Prevalence and Distribution of Larvae of Trichinella sp. in Cougars, Felis concolor L., and Grizzly Bears, Ursus arctos L., in Alberta

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marrow showed numerous large macrophages which contained multiple schizogenous stages of *C. felis*. Post-mortem findings were the same as those reported for both the naturally-occurring and experimentally-induced cytauxzoonosis in domestic cats (Wagner, 1976, op. cit.; Wagner et al., 1976, Mo. Vet. 26: 12–13; Kier et al., 1982, op. cit.; Glenn et al., 1983, op. cit.). Prior to the initial feeding of nymphs of *D. variabilis* on the donor bobcat, a 3 ml sample of whole blood from this bobcat was inoculated subcutaneously into a domestic cat and a persistent but non-fatal erythroparasitemia developed. The domestic cat was necropsied 6 mo after blood inoculation and no schizogenous stages were found on stained impression smears (Diff-Quik Stain) of lymph nodes, lungs or bone marrow.

The results of this study demonstrated that, at least experimentally, *D. variabilis* can serve as a transstadial vector of *C. felis*. It also appears that subinoculation of bood from the naturally-infected bobcats transmitted only the erythrocytic piroplasm stage; schizonts developing only after tick transmission of the organism. Transmission of this organism by ticks supports the hypothesis that the erythrocytic piroplasms observed in the bobcat are the erythrocytic stage of *C. felis*.

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Larvae of *Trichinella* sp. are prevalent in cougars and grizzly bears in the Rocky Mountain regions of British Columbia (Schmitt et al., 1976, Can. J. Public Health 67: 21–24; Schmitt et al., 1978, Public Health Rep. 190: 189–193), Montana, Idaho and Wyoming (Winters, 1969, Bull. Wildl. Dis. Assoc. 5: 400; Worley et al., 1974, *In* Proc. Third Int. Conf. on Trichinellosis, C. W. Kim (ed.), Intext Press, New York, pp. 597–602). A survey in Alberta (Gunson and Dies, 1980, J. Wildl. Dis. 16: 525–528) found larvae of *Trichinella* sp. in gray wolves (*Canis lupus* L.) and in one black bear (*Ursus americanus* Pallas). In 1979 a survey for *Trichinella* sp. infections in cougars and grizzly bears was initiated.

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Most of the 57 cougars were taken by hunters during January of the years 1979–1982; two were shot illegally and one was acquired from a zoo in Edmonton. Most of the grizzly bears were shot by hunters during the spring hunting seasons of April–June 1979–1982; eight were taken as the result of reported killings of livestock; three were road-kills and three were involved in human maulings. All cougars except one and most of the grizzly bears were collected from the Rocky Mountains or adjacent foothills; two grizzly bears were taken east of the Rockies and four were from northwestern Alberta (Figs. 1, 2). Hunters were required to bring the an-

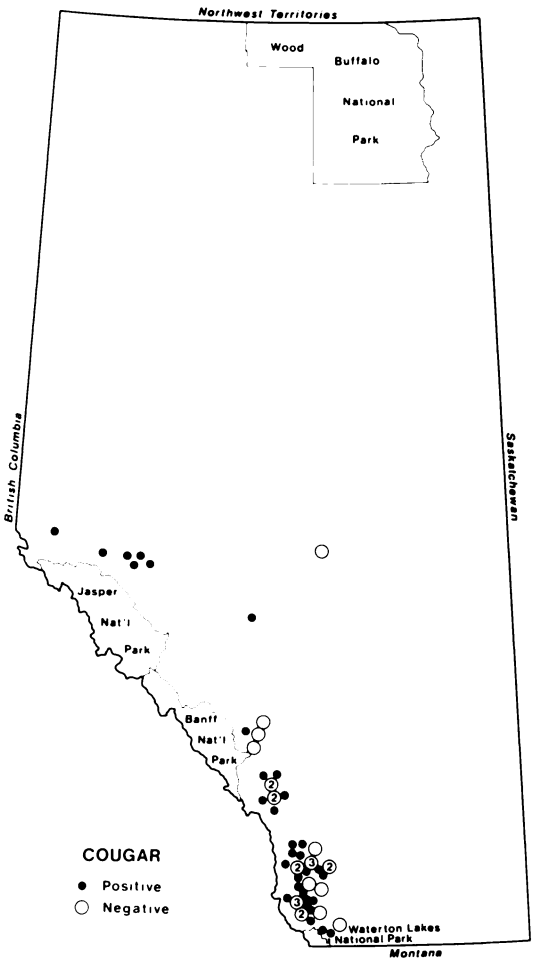

FIGURE 1. Locations of cougars examined for larvae of *Trichinella* sp. in Alberta 1979–1982. Each symbol represents one animal unless a number appears inside circle.

