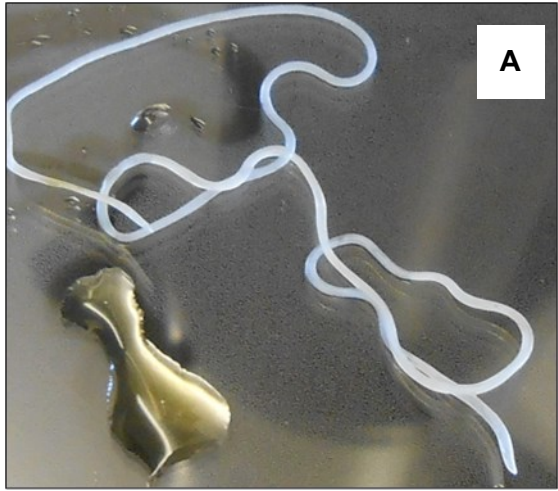


# The life cycle of *Dirofilaria repens* and other filarial worms of dogs; identification of blood microfilariae

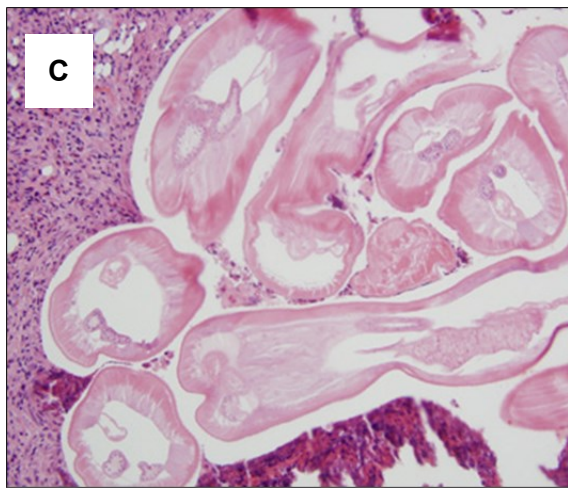
*Dirofilaria repens* is a mosquito-borne nematode found in the subcutaneous and intermuscular tissues of dogs, foxes and cats. Infection by this and by other filarial worms endemic in Europe - *Acanthocheilonema* (syn. *Dipetalonema*) *reconditum* and *Acanthocheilonema* (Syn. *Dipetalonema*) *dracunculoides* - are relatively non pathogenic. *A. reconditum* and *A. dracunculoides* live in the peritoneal cavity and adipose tissue. These species occupy the same endemic zones as the highly pathogenic *Dirofilaria immitis* and also produce microfilariae in blood. In clinical cases species-specific identification of microfilariae in blood is therefore required to inform correct treatment. Other species of canine filariae include *Cercopithifilaria* spp., which live in the dermis.



1. *Dirofilaria repens* is usually located in subcutaneous tissue in nodules. Image A shows an intact *Dirofilaria repens* isolated during a pre-scrotal castrate incision of a dog imported from southern Europe. Adult females *D. repens* are white, long and slender measuring 5cm -15cm. Males are smaller than females .



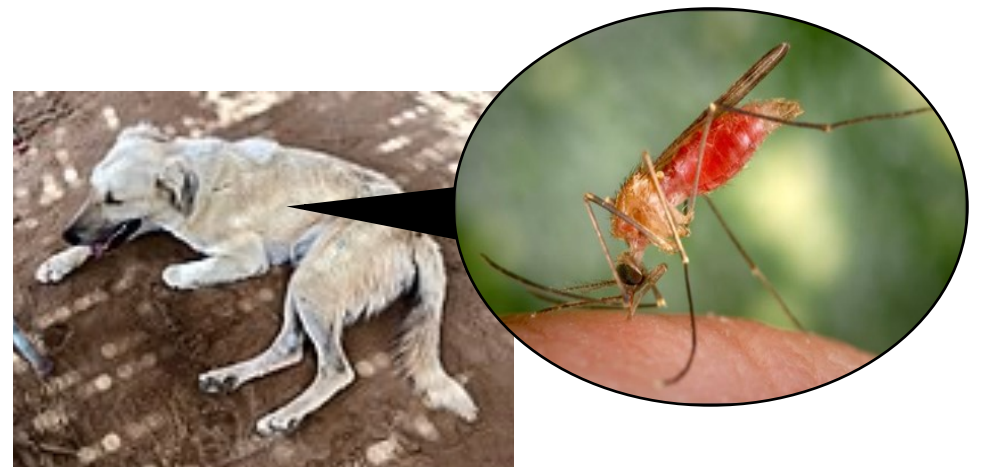
2. Adult *D. repens* release microfilariae (mfs) measuring approx. 360µm in length (image B) which migrate to the blood from nodules. This is a Geimsa-stained blood preparation from a dog with cutaneous dirofilariasis.



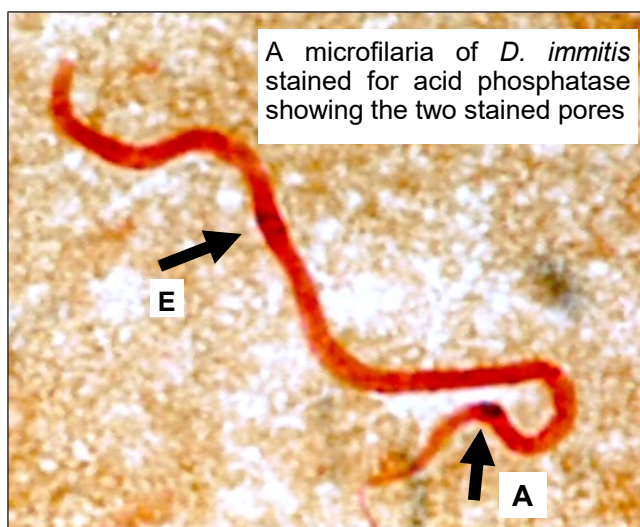
4. In the host, the larvae grow and moult to adult worms within nodules. Image C is a cross section of a skin nodule showing numerous transverse and longitudinal sections of the same coiled up worm.

The pre patent period for *D. repens* is 27-34 weeks

*A. reconditum* uses fleas and lice as the vector and intermediate host, whereas *A. dracunculoides* is transmitted by ticks.



3. Once microfilariae of *D. repens* have been taken up by a feeding mosquito, they moult twice to become infective third stage larvae. These L3 ultimately migrate to the mosquito mouthparts and when a mosquito feeds on a new dog transmission of the parasite occurs.



A microfilaria of *D. immitis* stained for acid phosphatase showing the two stained pores

## Differential identification of microfilariae in dogs' blood

*D. immitis* and *D. repens* microfilariae are morphologically similar and both are greater than 300µm in length. They have tapered heads and straight tails; mfs of *Acanthocheilonema reconditum* measures less than 300µm and have a blunt head and a tail which ends in a hook.

Use of a specific biochemical staining method for nematode acid phosphatase activity shows that in the case of *D. immitis*, strong enzyme activity (denoted as red spots) occurs at both the excretory pore (E) and anal pore (A) (arrows left). In the case of *D. repens*, only the anal pore stains strongly. For *Acanthocheilonema reconditum* diffuse acid phosphatase activity occurs throughout the body.

Taken together, morphometric analysis and staining is a useful practical tool. Species-specific PCR can also be used to distinguish mfs following concentration from blood using the Knott technique.