

Dirofilaria immitis in the Dingo (*Canis familiaris dingo*) in a Tropical Region of the Northern Territory, Australia

Authors: Starr, T. W., and Mulley, R. C.

Source: Journal of Wildlife Diseases, 24(1) : 164-165

Published By: Wildlife Disease Association

URL: <https://doi.org/10.7589/0090-3558-24.1.164>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

***Dirofilaria immitis* in the Dingo (*Canis familiaris dingo*) in a Tropical Region of the Northern Territory, Australia**

T. W. Starr¹ and R. C. Mulley,² ¹ Ban Ban Springs Station, via Adelaide River, 5783, Northern Territory, Australia; ² Department of Veterinary Clinical Studies, The University of Sydney, Private Mailbag 3, Camden, 2570, New South Wales, Australia

ABSTRACT: The heart and lungs from 32 adult dingoes (*Canis familiaris dingo*) were examined for canine heartworm (*Dirofilaria immitis*) infection. Eighteen of 32 (56%) samples were infected, with intensity of infection ranging from 1 to 31 worms per animal. Seven of 18 (39%) infections were single sex infections. Large numbers of circulating microfilariae were present in blood from all dingoes infected with both sexes of worms.

Key words: Dingo, *Canis familiaris dingo*, heartworm, *Dirofilaria immitis*, survey.

Dirofilaria immitis is an important nematode parasite of domestic dogs (Kelly, 1978). Infections have been reported also in many species of wild canids including coyotes (*Canis latrans*) by Custer and Pence (1981), cape hunting dogs (*Lycaen pictus*) by Loomis and Lee (1984), gray foxes (*Urocyon cinereoargenteus*) by Hubert et al. (1982), red foxes (*Vulpes vulpes*) by Mulley and Starr (1984), and red wolves (*Canis rufus*) by Custer and Pence (1981). It has been reported infrequently also in a range of other mammals including domestic cats, horses and marine mammals (Kelly, 1978) and human beings (Merril et al., 1980).

Dirofilaria immitis occurs in dingoes (*Canis familiaris dingo*) in Australia (Kelly, 1978), but there are no reports on its prevalence. This paper reports the prevalence of canine heartworm in a sample of dingoes from a monsoonal region of the Northern Territory, Australia.

Thirty-two adult dingoes (19 male and 13 female) were shot on Ban Ban Springs Station (latitude 13°30'S, longitude 132°0'E), in the Northern Territory, Australia, over a 2-yr period as part of a dingo control program.

Immediately after collection of dingoes, the heart and lungs were removed and

examined for the presence of heartworms. Blood samples were collected also and examined for the presence of microfilariae using a filter technique described by Wylie (1970). There was no attempt to accurately age the animals sampled, although two were known to be ≤ 1 yr old based on collection date and size of the animal.

Eighteen of 32 (56%) dingoes examined were infected with *D. immitis*. Representative specimens of *D. immitis* were deposited in the South Australian Museum (North Terrace, Adelaide, South Australia, 5000, Australia; accession number V 4065). The prevalence of infection in female dingoes was 69% (9/13) and in males 47% (9/19). The intensity of infection ranged from 1 to 31 with a mean of 9.2 nematodes per host. Seven of 18 (39%) dingoes had single sex infections of heartworms and in all cases female worms were present. Patent infections, as exemplified by the presence of microfilariae in circulating blood, were detected in all dingoes infected with both sexes of *D. immitis*.

Ten of 18 infected dingoes (56%) had heartworms in the pulmonary artery and right ventricle; 3/18 dingoes (17%) had heartworms in the pulmonary artery only; 1/18 (6%) had heartworms in the right ventricle only; 3/18 (17%) had heartworms in the pulmonary artery, right ventricle and the pulmonary arterial tree of the lungs; and 1/18 (6%) had heartworms only in the pulmonary arterial tree of the lungs. A total of 117 worms was collected from 18 infected dingoes. Twenty-seven of the 117 worms (23%) recovered were males.

