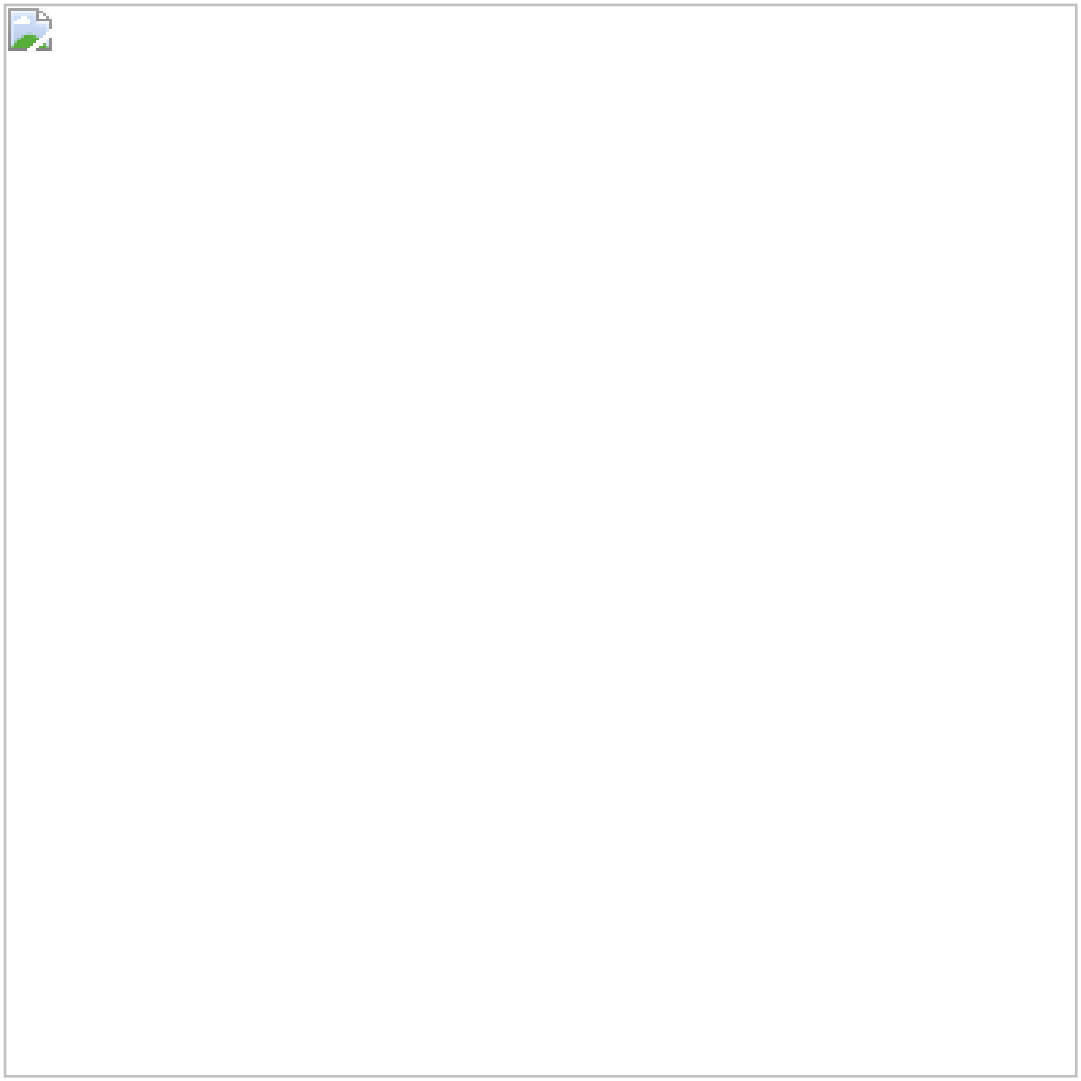

SYLVATIC TRICHINOSIS IN ALBERTA

Authors: GUNSON, JOHN R., and DIES, KEN H.

Source: Journal of Wildlife Diseases, 16(4) : 525-528

Published By: Wildlife Disease Association

URL: https://doi.org/10.7589/0090-3558-16.4.525

SYLVATIC TRICHINOSIS IN ALBERTA

JOHN R. GUNSON, Alberta Fish and Wildlife Division, 6909 116 St., Edmonton, Alberta, T6H 4P2.
KEN H. DIES, Peace River Regional Veterinary Diagnostic Laboratory, Box 197, Fairview, Alberta, T0H 1L0.