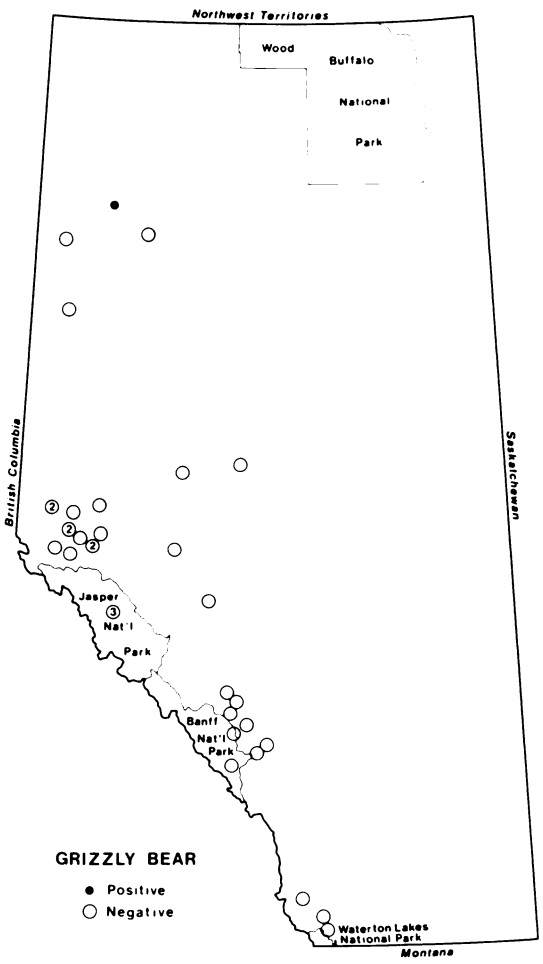

FIGURE 2. Locations of grizzly bears examined for larvae of *Trichinella* sp. in Alberta 1979–1982. Each symbol represents one animal unless a number appears inside circle.

imals to an office of the Alberta Fish and Wildlife Division for compulsory registration. If the entire carcass was submitted, samples of tongue, masseter, diaphragm and semitendinosis muscle were collected. If only the head was brought in, portions of tongue and masseter muscles were saved. All muscle samples were submitted frozen to the Peace River Regional Veterinary Laboratory at Fairview for examination. Frozen tissues were sliced by scalpel to a thickness of approximately 2 mm and at least 2 g of each tissue was digested in a 1% pepsin 0.5% HCl solution for 1.5 hr in a 37 C incubator. Each tissue was then placed in a compressorium and viewed with a stereoscope at ×25 (Simon and Stovell, 1972, Can. J. Comp. Med. 36: 178–179). Encysted larvae and surrounding tissue were stained with Giemsa, cleared with xylene and mounted in Permount. The resulting representative mounts of larvae of *Trichinella* sp. were deposited in the National Museums of

Canada, Invertebrate collection, Ottawa, Ontario. The accession numbers are #NMCIC (P) 1983-0175 (grizzly bear) and #NMCIC (P) 1983-0176 (cougar).

Larvae of *Trichinella* sp. were recovered from 32 of 57 cougars and from one of 35 grizzly bears. From Banff National Park south to the Alberta–Montana border, 25 of 50 cougars collected were positive (Fig. 1). All seven cougars from north and east of Jasper National Park were infected. The lone cougar from the zoo was negative. All of the 28 grizzly bears collected from areas immediate to the Rocky Mountains were negative. The single positive grizzly bear came from northwestern Alberta some 380 km northeast of the Rocky Mountain range (Fig. 2).

Our results differed from other surveys from neighboring Rocky Mountain regions. Larvae of *Trichinella* sp. have been reported from 58% of grizzly bears and 55% of cougars examined in Montana, Idaho and Wyoming (Worley et al., 1974, op. cit.). In British Columbia 35% of the grizzly bears and only 10% of the cougars examined were positive (Schmitt et al., 1978, op. cit.). In these areas where grizzly bears and cougars inhabit the same immediate area, grizzly bears are more commonly infected than cougars. This was not the case in our findings, as 56% of the cougars examined from our Rocky Mountain regions were positive whereas all of the grizzly bears collected from the same area were negative. In a previous survey 60 wolves from the same mountain regions and adjacent areas were negative for larvae of *Trichinella* (Gunson and Dies, 1980, op. cit.).

Transmission of *Trichinella* sp. from animal to animal is accomplished primarily through consumption of tissue containing viable larvae (Villella, 1970, *In* Trichinosis in Man and Animals, S. E. Gould (ed.), C. C Thomas, Springfield, Illinois, pp. 19–60). Cougars feed on a wide variety of large and small wildlife species (Robinette et al., 1959, J. Wildl. Manage. 23: 261–273; Hornocker, 1970, Wildl. Monogr. 21: 1–39; Spalding and Lesowski, 1971, J. Wildl. Manage. 35: 378–381). It is suggested that rodents and lagomorphs might play an important part in the cycle as maintenance hosts (Rausch et al., 1956, J. Parasitol. 42: 259–271; Worley et al., 1974, op. cit.). In addition, cannibalism may be a major factor in the transmission of *Trichinella* in cougars. Like most carnivores, cougars feed on the carcasses of their own kind (Spalding and Lesowski, 1971, op. cit.). Decapitated and skinned carcasses of cougars left by hunters and natural mortality would leave a readily available source of meat for other cougars and small mammals.

Although grizzly bears are mainly herbivorous they commonly feed on carrion. Taking into account the high prevalence of *Trichinella* sp. in cougars observed here and the availability of their carcasses to grizzly bears, one would have assumed the latter to be infected also.

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