

# The role of sylvatic rodents in transmission of *Toxoplasma gondii* in NE Poland

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There is currently considerable interest in understanding the transmission of pathogens and the range of different variables that influence infection dynamics. Wild rodents pose a particular threat to human communities because they constitute the most abundant and diversified group of all living mammals. *Toxoplasma gondii* is an intracellular Apicomplexan parasite with a broad range of intermediate hosts, including humans and rodents. Rodents are considered to be reservoirs of infection for their predators that include cats, pigs and dogs. We conducted a multi-site, long-term study of *T. gondii* in northeastern Poland. Our objectives were to monitor the seroprevalence of *T. gondii* in the four abundant vole species found in the forests and meadows of the region (*Myodes glareolus*, *Microtus arvalis*, *Microtus agrestis*, *Alexandromys oeconomicus*) and to assess variation in seroprevalence attributable to both intrinsic and extrinsic factors that were quantified. A bespoke enzyme-linked immunosorbent assay was used to detect antibodies against *T. gondii*. We detected *T. gondii* antibodies in the sera of all four rodent species with an overall seroprevalence of 5.5% (3.6% for *M. glareolus* and 20% for other vole species). Seroprevalence in bank voles varied significantly between host age classes, increasing with host age, and between the sexes, with higher levels recorded in female compared with male voles.

Since *T. gondii* seroprevalence was significantly higher in rodents trapped in meadows, we aimed to assess the prevalence of *T. gondii* in these animals. We trapped 24 rodents comprising *Microtus arvalis*, *Apodemus agrarius* and *Apodemus sylvaticus* in September 2021. We extracted DNA from their brains and femoris muscles. Using PCR and nested-PCR reactions we detected *T. gondii* in 2 samples with an overall prevalence of 8.3% (1.5-26.7). Our results confirm that sylvatic rodents play a role as intermediate hosts and reservoirs of *T. gondii*. Taken together, these results contribute to our understanding of the distribution and abundance of *T. gondii* in rodents in Poland and establish that all the four species sampled in the current study are potential reservoir hosts of *T. gondii*.

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