

## Summary:

The roe deer (*Capreolus capreolus*) is the most common deer in both Europe and Poland. There are two ecotypes of roe deer in Poland: the field-dwelling and the forest-dwelling type. The roe deer are very important hosts for ticks which are the main vector and/or reservoir of *Borrelia burgdorferi* sensu lato, *Anaplasma phagocytophilum* and *Babesia microti*. These pathogens can induce diseases such as Lyme borreliosis, human granulocytic anaplasmosis and babesiosis.

The purpose of this work was to determine the role of roe deer as a potential reservoir for pathogenic agents that cause tick-borne diseases.

The research was carried out in two selected areas in the Wielkopolskie voivodeship. The research material came from the Podanin Forest District, where there is a population of the forest roe deer, and areas belonging to the PZŁ Czempin, where the field roe deer lives. The research included faunistic and molecular analysis. The fauna research comprised a collection of ticks from vegetation and from hosts while molecular research consisted in isolation of DNA from *I. ricinus* ticks collected from vegetation and animals and detection of pathogens in ticks and tissues from roe deer (blood and spleen) detected by the PCR and nested PCR techniques. The study also investigated the degree of infestation of particular parts of the roe deer body taking into account the distinction between the forest and field roe deer.

Two species of *I. ricinus* and *I. hexagonus* ticks were collected from roe deer. Only *I. ricinus* were considered in the molecular research. Pathogens were found in 35% of the ticks collected from roe deer. *Anaplasma phagocytophilum* was found in 31.9% specimens, while *B. microti* in 3.1%. No *B. burgdorferi* s. l. were found in the examined material. In the tissues from roe deer pathogens were found in 52.4%. Both *A. phagocytophilum* and *B. microti* were more commonly found in the spleen than in the blood of the tested animals. The rickettsiae were found in 49.4% of the examined spleens, while *B. microti* in 15.2% of the samples. Additionally, in one field roe deer spleen the presence of *B. burgdorferi* s. l. spirochete was revealed. The analysis of the genus showed that it was *B. burgdorferi* s.s.

*I. ricinus* ticks were collected from vegetation with the exception of a single *D. reticulatus* species representative. Only *I. ricinus* individuals were included in molecular analyses. Pathogens were discovered in 22.8% of the tested samples. *Babesia microti* was found in ticks from both areas. This protozoan occurred in 40% of the ticks from the Podanin 93



area and in 46.6% of the ticks collected in the Czempiń area. *Anaplasma phagocytophilum* occurred in 10% of the ticks from the Podanin area and in 13.3% from the Czempiń area. No instances of *Borrelia burgdorferi* s. l. were found in the material.

The research confirmed the reservoir role of roe deer for *A. phagocytophilum*. What is more, the finding of other pathogens causing tick-borne diseases may indicate the potential role of the mammal in the circulation of *B. burgdorferi* s. and *B. microti* in the environment. The occurrence of *B. microti* and *A. phagocytophilum* in ticks indicates the potential risk of human and animal exposure to tick-borne infection with these pathogens in the examined areas of the Wielkopolskie Voivodeship.

