

MICROBIAL STATUS OF APPARENTLY NORMAL CAPRINE MILK IN SINAI DESERT

By

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ABSTRACT

Fifty samples of caprine milk were randomly collected from Sinai Desert and subjected to both bacterial and fungal examinations. The obtained results revealed that 36/50 were positive in ratio 72%, the high mean value of different counts (Aerobic, coliforms, staphylococci and Mould and yeast counts, with mean values $1.9 \times 10^5 \pm 8.9 \times 10^4$, $7.6 \times 10^3 \pm 7.0 \times 10^3$, $2.9 \times 10^2 \pm 1.4 \times 10^2$ and $2.9 \times 10^2 \pm 0.83 \times 10^2$ respectively. Incidence of typical E.coli, Staphylococcus aureus, coagulase negative staphylococci, A. flavus, Alternaria spp, Cladosporium spp. and Penicillium spp. were 27.27%, 54.55%, 18.18%, 6.67%, 20.0%, 26.67% and 13.33% respectively. The bacterial isolates were resistant to oxytetracycline and Neomycin, highly sensitive to Gentamicin and Amoxicillin. The public health importance of the isolated bacteria and fungi were discussed.

INTRODUCTION

Goat milk in Sinai desert, is drunk raw, as milk considered an excellent food for human of all ages in Sinai Area. Apparently normal udder may at times, be a vehicle for transmission of many zoonotic pathogens. Therefore, the present study throw more light on the prevalence rate bacteria and fungi isolated from Caprine milk in this area, as well as it is public health importance.

MATERIAL AND METHODS

A total of 50 samples of apparently normal Caprine milk were randomly collected from Sinai Desert. Collected samples were enclosed in sterile stoppered bottles and transferred to the laboratory without delay for bacteriological and fungal examinations as follows:

- 1- Aerobic plate count (APC).
The surface spread plate method recommended by (A.P.H.A, 1985).
- 2- Coliforms count (Most probable Number "MPN/ml) according to (A.P.H.A, 1985).
- 3- Staphylococcus count according to I.C.M.S.F, (1986).
- 4- Mould and Yeast counts according to Bailey and Scott, (1978).
- 5- Isolation and identification of *S. aureus*. The technique outlined by Buchanan and Gibbons, (1975) was followed.
- 6- Isolation and identification of *E. coli* was done according to Finegold and Martin, (1982) and Kaneman *et al.*, (1992) was used.
- 7- Isolation and identification of coagulase negative staphylococci "CNS" was done according to MacFaddin, (1980) and Sneath *et al.*, (1986).
- 8- Isolation and identification of Moulds according to Al-Doory, (1980); Finegold and Martin, (1982) and Ramirez, (1982).
- 9- Antibiotic and antimicrobial sensitivity patterns of bacterial isolates according to komeman, (1992).

RESULTS

Table (1): Incidence results of microorganisms isolated from examined goat milk samples.

| | Total no. | Positive samples | |
|-------------------|-----------|------------------|----|
| | | No | % |
| Goat milk samples | 50 | 36 | 72 |

Table (2): Statistical analytical results microbial count in examined milk samples.

| Statistical analysis | APC | Coliform | Staphylococci | Moulds and yeasts |
|----------------------|---------------------------------------|---------------------------------------|---------------------------------------|--|
| Min. | 10^2 | 4×10 | 5×10 | 5×10 |
| Max. | 4×10^6 | 5×10^4 | 2.1×10^3 | 9.0×10^2 |
| Mean \pm SEM | $1.9 \times 10^5 \pm 8.9 \times 10^4$ | $7.6 \times 10^3 \pm 7.0 \times 10^3$ | $2.9 \times 10^2 \pm 1.4 \times 10^2$ | $2.9 \times 10^2 \pm 0.83 \times 10^2$ |

Table (3): Incidence of pathogenic organisms (Bacteria and moulds in examined 50 Caprine milk samples.

| Isolates | No of positive samples | % of positive samples |
|----------------------------|------------------------|-----------------------|
| <u>I-Bacteria :</u> | | |
| E.coli | 6 | 27.27 |
| S.aureus | 12 | 54.55 |
| Coagulase -ve Staph | 4 | 18.18 |
| Total | 22 | 100.00 |
| <u>II-Moulds :</u> | | |
| A. flavus | 2 | 6.67 |
| A. niger | 8 | 26.67 |
| A. fumigatus | 2 | 6.67 |
| Alternaria spp. | 6 | 20.0 |
| Cladosporium spp | 8 | 26.67 |
| Penicillium spp | 4 | 13.33 |
| Total | 30 | 100.00 |

Table (4): Antimicrobial sensitivity test of bacterial isolates.

| Bacterial isolation | No of strains tested | CN 10 µg | AML 25 µg | P 10 µg | O.T 30 µg | N 30 µg |
|----------------------------------|----------------------|----------|-----------|---------|-----------|---------|
| E. coli | 6 | 85.7% | 52.3% | 0 | 0 | 0 |
| S. aureus | 12 | 82.1% | 88% | 83.5% | 0 | 0 |
| Coagulase negative Staphylococci | 4 | 83.4% | 93% | 53.6% | 0 | 0 |

CN = Gentamicin, AML = Amoxicillin

P = Penicillin, OT = Oxytetracycline N = Neomycin sulphate

DISCUSSION

Table (1) indicates that Caprine milk were positive for microbiological examination with an incidence of 72%. Nearly similar results were reported by Nesbakken, (1978).