The prevalence of infection in the wild population of dingoes in this area of the Northern Territory is high, but the impact of infection in terms of morbidity and

mortality within the population is not known. The area sampled is part of an 1,800 km² property which is geographically isolated from the domestic dog population of Darwin, approximately 140 km to the north. There have been no domestic dogs resident on the property for at least 20 yr.

In all cases where circulating microfilariae were sought they were found in large numbers. Calvert and Losonsky (1985) reported that circulating microfilariae are not present in 10–67% of all canine heartworm infections of domestic dogs because of the host immune response. The dingo appears to be a suitable host for *D. immitis* based on the high prevalence of heartworms and patent infections in our study.

Custer and Pence (1981) found a 1:1 male to female ratio of heartworms in wild canids. However, in our study only 23% of worms recovered were male and in all individual cases where both sexes of the nematode were present the number of females was greater than the number of males.

The occurrence of heartworms in the pulmonary arterial tree of the lung in dingoes is consistent with the findings of Custer and Pence (1981) in coyotes and red wolves in the United States. In that study the location of nematodes in the lungs was usually associated with intensities of >15; this was also the case in our study. However, the one dingo that had nematodes present only in the lungs had an intensity of only two heartworms. There was no evidence of a pathological response in any of the dingoes examined, although hypertrophy of the right ventricle and extensive vascular sclerosis of the pulmonary artery is sometimes observed in domestic dogs and red foxes (Hennigan and Ferguson, 1957; Adcock, 1961; Hirth and Nielson,

1966). This was probably due to the low intensities of heartworms encountered in dingoes compared to those reported in other species.

LITERATURE CITED

- ADCOCK, J. L. 1961. Pulmonary arterial lesions in canine dirofilariasis. *American Journal of Veterinary Research* 22: 655–662.
- CALVERT, C. A., AND J. M. LOSONSKY. 1985. Pneumonitis associated with occult heart worm disease in dogs. *Journal of the American Veterinary Medical Association* 186: 1097–1098.
- CUSTER, J. W., AND D. B. PENCE. 1981. Dirofilariasis in wild canids from the gulf coastal prairies of Texas and Louisiana, U.S.A. *Veterinary Parasitology* 8: 71–82.
- HENNIGAN, G. R., AND R. W. FERGUSON. 1957. Pulmonary vascular sclerosis as a result of *Dirofilaria immitis* infection in dogs. *Journal of the American Veterinary Medical Association* 131: 336–340.
- HIRTH, R. S., AND S. W. NIELSON. 1966. Vascular lesions of *Dirofilaria immitis* in the red fox. *Journal of the American Veterinary Medical Association* 149: 915–919.
- HUBERT, G. F., T. J. KICK, AND R. D. ANDREWS. 1982. Dirofilaria in gray (*Urocyon cinereoargenteus*) in Illinois, U.S.A. *Transcript III, State Academy of Science* 75: 1–2.
- KELLY, J. D. 1978. Refresher course in canine heartworm disease. Post Graduate Committee in Veterinary Science, University of Sydney, Sydney, Australia, Proceedings Number 40, pp. 5–34.
- LOOMIS, M. R., AND C. D. LEE. 1984. Canine heartworm infection in African cape hunting dogs (*Lycan pictus*). *Annual Proceedings of the American Zoo Veterinarians* 1984: 137.
- MERRILL, J. R., J. OTIS, W. D. LOGAN, AND M. R. DAVIS. 1980. The dog heartworm *Dirofilaria immitis* in man. An epidemic pending or in progress. *Journal of the American Medical Association* 243: 1066–1068.
- MULLEY, R. C., AND T. W. STARR. 1984. *Dirofilaria immitis* in red foxes (*Vulpes vulpes*) in an endemic area near Sydney, Australia. *Journal of Wildlife Diseases* 20: 152–153.
- WYLIE, J. P. 1970. Detection of microfilariae by a filter technique. *Journal of the American Veterinary Medical Association* 156: 1403–1405.

Received for publication 27 July 1987.