

Rumen Microorganisms in Buffalo from Southern Utah

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Rumen microbial populations from buffalo (*Bison bison bison* Linn.) in southern Utah were identified on the basis of their morphology and staining characteristics. The rumen bacteria and ciliate protozoa were similar in number and kind to those found in domestic livestock.

Although voluminous research has been done on the rumen microorganisms of domestic animals (1, 2, 4, 5), few studies have dealt with wild-animal rumen organisms. Most studies which have investigated rumen bacteria of wildlife have been confined to deer.

This article reports examination and counts of rumen bacteria and ciliate protozoa from buffalo.

MATERIALS AND METHODS

Rumen samples for microscopic examination were collected from seven buffalo killed during the regular hunting season (2 September 1961) in the Henry Mountains of southern Utah. Rumen fluid was strained through cheesecloth to remove the large food particles before it was put in containers. The samples were then preserved by adding an equal volume of 10% Formalin. These Formalin rumen fluid samples were used for counting the organisms. Microscopic slides were made during collections for Gram staining and identification purposes. Organisms were counted by use of a hemacytometer (8).

RESULTS AND DISCUSSION

Several genera and species of ciliate protozoa were observed in the buffalo rumen contents. According to descriptions given by Kudo (6), the following ciliate protozoa were present: *Isostricha prostoma*, *Dasytricha ruminantium*, *Ophryoscolex caudatus*, *Entodinium caudatum*, *Entodinium bursa*, *Diplodinium dentatum*, *Eudiplodinium maggii*, and *Metadinium medium*. These protozoa are the same as those found in domestic animals. The abundance of rumen ciliate protozoa was similar to counts of total ciliate protozoa from both wild and domestic animals. The rumen protozoa counts from buffalo averaged 580 thousand per ml of rumen fluid (Table 1).

The morphological types of bacteria observed

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in the buffalo rumen contents included various cocci, rod-shaped, and spiral organisms, similar to those described in domestic and wild ruminants (1, 5, 8). These bacteria were separated into five different bacterial types for counting purposes (Table 1). The average number of bacteria counted from buffalo was 7 billion per ml of rumen fluid, which is similar to counts from other ruminants.

Apparently, buffalo rumen microbial populations are more closely related to those of domestic animals than to deer, since several genera of ciliate protozoa were present. Only one genus of ciliate protozoa has been observed in deer (8, 9), whereas many genera have been observed in sheep and cattle (4, 5). Buffalo have feeding habits similar to those of cattle, in that the diet consists largely of grasses (3, 7). This would partially explain similarities in the rumen microbial populations.

TABLE 1. Rumen microorganisms counted from seven buffalo in southern Utah^a

Types of bacteria					Total counts	
Gram-negative bacilli	Gram-positive bacilli	Gram-negative cocci	Gram-positive cocci	Spiral organisms	Bacteria	Ciliate protozoa
2.17	0.41	1.58	1.71	.01	5.88	.84
3.65	0.47	0.74	1.83	.07	6.76	.70
4.01	0.45	1.59	1.51	.02	7.58	.58
1.44	0.75	0.75	2.35	.05	5.34	.32
3.58	1.10	1.53	2.30	.01	8.52	.30
1.61	1.53	2.10	2.74	.08	8.06	.86
2.51	0.79	1.88	2.67	.01	7.86	.46
Average						
2.71	0.79	1.45	2.16	.04	7.14	.58

^a Numbers represent billions of microorganisms per milliliter, except for the ciliate protozoa, which are expressed in millions per milliliter.

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