

Detection of pathogenic *Leptospira* spp. serogroups in Europe between 2017 and 2020 applying a gene-based molecular approach

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A wide spectrum of mammals, including dogs, can acquire leptospirosis resulting in the shedding of *Leptospira* spp. with urine. Canine vaccines in Europe contain two to four leptospiral serogroups. The lack of cross-protection among leptospiral serogroups makes the continuous evaluation of epidemiology necessary to assess the suitability of current vaccines and identify shortcomings to protect dogs.

Residual DNA from canine blood and urine ($n = 239$) was collected when *L. spp.* infection was suspected, and the *lipL32*-PCR displayed positive results. The remaining DNA was analyzed using a novel molecular serogroup typing consisting of a 16S rRNA endpoint PCR followed by 16S rRNA gene amplicon sequencing to identify the respective leptospiral genospecies. According to the species identified, a PCR with serogroup-specific primers for serogroups Icterohaemorrhagiae (ICT), Australis (AUS), Pomona (POM), Canicola (CAN), Autumnalis (AUT), and Pyrogenes (PYR) was performed.

The new PCR was able to type the leptospiral serogroup in 172 samples. The most prevalent *L. spp.*-serogroup identified in Europe was ICT (53%), followed by serogroups AUS (13%), POM (5%), and AUT (4%). Considering the occurrence of ICT, AUS, and GRI in rodents a core vaccination with these serovars is important, while the inclusion of the host-adapted serogroup CAN is recommended. This work shows that current L4 vaccines are relevant and should confer reliable protection against ICT and AUS serogroups.

Keywords

Leptospira; Leptospirosis; Epidemiology; PCR; molecular serogroup typing; Canine leptospirosis;

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Yes, I am a Junior Scientist.

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