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BOVINE COCCIDIA IN AMERICAN BISON[1]

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Abstract: Three species of coccidia, found in American bison sampled in Wyoming, are identified. The described coccidial species, common to cattle, have not been reported previously from American bison, (*Bison bison*). Identification of the parasites was determined by oocyst structural measurements and by oocyst sporulation times.

INTRODUCTION

Two species of coccidia, *Eimeria bovis* and *E. bukidnonensis*, have been reported from the American bison (*Bison bison*).[5,7] The present writers have known for several years that species other than those noted above are common in fecal samples from bison. During the past 2 years, observations of oocyst development and measurements of sporulated oocysts have been made on what appear to be the following species: *E. auburnensis, E. brasiliensis* and *E. canadensis*.

MATERIALS AND METHODS

Fecal samples were collected from *Bison bison* confined to an enclosure on the Durham Meat Company Ranch, south of Gillette, Wyoming. Cattle had not been grazed on the ranch ranges for a number of years but sheep and horses were grazed on the same range used by the bison. Limited exposure to cattle or to range grazed by cattle occurred in the summer and fall months when some of the bison broke through the ranch boundary fence. The bison calves were weaned in December, placed in an enclosure and fed a ration which included various nutrient supplements. A few aged bison cows were also present in the group of approximately 700 bison calves.

Oocysts were isolated from the fecal samples by centrifugation and flotation and were sporulated in 2% potassium dichromate solution 2-3 mm deep. The sporulated oocysts were floated onto coverslips for transfer to slides for microscopic examination. Twenty-five oocysts and 30 sporocysts were measured from *E. auburnensis*. Twenty oocysts and 20 sporocysts were measured from *E. canadensis*. Thirty oocysts, 30 sporocysts and 30 polar caps were measured from *E. brasiliensis*. Photographs were made with Kodachrome II color film using a Zeiss Ikon SLR camera mounted on a Zeiss standard research microscope.

RESULTS

Oocyst sporulation times and measurements made on oocysts, sporocysts, and polar caps are presented in Table 1.

Eimeria auburnensis Christensen and Porter 1939 (Fig. 1).

The oocysts appeared elongate ovoid with a smooth, colorless to yellowish wall. The significant feature was the flattened micropylar end with prominent shoulders apparent in most oocysts observed. Oocyst residuum was absent in freshly sporulated oocysts but sometimes appeared in aged sporulated oocysts. Sporocysts were elongate with a steida body and residuum.

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TABLE 1. Oocyst structural measurements[a] and oocyst sporulation times[b] of **E. auburnensis, E. brasiliensis,** and **E. canadensis.**

Structure	*E. auburnensis*		*E. brasiliensis*		*E. canadensis*	
	mean	range	mean	range	mean	range
Oocyst width	26	24-29	28	25-31	26	23-27
Oocyst length	41	39-43	40	37-43	36	34-38
Sporocyst width	8	7-10	10	9-11	8	7-10
Sporocyst length	17	15-19	20	18-23	19	16-20
Polar cap width	—	——	9	7-11	—	——
Sporulation time		2-3		8-9		4-5

[a] All measurements in micrometers
[b] Days at ambient room temperatures 18-23 C

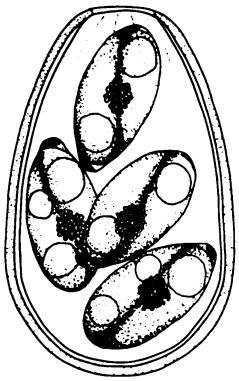


Fig. 1

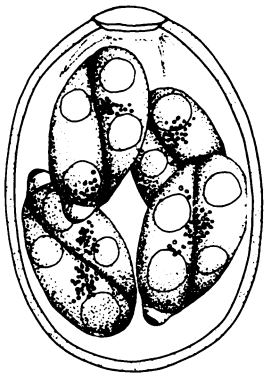


Fig. 2

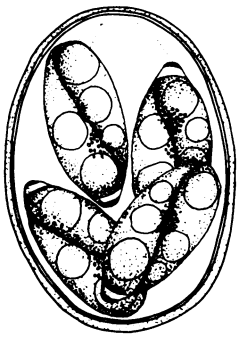


Fig. 3

FIGURES 1-3. Sporulated oocysts from **Bison bison.**

FIGURE 1. **Eimeria auburnensis.** FIGURE 2. **E. brasiliensis.** FIGURE 3. **E. canadensis.** Bar represents 10 micrometers.

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Eimeria brasiliensis Torres and Ramos 1939 (Fig. 2).

Oocysts appeared ellipsoidal with a prominent polar cap. The brownish-yellow oocyst wall appeared thicker at the polar cap end. Oocyst residuum and a polar granule were absent. Sporocysts were elongate with a knob-like narrow end. A sporocyst residuum and clear globules were usually present.

Eimeria canadensis Bruce, 1921 (Fig. 3)

Oocysts appeared ellipsoidal with a colorless to yellowish oocyst wall. The wall appeared thinner at the micropylar end. Oocyst residuum usually was absent. Sporocysts were elongate with a residuum.

DISCUSSION

The most prevalent coccidium observed by the authors from American bison was *E. bovis* = (*E. smithi*). We have not seen *E. bukidnonensis* which Pellerdy lists as the only coccidium in *B. bison*.[5,6] The descriptive features and sporulation times of the oocysts described in this report appear to agree with the descriptions of *E. auburnensis, E. brasiliensis* and *E. canadensis*.[1,2,3,4] These three species of coccidia, common to cattle, have not been previously reported from American bison.

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