

SURVEY OF SOME TICK-BORNE ZONOSEs IN UNGULATES OF THE COLLI EUGANEI REGIONAL PARK

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A survey of zoonotic bacterial infections was carried out during the period March-November 2014, in wild boars (*Sus scrofa*) and fallow deer (*Dama dama*) of the Colli Euganei Regional Park. This is a tourist and recreational area, characterized by a wide botanical and faunal biodiversity and by complex relationships between wild animals, livestock and humans.

Wild boar and fallow deer are recognized as important hosts for maintaining *Ixodes* ticks and several pathogens transmitted by ticks to other animals and to humans.

Wild boar was illegally introduced in the park in the nineties and since then the population has been progressively growing up despite of the increasing number of animal culled in the framework of the population control programme, established by the park administration (about 500 animals culled in 2007 and more than 1000 in 2016).

Fallow deer represents another allochthonous species of Euganean hills submitted to population control. The population of fallow deer is estimated to be few hundred individuals.

Blood samples were collected by park operators from 211 wild boars and from 61 fallow deer. DNA was extracted from 200 µl of blood using a commercial kit and the presence of vector-transmitted zoonotic bacteria (*Borrelia burgdorferi sensu lato*, *Rickettsia* spp., *Anaplasma* spp., *Ehrlichia* spp. and *Bartonella* spp.) was evaluated by biomolecular analysis. *B. burgdorferi s.l.* and *Rickettsia* spp. detection was performed by real-time PCR assays targeting *23S rRNA* and *gltA* genes respectively. The presence of the other microorganisms was assessed by PCR amplifying a portion of the *16S rRNA* (*Anaplasma* spp. and *Ehrlichia* spp.) and *ribC* (*Bartonella* spp.) genes. Nucleotide sequences obtained from positive samples were compared to homologous fragments in GenBank by using BLAST. *A. phagocytophilum* was further confirmed applying a specific real-time PCR targeting *msp2* gene.

Only one out of the 211 wild boars sampled resulted positive to *B. burgdorferi s.l.* (prevalence: 0,4%; 95% c. l.: 0%-1,4%). No wild boar was positive to the other zoonotic bacteria.

Out of the 61 fallow deer, 18 (29,5%; 95% c. l.: 19,6%-39,5%) were positive for *A. phagocytophilum* (nucleotide similarity between 99% and 100%) and 1 (1,6%; 95% c. l.: 0%-4,4%) for *Ehrlichia* spp. (nucleotide similarity between 97% and 99%).

Bartonella spp. was detected in 37 blood samples (60,7%; c. l. 50,0%-71,3%); 18 amplicons were sequenced and were 98-99% similar to *Bartonella capreoli* homologous nucleotide sequences. None of the tested fallow deer were positive for *B. burgdorferi* and *Rickettsia* spp.

These results demonstrate the presence of zoonotic tick-borne pathogens (*A. phagocytophilum*, *B. burgdorferi s.l.*, *Ehrlichia* spp.) in the Colli Euganei Regional Park. Furthermore, the presence of wild boar and fallow deer populations promotes the maintenance of ticks in the environment. The risk of livestock and of human exposure to infections during the outdoor recreational or professional activities or manipulation of hunted animals should therefore not be disregarded.