Aerobic plate count is still widely used for legislative purpose and is the most reliable indicator of conditions of examined milk. More than 200/ml are used as a criterion. For a positive diagnostic of contamination. Results in Table (2) agree with that found by Vashin *et al.*, (1999), while Shin *et al.*, (1998) results were lower, the higher data reported by Sabreen and Abdel-Haleem, (2000).

Coliforms are considered as normal flora of the intestinal tract of human and animals. They have been used as indicator organisms for bacteriological quality of milk (I.C.M.S.F. 1986). The present results agree with that obtained by Vashin *et al.*, (1999). In spite of that there was no incidence of Coliforms bacteria as reported by (Shin *et al.*, 1998).

On the other hand, the higher prevalence rate of Staphylococci isolated from examined samples was a reflection of natural skin flora, also a characteristic of chronic staphylococcal mastitis which the organism shedding from udder with subclinical mastitis (Rainard *et al.*, 1990). Our data in table (2) go hand to hand with that reported by Vashin *et al.*, (1999) and Sabreen and Abdel-Haleem, (2000).

It is evident from the obtained results that moulds and yeasts, count agree with that reported by Vashin *et al.*, (1999), while higher results obtained by Sabreen and Abdel-Haleem, (2000). Generally, moulds cause lipolytic and proteolytic action thus cause milk spoilage. (Hassan *et al.*, 1994).

Enteropathogenic E.coli has been incriminated as a potential food poisoning and is associated with infantile diarrhoea and gastroenteritis. Results clearly showed that 12% of E. coli was detected (Table 3). Higher incidence was previously reported by Sudarsana Rao *et al.*, (1996).

Presence of S.aureus in milk is usually taken as an index for contamination either from animal especially in cases of subclinical mastitis or human sources, also due to post-secretory contamination. (Maisi and Riipinen, 1991 and Hahn *et al.*, 1992). The higher results than our data in Table (3) reported by Hahn *et al.*, (1992), and Sudarsana Rao *et al.*, (1996), while the lower incidence obtained by Little *et al.*, (1999).

Coagulase negative staphylococci was detected in 18.18% while Ryan and Greenwood, (1990) isolated CNS from 13.3% of milk samples. As shown in Table (3) A. flavus, A. niger, Alternaria spp., and Pencillium spp. were isolated with an incidence 6.67%, 26.67%, 20% and 13.33% respectively. Mean while, Upadhaya *et al.*, (1992) isolated pencillium spp. (2%), A. niger (1%), also Vashin *et al.*, (1999) isolated moulds from only one sample.

Moulds proved to be economical importance as their presence in milk, even in few numbers, result in undesirable changes that rendering milk of inferior quality as well as Constituting a public health hazard to the consumers. (Mossel, 1982).

It is evident from the result in Table (4) that most of the bacterial isolates from milk samples using the disk method were highly sensitive to gentamicin followed by amoxicillin while it was resistant to tetracycline and neomycin, This is confirmed by the work of Burriel and Dagnall, (1997).

Finally, it may be concluded that, there is no sanitary control measures applied, so a strict hygienic measures should be applied to improve caprine milk quality and safeguard the users against infections.

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الملخص العربي الحالة البكتيرية والفطرية لألبان الماعز السليمة ظاهريا في صحراء سيناء

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تم فحص عدد خمسون عينة لبن مأخوذة من الماعز السليمة ظاهريا في صحراء
سيناء وتقييمها لمعرفة مدى ما يتواجد به من بكتيريا وفطريات ومدى حساسية
الميكروبات المعزولة للمضادات الحيوية .

أشارت النتائج إلى أن ٣٦ عينة من إجمالي ٥٠ عينة لبن ماعز بنسبة ٧٢% كانت مصابة
بالبكتيريا ، وكان متوسط العدد البكتيري الكلي والميكروبات المعوية، والعنقودية،
والفطريات، والخمائر هو $10 \times 1,9 \pm$ ، $10 \times 8,9 \pm$ ، $10 \times 7,6 \pm$ ، $10 \times 7 \pm$ ،
 $10 \times 2,9 \pm$ ، $10 \times 1,4 \pm$ ، $10 \times 2,9 \pm$ ، $10 \times 0,83 \pm$. على التوالي.

وأمكن عزل ميكروبات الايشريشيا كولاى (المكور)، العنقودي الذهبي ، الاسبرجلس
فلافس، الالترناريا ، كلادوسبوريوم، البنسليوم بنسب ٢٧,٢٧% ، ٥٤,٥٥% ، ٦,٦٧% ،
٢٠% ، ٢٦,٦٧% و ١٣,٣٣% على التوالي.

كانت العزلات البكتيرية اكثر حساسية للمضادات الجنتاميسين ، والاموكسيسيلين وقد تم
مناقشة الإجراءات والأهمية الصحية للمعزولات البكتيرية والفطرية للحد منها من
الناحيات الصحية والاقتصادية.