

A CASE OF HEARTWORM (*DIROFILARIA IMMITIS*) IN AN IMPORTED DOG AND A REPORT OF THE OCCURRENCE OF CANINE MICROFILARIAE IN THE REPUBLIC OF SOUTH AFRICA

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ABSTRACT

A dog imported from Australia had microfilariae of *Dirofilaria immitis* in its blood. This is the second report of these microfilariae in dogs imported into the Republic of South Africa. The treatment of this dog is described. Other filarial worms which are known to occur in the RSA are discussed.

Key words: Microfilariae, canines, *Dirofilaria immitis*, *Dirofilaria repens*, *Dipetalonema reconditum*, *Dipetalonema dracunculoides*

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The heartworm, *Dirofilaria immitis*, occurs in the right ventricle and pulmonary artery of the dog and various other carnivores. It has also been recorded in various primates, including man⁴. It is found in temperate, but is more common in tropical countries, such as the Far East, islands in the Pacific, Australia, North and South America; in Europe it is present in Italy, Spain and Portugal⁸. It is not common in Africa, but has been recorded in Kenya³ and in Malawi². According to Cruz e Silva¹ Travassos Dias recorded *Dirofilaria immitis* in a dog in Beira, Mozambique. It has not been found in dogs bred and reared in the Republic of South Africa (R.S.A.), but microfilariae were found in the blood of a dog imported from Kenya¹⁰.

Numerous species of mosquitoes of the genera *Aedes*, *Anopheles*, *Culex* and *Mansonia* which act as intermediate hosts, acquire infection when they take a blood meal. Infective larvae develop in 16 to 20 d and are transmitted to dogs and

other definitive hosts when the mosquito feeds on them. In view of the fact that dogs, which are family pets, frequently accompany their owners when they move from one country to another and that this helminth utilises a wide range of mosquitoes as intermediate hosts, it is possible that it could establish itself in the R.S.A.

The purpose of this paper is to report a further positive identification of heartworm and to document the morphological features of other known canine filarids in the R.S.A.

A 5 year-old Alsation crossbred bitch was imported from Brisbane, Australia, on 21 January 1988. According to the owner, she had been or was being treated for a microfilarial infestation prior to being boarded before departure. A health certificate was issued at the same time but no mention was made of *Dirofilaria immitis*. Six months later, she was brought to a veterinary clinic as her behaviour was slightly abnormal and she had not been eating normally for 2 d. Clinically no abnormality was found, but as a blood smear showed a raised eosinophil count, the dog was dosed with nitroscanate (Lopatol, Ciba-Geigy). Blood was collected for examination for microfilaria by Knott's technique (one ml blood is mixed

with 9 ml 2% formalin to luke it. Prior to examination, the specimen is centrifuged, the supernatant decanted and the sediment resuspended in distilled water. After centrifugation and decantation the sediment is examined for microfilariae. The specimen may be stained by the addition of a drop of aqueous 1% methylene blue). The identification of the microfilariae as *Dirofilaria immitis* was confirmed by J.R. Georgi (Cornell University, Ithaca, N.Y. USA).

One month later the dog was treated with Ripercol-L (Jansen) (10 mg kg⁻¹ per os daily for 14 d. No microfilariae were subsequently seen in a hanging drop of blood, but microfilariae were present in blood examined by Knott's technique. The dog was then treated with thiacetarsamide sodium (Caparsolate, Abbotts Laboratories), 0,22 ml kg⁻¹ live mass twice daily for 2 d by slow intravenous injection. Eight hours after the initial treatment, the dog's lips were swollen and she was treated with antihistamine and prednisolone. Prior to the initial treatment with thiacetarsamide, blood was formalinised for examination by Knott's technique when 240 microfilariae were found in one ml blood. This procedure was repeated on 15 February 1989 when there were 110 microfilariae in one ml blood and the bitch was treated with ivermectin (Ivomec, Logos) at 0,4 mg kg⁻¹ per os to destroy the microfilariae. There were no side-effects. No microfilariae were present in formalinised blood collected 2 months after treatment.

The microfilariae reported on in this paper were collected by Knott's technique as described above. The parasites were not stained and were examined with the aid of a compound microscope using 40 x and 100 x objectives. Their length and width were determined by means of a calibrated graticule.

The microfilariae of *Dirofilaria immitis* are unsheathed with a total length of 286-340 µm and a width of 6-7 µm⁴. The anterior end is tapered and the tail is straight⁴. The intermediate hosts of *Dirofilaria repens* are mosquitoes of the genera *Aedes*, *Anopheles* and *Mansonia*. The adults occur in subcutaneous connective tissue and although they may

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cause nodules, there are often no clinical signs⁴. Autochthonous infections have been found in a dog in Empangeni and a cat in Durban. Microfilariae of this filarid were found in the blood of an imported dog from the United States via Nigeria. (Verster, unpublished data).

The unsheathed microfilariae of *Dirofilaria repens* are 268-360 µm long and 5-8 µm wide⁴. This filarid occurs in the subcutaneous tissues in dogs, cats and various other carnivores. It occurs in southern Europe (Italy, France, Spain, Portugal), India, Sri Lanka, south east Asia and the USSR, but not in North America and Australia⁴. Heisch et al.³ found microfilariae of this species in 2/12 dogs, 19/24 cats and 8/9 genets on Pate Island off the Kenyan coast and according to Levine⁴, Van Veen recorded microfilariae in 9% of 188 dogs from northern Nigeria.

The microfilariae of *Dipetalonema reconditum* are unsheathed from 246 to 292 µm long and 5,2 µm wide⁴. According to Sloss & Kemp⁷ they are 269-283 µm long and 4,3-4,8 µm wide. Anteriorly the sides are parallel and the tail is curved, like a button hook⁴. Some of these microfilariae have a large, refractile structure (Innenkörper) near the junction of the middle and posterior thirds of the body⁴.

The adults of this nematode occur in the subcutaneous connective tissue of dogs⁵. It is present in Europe, North and South America, Hawaii, New Zealand and Kenya⁴. The intermediate hosts of

this helminth are fleas, *Ctenocephalides canis* and *Ctenocephalides felis*, and the louse, *Heterodoxus spiniger*⁶. *Dipetalonema reconditum* is non-pathogenic in dogs⁴.

In the R.S.A., microfilariae of *Dipetalonema reconditum* are the most common microfilariae seen in the blood of dogs and have been recorded in all 4 provinces. They have also been identified in blood from a dog in Namibia. Van Heerden⁹ reported microfilariae of this helminth in the blood of 6 out of 13 captive wild dogs (*Lycaon pictus*). These microfilariae were also present in the blood of 12/13 wild dogs from the Kruger National Park (Verster, unpublished data). Adult females and one adult male were also recovered from the subcutaneous connective tissue of an animal that died of unknown causes.

The microfilariae of *Dipetalonema dracunculoides* are the smallest ones recovered in this survey. They are unsheathed, 189-230 µm long and 5-6 µm wide. This filarid occurs in the peritoneal cavity of dogs as well as spotted hyaena (*Crocuta crocuta*), aardwolf (*Proteles cristata*) and the fox (*Vulpes vulpes*) in Africa⁴. It does not appear to be pathogenic. Nelson⁶ reported that the louse fly, *Hippobosca longipennis*, was its intermediate host. In the R.S.A., the adults have been found in dogs at necropsy in Vryburg in the Cape Province, and in Windhoek, Namibia. In the Transvaal (Pretoria, Krugersdorp, Rustenburg), adult worms were found in the peritoneal

cavity of 3 brown hyaenas (*Hyaena brunnea*). Verster, unpublished data).

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