Abstract: Results of surveys for *Trichinella* sp. in several species of wildlife in Alberta suggest that infection is limited to wolves *(Canis lupus)* in northern areas of the province and maintained by a wolf/wolf transmission.

INTRODUCTION

Trichinella sp. has been reported from wildlife in northwestern North America, including Alaska,[2,15] British Columbia,[18] Montana, Idaho and Wyoming,[22,23] the Yukon and Northwest Territories,[3,4] but not from Alberta.[8,4] Human cases of trichinosis associated with wildlife sources have been diagnosed in the same areas.[5,6,7,10,11,16,17] We initiated surveys in 1975 to determine the distribution and prevalence of trichinosis in Alberta because of the relatively high rate of infection in several species of wildlife in surrounding areas.[15,18,23]

MATERIALS AND METHODS

This initial series of surveys was designed to sample carnivores from diverse ecological niches in Alberta. Three species were chosen; black bear *(Ursus americanus)* from the semi-settled, boreal Peace River area of northwestern Alberta, striped skunks *(Mephitis mephitis)* from the settled farm and rangelands of the southeast, and wolves *(Canis lupus)* from the forested western foothills and north (Fig. 1). In addition, coyotes *(Canis latrans)* were collected during wolf management programs. All specimens were obtained from ongoing predator and disease management programs of Alberta Energy and Natural Resources.

Muscle tissue, usually including portions of tongue, masseter, diaphragm and semitendinosus, were collected in the field from skunks and wolves, and in the laboratory, from bears and wolves and frozen before examination at the Peace River Regional Veterinary Diagnostic Laboratory at Fairview, Alberta. Frozen tissues were sliced by scalpel to a thickness of ≈2 mm, and at least 1 g of each tissue was digested in a 1% pepsin/0.5% HCl solution for 1.5 h in a 37 C incubator. Each tissue was then placed in a compressorium and viewed with a stereoscope at 25×.[19]

Encysted larvae and surrounding tissue were stained with Giemsa, cleared with xylene and mounted in Permount. Resulting representative mounts of *Trichinella* sp. have been deposited in the National Museums Canada, Invertebrate collection, Ottawa, Ontario; accession #NMCIC(P) 1979-1466.

RESULTS AND DISCUSSION

Larvae of *Trichinella* sp. were recovered from 12 of 217 wolves; no larvae were found in 165 black bears, 98 skunks and 27 coyotes. Positive cases in wolves were not randomly distributed within areas of collection; six were from the immediate area of Fort McMurray during winter 1977-78, five from more remote areas near Grande Prairie (from which numerous negative black bears were collected) during 1975-76 and 1977-78, and one from near High Level during 1976-77 (Fig. 1). None of 60 wolves from southwestern and western areas of the province was positive.

