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ENDOPARASITES OF THE NORTHERN POCKET GOPHER FROM WYOMING [†]

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Abstract: Forty-six northern pocket gophers, *Thomomys talpoides*, were collected in Park County, Wyoming. The following prevalence of endoparasites was found: *Eimeria thomomysis* — 52%, *Eimeria fitzgeraldi* — 4%, *cysticerci* — 2% *Paranoplocephala infrequens* — 15%, *Paranoplocephala variabilis* — 38%, *Paranoplocephala spp.* — 46%, *Ransomus rodentorum* — 81%, *Longistriata vexillata* — 4%, *Protophysa ascaroidea* — 4%, *Trichuris fossor* — 65%, and *Capillaria hepatica* — 39%.

Northern pocket gophers, *Thomomys talpoides*, from Park County, Wyoming have been the subjects of an ecologic study since 1962. A description of the study area and population was reported by Tryon and Cunningham.¹⁰ During 1968 and 1969, 46 animals were collected for a parasitologic study.

MATERIALS AND METHODS

Of the 46 animals examined, 36 were trapped during June and July 1969, 7 during October 1968, and 1 each month during November 1968, April 1969, and May 1969.

The sample included 18 adult males, 24 adult females, and 4 juveniles. The sex, age and elevation at which the animals were taken was recorded at the time of trapping. The animals were then placed in plastic bags, frozen, and shipped to Urbana, Illinois, in dry ice.

At autopsy the body cavity was examined and the lungs, liver, heart and the gastro-intestinal tract were separated and placed in tap water. The organs were examined for gross evidence of parasites and then dissected. The liver, lungs and heart were broken apart with probes and examined with a dissecting microscope. The components of the alimentary canal were opened and the contents and organs were examined with a dissecting

microscope. Fecal pellets were taken from the colon and examined by the modified Sheather's sugar flotation technique.¹

Nematodes were fixed in 70% ethanol + 5% glycerol and cleared in glycerol or lactophenol. Permanent slides were prepared by mounting the specimens in glycerol jelly. Cestodes were fixed in AFA solution and permanent slides were made by staining the specimens with either Harris' hematoxylin or the trichrome method described by Horen.⁸

RESULTS

All of the animals contained helminths or coccidian oocysts. One animal did not have helminths, but was infected with coccidia. No parasites were found in the lungs or hearts. Cestodes were recovered from the body cavities of two animals, but this was thought to be the result of rupture of the intestine during trapping or autopsy.

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The prevalence of infection for the parasites recovered is presented in Table 1. The following species were found:

Protozoa

Oocysts of *Eimeria thomomysis* Levine, Ivens and Kruidenier, 1957 were present in fecal pellets of 24 of the gophers.

Eimeria fitzgeraldi Todd and Tryon, 1970 oocysts were in 2 of the fecal samples.

Cestoda

Cysticerci of the family Taeniidae were attached to the mesentery of the stomach and cecum of one gopher.

Fragments of cestodes which we believe to be *Catenotaenia linsdalei* McIntosh, 1941 were found in the body cavities of 2 animals. The tapeworms were so disintegrated that positive identification could not be made.

Paranoplocephala variabilis (Douthitt, 1915) Hansen, 1947 were present in the small intestine of 18 animals.

Paranoplocephala infrequens (Douthitt, 1915) Hansen, 1947 were recovered from the small intestine of 7 gophers.

Paranoplocephala spp. were found in the small intestine of 22 animals. These

are all thought to be *P. variabilis* or *P. infrequens*, but because most of the specimens were fragmented when recovered at autopsy, they could not be positively identified after fixation and staining. Several hosts probably harbored mixed infections of these two species.

Nematoda

Ransomus rodentorum Hall, 1916, was the most common parasite found. It was present in the cecum of 34 animals and a single specimen was also found in the large intestine of one of these. The number per infected animal varied from 1-6 (mean 2.6) and the ratio of females: males was 1:1.4.

Longistriata vexillata (Hall, 1916), Travassos and Darriba, 1929 was found in the small intestine of two gophers. There were 4-5 (mean 4.5) per infected animal, and the ratio of females:males was 1:0.29.

Protospirura ascaroidea Hall, 1916 was in the stomach of two animals. The number per infected animal was 1-15 (mean 8.0) and the ratio of females: males was 1:0.88.

Trichuris fossor Hall, 1916 was the second most common parasite found. It was in the cecum of 30 animals, and a single specimen was also found in the

Table 1. Percentage prevalence of endoparasites in 46 northern pocket gophers.

