



The effect of acid drinking water on rumen protozoa in the blesbok (*Damaliscus dorcas phillipsi*)

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Abstract. Rumen contents were collected from ten adult female blesbok, five from a mine area with only acid drinking water available and five from a control group consuming normal, non-polluted drinking water. The mean concentration of total protozoa in the normal water group was almost double that in the acid drinking water group, 24.9×10^3 versus 14.7×10^3 . Percent of *Entodinium* was higher and *Diplodinium* lower in those animals drinking the acid water. The number of different protozoa species present in animals from both locations was fairly similar. *Diplodinium bubalidis*, *Ostracodinium gracile* and *Diplodinium consors* were present in the highest percentage in the normal water group, 18.8, 18.4 and 17.7 %, respectively. The same three species, plus *Entodinium dubardi*, were also highest in the acid water group, *O. gracile*, 21.3 %; *D. consors*, 12.6 %; *E. dubardi*, 11.4 % and *D. bubalidis*, 10.3 %. Seventeen species of protozoa found in this study were a new host record for the blesbok, bringing the total number of species reported from the blesbok to 29.

Key words: Acid drinking water, Blesbok, *Damaliscus dorcas phillipsi*, Rumen, Protozoa

Introduction

Because of reported blesbok deaths in the area of an abandoned gold and uranium mine, Nothling *et al.* (2014), conducted a study in which they measured lead isotope ratios in bone ash of animals consuming acid water draining from the mine. In addition, these same measurements were taken on animals from a different area consuming non-contaminated drinking water. They found that the blesbok drinking the acidic water had accumulated higher concentrations of uranium in their tibia bones, presumably as a result of this element leaching from uraniumiferous rocks. The present study was undertaken to determine whether the acid mine water may have also contributed to changes in the rumen protozoa and affected animal health.

Material and methods

Collection sites. Five female blesbok were harvested from the Krugersdorp Game Reserve (KGR) (26° 05' 11" S and 27° 42' 45" E) in the Gauteng Province of South Africa. These animals only had access to acidic drinking water. The control group of five female blesbok, drinking from a normal water supply, were harvested from the Rhino and Lion Nature Reserve (RLNR) which is located approximately 15 km north-east of KGR.

Drinking water. A sample of the water being consumed by the blesbok was collected at each site and returned to the lab for measurement of pH. Water from the mine area had a pH of 3 while the normal drinking water had a pH of 7.

Sample collection. Handfuls of rumen digesta were squeezed in the fist with the thumb pointing downwards so that liquid could run down into a plastic container. This was repeated until a 40ml sample was obtained. This volume was then transferred to a 100ml bottle and 40ml of 40% formalin was added to preserve the sample.

Counting protozoa. Because of the high concentration of protozoa, a 1ml sub sample of the fixed rumen fluid