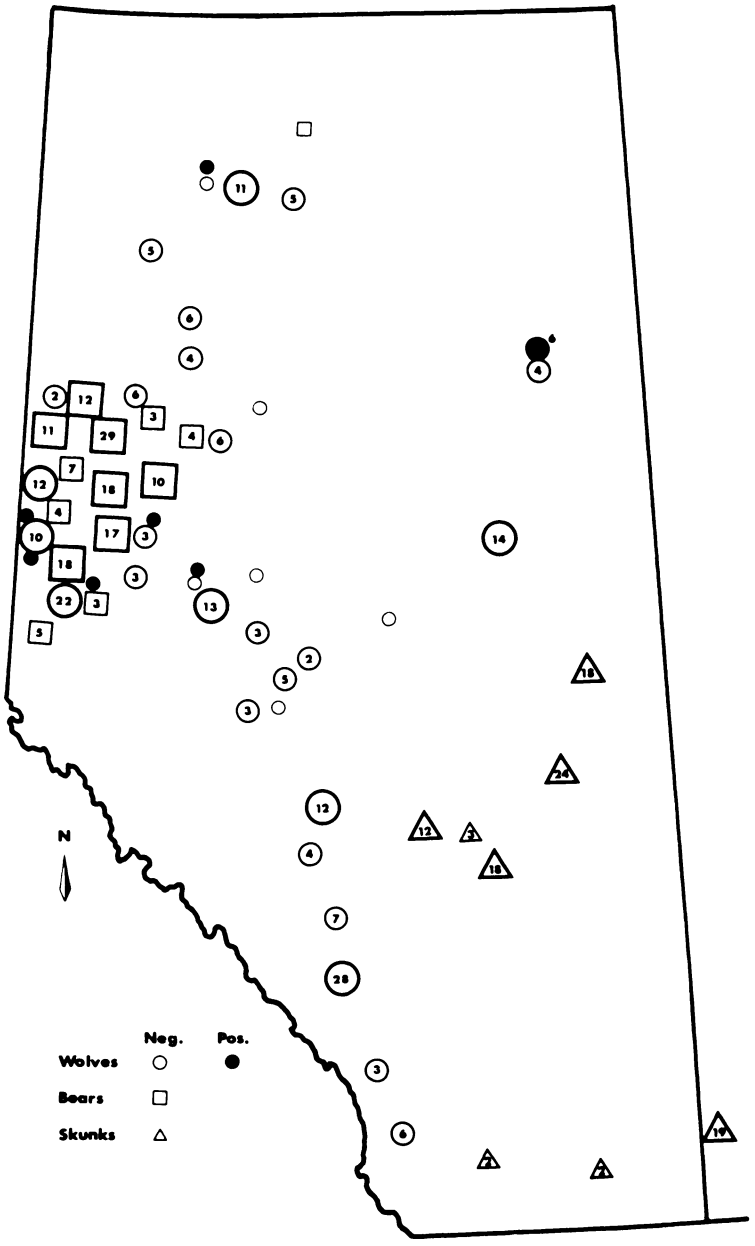

FIGURE 1. Locations of wolves, black bears and striped skunks examined for *Trichinella* in Alberta, 1975-78 (locations of 23 bears not shown, but all were from Peace River area).

All results of earlier surveys in Alberta were negative. These included 105 black bears collected in the Peace River region in 1973,[13] 28 wolves and 6 coyotes from the western and northern forests in 1973-74 [J. Hunter, Alberta Animal Health (AAH) pers. comm.], 98 wolves and 75 coyotes from the same areas during 1959-67,[8] and 5 cougars *(Felis concolor),* 2 wolverines *(Gulo gulo),* 56 lynx *(Felis lynx),* and 11 red foxes *(Vulpes vulpes)* examined at the University of Alberta since 1959 (Parasitology Collection, University of Alberta Museum of Zoology). In addition, 24 martens *(Martes americana)* from areas north of Alberta and an unknown number of black bears from east central Alberta were negative on examination at University of Alberta (J. Holmes pers. comm.). W. Harries (AAH) noted larvae of *Trichinella* sp. in a black bear collected in extreme southwestern Alberta in 1977.

The observed infection in wolves was not likely related to human-affiliated sources, despite the fact that positive wolves were taken at a dump and near townsites. *Trichinella* surveys of Canadian pork in Alberta, including an examination of 831 swine from 594 farms in 1971 [G. Summers (AAH) pers. comm.] have been negative. Only two cases in man were diagnosed during 1970-79 [imported bacon was likely source in one case; other source is unknown (F. White pers. comm.)]. Reservoirs of *Trichinella* in swine and small mammals probably do not exist in settled areas of Alberta since all skunks were negative. Striped skunks scavenge extensively at dumps and other human-related facilities, are highly omnivorous and opportunistic, prey on various small mammals; hence they are hosts of many, diverse parasites[21] including *T. spiralis.*[1,18,23]

Considering the lack of infection in skunks, bears and wolves in western Alberta, sylvatic infection of *Trichinella* sp. in Alberta may be confined currently to wolves in northern Alberta, an extension of infection in wolves of the more northern NWT and Yukon Territories.[4] Wolves are potentially highly mobile[9,12] and a southerly movement of 670 km from the NWT into Alberta was recorded in 1977.[20] Larvae from 1 of the 12 wolves were identified as the arctic *Trichinella* strain (ATS)[14] on the basis of longevity and viability following ≃18 months freezing at -10 C. Survival of *Trichinella* in northern Alberta may depend on wolf to wolf transmission, as wolves feed on carcasses of their own species.[12]

Acknowledgements

Thanks are extended to P. Cole, W. Johnson and W. Wynnyk for collections of tissues in the field, to personnel of the Alberta Fish and Wildlife Division, Peace River Region for carcasses and to M. Bartholet for assistance in the laboratory.

