A Survey of Grey Foxes (UROCYON CINEREOARGENTEUS) for ECHINOCOCCUS MULTILOCULARIS in Southern Illinois

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ABSTRACT

Six hundred seven *Urocyon cinereoargenteus* collected in Union, Williamson, Johnson, and Jackson counties, southern Illinois between June 1955 and October 1963 were examined for *Echinococcus multilocularis*. None were found infected with this cestode.

INTRODUCTION

The report of Rausch (1956) of *Echinococcus multilocularis* Leuckart, 1863, in the arctic fox, *Alopex lagopus* L., and the red fox, *Vulpes vulpes* L., on the mainland of Alaska constitutes the first published record of the etiological agent of alveolar hydatid disease on the North American continent. Rausch (1956) predicted the establishment of this cestode in southern Canada and the contiguous United States, pointing out that sylvatic infection may be expected to occur whenever the predator-prey relationships existing between foxes and microtine rodents favor completion of the life cycle.

The first report of *E. multilocularis* on the Canadian mainland occurred 6 years later when Choquett *et al.* (1962) reported this species in *A. lagopus* from Eskimo Point on the western shore of Hudson Bay, Northwest Territories. Subsequent reports of *E. multilocularis* in carnivores and rodents from Canada have been numerous. Hnatiuk (1966) found the multilocular hydated stage of *E. multilocularis* in a meadow vole, *Microtus pennsylvanicus* Ord., near Saskatoon, Saskatchewan and in 1969 found the adult stage of *V. vulpes* in Saskatchewan. *Leiby et al.* (1969) found deer mice, *Peromyscus maniculatus* (Wagner) near Stony Mountain and Argyle, northwest of Winnipeg to be infected with the larval stage of *E. multilocularis*. Lee (1969) also reported this cestode in *P. maniculatus,* 10 miles north of this area at Gunton. Baron (1970) reported this tapeworm in *V. vulpes* from southern Manitoba. Recently, Samuel *et al.* (1978) reported it in coyotes, *Canis latrans* Say, and *V. vulpes* from southeastern Manitoba.

The first report of *E. multilocularis* in the contiguous United States was that of Leiby and Olsen (1964), who recorded this cestode from *V. vulpes* in North Dakota. The following year, Leiby (1965) found *M. pennsylvanicus* and *P. maniculatus* from North Dakota infected with the alveolar larval stage of this parasite. Leiby (1966) reported it from *V. vulpes, M. pennsylvanicus, P. maniculatus* and feral house mice, *Mus musculus* L. in North Dakota. The finding of this parasite in *P. maniculatus* and *V. vulpes* in Minnesota by Carney and Leiby (1968) constituted an eastern and southern extension of the known geographic range of this cestode in the contiguous United States. Leiby *et al.* (1970) reported adult cestodes in *V. vulpes* from Iowa, Minnesota, North Dakota, and South Dakota and in *C. latrans* in Iowa, Montana, North Dakota, and South Dakota. They also found the larval stage of this cestode in *P. maniculatus* from Iowa, Minnesota, Montana, North Dakota, and South Dakota, in *M. pennsylvanicus* from Iowa and North Dakota, and in *M. musculus* from North Dakota. Iowa, Montana, and South Dakota represented extension of this cestode's known geographic range in the contiguous United States.

Although several extensive studies on gastrointestinal parasites in wild canid populations have been conducted in North America, only a paucity of studies have been conducted on the gastrointestinal parasites of grey foxes. To our knowledge, natural infections of *E. multilocularis* have not been reported for *U. cinereoargenteus*. Because conditions for completion of the life cycle of *E. multilocularis* are equally favorable in southern Illinois and because Rausch (1958) has successfully infected *U. cinereoargenteus* experimentally with *E. multilocularis,* the data presented in this report deals with the examination of 607 *U. cinereoargenteus* collected over an 8-year period.

MATERIALS AND METHODS

Six hundred and seven (375 males and 232 females) grey foxes which included 11 animals in 1955, 13 in 1956, 24 in 1957, 4 in 1958, 21 in 1959, 103 in 1960, 290 in 1961, 72 in 1962, and 69 in 1963, were either shot or trapped in Union, Williamson, Johnson, and Jackson counties, southern Illinois, between June 1955, and October 1963.

The small intestine of each fox was opened, the lining scraped, and the contents and scrapings examined under a dissecting microscope for the presence of *Echinococcus multilocularis*. Other cestodes were fixed in alcohol-formalin-acetic acid (AFA) for future identification.

RESULTS AND DISCUSSION

Of the 607 grey foxes collected over an 8-year period from the four counties in southern Illinois, none were found infected with *E. multilocularis*. Examination of other carnivores from this area (unpublished data) has also not revealed the presence of this cestode. Studies are now in progress to examine *P. maniculatus* for the presence of the alveolar hydated larval stage, as late fall food habit studies of grey foxes from southern Illinois by Pils and Klimstra (1975) reveal a high percent frequency of occurrence of rodents (62%) in the diet of this carnivore.

As pointed out by Leiby *et al.* (1970), the widespread sylvatic occurrence of this cestode in the north central states is significant in zoonotic public health. While the presence of this tapeworm in grey foxes from southern Illinois has not been established by the present study, personnel who handle carcasses of foxes are warned to take precautions to avoid contamination with the eggs of this parasite.

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