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PARASITES OF BLACK BEARS OF THE LAKE SUPERIOR REGION

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Abstract: Parasites collected from free-ranging black bears, *Ursus americanus* Pallas, 1780, from northeastern Minnesota or northern Michigan include the dog tick, *Dermacentor variabilis* (Say, 1821), the winter tick, *D. albipictus* (Packard, 1869), a louse, *Trichodectes pinguis euarctidos* Hopkins, 1954, an ascarid worm, *Baylisascaris transfuga* (Rudolphi, 1819), a filarial worm, *Dirofilaria ursi* Yamaguti, 1941, taeniid tapeworms, and unidentified fleas. The broad fish tapeworm, *Diphyllobothrium latum* (Linnaeus, 1785), was reported to be common in man and black bears in northeastern Minnesota earlier in this century, but now it apparently is uncommon or absent in both species. *Trichinella spiralis* (Owen, 1835) recently was found in black bears in northern Wisconsin. Cannibalism of carcasses is common in the black bear and may play a major role in the transmission of *Trichinella*.

INTRODUCTION

This paper reports parasites collected during population studies of black bears in Upper Michigan during 1968 and in northeastern Minnesota from 1969 through 1974. Little is known of the parasites of black bears (*Ursus americanus* Pallas, 1780) from the central portion of North America. Published literature from that area apparently is limited to reports of filarial worms, *Dirofilaria ursi* Yamaguti, 1941, from southern Ontario^{1,2} and a report of broad fish tapeworms, *Diphyllobothrium latum* (Linnaeus, 1758), from northern Minnesota.¹⁸

MATERIALS AND METHODS

Ectoparasites were collected from 13 bears live-trapped in Michigan and Minnesota. Additionally, 962 fecal droppings and nine intestinal tracts from bears in Minnesota were examined macroscopically for helminths. Arthropods were identified by Edwin F. Cook or Roger Price and deposited in the collection of the Department of Entomology at the University of Minnesota at St. Paul. Helminths were identified by Henry Griffiths and deposited in the collection

of the Animal Parasitology Institute at Beltsville, Maryland.

RESULTS AND DISCUSSION

Dog ticks, *Dermacentor variabilis* (Say, 1821), were collected from bears in both Michigan and Minnesota. In Minnesota, 10 (56%) of 18 bears examined between 28 May and 24 July carried from 1 to approximately 65 *D. variabilis*, but only one bear of 22 captured between 2 August and 11 October and none of eight adults in dens in March carried *D. variabilis*. However, one of the eight adults examined in March had at least 30 winter ticks, *D. albipictus* (Packard, 1869). Two 2-month-old cubs in the den with the infested bear were free of ticks. *D. variabilis* previously was reported from a black bear in Nova Scotia.⁴ Soulsby¹⁷ listed bears (species not given) as hosts for *D. albipictus* but did not indicate the source of the information.

An adult male bear killed near Marquette, Michigan, on 20 June 1968 carried lice (*Trichodectes pinguis euarctidos* Hopkins, 1954), ticks (*Dermacentor variabilis*), and numerous fleas. The latter were lost before they could be identified to genus. Previous reports of

fleas on bears in North America have been limited to the northwestern portion of the continent,^{6,16} with the southeasternmost records being from Montana.^{8,9,20} No fleas were reported from 306 wild black bears in New York.¹⁰ Lice, *Trichodectes pinguis euarctidos*, apparently are more widespread, having been reported from black bears in New York,¹⁰ Ontario,⁵ British Columbia,⁵ and Montana.^{9,20}

Adult specimens of a filarial worm, *Dirofilaria ursi* Yamaguti, 1941, were found in the connective tissue and peritoneal cavities of bears from Michigan and Minnesota. Microfilariae (larvae of *Dirofilaria*) were found in the blood of each of 47 bears examined in Minnesota from April through September (L. L. Rogers and U. S. Seal, unpublished manuscript). *D. ursi* is found in bears throughout the northern United States^{9,10,14,20} and Canada.^{1,2,3,16}

Seven intestinal tracts were examined in Minnesota in the summer. Five of them contained one to four ascarid worms, *Baylisascaris transfuga* (Rudolphi, 1819). This parasite is found throughout the range of the black bear in Canada and the northern United States, although it apparently has not been reported from the southern United States.¹⁰ Two of the tracts contained two to four taeniid cestodes. Due to poor preservation and the small number of specimens, positive identifications could not be made; however, the cestodes from one of the tracts tentatively were identified as *Multiceps serialis* Gervais, 1847, which apparently has not been reported previously from a bear.¹⁰ Carcasses of the usual intermediate host of *M. serialis* in Minnesota, the snowshoe hare (*Lepus americanus* Erxleben, 1777),¹¹ were numerous along roadsides during this study and were observed to be scavenged by bears. Previous reports of taeniid cestodes in bears in North America have been limited to the northwestern portion of the continent with the southeasternmost records being from Colorado⁷ and Montana.^{9,20}

Two intestinal tracts from denning bears that died on 24 November and 20 March were examined. Both appeared to be free of helminths. Rausch^{18,14} and Choquette *et al.*³ presented evidence that intestinal helminths that derive nourishment from ingested materials are lost prior to denning. In this study, a free-ranging black bear was observed to pass two adult *B. transfuga* on 9 September, ten days before it denned. Two additional specimens of *B. transfuga* were found in droppings from other bears on 6 and 16 October. These were the only helminths found in 962 droppings examined between April and November.

The absence of strobilae of *Dipyllobothrium* Cobbold, 1858, in fecal droppings was striking because bears infected with this genus are known to pass large numbers of strobilae in autumn^{18,14} and because *D. latum* was reported as common in man and black bears in northeastern Minnesota during the early 1900's following its introduction by immigrating Finlanders.^{12,18} Subsequent improvements in sewage systems and proper cooking of fish, an intermediate host of *D. latum*, apparently led to a decline in the incidence of this cestode in man;¹² no case of *D. latum* infection has been reported to the Minnesota Department of Public Health in the last 35 years.¹ Apparently *Dipyllobothrium* also has declined in bears.

Zimmerman² recently found *Trichinella spiralis* (Owen, 1835) in 6 (3.8%) of 163 diaphragms of black bears in northern Wisconsin, demonstrating that trichinous bears are present in the Lake Superior Region. There has been considerable discussion concerning the means by which *Trichinella* infection is perpetuated in bear populations.^{10,15,19} Observations in this study give support to the hypothesis that cannibalism of carcasses is a major factor in the transmission of *Trichinella* in bears. Twelve (92%) of 13 carcasses of black bears were cannibalized, often by more than one bear.

[1] Finkelstein, S., 1974, personal communication.

[2] Zimmerman, W. J., 1974, personal communication.

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