

# PLAYING IT SAFE IN THE FOREST

An experiment studying tick infestation in a pine forest



When ordinary people visit Poland's forests, they are most afraid of encountering a big mammal – a wolf, boar, or bear. But the greatest dangers are actually posed by more inconspicuous animals: ticks and snakes.

**Anna Wierzbicka**

Poznań University of Life Sciences

Are people in Poland actually reluctant to go into the forest because of the potential risk of tick-bites? To find out, the Polish Institute for Patients' Rights and Health Education (IPPEZ) commissioned a nationwide survey in 2018. Three-quarters of those surveyed indicated that they had indeed, at least once, opted out of going for a stroll in the woods or park out of a fear of being bitten by a tick, while one in three respondents (37 percent) reported

that they were "definitely" afraid of ticks. Moreover, the most prevalent reason the survey participants cited for fearing ticks was the disease risk associated with getting bitten – indicated by 94 percent of respondents. Lyme disease was named by 87 percent of survey participants as the main disease transmitted by ticks, while tick-borne encephalitis (TBE) was indicated by not quite half as many (42 percent). Lyme disease is indeed the most frequently diagnosed and registered disease (17,338 cases in 2022) and as such it provokes considerable anxiety. However, it is worth bearing in mind that Lyme disease is a curable disease that responds well to antibiotics, and so from a public health perspective it is not as dangerous as TBE, which can lead to death or permanent disability. There is no known cure for TBE, the number



**Anna Wierzbicka,  
PhD, ME**

is an Assistant Professor at the Department of Game Management and Forest Protection, Poznań University of Life Sciences. She studies mites living in the forest and people's attitudes towards forest and game management. A promoter of greater public awareness of science, head of the Polish Association of Forestry Educators.  
anna.wierzbicka@puls.edu.pl

of diagnosed cases of the disease doubled last year, and a very robust upward trend has been recorded since 2020 in countries neighboring on Poland. So it turns out it is actually TBE that we should fear more. We should also take steps to protect ourselves from the latter disease – preferably by getting vaccinated. Unfortunately, only foresters and soldiers in Poland receive mandatory TBE vaccinations, whereas only 2 percent of the general population is currently vaccinated.

### Ticks lying in wait

For more than 10 years now, the Department of Game Management and Forest Protection at the Poznań University of Life Sciences has been conducting research into tick biology and ecology. One interesting experiment sought to identify when people spending time in the forest are most likely to become tick hosts. An equal number of men and women of different ages (students and faculty members) performed various activities typical for forest visitors in Poland (e.g. walking, sitting by a tree trunk, sitting on under-

One interesting experiment sought to identify when people spending time in the forest are most likely to become tick hosts.

growth, collecting firewood, sitting on a fallen log). The activity “gathering firewood” was included even though Poles do not currently gather brushwood or do so occasionally, because it was intended to mimic mushroom-gathering (i.e., slowly wandering in different directions, frequently stopping to bend over) as the experiment was conducted in the spring, when mushrooms are not present in the forest. The participants wore white beekeeping suits, white gloves and socks, sports shoes or below-the-ankle hiking boots. Their sleeves and pant legs were further secured with silver adhesive tape. We repeated the experiment in May and September (traditionally considered to be the months of highest tick activity in the forest) in coniferous (boreal) and mixed forest at the experimental forestry sites of the university’s Faculty of Forestry and Wood Technology. The forests differed primarily in terms of the undergrowth vegetation – there were not many plants on the forest floor in the boreal forest, whereas berry bushes, grasses, and shrubs made up the undergrowth in the mixed forest. After the activities, all ticks present on the suits were collected and then analyzed for tick-borne diseases.

Nymph of the common tick  
(*Ixodes ricinus*)



ANNA WIERZBIČKA



(Wielkopolska) region even in January and February, on vegetation in the forest and on forest animals (studies have looked at roe deer, red deer, and foxes).

