

Abstract

Ticks (Acari: Ixodida) are one of the most common ectoparasites of domestic cats and dogs and play a vital role in the natural transmission of pathogens between their hosts. The high capability of ticks to adapt to changing environmental and weather conditions, develop commensal relationships with a broad group of hosts, and be transmitted through transstadial, transovarial, and transpermal routes, contribute to the spread of these parasites to increasingly larger areas and animal and human hosts. In addition, due to the migration of hosts on which the ticks feed, increased tourism, and more frequent travelling with pets, ticks are being transferred to new areas that give them access to a wider range of hosts. Through this mechanism, new disease entities may appear in regions they had not previously occurred.

In recent years, tick-borne diseases have aroused great interest as a public health concern due to the increasing frequency of diseases transmitted by ticks to humans and animals. In Poland (mainly in the Dolnośląskie, Lubelskie, Mazowieckie, and Warmińsko-Mazurskie voivodships), faunistic and molecular studies have demonstrated tick species on domestic cats and dogs, and the presence of tick-borne pathogens in ticks collected from pets. However, their distribution and population ecology remain poorly understood in some areas of the country.

Due to the high medical and veterinary importance of ticks and the close contact between humans and domestic animals, an attempt was made to compare the exposure levels of cats and dogs to ticks and assess the frequency of tick invasion. In addition, the research sought to identify the species and developmental stages of the ticks infecting domestic cats and dogs most often in the Małopolskie and Śląskie voivodships, and determine the presence of selected pathogens, including *Anaplasma phagocytophilum*, *Babesia microti*, *Borrelia burgdorferi* sensu lato, *Rickettsia* spp., and *Toxoplasma gondii*, in these parasites.

The findings demonstrated that domestic cats and dogs in the Małopolskie and Śląskie voivodships were primarily exposed to *Ixodes ricinus* ticks, as well as *Ixodes hexagonus*, *Ixodes crenulatus*, *Ixodes apronophorus*, and *Dermacentor reticulatus*, but only rarely. An assessment of the seasonal tick activity among the domestic animals tested, which depends on many biotic and abiotic environmental factors, showed that ticks were most active during the spring. In addition, there was a potential risk of tick-borne invasion by the parasites *B. microti* and *T. gondii* and bacterial infection by *A. phagocytophilum*, *B. burgdorferi* s.l., and *Rickettsia* spp. The results also indicated that by accompanying humans daily, pets contributed to tick and pathogen circulation in recreational and urbanized areas of the two provinces.

In summary, the Małopolskie and Śląskie voivodships may be a favorable habitat for ticks, which justifies regular prophylactic treatment and examination of companion animals for infestation with these parasites and the presence of pathogens they transmit. Findings from such investigations will provide information on novel tick-borne disease outbreaks and indicate the potential infection risk to humans and animals. Understanding the ecology of ticks and their hosts in urban and suburban environments is critical for quantifying the parameters necessary for initial risk assessment and identifying public health strategies for tick-borne disease control and prevention.

The results presented in this doctoral thesis contribute to the expansion of the current knowledge in the field of parasitology and acarology. The data may also be important for epidemiologists and forestry workers by highlighting areas where tick-borne pathogens are more prevalent among tick populations. Furthermore, the findings will help domestic cat and dog owners better protect their pets from attacks by these dangerous parasites.