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VECTOR-BORNE PARASITIC INFECTIONS IN DOGS IN TIMIȘ COUNTY

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Abstract: *Vector-borne diseases are caused by a broad spectrum of infectious agents, including bacteria, viruses and the most relevant for this paperwork: parasites (protozoa and helminths). They are transmitted by a wide range of arthropod vectors such as mosquitos, fleas and ticks. The aim of this study was to investigate the prevalence of canine vector-borne parasitosis in Timiș county, Romania, from February to November 2020. In this study were included 300 dogs of both sexes, different ages and breeds, from different regions of the county, which presented or not clinical manifestations and were tested for Dirofilaria immitis / D. repens, Ehrlichia canis, Anaplasma spp., Borrelia spp. and/or Babesia spp. Blood samples were collected and examined by Knott modified test, specific antigen RapidCaniV-4 test (VetExpert), and by light microscopy after a Diff-Quick staining or fresh blood smear. Vector-borne pathogens were detected in 8,33% of the examined dogs. The most prevalent pathogen was Dirofilaria immitis, 6,33%, followed by Babesia canis, 3%, and Dirofilaria. repens, 0,1%. No other vector-borne pathogens have been identified.*
Keywords: *dirofilariasis; babesiosis; dogs; vector-borne pathogens.*

• Introduction:

- Vector-borne diseases are caused by a broad spectrum of infectious agents, including bacteria, viruses and the most relevant for this paperwork: parasites (protozoa and helminths). Canine vector-borne diseases, including babesiosis, anaplasmosis, ehrlichiosis, dirofilariasis and many others are transmitted by a wide range of arthropod vectors such as mosquitos, fleas and ticks and they can expand through climate change, wildlife migration, and increased relocation of companion animals throughout the world.
- **The aim of this study** was to investigate the prevalence of canine vector-borne parasitosis in Timiș county, Romania, from February to November 2020.

• Material and method:

- In this study were included 300 dogs of both sexes, different ages and breeds (fig. 1), from different regions of the county (fig. 2), which presented or not clinical manifestations and were tested for *Dirofilaria immitis / D. repens*, *Ehrlichia canis*, *Anaplasma* spp., *Borrelia* spp. and/or *Babesia* spp. Blood samples (fig. 3) were collected and serologic screened by Knott modified test (fig. 4), specific antigen RapidCaniV-4 test (VetExpert)(fig. 5), and by light microscopy after a Diff-Quick staining (fig. 6) or fresh blood smear (fig. 7). The statistical analysis was performed by GraphPad, QuickCalcs, Fishers exact test and Office Excel 2016.


Fig. 1. Breeds of dogs included in the study

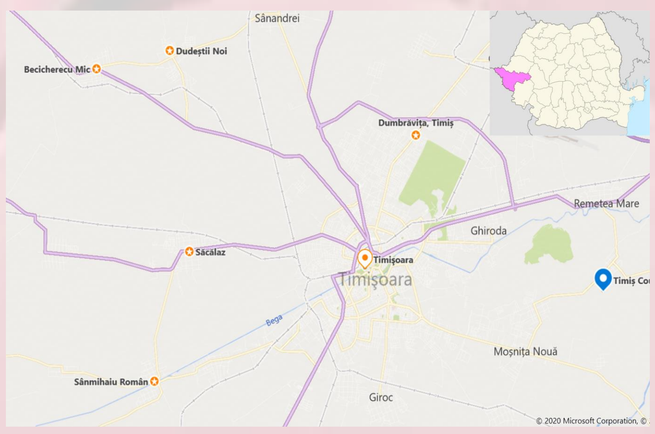

Fig. 2. Provenience of dogs


Fig. 3. Blood samples

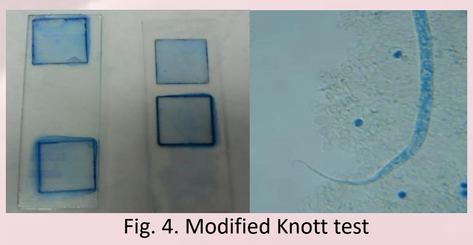
Fig. 4. Modified Knott test

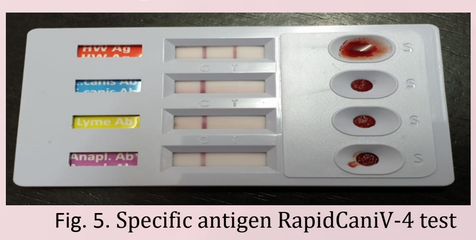

Fig. 5. Specific antigen RapidCaniV-4 test

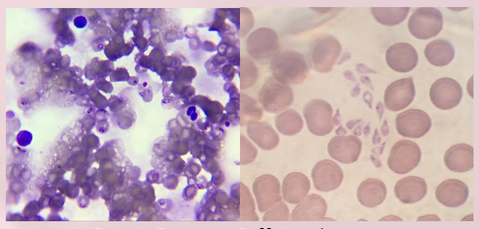
Fig. 6. *B. canis*, Diff Quick staining

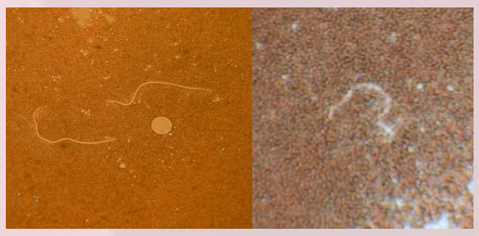
Fig 7. *Dirofilaria* spp, fresh blood smear

