

## Conjunctival Flora of Fifty Healthy Goats in Sebele Farm, Gaborone, Botswana

<sup>1</sup>E.Z. Mushi, <sup>2</sup>M.G. Binta, <sup>1</sup>R.G. Chabo and <sup>1</sup>K. Dintwe

<sup>1</sup>Botswana College of Agriculture, <sup>2</sup>National Veterinary Laboratory,  
Private Bag 0027 Gaborone, Botswana

**Abstract:** Fifty eye swabs were taken from one eye of each healthy goat and were cultured into sheep blood and McConkey agar. Bacteria were isolated from the eyes of 32 out of 50 (60%) healthy goats. *Brahmella* sp. (26.3%) were the most commonly recovered organisms followed by *Staphylococcus* sp. (22.8%). Other organisms isolated included *Corynebacterium* sp. (15.8%), *Streptococcus* sp. (8.8%), *Micrococcus* sp. (7.0%) and *Pasteurella* sp. (1.8%). A single bacterium was isolated from 12 out of 50 (24%) of the eye swabs.

**Key words:** Conjunctival, eye swabs, bacteria, McConkey agar

### INTRODUCTION

Goats (*Capra hircus*) are multipurpose animals producing meat, milk, skin and hair with meat being the main one. They are kept in large numbers and in most developing countries such as Botswana they are kept for subsistence farming. There is not much done in terms of medication for these animals by the farmers. Goats are distributed world wide for they can acclimatize to various climatic conditions except the Arctic and Antarctic circles (Davendra, 1985).

Ophthalmic problems like keratoconjunctivitis are not of that much importance in the production of goats unless if both eyes are affected which may result in total blindness (Smith and Sherman, 1994). In the Botswana College of Agriculture (BCA) farm, the cases of eye infections are reported mostly in summer or warm months when the fly activity is high. Flies carry the pathogens of this disease from one host to another. Since here our main concern is with the conjunctival flora of goats, we should expect to isolate some bacteria found on the skin for the conjunctiva is a continuation of the skin of the skin and mucosa (Tortora *et al.*, 1992). Conjunctival flora consists of many microorganisms such as bacteria, viruses and protozoa but here we are concerned with the bacteria part of it. A knowledge of the conjunctival flora of healthy goats may be useful in the treatment of ophthalmic problems.

Several bacteria such as *Staphylococcus aureus* have been isolated from healthy and infected eyes. *Staphylococcus* sp. often occur as commensals in the environment and can cause opportunistic infections in humans and very occasionally in animals, although they are regarded as non pathogenic (Quinn *et al.*, 1998). A

study carried out in rabbits found the commonest bacteria isolated from healthy eyes were *Staphylococcus* sp. (Cooper *et al.*, 2001). *Brahmella ovis* has been isolated from normal eyes and its role in causing keratoconjunctivitis is considered doubtful (Van Halderen and Henton, 1994).

The purpose of this study was to record the commensal bacteria present in the conjunctiva of normal healthy goats, which were free from overt signs of clinical disease.

### MATERIALS AND METHODS

Conjunctival swabs were obtained from one eye of each of the 50 goats picked at random from a flock of 200 goats at the BCA farm. The goats were of the local Tswana breed and their crosses with Boer breed goat. The goats sampled were of different ages and sexes. The goats were kept under semi-intensive system of management and were mixed with sheep. They were released into paddocks and in the early afternoon, they were returned to the kraals and given supplementary feed consisting of hay. The flock was also given water ad libitum. The samples were collected during September 2001. Sampling was done in the mornings and the weather was warm.

All goats were diagnosed ophthalmically healthy for there were no eye discharges. A group of goats was taken in a separate kraal and one eye from each goat was swabbed. A microbiological sterile swab was removed from aseptically from protective cover and was used dry. The swab was taken from the lower fornix by everting the eyelids and wiping under the third eyelid. Care was taken to avoid the eyelid skin as it could contaminate the sample. The swab was then returned to the protective

cover. No transport medium was used as the swabs were inoculated into culture plates within 2 h of sampling. This was done in order to avoid loss of some bacteria susceptible to desiccation away from the host. Bacteria were cultured on sheep blood agar aerobically and anaerobically and also on McConkey agar aerobically. The plates were then incubated at 37°C. They were reincubated if there was no growth after 24 h or if the growth was too small to be taken for tests. A number of colonies per culture were noted. The plates were purified and a series of tests performed so as to identify these bacteria. These tests included Gram staining, catalase, oxalase, oxidase and coagulase test.