PARASITE	PERCENTAGE PREVALENCE			
	ADULT MALES	ADULT FEMALES	JUVENILES	TOTAL
<i>E. thomomysis</i>	61	50	25	52
<i>E. fitzgeraldi</i>	6	4	—	4
Cysticerci	6	—	—	2
<i>P. infrequens</i>	21	17	—	15
<i>P. variabilis</i>	47	43	—	38
<i>Paranoplocephala</i> spp.	41	65	—	46
<i>R. rodentorum</i>	78	83	75	81
<i>L. vexillata</i>	6	4	—	4
<i>P. ascaroidea</i>	6	4	—	4
<i>T. fossor</i>	78	63	25	65
<i>C. hepatica</i>	67	25	—	39

small and large intestine. The number per infected animal was 1-24 (mean 5.2) and the ratio of females : males was 1:0.74.

Capillaria hepatica (Bancroft, 1893) Travassos, 1915 infections were detected

in the livers of 18 animals. No entire specimens were recovered from any of the livers.

The percentages of infection of animals trapped at different altitudes are presented in Table 2.

Table 2. Relation of altitude to percentage prevalence of endoparasites in 46 pocket gophers.

PARASITE	ALTITUDE (FEET)		
	6,800 (n = 11)	8,400 (n = 28)	9,800 (n = 7)
Coccidia	27	87	43
Cestodes	0	87	72
<i>R. rodentorum</i>	100	96	57
<i>L. vexillata</i>	9	4	0
<i>P. ascaroidea</i>	0	9	0
<i>T. fossor</i>	82	78	43
<i>C. hepatica</i>	18	70	0

DISCUSSION

Eimeria fitzgeraldi was described from this population of pocket gophers by Todd and Tryon.¹⁷ They also found oocysts of *E. thomomysis* in 25 of the same 65 fecal samples from which *E. fitzgeraldi* was described (Todd, unpublished data). The finding of *E. thomomysis* in *T. talpoides* is evidently a new host and geographic record. *Eimeria thomomysis* was described from *Thomomys bottae* in Arizona by Levine et al.¹¹ The only other report of coccidia from pocket gophers was by Skidmore,¹⁸ who described *Eimeria geomydis* from *Geomys bursarius* in Nebraska.

Lubinsky¹² reported cysticerci of *Taenia mustelae* Gmelin, 1790 from *T. talpoides* from Alberta. This is evidently the only other record of larval tapeworms from *Thomomys*.

Paranoplocephala variabilis and *P. infrequens* were described by Douthitt⁴ from *Geomys bursarius*. Rausch and Schiller¹⁴ reviewed the literature on *Paranoplocephala* spp. in rodents. The finding of these is a new geographic record.

Ransomus rodentorum was originally described by Hall⁶ as a species of *Chabertia* from *T. talpoides* in Colorado, but he later⁷ assigned the specimens to a new genus and species. This species is still the only one in the genus. *Ransomus rodentorum* has since been reported from *T. talpoides* and *T. umbrinus* in Utah.⁵ Our finding is evidently a new geographic record.

Longistriata vexillata was described by Hall⁷ from *T. talpoides* from Colorado, and since then the taxonomic position of this species has been frequently changed. A review of the literature concerning this parasite is given by Skrjabin et al.¹⁶ Evidently the only other report of this parasite, other than that by Hall⁷ and the present study, was by Travassos and Darriba,¹⁸ who found it in *Rattus norvegicus*. The present finding is a new geographic record.

Protospirura ascaroidea was described by Hall⁷ from *Geomys breviceps* and has since been reported from *T. talpoides* by Lubinsky.¹² The present finding is evidently a new geographic record.

Hall⁷ described *T. fossor* from *T. talpoides* collected in Utah; since then the species has been reported from the following hosts: *T. bottae* from California,^{2,20} *T. talpoides* from Alberta,¹² and *T. talpoides* and *T. umbrinus* from Utah.⁵ *Trichuris fossor* from Wyoming is a new geographic record.

Capillaria hepatica has been reported from many species of mammals. A summary of North American host and locality records was given by Layne.¹⁰ The parasite has previously been reported from *T. talpoides* in Wyoming by Dikmans³ and Rausch.¹³

The differences in prevalence of parasitism by different groups or species of

parasites are of interest. Although the sample size was small (46), there seem to be some trends. The high prevalence of coccidia from animals collected at 8400 ft., the absence of cestodes in animals from 6800 ft. and the apparent altitudinal distribution of *R. rodentorum*, *T. fossor* and *C. hepatica* need further study. The complex relationships of the host, intermediate host and environment are all interrelated factors which determine the prevalence and distribution of parasites and other pathogens. The study of parasites of *Peromyscus floridanus* by Layne⁹ is an example of the types of information that are needed to properly evaluate the interaction between hosts, parasites and the environment.

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