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J. Helminthol. Soc. Wash.
57(2), 1990, pp. 160–162

Research Note

A Cestode, *Taenia mustelae*, in the Black-footed Ferret (*Mustela nigripes*) and the White-tailed Prairie Dog (*Cynomys leucurus*) in Wyoming¹

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ABSTRACT: *Taenia mustelae* was recovered from naturally infected black-footed ferrets, *Mustela nigripes* (adult cestodes), and a white-tailed prairie dog, *Cynomys leucurus* (cysticerci), near Meeteetse, Wyoming. Cysticerci fed to a domestic ferret, *Mustela putorius*, produced adult *T. mustelae*; eggs of adult tapeworms from *M. nigripes* and *M. putorius* fed to *C. leucurus* and a white-footed mouse, *Peromyscus leucopus*, resulted in recovery of cysticerci. *Mustela nigripes* is a new host for this tapeworm.

KEY WORDS: cestode, *Taenia mustelae*, black-footed ferret, *Mustela nigripes*, white-tailed prairie dog, *Cynomys leucurus*, natural infections, experimental infections, Meeteetse, Wyoming.

The black-footed ferret, *Mustela nigripes* Audubon and Bachman, among the rarest of North American mammals, until recently was considered possibly extinct (Schreiber et al., 1989). The recovery of a carcass of this mustelid and subsequent discovery of a small colony near Meeteetse, Wyoming, in 1981 fortunately belied this pessimistic conclusion.

Necropsy of the black-footed ferret carcass resulted in the recovery of 5 apparently intact tapeworms from the small intestine. Based on internal anatomy, the tapeworms were considered probably *Taenia mustelae* Gmelin, 1790, a parasite of various species of *Martes* and *Mustela* throughout North America, Europe, and the USSR (Freeman, 1956; Verster, 1969). The ap-

¹ Published with the approval of the Director, Agriculture Experiment Station, College of Agriculture, University of Wyoming, Laramie, Wyoming 82071.

Table 1. Results of experiments feeding cysts and eggs of *Taenia mustelae* to various hosts.

Host	Source	Stage fed	Stage recovered	\bar{x} hook length* (range)	\bar{x} hook width (range)	Age of infection (in days)	Type of infection
<i>Cynomys leucurus</i>	—	—	cysticerci	19.0 (16.7–21.3)	9.8 (8.5–12.2)	—	natural
<i>Mustela putorius furo</i>	<i>Cynomys leucurus</i>	cysticerci	adults	18.0	9.7	62	experimental
<i>Cynomys leucurus</i>	<i>Mustela putorius</i>	eggs	cysticerci	16.0 (15.0–17.4)	8.4 (6.5–9.1)	153	experimental
<i>Peromyscus leucopus</i>	<i>Mustela nigripes</i>	eggs	cysticerci	14.5	9.7	66	experimental
<i>Cynomys leucurus</i>	<i>Mustela nigripes</i>	eggs	3 cysticerci recovered and placed in formalin			155	experimental

* All measurements in micrometers (μm).

parent loss of rostellar hooks from these specimens, however, precluded definitive identification.

A survey of 17 white-tailed prairie dogs, *Cynomys leucurus* Merriam, from Meeteetse in 1986 revealed cysticerci in the liver of 1 female (Seville and Williams, 1989). En face hook mounts were prepared in Hoyer's medium and measured; hook measurements (Table 1) were consistent with published reports of those of *T. mustelae* from definitive and intermediate hosts (Freeman, 1956; Verster, 1969) and the cysticerci were considered conspecific with that species. Five to 7 cysts were retained for feeding experiments (Table 1).

A program to breed black-footed ferrets in captivity was established at the Sybille Wildlife Research and Conservation Education Unit, Wheatland, Wyoming, in 1986 (Wyoming Game and Fish Department, 1987). After some time in captivity, an intact tapeworm, believed to be *T. mustelae*, was recovered from feces of a juvenile female black-footed ferret. Several gravid proglottids were removed and the remainder of the specimen placed in 10% formalin. Eggs passed in feces were also recovered from 2 other juvenile *M. nigripes*. The availability of both cysticerci and gravid proglottids prompted feeding experiments, using various intermediate and definitive hosts, for positive identification of this tapeworm species.