LITERATURE CITED

1. BABERO, B.B. 1960. A survey of parasitism in skunks *(Mephitis mephitis)* in Louisiana, with observations on pathological damages due to helminthiasis. J. Parasit. 46 (Supp.) p. 26.
2. BRANDLY, P.J. and R. RAUSCH. 1950. A preliminary note on trichinosis investigations in Alaska. Arctic 3: 105-107.
3. CHOQUETTE, L.P.E. and G.G. GIBSON. 1969. Helminths of the grizzly bear, *Ursus arctos* L., in northern Canada. Can. J. Zool. 47: 167-170.
4. ——, ——, E. KUYT and A.M. PEARSON. 1973. Helminths of wolves, *Canis lupus* L., in the Yukon and Northwest Territories. Can. J. Zool. 51: 1087-1091.
5. COFFEY, J.E. and F.W. WIGLESWORTH. 1956. Trichinosis in Canadian Eskimos. Can. Med. Ass. J. 75: 295-299.

6. DAVIES, L.E.C. and T.W.M. CAMERON. 1961. Trichinosis in the Northwest Territories. Med. Serv. J. Can. 17: 99-104.
7. EMSON, H.E., M.A. BALTZAN and H.E. WIENS. 1972. Trichinosis in Saskatchewan: an outbreak due to infected bear meat. Can. Med. Ass. J. 106: 897-898.
8. HOLMES, J.C. and R. PODESTA. 1968. The helminths of wolves and coyotes from the forested regions of Canada. Can. J. Zool. 46: 1193-1204.
9. KUYT, E. 1962. Movements of young wolves in the Northwest Territories of Canada. J. Mammal. 43: 270-271.
10. MARGOLIS, H.S., J.P. MIDDAUGH and R.D. BURGESS. 1979. Arctic trichinosis: two Alaskan outbreaks from walrus meat. J. Inf. Dis. 139: 102-105.
11. MAYNARD, J.E. and F.P. PAULS. 1962. Trichinosis in Alaska: a review and report of two outbreaks due to bear meat with observations on serodiagnosis and skin testing. Am. J. Hyg. 76: 252-261.
12. MECH, L.D. 1970. *The Wolf: The Ecology and Behaviour of an Endangered Species.* The Natural History Press, Garden City, New York. 384 pp.
13. PARKER, P.J. 1973. A search for *Trichinella spiralis* in black bears in Alberta. Alta. Fish and Wildl. Div. Prog. Rep. 3 pp.
14. RAUSCH, R. 1970. Trichinosis in the Arctic. In: *Trichinosis in Man and Animals.* S.E. Gould, Ed. C.C. Thomas, Springfield, Ill.
15. ——, B.B. BABERO, R.V. RAUSCH and E.L. SCHILLER. 1956. Studies on the helminth fauna of Alaska. XXVII. The occurrence of larvae of *Trichinella spiralis* in Alaskan mammals. J. Parasit. 42: 259-271.
16. SCHMITT, N., E.J. BOWMER, P.C. SIMON, A.S. ARNEIL and D.A. CLARK. 1972. Trichinosis from bear meat and adulterated pork products: a major outbreak in British Columbia, 1971. Can. Med. Ass. J. 107: 1087-1091.
17. ——, J.M. SAVILLE, L. FRIIS, and P.L. STOVELL. 1976. Trichinosis in British Columbia wildlife. Can. J. Publ. Hlth. 67: 21-24.
18. ——, ——, J.A. GREENWAY, P.L. STOVELL, L. FRIIS and L. HOLE. 1978. Sylvatic trichinosis in British Columbia. Publ. Hlth. Rep. 190: 189-193.
19. SIMON, P.C. and P.L. STOVELL. 1972. A digest compressorium technique for detection of *Trichinella spiralis* larvae. Can. J. Comp. Med. 36: 178-179.
20. VANCAMP, J. and R. GLUCKIE. 1979. A record long-distance move by a wolf *(Canis lupus).* J. Mammal. 60: 236-237.
21. VERTS, B.J. 1967. *The Biology of the Striped Skunk.* University of Illinois Press, Urbana. 218 pp.
22. WINTERS, J.B. 1969. Trichiniases in Montana mountain lions. Bull. Wildl. Dis. Ass. 5: 400.
23. WORLEY, D.E., J.C. FOX, J.B. WINTERS and K.R. GREER. 1972. Prevalence and distribution of *Trichinella spiralis* in carnivorous mammals in the United States Northern Rocky Mountain region. In: Proc. Third Int. Conf. Trichinellosis. Miami Beach, Florida.

Received for publication 15 January 1980