

Common Ticks

of the Cariboo-Chilcotin and other parts of British Columbia

by Rob Higgins

ABSTRACT

A general review of the taxonomy and life cycle of ticks is provided and several species found in British Columbia are described. Tick-borne diseases and their prevention are also discussed.

Ticks are one of the few animals that seem to elicit a strong, preconditioned, negative visceral response. For many, the stress at the sight of an attached tick ranks somewhat ahead of stumbling with half a sandwich in your hand, across a hungry grizzly, and just slightly below watching your house burn to the ground with your CD collection. Or at least, so it seems. Perhaps it's the spider-like appearance of the tick, the knowledge of its purpose on your body, the risk of disease, or just the size of our grassland ticks that upsets so many. There are good reasons for some concern with respect to diseases vectored by ticks but, in reality, the risk of disease is quite low. And additional knowledge of the subject can reduce those risks.

WHAT ARE TICKS?

Ticks belong to a group of arthropods (animals with jointed legs) that are placed in the same class as the spiders (Arachnida). An adult tick has four pairs of legs and lacks any antennae (Figure 1). Thus, ticks are not insects, and you will likely not find them discussed in entomology books. Ticks belong to the Order Acarina, of which some 850 species have been described (30 or so in Canada). The two principal families within this order are the Argasidae (soft-bodied ticks) and the Ixodidae (hard-bodied ticks).

SOFT-BODIED TICKS

Few people are familiar with soft bodied ticks. These ticks are usually very small (around 1 mm) and records of them biting humans are rare (although this may be under-reported). Most of these blood feeding parasites act more like bedbugs. They spend most of their time hiding in cracks or crevices around the nests of birds or small mammals. They emerge to quickly feed on resting animals, then return to their hiding places. Thus, it is rare to find one of these ticks actually on its host. In British Columbia, one species, *Ornithodoros hermsi*, has been known to pass Relapsing Fever to humans. Typically, human interactions with this tick occur when sleeping in a cabin or home that is shared with a mammal or bird nest infested with this tick. Relapsing Fever is caused by a spirochete bacterium and results in a series of serious, but usually not life threatening, bouts of high fever.

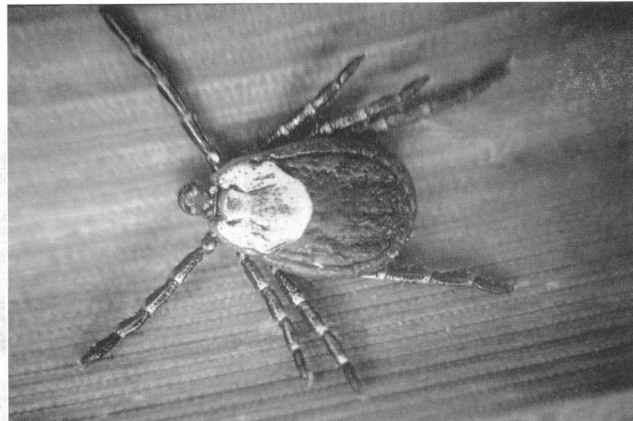


Figure 1 Like spiders, ticks have eight legs. Female Rocky Mountain Wood Tick.

HARD-BODIED TICKS

Life Cycle

The hard-bodied ticks are what most people have encountered at one point or another. There are many in British Columbia, but before one can understand the different types, a few things need to be said about the group as a whole. A hard-bodied tick can be seen to have thin, poker-like mouth parts sticking out front when viewed from above. Hard ticks have a life cycle consisting of four stages. Eggs (stage 1) are laid on the ground and hatch as larvae (stage 2). The larvae are also called “seed ticks” and, oddly, have only three pairs of legs. The larvae find a host, feed on its blood, and develop into nymphs (stage 3). The nymphs also feed on blood and then develop into adults (stage 4). An adult female tick can be distinguished from a male by the semi-circular scutum (shield) she possesses on the upper part of her back. The back of a male is entirely covered by the scutum and he thus lacks the semi-circular shield near the head. The reduced scutum allows the females to engorge with blood and increase in size ten fold (Figure 2). A female tick will use this blood to produce anywhere from 5000 to 10 000 000 eggs. The following is a description of some of the species of hard-bodied ticks found in British Columbia.