**RESULTS AND DISCUSSION**

Bacteria were isolated from the eyes of 32 out of 50 (60%) healthy goats. No bacteria could be isolated the eye swabs of 18 out of 50 goats. The distribution of the number of bacteria isolated per goat is shown in Fig. 1. A single bacterium was isolated from 12 out of 50 goats (24%).

The different bacteria isolated and their frequency of isolation is depicted in Table 1. *Brahmnella sp.* were the commonest bacteria found accounting for 26.3% of all the bacterial isolates.

Several bacteria were isolated from the goats' eyes that were apparently health. The commonest were the *Brahmnella sp.* followed by the *Staphylococcus sp.* Bacteria found on sheep normal conjunctival membranes were *Brahmnella ovis*, *E. coli*, *Staphylococcus epidermidis* *Streptococcus sp.* and *Bacillus sp.*

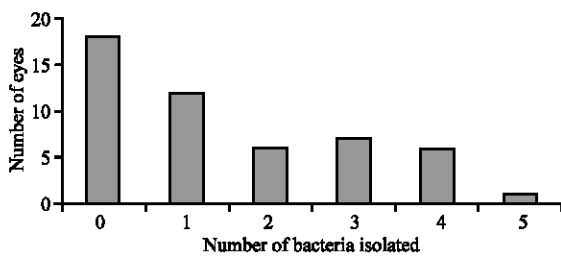


Fig. 1: Number bacteria isolated per eye

Table 1: Bacteria isolated from goat eyes

Name of bacteria	Number bacteria	Percentage bacteria isolated
<i>Brahmnella</i>	15	26.3
<i>Staphylococcus</i>	13	22.8
<i>Corynebacteria</i>	9	15.8
<i>Streptococcus</i>	5	8.8
<i>Micrococcus</i>	4	7.0
<i>Pasteurella</i>	1	1.8
Others	10	17.5
Total	57	100.0

*Brahmnella sp.* has also been isolated from most cases of keratoconjunctivitis in goats but its aetiological role has not been established (Van Halderen and Henton, 1994). Attempts to reproduce the disease in lambs using cultures of *B. ovis* obtained from clinical cases however, were not successful (Van Halderen and Henton, 1994). It has been suggested that infection with Chlamydia and/or Mycoplasma were the primary pathogens whereas *Brahmnella* were just secondary invaders (Pugh and McDonald, 1986).

Cooper *et al.* (2001) working with rabbits found the *Staphylococcus* to be the most abundant bacteria in the eyes. It was interesting to note that as many as 5 different bacteria genera were isolated from the eye of a goat.

**CONCLUSION**

Several bacteria were isolated from the eyes of healthy goats. *Brahmnella sp.* were the commonest followed by the *Staphylococcus sp.*

**ACKNOWLEDGEMENT**

The able technical assistance of Mr L. Molelekwa is gratefully acknowledged.

**REFERENCES**

Cooper S.C., G.J. McLellan and A.N. Rycroft, 2001. Conjunctival flora observed in 70 healthy domestic rabbits (*Oryctolagus cuniculus*), *Vet. Rec.*, 149: 232-235.

Davendra, C., 1985. Goats. In: An Introduction to Animal Husbandry in the Tropics. Williamson, G. and W.J.A. Payne (Eds.). Longman, London.

Pugh, G.W. and T.J. McDonald, 1986. Identification of bovine carriers of *Moraxella bovis* by comparative cultural examinations of nasal and ocular secretions. *Am. J. Vet. Res.*, 47: 2343-2345.

Quinn, P.J. and M.E. Carter, B. Markey, G.R. Carter, 1998. *Clinical Veterinary Microbiology*. Mosby International, London, England, pp: 118-120.

Smith, M.C. and D.M. Sherman, 1994. *Goats Medicine*, Williams and Wilkins, USA., pp: 182-84.

Tortora, M.C., B.R. Funkie and C.L. Case, 1992. *Introduction to Microbiology*. The Benjamin/Cumming Publishing Company, New York, pp: 392.

Van Halderen, A. and M.M. Henton, 1994. *Moraxella sp.* infections. In *Infectious diseases of livestock*. Coetzer, J.A.W., G.R. Thomson and R.C. Tustin (Eds.). Oxford University Press, Cape Town, pp: 1033-1037.