TICKS

Tick biology, habits, identification, elimination

In this article, you will find info on: tick biology and habits, identification of the two major families of ticks, ticks as vectors of Lyme Disease (and other diseases) and tick extermination. The more you understand the habits and life of ticks, the easier it will be to eliminate them from your environment.

Ticks are one of the last things you want to find crawling in your home, infesting your lawn and shrubs or attached to your pets and family members. These little blood-suckers can be a stubborn pest to eliminate if given a chance to take hold. In our many years of pest management, we have found that homeowners usually do a better job in killing ticks than the average pest control technician. We believe this is because you (the homeowner) only have one house to concentrate on (instead of twenty per day!) and you also know the habits of your family and pets. You are familiar with the favorite haunts of your dogs and cats, so you know where to inspect and treat for ticks.

Tick Identification

Ticks are the only members of the order Acarina that can be recognized without a microscope. The most easily seen features are the spiracular plates (or stigmatal plates) which surround the external openings of the respiratory system. These plates are well developed and large. They are located just outside the bases of the third and fourth pairs of legs.

Ticks feed only on the blood of vertebrates, making them one of the least favorite visitors in our homes. Hard ticks and soft ticks are the two major groups that are pests.

Hard ticks have the capitulum (where the head and mouthparts are located) exposed and easily visible from the top. The upper side of their body also bears a distinctly sclerotized shield or scutum. This structure covers most of the upper body surface in the male tick, but is restricted to a much smaller area (immediately behind the capitulum) in the female. When a female becomes completely engorged

with blood, her abdomen increases to many times its normal dimensions and the scutum will then appear to be extremely small in relation to the body size. Male ticks do not become so large when engorged.

In soft ticks, the body has a rather non-descript sac-like shape. The front portion of the body extends forward, above and beyond the base of the capitulum, so that the capitulum is concealed when the tick is viewed from above. Soft ticks of not have a scutum on the upper side of the body, and the exoskeleton is rather leathery in texture with a distinctly roughened surface.

Tick Life Cycle and Habits

Ticks have four stages in their life cycle: egg, larva, nymph and adult. Mating usually occurs while adult ticks are on the body of the host animal. The female then drops to the ground and deposits her eggs. Adult female hard ticks feed only once and lay one large batch of eggs, often containing as many as 10,000 or more. Some adult female soft ticks will feed several times and lay 20 to 50 eggs after each meal. depending on such conditions as temperature and humidity, larvae will hatch from the eggs in anywhere from two weeks to several months.

The first immature stage (larvae, which are many times called seed ticks) have only six legs. These larvae must find and attach themselves to a host in order to get a blood meal. After obtaining this blood meal they usually drop to the ground, shed their skin and emerge as 8-legged nymphs. Larvae of some ticks which feed only on one host remain on the host to molt. Because of the difficulty of finding a suitable host, larvae can withstand long periods without feeding.

Nymphs resemble the adult tick in that they have eight legs. They do not, however, have a genital opening. Like the larva, the nymph must be able to live without feeding for long periods of time until it finds a suitable host. After finding a host and feeding, the nymph molts and becomes an adult tick. Hard ticks have only one nymphal instar while soft ticks may have several. A few ticks, such as the cattle, *Boophilus annulatus,* have only one host and molt on it, leaving the host only to lay eggs.

Adult ticks may require several days of feeding before they are able to reproduce. Male hard ticks usually die soon after mating, and females die soon after laying their eggs. Adult soft ticks are generally longer-lived, and egg-laying is a periodic activity of the female.

Most ticks spend the bulk of their life on or near the ground, waiting for a suitable host animal. Since they cannot run, hop, fly or move quickly, ticks must climb onto an appropriate object such as tall grass or weeds or up onto fences and siding of buildings. It is from these advantageous positions that they wait for a suitable host to pass by. When they detect vibrations and chemical cues such as host odors or exhaled carbon dioxide, ticks will fall from their perch or stretch out (holding on to

their perch with only 2 or 4 of their rear legs) and hope to snag or attach onto a passing host (e.g., a mammal with a fur coat or pants and socks worn by humans.) Ticks are also capable of detecting shadows cast by a passing host. These tick behaviors are important to understand and recognize in order to make thorough and effective applications of acaricides, pesticide dusts or sprays labeled for eliminating ticks and other arachnids. These behaviors also explain why ticks crawl up exterior or interior surfaces of homes and often lodge in cracks and crevices below shingles, clapboard siding, window molding, baseboards, etc. In these latter cases, you must understand this aspect of tick behavior and carefully inspect and treat all these crack and crevices with a good insecticide dust.

Most ticks will feed on blood from a wide variety of animals, with only a few tick species feeding on but one kind of host. In some tick species the immature stages will feed on different hosts than do the adults. reptiles, amphibians, mammals and birds are all vertebrates which ticks may parasitize. Migratory song birds regularly spread ticks across wide regions of the United States as they move about enroot to their seasonal habitats.

