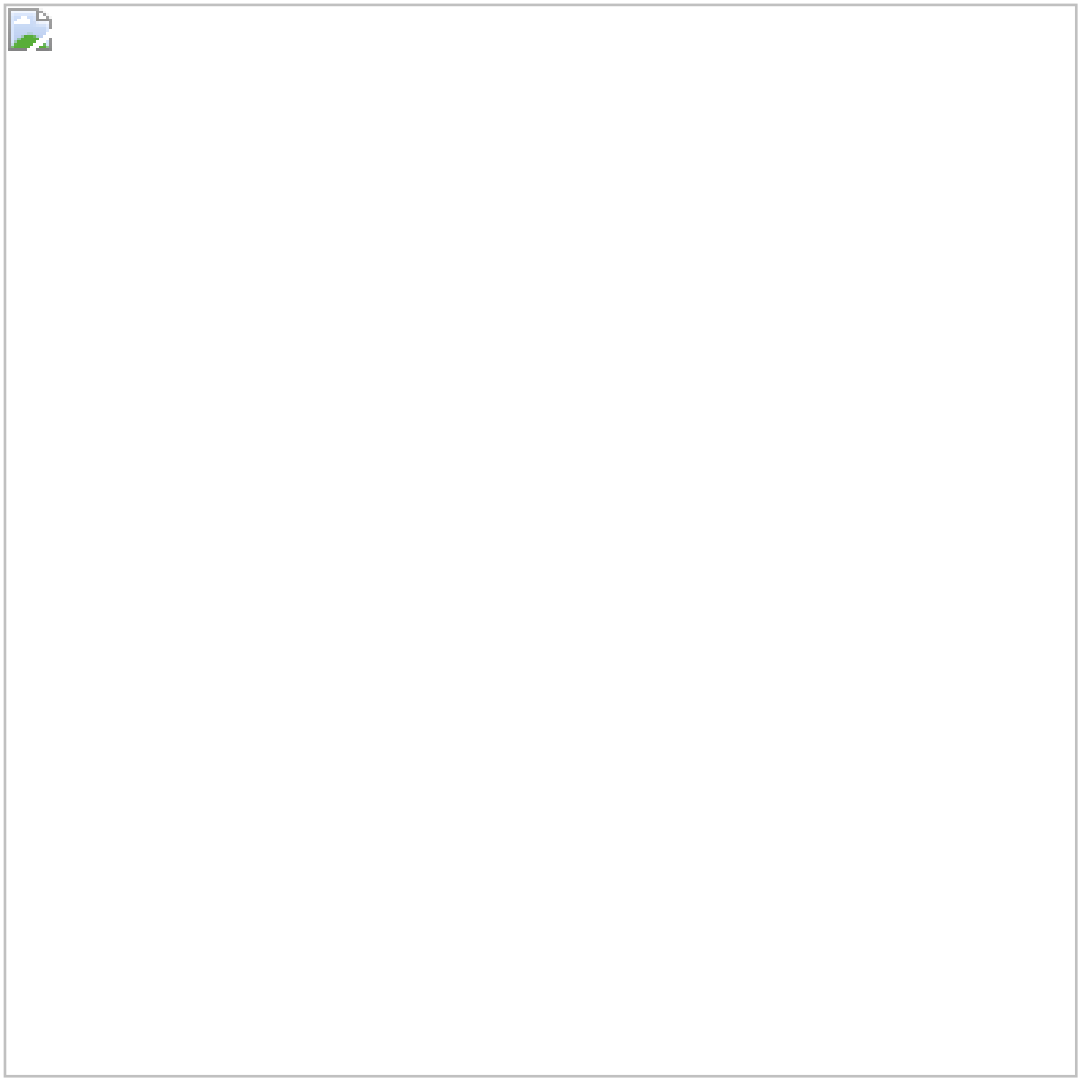

Helminths of the Coyote (Canis latrans Say) in Montana 1

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desirable to confirm conclusively that one injection is completely effective in eliminating psoroptic mites from bighorn sheep.

The high degree of acaricidal effectiveness demonstrated indicate that injectable ivermectin has a strong potential for management of *P. ovis* infections in bighorn sheep. Of particular interest is the possibility of using aerial delivery systems that may allow efficient injection of this acaricide without the necessity of capturing the animals for treatment.

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Helminths of the Coyote (*Canis latrans* Say) in Montana[1]

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The helminth fauna of coyotes varies between regions studied (Custer and Pence, 1981, *In* Worldwide Furbearer Conf. Proceedings, Vol. II, J. A. Chapman and D. Pursley (eds.), The Worldwide Furbearer Conf., Inc., Frostburg, Maryland, pp. 730–759). Several studies (Freeman et al., 1961, Can. J. Zool. 39: 527–532; Holmes and Podesta, 1968, Can. J. Zool. 46: 1193–1204) have indicated that the helminth fauna is related to the food habits of the host in any particular region. The purpose of this study is to determine the helminth fauna of coyotes of Montana and to compare the findings with similar studies in other northern regions.

