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The potential role of *Ixodes ricinus* ticks in life cycle of *Toxoplasma gondii*

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Ixodes ricinus as a blood-sucking tick uses many of wild and domestic animal species as hosts. Almost each of *Toxoplasma gondii* intermediate host may serve as a source of blood for each tick stage. In this way, an infected tick may take part in the spread of *T. gondii* in the environment through the transmission of this parasite between different host species. In this way, ticks may increase the number of infected specimens among host populations. How *Ixodes ricinus* takes part in the life cycle of *T. gondii*? *I. ricinus* takes part in the life cycle of *T. gondii* as a mechanical or even biological vector. Even though the tick does not transmit *T. gondii* to other host mammals, it may take infection from them after molting and increases populations of infected ticks. The mammalian hosts digest infected ticks and in this way *T. gondii* is transmitted, what explains herbivorous infection, rodents and birds infection. In this case, ticks do not transmit *T. gondii* to other hosts but serve as reservoir host for *T. gondii*, however, it requires more studies. *Ixodes ricinus* may help to explain the wide spread of this parasite. Toxoplasmosis is globally distributed, water- and food borne zoonosis caused by that single protozoan and probably one-third of the world's human population is infected with this pathogen. Human as other of the intermediate hosts may become infected in the main route of infection; it is the ingestion of parasite oocyst in contaminated water or soil and undercooked meat. However, the mechanism which this parasite uses to so large spread is not fully understood, because oral transmission does not explain the common event of this parasite in a variety of hosts. Thus, ticks may help to explain the wide spread of this parasite in almost all geographical areas and warm blooded animals, but there is need to establish whether they are an important infection source for toxoplasmosis. We examined 1737 feeding *I. ricinus* ticks collected from 49 Shetland ponies (Imno Stud, Poland) and 371 questing ticks using B1 gene based PCR and sequencing of positive samples for genotyping of *T. gondii*. *T. gondii* genotype I pathogenic for humans was detected in 4.5% of all *I. ricinus*, including in 2.99% of feeding ticks and in 10.24% of questing ticks and the difference was statistically significant. Our results confirmed the presence of *T. gondii* in *I. ricinus* and showed a new geographical habitat of *T. gondii* occurring in *I. ricinus* ticks in Poland.

Biography

Bogumila Skotarczak has been the Head of Department of Genetics at University of Szczecin, Poland since 1998. The main scope of her studies concerns molecular biology of pathogens transferred by ticks (*Borrelia burgdorferi sensu lato, Babesia sp., Anaplasma sp., Rickettsia sp., Toxoplasma gondii*). She has been the member of Editorial Board of *Annals of Agricultural and Environmental Medicine* and member of International Society of Evolutionary Protistology. She is the author of one monograph and author or co-author of many publications (*Annals of Agricultural and Environmental Medicine, European Journal of Wildlife Research and Journal of Parasitology*).

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