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Clock is ticking on Lyme disease

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By SHAUN KITTLE - Outdoors Writer (skittle@adirondackdailyenterprise.com), Adirondack Daily Enterprise

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TUPPER LAKE - The threat of Lyme disease is real in the Adirondacks.

Jonathan Krant, a doctor with the Division of Rheumatology in the Adirondack Health system, told attendees of a recent Tick Talk at The Wild Center about a patient from Keene Valley who came in with a swollen knee, a possible symptom of Lyme disease. Krant didn't think it was possible to pick up a tick while hiking in the Great Range in the High Peaks. He was wrong.

"If you're a hiker, a camper, a fisherman or a hunter, you are exposed," Krant said.

Article Photos



The dark-legged, or deer, tick is one of about 10 Lym...



Krant explained that the symptoms of Lyme disease are similar to those of other maladies, so it can be difficult to diagnose. They can include a rash, headache, fever, chills and aches and pains.

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If left untreated, Lyme disease can cause advanced symptoms that include arthritis, meningitis, temporary paralysis on one side of the face (Bell's palsy), numbness or weakness in limbs and impaired muscle movement.

Little is understood about the disease and why the ticks that carry it are being found increasingly farther north. The Tick Talk was organized by Paul Smith's College students, who have been collecting data to better understand what makes ticks tick.

There are a lot of unanswered questions, but two things are certain: Tick sightings and incidences of Lyme disease are both on the rise throughout the region.

Lyme disease

In the United States, Lyme disease is caused by a bacteria called *Borrelia burgdorferi*.

Tim Sellati, an immunologist at Trudeau Institute in Saranac Lake, said the disease may have spread into the United States from Europe in the early 1900s, but it was not until 1982 that research showed that ticks were *Borrelia* vectors, or carriers.

"Lyme disease is the most common vector-borne disease in North America, with a recently revised number of approximately 300,000 confirmed and probable cases occurring annually in the United States," Sellati said.

Lyme disease is present in nearly every state, but it's most prevalent from the North Atlantic into the Northeast, and west into the north-central states of Minnesota and Wisconsin.

New York is consistently one of the top five case reporting states. In the last 10 years, more than 40,000 Lyme disease cases were reported here.

"In 1986, the incidence of Lyme disease was primarily in Long Island and New York City," Sellati said. "As you go year over year, you start to see the spread of ixodes ticks and the spread of the pathogens it carries throughout the years."

Sellati said reports of Lyme disease have plateaued downstate, but they've been steadily increasing in the Adirondacks in the last 20 years.

The good news is that fewer than 10 tick species have been confirmed as vectors for Lyme *Borrelia*. That's not a lot, considering there are more than 80 tick species in America and more than 200 worldwide.

Brian Leydet, a biologist with the Trudeau Institute, said there are several tick species in the Adirondacks, but the one people are most familiar with is *Ixodes scapularis*.

Ixodes scapularis is commonly called the deer tick, but scientists call it the black-legged tick because there are numerous tick species that feed on deer. They are the only species known to carry Lyme disease in the region.

Now that scientists are studying ticks, they are learning that assumptions about cold Adirondack winters keeping black-legged ticks at bay might not be accurate.

"It could be the number of hot days in a season, or the number of warm days in a season," Leydet said. "There's a group up in Canada that has done this work in the field, and they saw that they could predict the laying of eggs by the number of warm days before the female laid eggs."

Information like that doesn't mean the spread of ticks can somehow be stopped, but it might allow public health officials to issue warnings prior to particularly robust tick seasons. It still doesn't

reveal why black-legged ticks are here, though.

So far, data show that reports of ticks in the Adirondacks are spotty, which could mean they are being brought into the region and settling in localized areas. It could also mean that the data is incomplete, and their occurrence isn't as spotty as it appears.

What is known is that the presence of ticks is more complicated than previously thought.

"It's not just the climate, but the climate does play a big part," Leydet said. "Obviously, if you have a permafrost and you live in a tundra, you're not going to have a tick there all the time because it's not the right environment."

Leydet said human habitation has made it so deer can linger in an area. If deer frequent an area, perhaps by feeding off of things like bird feeders, that could benefit the ticks that feed off of them.

Research shows that places where animals frequent, like trail edges, animal paths and forest edges, often contain more ticks. Leydet said ticks can still be found 20 feet off of a trail, but they might not be as abundant there.

Forest type is important, too. Ticks are susceptible to drying out, so they live in the leaf litter, where it's moist and a little warmer than the surrounding air. That enables them to survive winter, but it also makes them less common in pine forests.

By studying the genetics of local ticks, Leydet hopes to trace where they are coming from, and maybe even predict where they're going to be next.

"Ticks are where they are and where they can be, and that's all we know right now," Leydet said.

Ticks 101

Ticks are arachnids, like spiders. They start their lives in tiny eggs and have three life stages: larva, nymph and adult. Each is larger than the stage before it, and each requires a blood meal to go on to the next stage.

Females go into the winter engorged with blood, which gives them enough energy to lay about 3,000 eggs in the spring.

The six-legged larva emerge and hang out on leaves, waiting for a small mammal, like a mouse, to happen by.

"The larva are never affected with borrelia burgdorferi," Leydet said. "That has to come from feeding on an infected animal. If all of these guys were infected, we'd be in trouble."

Most larva don't survive to molt into the nymph stage, which is a little bigger. The sexless, eight-legged nymphs are responsible for most Lyme disease cases in the United States because they're tiny and therefore difficult to detect.

Nymphs prefer small mammals as well, but will attach to humans. They sometimes overwinter before molting into adults, the largest life stage.

Adult ticks prefer feeding on larger animals, like deer and humans. Males require little nourishment, as their primary function is to mate.

Once a female tick has mated, she begins questing for a blood meal. It takes five to seven days for her to become fully engorged, and after giving birth she withers and dies. A greater number of adults than nymphs tend to be infected with borrelia because they've had two life stages of feeding.

The best way to prevent exposure to ticks is to secure all openings in the clothing and to wear long pants, sleeves and light-colored

clothes, which makes ticks easier to see.

Anyone who spends time in the woods should also check themselves for ticks after every outing. If a tick is found imbedded in the skin, it should be carefully removed using a tick twister or tweezers, and kept in the freezer.

If a rash or any other symptoms of Lyme disease develop, go to a doctor immediately, and bring the tick along for testing. The same precautionary efforts should be applied to pets who spend time in the woods.

For more information on ticks and Lyme disease, visit www.cdc.gov/ticks.

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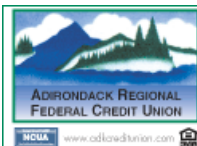
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