

New coprological and molecular diagnosis of canine spirocercosis

Donato Traversa¹, Stefania Avolio¹, David Modrý^{2,3}, Domenico Otranto⁴, Raffaella Iorio¹, Itamar Aroch⁵, Giuseppe Cringoli⁶, Angela Di Cesare¹, Katka Albrechtová², Andrei D. Mihalca⁷ and Eran Lavy⁵

¹Department of Comparative Biomedical Sciences, Faculty of Veterinary Medicine, Teramo, Italy

²Department of Parasitology, Faculty of Veterinary Medicine, University of Veterinary and Pharmaceutical Sciences, Brno, Czech Republic

³Institute of Parasitology, Biology Centre of the Czech Academy of Sciences, České Budějovice, Czech Republic

⁴Department of Veterinary Public Health, Faculty of Veterinary Medicine, Valenzano, Bari, Italy

⁵Koret School of Veterinary Medicine, The Hebrew University of Jerusalem, Rehovot, Israel

⁶Department of Animal Pathology and Health, University of Naples 'Federico II', Naples, Italy

⁷Department of Parasitology, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania

Spirocerca lupi (Nematoda, Spirurida) is a parasitic nematode of dogs that is presently emerging in several countries. Nonetheless, canine spirocercosis is neglected and underestimated, mainly due to diagnostic limitations inherent to clinico-pathologic, diagnostic imaging and laboratory methodologies. Given the significant benefit of improved diagnosis, the present work evaluated the sensitivity and specificity of an innovative coprological approach, the FLOTAC technique, as well as a PCR-based assay with that of traditional coprological techniques to diagnose *S. lupi* infection. Faecal field samples were collected from two endemic areas (i.e. 29 and 65 from Kenya and Israel, respectively) and processed using different coprological examination techniques. Set I (Kenyan samples) comprised the modified Sheather's sugar solution flotation and merthiolate-iodine-formalin technique. Set II (Israeli samples) comprised zinc sulphate and modified sugar flotation techniques and the FLOTAC method. All samples were also subjected to a semi-nested PCR protocol specific for a region internal to the *S. lupi* mitochondrial cytochrome *c* oxidase subunit 1 gene. The traditional coprological examinations showed low sensitivity and high variability, demonstrating the unreliability of the conventional methods for detecting *S. lupi* eggs. In contrast, the FLOTAC technique scored the highest number of positives and significantly higher of *S. lupi* egg number per microscopic field compared to all other coprological methods. All coprologically-positive samples were positive using the PCR test. Additionally, of the coprologically-negative samples, 30 (40%) samples scored molecularly positive using the PCR-based approach. This work opens important potential implications and perspectives for studying the epidemiology, biology and clinical aspects of canine spirocercosis.