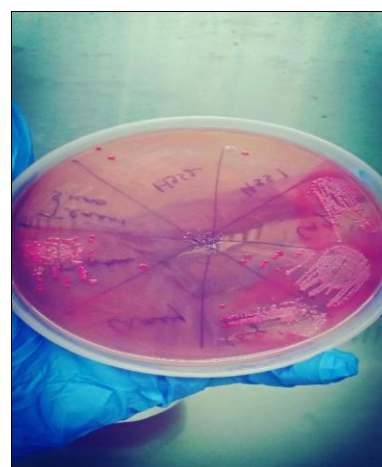
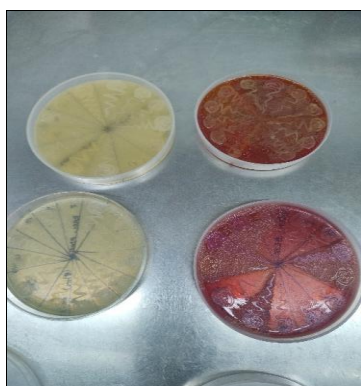
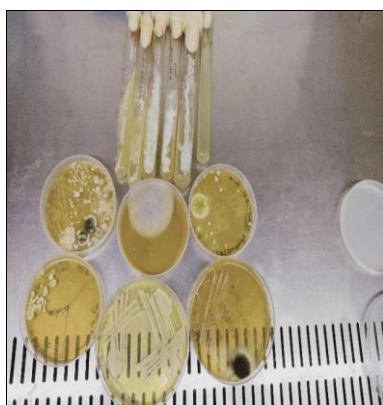
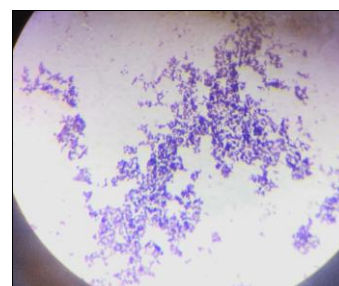
body temperature above 105° F and an accelerated pulse and the affected animals were depressed and lose its appetite. The clinical examination of mammary gland shows hard, swollen, reddish in color and hot and sensitive to touch. Milk secretions are watery and yellowish in color and milk had flake and clot. In most severe form of mastitis causes death in some animals. The chronic form of mastitis occurs as a persistent and incurable infection. The udder have hard lumps as a result of bacteria forming colonies and reactions occurring in the mammary tissues. In chronically affected animals shows agalactia and sometimes reduced milk production. The subclinical mastitis causes the most concern among producers and veterinarians because there are no visible signs of the disease. There is no swelling of the udder or detectable abnormalities in the milk to indicate the presence of mastitis. but sub-clinical form can eventually develop into the chronic clinical form of mastitis. The diagnosis based on signs and history of the herd, microbiologic milk culture, a somatic cell count (SCC) or an Enzyme-Linked Immuno Sorbent Assay (ELISA). However, the microbiological culture is the most reliable source of diagnosis of mastitis in sheep and goats. The *Mycoplasma bovis* and *Mycoplasma agalactiae* induced mastitis may molecularly confirmed by PCR (Chávez González, *et al.*, 1995) ^[3]. The SCC and the California Mastitis Test (CMT) are the most common tests used to diagnose mastitis in dairy goats. Some of the antibiotics like benzylpenicillin, cloxacillin, amoxicillin plus clavulanic acid, cephalonium and cefoperazone, erythromycin, tylmicosin, kanamycin, penicillin, ampicillin, erythromycin, or tetracycline have been recommended to treat mastitis but the cure rates may vary from animal to animal and according to the severity of the case (Karzis *et al.*,2007) ^[5]. After treating goats with antibiotics, it is necessary to withdraw drug treatment to prevent antibiotics from building up in the milk and meat that can be hazardous to humans. (Brouillette, *et al.*,2004) ^[2]. The glucocorticoids can be administered early in the course of disease and administration of dexamethasone in the mammary gland has been reported to reduce swelling of udder. In addition, intramammary infusion with mastilip ointments used to treat mastitis among dairy cows is effective among sheep and goats as well. However, observe tissue irritation after administration intramammary antibiotics (Poutrel *et al.*,1997) ^[10]. In this study most of the small ruminant mastitis caused by *E. coli* and Staphylococcus, Klesiella and Candida and antibiotic sensitive pattern showed sensitivity towards gentamicin, erythromycin, gatifloxacin, endrofloxacin and resisatnce towards oxytetracycline, cefotaxime, cefrizone, sulphadiazine but however indepth detailed study were needed for antibiotic pattern analysis

Table 1: bacteria isolated from milk sample of suspected small ruminants

S. No.	Organism isolated	Sheep	Goat
1	Staphylococcus	4	20
2	<i>E. coli</i>	7	60
3	Streptococcus	3	9
4	Pseudomonas	-	8
5	Klebisella	3	15
6	Candida	3	19
7	Aspergillus	-	4
8	Total	20	135

