

Molecular survey of two major tick-borne pathogens in *Ixodes ricinus* ticks collected from natural habitats in North East Germany

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Ixodid ticks are responsible for transmitting the greatest variety of pathogens when compared to other arthropods. *Ixodes ricinus*, the most widespread tick species in Europe and Germany, is known to feed on many different hosts and is capable to transmit numerous pathogens. Most relevant pathogens for which *I. ricinus* is a competent vector are *Borrelia burgdorferi* sensu lato, the agent responsible for Lyme disease and the tick-borne encephalitis virus.

The aim of this study was to assess the prevalence rates with molecular methods of two major tick-borne pathogens in *I. ricinus* ticks from North East Germany. In order to perform the study, we collected ticks by flagging from 17 forest sites in Western Pomerania between April and October 2018. Samples were processed by RNA and DNA extractions, performed from each individual adult tick and from pools of 10 nymphs. RNA samples were tested by RT-qPCR for detection of tick-borne encephalitis virus while DNA was tested by nested PCR followed by sequencing for identification of *Borrelia* species. A total of 2410 ticks were obtained of which 234 were females, 231 males and 1945 nymphs.

So far, after analyzing 249 samples for *Borrelia* spp., 61 (24.5 %) ticks tested positive. The comparison between developmental stages showed a higher prevalence rate in nymphs (34.8 % vs 23.9 % of females vs 14.6 % of males). Sequencing revealed several *Borrelia* species relevant for public health: *B. garinii*, *B. afzelii*, *B. valaisiana* and relapsing fever agent *B. miyamotoi*. RT-qPCR for TBEv is undergoing, no positive samples being detected until now.

To elucidate the potential of pathogen transmission by *I. ricinus* and other relevant tick species in Germany and Europe, a main focus of our perspective research will be the assessment of vector competence for putative and major tick-borne pathogens that constitute a growing threat to human and animal health.