

Dirofilaria repens from the subcutaneous tissue of a dog native to the Abruzzo region, Italy

E.E.TIERI¹, G. GIOVANNINI², D. SANTOLERI², M. PRIMAVERA², G.C. TELERA¹,
D. MALATESTA¹, S.V.P. DEFOURNY¹, M. DE ASCENTIS¹, S. D'ALESSIO¹, A. COCCO¹,
P. BADAGLIACCA¹, M.S. LATROFA³, D. OTRANTO³, A. PETRINI¹

¹Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale", Teramo, Italy.

²Clinica Veterinaria Guardiense, Guardiagrele (CH), Italy.

³Department of Veterinary Medicine, University of Bari "Aldo Moro", Valenzano (BA), Italy.



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Introduction

Dirofilaria repens (Railliet and Henry, 1911) is a mosquito-borne parasite of domestic and wild canids and humans (reviewed by Otranto *et al.*, 2015 *Vet. Parasitol.*, **213**: 24-37), endemic throughout European countries. The infection is frequently asymptomatic in dogs, and only a few reports of clinically manifest disease have been reported. Currently, *D. repens* is showing a faster and more intense spreading through Europe. From its first discovery in 1965 in native dogs from Abruzzo region (Mantovani *et al.*, 1965 *Parassitologia*, **7**:117-21), scan information is available from this part of Italian country. The aim of this study is to signal the current presence of *D. repens* in a dog native to the province of Chieti and to assess the pathogenicity caused by microfilariae (mfs). In order to identify the vector species involved in the transmission of *D. repens*, mosquitoes collected as part of the entomological surveillance of arboviroses in Abruzzo region were included in the study.

Results and Conclusions

Adult parasites and mfs have been identified as *D. repens*. More than 5,000 mosquitoes, belonging to 5 genera and 11 species, have been morphologically identified (Table 1). Among them, at least five species are recognized as vectors of *D. repens* (i.e., *Aedes albopictus*, *Ae. vexans*, *Anopheles maculipennis* s.l., *Culex pipiens* s.l. and *Culiseta annulata*, reviewed by Capelli *et al.*, 2018 *Parasit Vectors*, **11**:663). The necropsy examination revealed the presence of lymphadenomegaly, abscesses in the region of the back at the level of the IV thoracic vertebra (Fig. 2c), hepatomegaly and nephritis (Fig. 2d). Histological examination revealed panniculitis (Fig. 4a), hepatitis (Fig. 4b) and interstitial nephritis associated to the presence of vascular mfs in the liver and in the kidney. The findings highlight the presence of *D. repens* in the province of Chieti and suggest its implication in the aetiology of histopathological lesions.

Materials and methods

In August 2020, in a veterinary clinic in the province of Chieti, the presence of an adult *D. repens* in the subcutaneous tissue of an adult male Briquet Griffon Vendéen dog, 4 years old, has been observed and filmed, during the suturing operation of a chest wound caused by a wild boar (Fig. 1). The parasite and the mfs present in the dog's blood have been identified morphologically and molecularly by real-time PCR (Latrofa *et al.*, 2012 *Vet. Parasitol.*, **185**:181-5).

The animal died after a few days and has been subjected to necropsy. Other 3 adult filariae from the subcutis of the thoracic region (Fig. 2a and 2b) were collected and identified and fragments of skin, liver and kidney tissues were subjected to histological examination.

From June to November 2020, 88 catches of Culicidae were made in four sites sampled weekly, using attractive traps with light and CO₂ (Fig. 3). All mosquitoes were morphologically identified at species level (Severini *et al.*, 2009 *Fragmenta Entomologica*, **41**:213-372).

Figure 1. *Dirofilaria repens* observed in the dog during the suturing operation of a chest wound caused by a wild boar.



Figure 2. a, b. Adult specimens of *D. repens* from the subcutaneous tissue of the thoracic region observed in the dog during the post mortem examination; **c.** Abscesses in the region of the back; **d.** Hepatomegaly and nephritis.



Figure 3. Attractive traps with light and CO₂.



Table 1. Mosquito species captured in the province of Chieti (2020), as part of the entomological surveillance of arboviroses in the Abruzzo region.

Species	Number of mosquitoes	%
<i>Aedes albopictus</i>	15	0.30
<i>Aedes geniculatus/sticticus</i>	18	0.35
<i>Aedes</i> sp.	92	1.81
<i>Aedes vexans</i>	294	5.78
<i>Anopheles claviger</i>	8	0.16
<i>Anopheles maculipennis</i>	3	0.06
<i>Anopheles plumbeus</i>	14	0.28
<i>Coquillettidia richiardii</i>	243	4.78
<i>Culex mimeticus</i>	130	2.56
<i>Culex pipiens</i>	4,256	83.78
<i>Culiseta annulata</i>	3	0.06
<i>Culiseta longiareolata</i>	4	0.08
Total	5,080	100

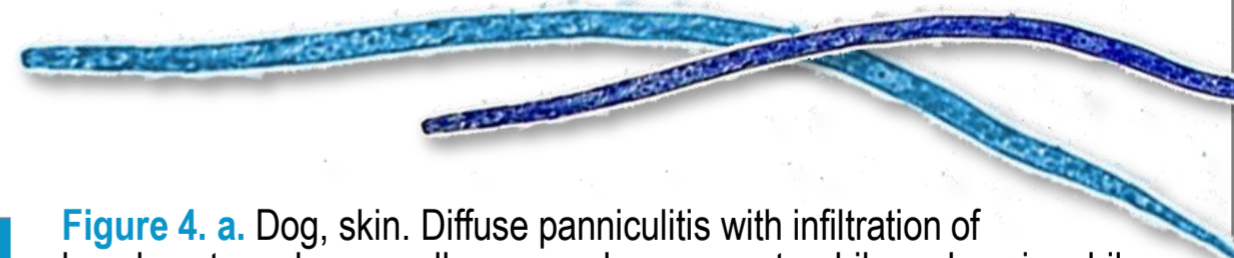


Figure 4. a. Dog, skin. Diffuse panniculitis with infiltration of lymphocytes, plasma cells, macrophages, neutrophils and eosinophils in different proportions with severe necrosis. EE, 10X. Inset. Inflamed subcutis connective tissue with a section of microfilariae (arrow). EE, 100X. **b.** Dog, liver. Longitudinal section of microfilariae (arrow) within interstitial fibrosis area. EE, 40X.

