BOHART Museum of Entomology University of California, Davis

INFORMATION

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Ticks

Ticks are blood-feeding external parasites of mammals, birds, and reptiles throughout the world. They are arachnids, the same group that includes spiders and scorpions. There are two different groups of ticks, the hard ticks (Ixodidae) and soft ticks (Argasidae). Both are important vectors of pathogens to humans and animals throughout the world. Some diseases of current interest in the United States caused by tick-borne pathogens include Lyme Disease, Rocky Mountain Spotted Fever, and tick-borne Relapsing Fever (soft ticks).

Hard ticks usually have four life stages: egg, two nymph stages and adult. Hard ticks take only one blood meal during each life stage after the egg. The entire life cycle may take less than a year in tropical regions to over three years in cold climates, where certain stages may enter diapause until hosts are again available.

The life stages of soft ticks are not readily distinguishable. Unlike hard ticks, many soft ticks go through multiple nymph stages, gradually increasing in size until the final molt to the adult. Soft ticks feed several times during each life stage, and females lay multiple small batches of eggs between blood meals during their lives. The entire life cycle is generally longer than that of hard ticks, lasting several years. Soft ticks have an impressive resistance to starvation, and can survive for years without feeding.

The tick mouthparts are called the hypostome, which has many backward directed projections. The projections prevent easy removal of the attached tick. Most hard ticks also secrete a cement-like substance from the salivary glands that literally glues the feeding tick in place. The substance dissolves after feeding is complete. When a tick is removed, this is the material left behind, not the “head”.

Many ticks seek hosts by "questing." Questing ticks crawl up the stems of grass or perch on the edges of leaves in a typical posture with the front legs extended. Certain chemicals, such as CO_2, as well as heat and movement cause questing behavior. Ticks climb onto a potential host that brushes against their extended front legs. Once on a host hard ticks may feed for several days to several weeks.

The outside surface, or cuticle, of hard ticks grows to accommodate the large volume of blood ingested, which may be anywhere from 200-600x the adult body weight.

Dog tick, *Dermacentor variabilis* (left)
(and Pacific deer tick, *Ixodes pacificus* (right) (photo courtesy of CDC).

Soft ticks are generally nest parasites, found in rodent burrows, caves, nests, and sleeping areas under trees. Soft ticks spend much of their time in the nest off the host, feeding only when the host returns.

There are several common ticks in California. The western black legged tick is a 3-host tick that feeds on lizards and small rodents as a subadult, and large mammals as adults. It occurs in the moister regions of the coastal and Sierra foothills throughout the state. It is a vector of Lyme Disease, and Equine Granulocytic Ehrlichiosis in California. Their feeding may cause intense inflammation at the site of the bite that may be slow to heal. These “bruises” do not necessarily indicate disease transmission by the tick but are caused by its toxic saliva.

The American dog tick is a 3-host tick that feeds on rodents as a subadult and on large mammals, such as dogs and humans, as adults. It is the most important vector of Rocky Mountain Spotted Fever in the eastern U.S. and can also transmit tularemia (Hunter's Disease). This tick is widespread in the U.S. In California it is most frequently found along the coastal ranges, but has also been collected in the Central Valley and eastern Sierra.

The Pacific Coast tick is a three-host tick that commonly feeds on rodents, especially squirrels, as subadults, and on cattle, horses, deer, and humans as adults. This is one of the most widely distributed ticks in California. It is found throughout the state except for the very dry regions of the Central Valley and the southeastern desert region. It is not known to carry any human pathogens.

For more information : http://entomology.ucdavis.edu/faculty/rbkimsey/caticks.html.