• Results and discussions:

- Vector-borne pathogens were detected in 8,33% of the examined dogs. The most prevalent pathogen was *Dirofilaria immitis*, 6,33%, followed by *Babesia canis*, 3%, and *Dirofilaria. repens*, 0,1%. No other vector-borne pathogens have been identified.
- In the urban area (Timișoara) the prevalence of any infection with enumerated vector-borne parasitosis is 10% (19 positive cases out of 190), and in the rural area (Dumbrăvița, Săcălaz, Sânmihaiu Român, Becicherecu Mic, Dudeștii Noi) the prevalence is 6,36% (7 cases out of 110) (fig. 8).
- Considering the sex of animal as an epidemiological factor, males show a higher prevalence of infection (11,85% - 16 positive cases out of 135 males) than females (5,45% - 9 cases out of 165)(fig. 9).
- Statistical analysis showed that there were no significant differences between positivity relative to the sex of animal were registered.
- The dogs that were tested positive for *D. immitis* (19 dogs) had ages between 4 and 15 years old, comparing to the dogs that were tested positive for *B. canis* (9 dogs), where the age fits in a lower range, of 2-12 years old. *D. repens* was diagnosed in a 7 years old dog, which also had a coinfection with *D. immitis*.

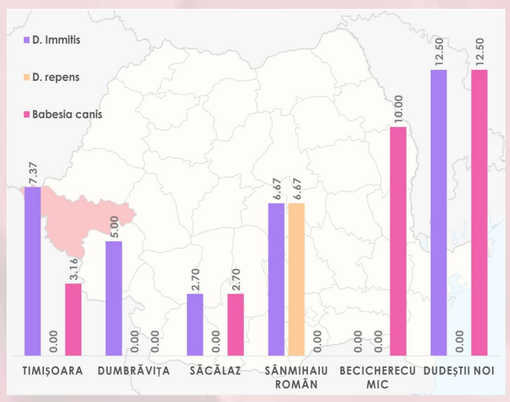

Fig. 8. Prevalence in localities of Timiș county

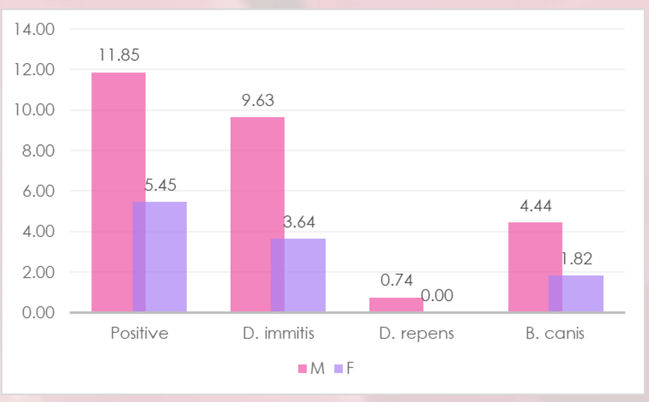

Fig. 9. Positive cases, gender repartition

- Information regarding the prevalence of vector-borne pathogens in Romania was published by Ciocan et al., 2009, Ilie et al., 2010, Imre et al., 2013.
- Yildirim et al., 2007 and Song et al., 2003 reported that the prevalence rates of *D. immitis* in males are higher than in females due to the fact that males are better propriety defendants and they are mostly kept outside, which facilitates contact between vectors and dogs.
- In Cluj county, according to Mircean et al, 2012, *D. immitis* prevalence was remarkably higher in dogs over the age of two years.
- In Hungary, which is a neighbouring country to Timiș, Farkas et al., 2019 reported a prevalence of 22,4% for *D. immitis* and *D. repens*, diagnosed based on serological results. In another epidemiological study from Hungary, Hamel et al., 2011 found that the dogs under investigations for *Babesia* spp, *Dirofilaria* spp, were positive for infections among which *B. canis* had the highest prevalence rate (43,1%).

• Conclusions:

- The results of this study suggest the importance and widespread occurance of these pathogens in Timiș county, that have previously been confirmed by other studies from different regions of the country and the neighboring. Canine vector-borne diseases in Timiș county have shown an alarming increase in the last years, but with an appropriate intervention like prophylactic treatment with parasiticides the level of these endemic affections can be reduced.

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