Table 2: Antibiotic sensitivity patterns for different bacterial isolates

S. No.	Organism isolated	Sensitive	Resistance
1	Staphylococcus	ciprofloxacin, ceftriazone chloramphenicol and cefataxime, gentamicin, enrofloxacin and gatrifloxacin The isolated Pseudomonas showed sensitivity towards sulphadiazine, ceftriazone, ciprofloxacin, gentamici, enrofloxacin	Erythromycin, ampicillin, amoxycillin
2	<i>E. coli</i>	Ciprofloxacin, gentamicin, cefataxime	Oxytetracycline sulphadiazine, ceftriazone, ampicillin, amoxyclav, chloramphenicol,
3	Streptococcus	Ciprofloxacin, gentamicin enrofloxacin and chloramphenicol,	cefataxime, oxytetracycline, sulphadiazine, ceftriazone, ampicillin, amoxyclav
4	Pseudomonas	Sulphadiazine, ceftriazone, ciprofloxacin, gentamicin, enrofloxacin	cefataxime, oxytetracycline, sulphadiazine, ceftriazone, chloramphenicol, ampicillin, amoxyclav
5	Klebisella	Chloramphenicol, gentamicin, erythromycin, gatrifloxacin, endrofloxacin	Sulphadiazine, cefotaxime, ceftriazone, ampicillin, amoxyclav
6	Candida	Ciprofloxacin, gentamicin chloramphenicol, gatrifloxacin	cefataxime, oxytetracycline, sulphadiazine, ceftriazone, ampicillin, amoxyclav
7	Aspergillus	Gatrifloxacin, sulphadiazine catrimazole	cefataxime, oxytetracycline, sulphadiazine, ceftriazone, ampicillin, amoxyclav

**Fig 1:** collection of milk samples from mastitis suspected cases**Fig 4:** Isolation of *E. coli* organism from suspected goat milk**Fig 2:** Isolation of different type of bacteria from suspected milk samples**Fig 5:** Antibiotic sensitivity test with isolated organism**Fig 3:** Isolation of fungus from mastitis affected milk**Fig 6:** The direct microscopic examination of affected animal milk shows yeast bodies by staining

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Disclaimer (Artificial intelligence)

Hereby I declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

Conflict of Interest

Not available

Financial Support

Not available

References

- Berri M, Rousset E, Champion JL, Russo P, Rodolakis A. Goats may experience reproductive failures and shed *Coxiella burnetii* at two successive parturitions after a Q fever infection. *Res Vet Sci*. 2007;83(1):47-52.
- Brouillette E, Grondin G, Lefebvre C, Talbot BG, Malouin F. Mouse mastitis model of infection for antimicrobial compound efficacy studies against intracellular and extracellular forms of *Staphylococcus aureus*. *Vet Microbiol*. 2004;101(4):253-262.
- Chávez González YR, Ros Bascuñana C, Bölske G, Mattsson JG, Fernández Molina C, Johansson KE. *In vitro* amplification of the 16S rRNA genes *Mycoplasma bovis* and *Mycoplasma agalactiae* by PCR. *Vet Microbiol*. 1995;47(1-2):183-190.
- Hötzel I, Cheevers WP. Host range of small-ruminant lentivirus cytopathic variants determined with a selectable caprine arthritis-encephalitis virus pseudotype system. *J Virol*. 2001;75(16):7384-7391.
- Karzis J, Donkin EF, Petzer IM. The influence of intramammary antibiotic treatment, presence of bacteria, stage of lactation and parity in dairy goats as measured by the California Milk Cell Test and somatic cell counts. *Onderstepoort J Vet Res*. 2007;74(2):161-167.
- Kyozaire JK, Veary CM, Petzer IM, Donkin EF. Microbiological quality of goat's milk obtained under different production systems. *J S Afr Vet Assoc*. 2005;76(2):69-73.
- Merck & Company. The Merck veterinary manual. New Jersey (US): Merck & Company, Incorporated; 2008.
- Moroni P, Pisoni G, Antonini M, Ruffo G, Carli S, Varisco G, *et al.* Subclinical mastitis and antimicrobial susceptibility of *Staphylococcus caprae* and *Staphylococcus epidermidis* isolated from two Italian goat herds. *J Dairy Sci*. 2005;88:1694-1704.
- Moroni P, Vellere F, Antonini M, Pisoni G, Ruffo G, Carli S. Antibiotic susceptibility of coagulase-negative staphylococci isolated from goats' milk. *Int J Antimicrob Agents*. 2004;23(6):637-640.
- Poutrel B, de Crémoux R, Ducelliez M, Verneau D. Control of intramammary infections in goats: Impact on somatic cell counts. *J Anim Sci*. 1997;75(2):566-570.
- Schweiz A, Schweiz T. Prevalence of subclinical udder infections and individual somatic cell counts in three dairy goat herds during a full lactation. *Schweiz Arch Tierheilkd*. 2006;148(12):641-648.

- Sela S, Hammer-Muntz O, Krifucks O, Pinto R, Weisblit L, Leitner G. Phenotypic and genotypic characterization of *Pseudomonas aeruginosa* strains isolated from mastitis outbreaks in dairy herds. *J Dairy Res*. 2007;74(4):425-459.6

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