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SEROLOGICAL EXAMINATIONS OF WILD RUMINANTS FROM VOJVODINA PROVINCE (REPUBLIC OF SERBIA)

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Many infectious diseases can be mutual for domestic and wild ruminants and health status of wildlife can represent a good indicator for the presence of infectious diseases foci in the environment. Infectious agents may be transmitted from wildlife to livestock, livestock to wildlife, and occasionally to humans. For this reason, the control of infectious diseases in a certain region, can be of significance for making further decisions in management strategies which will ensure maintenance and expansion of wildlife populations while maintaining the livestock population without initiating disease problems.

No extensive research has been done lately, on the presence of different infections among wild ruminants in the province of Vojvodina. Due to that, it is a complete unknown field - the presence and the outspread of certain infections.

KEY WORDS: wild ruminants, infectious diseases, serology, Vojvodina

MATERIAL AND METHODS

Serological survey in wild ruminants was done in the region of six municipalities of the province of Vojvodina (Republic of Serbia). Blood samples were taken from 87 roe deer (*Capreolus capreolus*) and 17 red deer (*Cervus elaphus*). All the roe deer and ten red deers were shot down in open hunting areas, during the hunting season in 2012. Blood samples were also taken from seven live deers which live in an enclosed part of National park. Serological analysis were done for the following diseases: brucellosis, leptospirosis, Q fever, chlamydiosis (*Chlamydia abortus*), paratuberculosis and toxoplasmosis. Analysis for Q fever, chlamydiosis, paratuberculosis and toxoplasmosis were done by ELISA method. The ELISA kits for Q fever and chlamydiosis are manufactured by IDEXX, the kit for paratuberculosis by Pourquier and the kit for toxoplasmosis was manufactured by ID-VET. ELISA (enzyme-linked immunosorbent assay) is a sensitive and specific method for detection of specific antibodies against a certain infectious agent, from blood sera of the animals. If there is an antibody existing in the sera, it will bind to the antigen coated in the wells of test and a complex of antibody-antigen would be formed, which is afterwards marked and coloured in the reaction. Tests for brucellosis were done by fast agglutination test, whereas all of the suspicious samples would be then analysed with ELISA test. Analysis for leptospirosis was done with the microscopic agglutination test in dark field. There were 10 strains used for each blood sample to test: *L.pomona*, *L.icterohaemorrhagiae*, *L.grippotyphosa*, *L.sejroe*, *L.batavia*, *L.bratislava*, *L.australis*, *L.tarassovi*, *L.canicola* and *L.hardjo*.

RESULTS AND DISCUSSION

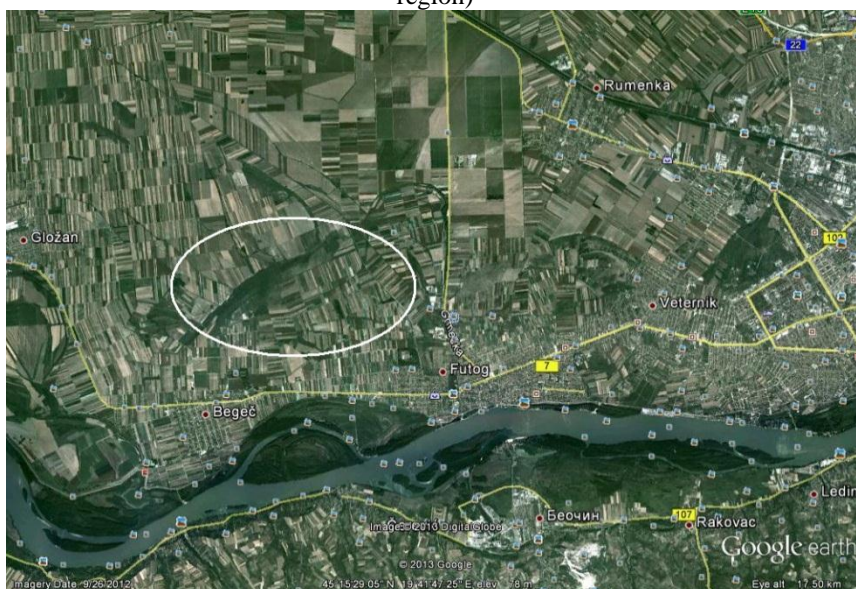
Roe deer and red deer are the wild ruminants living in the region that was examined in the study. Roe deer lives mostly free in the nature, while the majority of red deers live in enclosed hunting areas. The population of 87 roe deers represents 1.6% of the estimated total population

of roe deers in the region that was examined. The red deers involved in the study represent 0.17% of the total population of deers in the same region. The estimated age of the roe deers involved in the study is over 2 years. Hunters and foresters did not have any knowledge, observations or anamnestic information which would indicate to a possible presence of infectious disease or other diseases among wild animals.

Seropositive findings were not identified in any of the animals for brucellosis, leptospirosis, Q fever, paratuberculosis, or chlamydiosis, meaning that all of the samples taken were negative to these diseases. On the other hand, blood samples from eleven animals gave positive findings for toxoplasmosis, 9 roe deers and 2 red deers. From this total number of animals, 7 seropositive roedeers (77.78%) were shot down in the hunting area located close by a large urban region (around 340,000 inhabitants) and between suburbs with around 45,000 inhabitants (map 1). A finding like this refers to a possibility of indirect contact of roe deers with cats from the surrounding settlements and that could represent the way of infection with toxoplasmosis. The seropositive red deers are from the enclosed hunting areas.

The analysed number of samples is too small to represent and indicate a solid proof and conclusion about the outspread of several diseases and about the reservoir of infectious agents for these diseases in the natural environment. So, the results of this study should be understood as preliminary and as an input for the further more extensive research. Previous serological analysis done in domestic animals living in the same region, have shown that paratuberculosis is present with the prevalence of 5,5% in cattle, and no presence in sheep population (Vidić et al, 2002). Prevalence for other infectious disease was also established: for leptospirosis in domestic animals (2-2.5%) (Grgic et al, 2002), for Q fever (19%) and toxoplasmosis (7.1% of abortion in sheep) (Vidić et al 2007). Brucellosis was present between 2003 and 2006 mostly in sheep kept on pastures. A finding of no seropositive animals to Q fever was unexpected, because Vojvodina region is an endemic region for this disease (Jovanović et Vidić, 2003). When analysing the findings of exclusively seronegative animals, one should take into the consideration the performances of the habitat and the possibility of interaction with domestic ruminants.

Map 1. The region with the highest seroprevalence for toxoplasmosis in roe deer (encircled region)



The region where examined reo deer were settled is a plain ground with intensive agriculture and relatively small part of uncultivated soil, close to the surface water, or in the regions where the soil is not cultivated at all, because of the great humidity or infertility of the soil. Domestic ruminants are almost exclusively kept in barns, except for the certain sheep flocks which are being grazed beside the channels. Conditions like this reduce the possibility for interaction of domestic and wild ruminants and the findings indicate that the domestic animals are the reservoirs of infectious agents, after all, which can damage the population. A similar data were also gathered in the neighboring regions, where it was assumed that the domestic ruminants are a major reservoir for Q fever in Hungary. The majority of cattle is placed in farms and do not go to the pasture at all, they can not represent as the reservoir of infections even for vectors (Gyuranec et al, 2012).

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