All the research described above entails some practical guidelines for people who spend time outdoors (which means virtually everyone): no matter what time of year it is, when you go out into a park or forest you should wear long pants, high-topped shoes or boots covering the ankle, and after coming back home and having a bath or shower, you should look your body over for ticks. This goes even for the autumn and winter months. Anyone who spends a significant amount of time outdoors (who likes to run, has a dog, goes mushroom-hunting) should also consider getting vaccinated against TBE. It's also a good idea to learn how to pull ticks out of the skin yourself – a video posted on the YouTube channel of the University of Life Sciences in Poznań shows how to do this properly. Each of us should hone our knowledge and skills in this respect: only one in four (29%) Polish respondents in the survey mentioned above declared that they were well informed (both in theory and in practice) on how to deal with a tick in the event of a bite.

## Adders also await

For people who often spend time in Polish forests, another noteworthy danger is posed by snakes. However, people are generally not aware of this risk, considering snakes to be present only in the mountain regions. There is only one venomous snake species in Poland, the adder, but it can be found throughout the country and is under strict protection. It is particularly numerous in the areas of Białystok, Pomerania, and the Bieszczady Mountains. It is active during the day and at dusk, especially on warm days and after prolonged cold spells. In October it goes into hibernation, which last until late April or early May. The adder does not attack without reason and only bites when it feels directly threatened – this often happens when someone is trying to catch it, or steps on it accidentally. In Europe, the frequency of snakebites, mainly from the Viperidae family, is estimated at 15,000–25,000 per year, and the number of deaths caused by bites at about 30 per year. Bites are most dangerous for children, the elderly, and people with cardiovascular disease. Bites most often affect an upper limb (51–60 percent) or lower limb (38–40 percent). Most bites occur during the spring and summer months. When mild winters and warm summers lead to an increase in the snake population, this is correlated with a higher incidence of bites. Bite victims are predominantly children and adult males.

Viper venom can cause a wide range of clinical symptoms. Poisoning depends on the dose of venom per kilogram of body weight, the site of the bite, physical activity after the bite (exertion, movement,



RADOŚLAW WITKOWSKI

alcohol consumption accelerate the absorption of venom), the particular person's sensitivity age and body weight, the type of bite (whether it was a dry bite, how deep it was, whether it was through clothing/footwear, and how long the snake remained adhered to the victim), secondary infections and treatment (nature of first aid given, time between bite and hospital admission, time elapsed before antitoxin administration). The most common symptoms are swelling and subcutaneous hemorrhaging, vomiting, abdominal pain, diarrhea, decreased blood pressure, sweating, cardiac disturbances, and fever. Others, such as losing consciousness, occur rarely, in about 5 percent of cases. The primary local symptom of poisoning is swelling, which can appear within minutes or after a longer delay. It most often occurs within the first two hours of the bite. The skin exhibits a reddish-blue color and a bite mark – two symmetrical holes spaced 1 cm apart. What should we do if someone is bitten by an adder? Never suck out the venom – the methods shown in Wild West movies are long outdated from a medical point of view! The person needs get to a hospital as soon as possible. The bitten limb should be immobilized and placed below the level of the heart for transport to the hospital, as this reduces the speed and degree of venom absorption. But above all, we can protect ourselves from getting bitten in the first place, by wearing high boots and long pants and showing caution when walking in the woods.

In the forest environment, people are exposed to many dangers. In Poland's forests, the main ones are associated with certain animals, although they turn out to be smaller animals than we might imagine. But regardless of the season, the best protection against these dangers is provided by the same very simple measures: long pants and high boots. ■

A common tick (*Ixodes ricinus*) compared to a pinhead

### Further reading:

Liberska J., Michalik J., Pers-Kamczyc E., Wierzbička A., Lane-R.S., Rączka G., Opalińska P., Skorupski M., Dabert M., 2021, Prevalence of *Babesia canis* DNA in *Ixodes ricinus* ticks collected in forest and urban ecosystems in west-central Poland, *Ticks and Tick-borne Diseases*.

Research report *Co Polacy wiedzą o kleszczach i KZM* [What Poles Know About Ticks and TBE], 2018, SW Research.

Wierzbička A., Rączka G., Skorupski M., Michalik J., Lane R.S., 2016, Human behaviors elevating the risk of exposure to *Ixodes ricinus* larvae and nymphs in two types of lowland coniferous forests in west-central Poland, *Ticks and Tick-Borne Diseases*.