

# DIROFILARIASIS IN VULPES VULPES FROM SOUTHERN ILLINOIS

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## ABSTRACT

*Dirofilaria immitis* was observed in the hearts of 5 (3.4%) of 145 red foxes (*Vulpes vulpes*) taken in Union, Williamson, and Jackson counties, southern Illinois between January, 1961 and December, 1963. Four (5.6%) of 71 males and 1 (1.4%) of 74 females were infected. Parasitic burdens ranged from 2 to 12 worms per infection with worms being much smaller than those found in domestic dogs in these areas. None of the females contained either developing embryos or microfilariae.

## INTRODUCTION

A search of the literature reveals that *Dirofilaria immitis* (Leidy 1856), the canine heartworm, has been reported in red foxes (*Vulpes vulpes*) from several localities in the contiguous United States. Erickson (1944) found no evidence of canine heartworms in 120 foxes from Minnesota. He did, however, list the first definite record of *D. immitis* in a red fox from New York. Likewise, Walton *et al.* (1963) found the blood of 2 red foxes from Fort Stewart, Georgia negative for microfilariae. Schlotthauer (1964) detected *D. immitis* in the right ventricle of the heart of 4 of 83 red foxes in Minnesota. Hirth and Nielsen (1966) observed a red fox in Connecticut with 40 young heartworms in the right ventricle and pulmonary artery, and many more in smaller vessels of the lungs. Stuhlt and Youatt (1972) recorded heartworms in the right ventricles, or pulmonary arteries, or both of 11 of 39 red foxes in Michigan. Monson *et al.* (1973) reported 2 of 551 red foxes captured in Wayne and Niagara counties, New York, infected with adult female *D. immitis*. The females recovered from the red fox of Niagara county were sexually mature and actively producing microfilariae, while those recovered from the Wayne county specimen contained developing ova but no microfilariae. Kazacos (1977) recorded 2 of 7 red foxes from Lake, LaGrange, and Tippecanoe counties in Indiana infected with adult *D. immitis*. However, none of the female worms contained developing embryos. Later, Kazacos and Edberg (1979) found 3 of 113 red foxes from Indiana infected with canine heartworm. None of the female worms contained developing embryos or microfilariae.

Although *D. immitis* has been known to occur in dogs in Illinois for some time (Marquardt and Fabian, 1966), the recent detection of this nematode by

Hubert *et al.* (1980) in 8 (3.6%) of 225 *V. vulpes* collected in Bond, Clinton, DeKalb, Edgar, Ford, Jasper, Moultrie, and Richland counties, Illinois constitutes the first published record of this parasite in red foxes from this state.

The present investigation represents the results of a survey of red foxes from counties in southern Illinois for the presence of the adult stage of this filariid nematode.

## MATERIALS AND METHODS

One hundred and forty-five red foxes were either trapped or shot in Union, Williamson and Jackson counties, southern Illinois between January, 1961 and December, 1963. Subsequent to removal of the heart and lungs, the atria, ventricles, and pulmonary arteries were incised and examined for *D. immitis*. The lungs were likewise incised, washed, and the filtered sediment examined with a dissection microscope. Specimens of *D. immitis* were counted, measured, and the female worms examined for developing embryos and microfilariae. The blood, however, was not examined.

## RESULTS

Of the 145 foxes studied, specimens of *D. immitis* were recovered from the right ventricle of 5 (3.4%) foxes. This included four (5.6%) of 71 males and 1 (1.4%) of 74 females. Parasitic burdens ranged from 2 to 12 worms per infection with worms being much smaller than those recovered from domestic dogs in these counties. None of the female worms contained either developing embryos or microfilariae.

## DISCUSSION

Recently, Hubert *et al.* (1980) reported a prevalence of 8 (3.6%) of 225 *V. vulpes*, collected in Bond, Clinton, DeKalb, Edgar, Ford, Jasper, Moultrie, and Richland counties, Illinois between December, 1978 and January, 1979, infected with *D. immitis*. While our investigation conducted between January, 1961 and December, 1963 is several years earlier and restricted to three counties located within the southern boundary of the state, a prevalence of 5 (3.4%) of 145 red foxes infected with canine heartworm concurs with that reported by Hubert *et al.* (1980).

The low prevalence of infection suggests that *V. vulpes* is probably an incidental host and does not represent a serious threat as a source of *D. immitis* for dogs in Illinois. However, further studies are warranted to update these data and to determine whether red foxes have a role in the epizootiology of *D. immitis* infections in this area. To our knowledge, the viability of this filariid nematode in red foxes has not been tested. In concurrence with Walton *et al.* (1963), Franson *et al.* (1976), Crowell *et al.* (1977), and Hubert *et al.* (1980), experimental cross-transmission of *D. immitis* between wild carnivores and dogs is warranted to ascertain the possibility of the former in serving as suitable reservoir hosts.

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