Ticks As Disease Carriers

Certain ticks carry the causal organisms of such diseases as Rocky Mountain spotted fever, Lyme disease, typhus, rickettsial pox, relapsing fever, tularemia, Colorado tick fever and Texas cattle fever. Another health threat posed by certain ticks attacking humans and other animals involves a poorly understood condition called "tick paralysis." This occurs during the feeding process when the host is afflicted with a paralytic condition, which develops gradually and may result in death. Paralytic symptoms disappear rapidly upon removal of the tick and there seem to be no serious after effects. Most of the tick problems which you might encounter are in and around homes, and do not involve the disease-carrying species. Only those species likely to be encountered around homes or other structures are described in this article. However, it is important to remember to save any tick that is found attached to you or your family. Save the tick in a vial or Ziploc with a damp cotton ball or paper towel. (This method keeps the tick alive longer or hydrated. The tick can be tested for B. burgdorferi using the cheaper IFA test as opposed to more expensive PCR test.)
If a rash (or other conditions develop) within the following four weeks, take the tick and the person involved to a doctor.

Hard Ticks

Brown Dog Tick *Rhipecephalus sanguineus*

This is one of the most widely distributed ticks on the world and there are records of its occurrence on a number of hosts. By far the most common host is the domestic dog and the brown tick is virtually restricted to this host in the United States. There

are occasional collection records of people and domestic cats as hosts, but these records are generally for instances where there has been close contact with infested dogs. In other parts of the world, this tick seems to have a somewhat wider range of hosts. Under normal circumstances in North America, all feeding stages of the tick feed on dogs. The adults commonly attach to the ears and between the toes, and the larvae and nymphs are often found in hair along the back. While these developmental stages are often found on the indicated host body regions, they are not restricted to these regions and may be found on practically any part of the dog's body.

When individuals of each feeding stage become fully engorged, they drop from the host and seek some protected situation in the immediate surroundings. For this reason, all tick life stages may be found behind baseboards, under window and door moldings, in window pulley openings or in furniture. Couple this behavior with the climbing behavior of newly hatched larvae or other stages which have not obtained a blood meal recently, and one can understand why nearly all cracks and crevices in an infested premise must be carefully treated in order to obtain good tick control. Homeowner calls usually occur in the late summer and fall when ticks are encountered crawling on carpeting, walls and sometimes furniture.

Brown dog ticks can be found outdoors in the southern United States during any time of the year, but are found outdoors during the warm months in the northern United States. It is generally believed that this species of tick cannot over winter in the more northern United States except within a heated structure.

Adult male ticks are flat, about 1/8 inch long and uniformly re-brown with tiny pits scattered over the back. They do not enlarge upon feeding as do females. Before feeding, adult female ticks resemble the males in size, shape and color. As they feed, females become engorged and swell to 1/2 inch long and 1/4 inch wide. The legs, mouthparts and shield area behind the head remain red-brown, but the enlarged portion of the body becomes gray-blue to olive. The red-brown color is distinctive and no other tick normally encountered will be uniformly red-brown.

Egg-laying begins about three days after the engorged adult female drops from the dog. She may deposit as many as 5,000 eggs in places such as between boards, under plaster or carpeting, or in other cracks and crevices. The eggs usually hatch in about three weeks, although up to several months may be required under particularly cool or dry conditions. After hatching, the larvae wait months while waiting for a host. Once on the host, the larvae feed for about three days and then drop off. Molting occurs about one week after the blood meal, and nymphs emerge to climb vegetation or vertical surfaces to again wait for a host. The second feeding will last about four days, after which they again drop off, to molt into the adult stage. Adults can live up to 1 1/2 years, without feeding, but must feed before mating. After mating, the female completely engorges herself with blood and then drops off the host to lay eggs.

A home can become heavily infested if the family dog picks up ticks from an infested residence, during which time some ticks may drop off. In this case, the home and yard may become infested even though a dog is not generally kept there. Dogs do not become infested with brown dog ticks by direct contact with other dogs. Ticks feeding on a dog drop off and molt before they will resume host-seeking behavior and attach to another dog.

American Dog Tick *Dermacentor variabillis*

Dogs are the preferred host of adults of this tick species, but they will also feed readily on many other large animals. Larvae and nymphs of this species feed virtually exclusively on small, wild rodents. Newly hatched larvae are yellow with red markings near the eyes, while engorged larvae are slate-gray to black. Nymphs are similar in appearance to the larvae but have four pairs of legs instead of three pairs. Adults are generally brown, but become slate-gray when engorged.

This tick is a vector of the causal organism of Rocky Mountain spotted fever and is one of the species commonly involved with tick paralysis. This species is the most widely distributed tick of this genus in North America and is the most commonly encountered by pest management professionals. It occurs throughout the eastern and central United States.

Rocky Mountain Wood Tick *Dermacentor andersoni Stiles*

As its common name suggests, this species is encountered throughout the Rocky Mountain region, where it is the principal vector for Rocky Mountain spotted fever. It is commonly involved with cases of tick paralysis. Larvae and nymphs are generally found on small wild rodents, and the adults on larger mammals. However, cases are known where all three life stages have been found on medium-sized mammals such as jack rabbits. This species is a common problem for campers and other vacationers in areas within its normal range.

Groundhog Tick *ixodes cokkei Packard*

Both nymphs and adults of this species may attack humans. They are most common in the New England states where they are found in summer cottages around areas frequented by groundhogs.

Common Fowl Tick *Argas radiatus Raillet*

This tick, known also as the chicken tick and the "blue bug," is a soft tick common in poultry houses in the southern and southwestern United States. It may injure or even kill chickens, and may attack humans. It can be controlled in chicken houses and bird-roosting areas by application of properly labeled insecticides such as Permethrin-10 concentrate or Permethrin Dust.

Relapsing Fever Tick *Ornithodorus turicata*

This group of soft ticks, which transmit the causal organisms of relapsing fever, are sometimes found in buildings in the western and southern United States.