An adult male domestic ferret (*Mustela putorius furo* L.) was fed the cysticerci from the naturally infected prairie dog and was necropsied 62 days postinfection (PI). Eight intact tapeworms were recovered from the small intestine. One intact specimen was stained in Ehrlich's acid

hematoxylin and mounted. A hook mount in Hoyer's medium was prepared (Table 1). A few gravid proglottids were retained for further infection experiments with intermediate hosts. Eggs from the proglottids were passed via stomach-tube to 2 anesthetized (ketamine-xylazine) white-tailed prairie dogs (Table 1) and 2 white-footed mice (*Peromyscus leucopus* Rafinesque). Necropsy of these intermediate hosts revealed cysticerci in 1 prairie dog (135 days PI). Hooks, mounted in Hoyer's medium, measured 15–17 μm in length ($\bar{x} = 16$) and 6.5–9.1 μm in width ($\bar{x} = 8.4$).

Eggs from gravid proglottids of the tapeworm recovered from the black-footed ferret were used to infect 2 prairie dogs and 2 white-footed mice, using procedures identical to those above. Cysticerci were found in 1 prairie dog and 1 mouse. Necropsy of the mouse 66 days PI (Table 1) revealed cysticerci located in the liver, mesenteries, stomach wall, body wall, urinary bladder, and wall of the large bowel. Cysts containing zero to multiple scolices were recovered. Freeman (1956) reported that multiscollex cysticerci of *T. mustelae* were more common than single-scollex forms. Three cysticerci were recovered from the liver of the prairie dog necropsied 155 days PI. These cysts were preserved in formalin.

All hooks examined from all hosts possessed a prominent guard, short handle, and blade (Fig. 1). Comparative average hook measurements correspond to values obtained by Freeman in experimental feedings and natural infections of *T. mustelae* (Freeman, 1956).

These feeding experiments substantiate the contention that the specimens recovered from

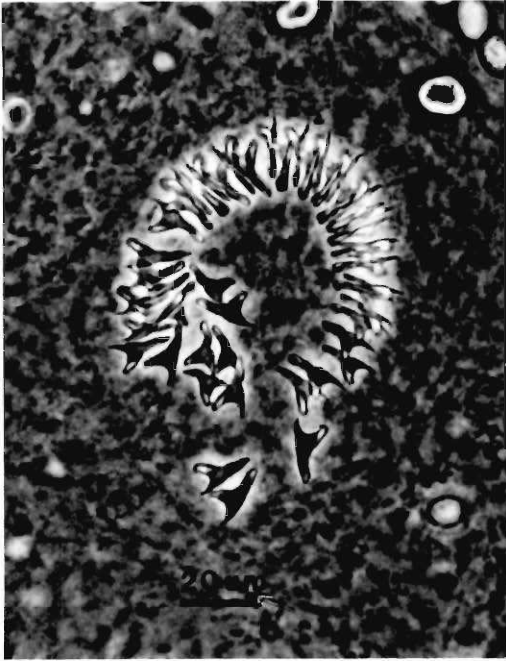


Figure 1. En face mount of rostellar hooks of *Taenia mustelae* from a cysticercus from a white-tailed prairie dog experimentally infected (Table 1) with eggs from a domestic ferret previously infected with cysticerci from a white-tailed prairie dog (Table 1). Phase contrast. Bar = 20 μ m.

hosts near Meeteetse, Wyoming, are *T. mustelae*. Recovery of *T. mustelae* from both the naturally and experimentally infected intermediate hosts (white-tailed prairie dog, white-footed mouse)

and definitive hosts (black-footed ferret, domestic ferret) demonstrates a viable pattern of transmission for this tapeworm. This report of *T. mustelae* in *M. nigripes* constitutes a new host record.

Voucher specimens of *T. mustelae* adults from *M. nigripes* (#80894) and *M. putorius* (#80893) and metacestodes from *C. leucurus* (experimental—#80890, natural—#80891) and *P. leucopus* (#80892) have been deposited in the USNM Helminthological Collection.

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J. Helminthol. Soc. Wash.
57(2), 1990, pp. 162–164

Research Note

Helminths of *Semotilus atromaculatus* from Sugar Creek, McLean County, Illinois

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ABSTRACT: Creek chubs were collected from Sugar Creek, Normal, Illinois, between May 1984 and June 1987. Adult helminths recovered from 1,072 chubs included *Acanthocephalus dirus* (Van Cleave, 1931), *Allocreadium lobatum* (Wallin, 1909), and *Proteoceph-*

alus buplanensis (Mayes, 1976). Larval helminths recovered from chubs were *Posthodiplostomum minimum* (MacCallum, 1921), *Neascus* sp., *Diphyllobothrium* sp., *Archigetes* sp., and an unidentified nematode. *Posthodiplostomum minimum* exhibited the highest