

Species Spotlight

Ticks

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This time of year we all love to be outside, hiking through the woods and grasslands, exploring the diversity of life around us. After spending a day watching birds and butterflies soar, seeing bumble bees fly from flower to flower, and listening to frogs sing, we return home only to find that unexpected visitors have hitched a ride on us or on our beloved dog. Ticks!

The mention of ticks brings a shudder to many, but this diverse and often misunderstood group deserves our attention. For years, when I discovered a tick, I would simply remove it and put it in a vial of alcohol to save for the Illinois Natural History Survey (INHS) Entomology Collection or an educational display. I never gave them much consideration, until this year, when for the first time, there was a red circle surrounding an attached tick on my shoulder. As I began reading about ticks and tick-borne diseases, I realized I had discovered a

fascinating group of organisms and the potential consequences of encountering them.

Although many people think of ticks as insects, they are actually arachnids, more closely related to spiders and scorpions. Adult ticks have four pairs of legs and no antennae. Ticks cannot jump or fly, only crawl to the edges of plants where they wait for an animal to pass by. Holding onto the vegetation with their hind legs, they stretch their front legs to detect and grab onto the next host. The Haller's organ, found on the forelimbs of a tick, enables it to sense changes in temperature and humidity as well as increases in carbon dioxide from an animal exhaling.

Approximately 20 species of ticks occur in Illinois, divided in



Typical bull's-eye rash that resulted from infection by a black-legged tick. Photo by Jen Mui, INHS

to two groups, the "soft bodied" and the "hard bodied." "Soft" ticks typically feed on birds and bats so we rarely encounter them. The "hard" ticks commonly found in Illinois are the American dog tick (wood) tick, blacklegged (deer) tick, lone star tick, and the brown dog tick.

The "hard" tick requires three blood meals to complete its life-cycle, which can take up to three years. Ticks feed by plunging their hypostome (a rodlike structure with barbs) into the host animal. The barbs on the hypostome

keep the tick from being easily removed. Most ticks also secrete a glue-like substance that cements the tick in place until it is done feeding. Once engorged, the tick removes its hypostome, falls off the host, goes underground, and transforms to the next life stage.

The "hard" tick hatches as a tiny, six-legged larva and after feeding on the blood of an animal, transforms to an eight-legged nymph. The nymph must find another animal to feed on before molting to its adult form. After the adult finds a meal, the female lays eggs and the process begins again.

Because an individual tick must feed on several animals throughout its life cycle, they are capable of transmitting certain diseases from one animal to

another. Tick-borne diseases include Rocky Mountain spotted fever, tularemia, Lyme disease, babesiosis, anaplasmosis, and ehrlichiosis.

It is important

to note that most ticks are not infected with these pathogens, but some regions may have a higher level of infection potential.

Ticks are found in shaded, humid areas in a variety of habitats including woodlands, grasslands, and urban areas. Black-legged (deer) ticks are the main vector of Lyme disease to humans, dogs, and other animals. This species was believed to be most common in wooded areas, acquiring *Borrelia burgdorferi* (the bacteria that causes Lyme disease) from white-footed mice. Recent re-

search by INHS wildlife epidemiologist Nohra Mateus-Pinilla and Jennifer Rydzewski found that in the fragmented landscape of central Illinois, where forests are limited, prairie voles are serving as hosts to the *Borrelia burgdorferi* bacteria. This additional host allows the bacteria to survive in open habitats as well as the forest. This research has shown that there is still much more to learn about these beguiling creatures.

Four Species of Hard Tick



*American dog ticks, (*Dermacentor variabilis*) are the most commonly encountered ones in Illinois. Adults are active from April to September and can carry the pathogens for Rocky Mountain spotted fever and tularemia. Photo by Jen Mui, INHS*



*The black-legged tick (*Ixodes scapularis*) is present year round and can carry the pathogens for Lyme disease, babesiosis, and anaplasmosis. All life stages of the black-legged tick will bite humans, dogs, and other animals. Photo by Jen Mui, INHS*

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