During the fall and winter of 1977–1978, 219 coyotes from Montana were collected and examined for helminths. Tongue tissue was digested in pepsin-HCl for recovery of larvae of *Trichinella spiralis* (Owen, 1835). Intestines were scraped and washed on a standard USDA No. 100 sieve for recovery of *Echinococcus multilocularis* Leuckart, 1863 and other helminths. Cestodes and trematodes were fixed in 10% buffered formalin, stained in Semichon's carmine or Delafield's hematoxylin, and mounted in Canada balsam. Nematodes were fixed in 70% ethanol, cleared in glycerine, and mounted in glycerine jelly. Representative specimens were deposited in the U.S. National Parasite Collection, Beltsville, Maryland (USNM Helm. Coll. Nos. 77188 to 77199).

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The results are presented in Table 1. Seven cestode, nine nematode, and one trematode species were found. *Taenia taxidiensis* Skinker, 1935 represents a new host record. All of the helminths except *T. spiralis* and *E. multilocularis* are new locality records.

Echinococcus multilocularis occurred in six widely separated counties in Montana, suggesting that it is enzootic throughout the state. Prevalence was highest in Gallatin County in southwestern Montana. Coyotes from west of the Continental Divide were negative for *E. multilocularis*. *Echinococcus multilocularis* has also been found in coyotes in North Dakota (Leiby et al., 1970, J. Parasitol. 56: 1141–1150) and southwestern Manitoba and Alberta (Samuel et al., 1978, Can. J. Zool. 56: 2614–2617).

Trichinella spiralis occurred in 8% of the coyotes in Montana. This was only one third of the prevalence reported by Worley et al. (1974, *In* Proc. Third Int. Conf. Trichinellosis, C. W. Kim (ed.), Intext Press, New York, pp. 597–602). This suggests that *T. spiralis* varies within a region. Prevalences of *T. spiralis* in coyotes from Alaska (Rausch et al., 1956, J. Parasitol. 42: 259–271), Iowa (Zimmermann and Hubbard, 1963, Proc. Am. Vet. Med. Assoc. 100: 194–199), and Quebec (Frechette and Panisset, 1973, Can. J. Public Health 64: 443–444) were 13%, 5%, and 1%, respectively.

The prevalence (18%) of *Taenia pisiformis* in coyotes from Montana was much less than that reported in coyotes from Manitoba (67%) (Samuel et al., 1978, op. cit.); Alberta (31%) (Holmes and Podesta, 1968, op. cit.); and Minnesota (39%) (Erickson, 1944, Amer. Midl. Nat. 32: 358–372). This suggests that the coyotes in

TABLE 1. Parasites from 219 coyotes collected in Montana during the fall and winter of 1977–1978.

Species	Site	No. positive	% Infected	Intensity	
				Mean	Range
Cestoda					
Echinococcus multilocularis	SI[a]	9	4	533.0	1–1,830
Taenia sp.	SI	44	20	5.3	1–100
Taenia pisiformis	SI	40	18	9.8	1–86
Taenia laticollis	SI	2	1	1.5	1–2
Taenia crassiceps	SI	1	<1		256
Taenia krabbei	SI	3	2	1.5	1–2
Taenia taxidiensis	SI	1	<1	4.0	4
Mesocestoides kirbyi	SI	10	5	4.7	1–200
Nematoda					
Trichinella spiralis	Tongue	18	8	14.7	1.05–138 l/g[b]
Physaloptera rara	Stomach	44	20	5.4	1–27
Oslerus osleri	Trachea	52	24	14.7	1–29 nodules
Toxascaris leonina	SI	180	82	22.1	1–579
Ancylostoma caninum	SI	3	1	1.6	1–2
Uncinaria stenocephala	SI	39	18	9.9	1–118
Pterygondermatites affinis	SI	5	2	2.0	1–5
Protospirura numidica	SI	3	1	22.0	5–39
Capillaria sp.	LI[c]	1	<1	1	1 ovum only
Trematoda					
Alaria marcianae	SI	12	5.4	18.2	1–66

[a] SI = Small intestine.
[b] l/g = Larvae per gram of muscle tissue digested.
[c] LI = Large intestine.

Montana may not depend on rabbits for food to the extent that they do in other northern regions.

Taenia krabbei occurred in only 2% of the coyotes from Montana. This was similar to that of the forested regions of Alberta (Holmes and Podesta, 1968, op. cit.), and of southwestern Manitoba (Samuel et al., 1978, op. cit.). Cervids, the intermediate hosts for *T. krabbei* are therefore not a common food item in the diet of coyotes in Montana. Mule deer are the main cervid in Montana infected with the cysticerci of *T. krabbei* (Seesee, unpubl. data).

The prevalence (6%) of *Alaria marcianae* in coyotes from Montana was similar to that in coyotes from the forested regions of Alberta (Holmes and Podesta, 1968, op. cit.), but much less than that (37%) from coyotes in southwestern Manitoba (Samuel et al., 1978, op. cit.). The Manitoba study area was interspersed with a network of small lakes and ponds (Samuel et al., 1978, op. cit.) whereas the Montana study area was mainly arid grasslands. The intermediate hosts include frogs, tadpoles, and snakes (Pearson, 1956, Can. J. Zool. 34: 295–387) and these were probably more abundant in the Manitoba study area.

This is the first published paper on the helminth fauna of the coyote in Montana. The findings reveal that there are some differences in the fauna from that of other northern regions. One explanation is that this is due to differences in the ecotypes and therefore to the abundances of the respective intermediate hosts involved.

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