D. andersoni is considered a “three-host tick” because it drops to the ground after each feeding and must find a new host before it can develop into the next stage.

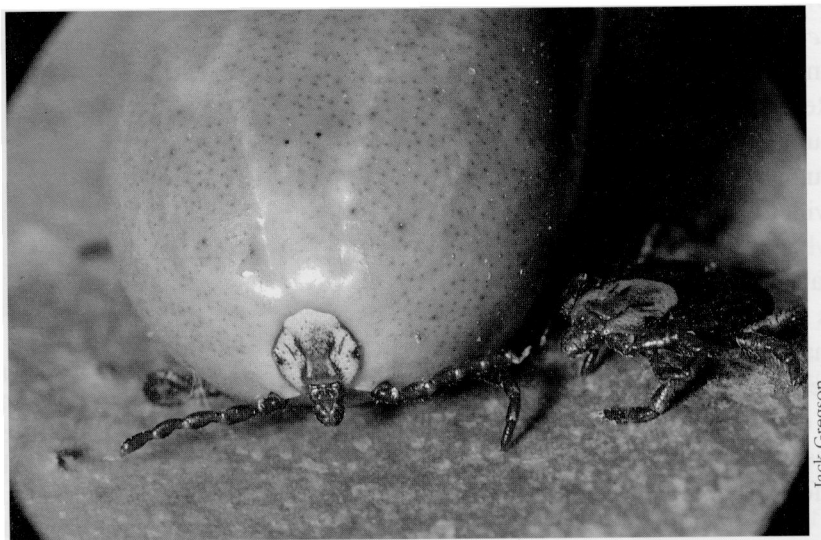
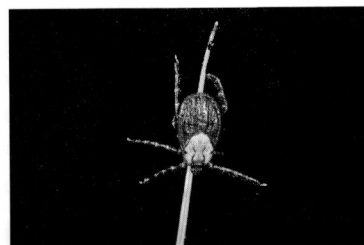


Figure 2. My, you've put on weight, sis! Rocky Mountain Wood Tick females — engorged and flat.

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Dermacentor andersoni (Rocky Mountain Wood Tick)

The tick that most people encounter in the Cariboo-Chilcotin area is the Rocky Mountain Wood Tick (Figure 3a & 3b). It may also be called the Wood Tick, Paralysis Tick, Spotted Fever Tick, Spring Tick, Cattle Tick, Sage Tick, or Sheep Tick. It is found, as these names suggest, on quite a variety of hosts, as well as on humans and dogs (although the name Dog Tick usually refers to *D. variabilis*, a species common east of Saskatchewan). We usually see only the adults, as the earlier life stages parasitize smaller mammals. *D. andersoni* is considered a “three-host tick” because it drops to the ground after each feeding and must find a new host before it can develop into the next stage.



Anna Roberts

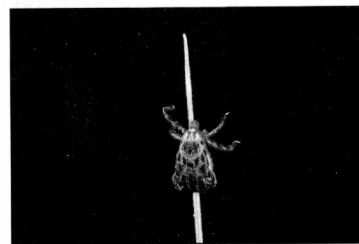
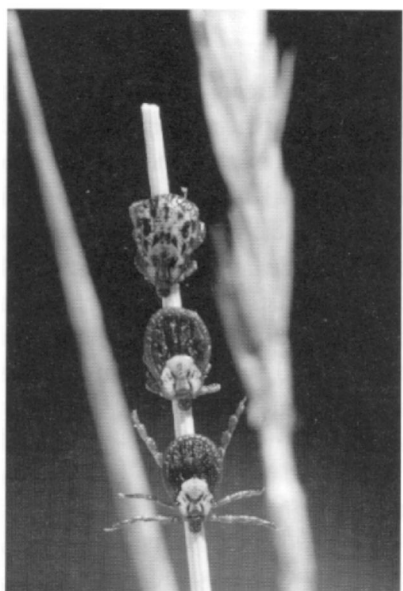


Figure 3. Rocky Mountain W
3a (top) Female
3b (bottom) Male

Between early March and mid-May (usually) the adults can be found at the top of blades of grass along game or walking trails. They are just over 0.5 cm long and can be spotted if you look carefully along a trail. They look like little brown seeds on the grass tips (Figure 4). Vibrations, carbon dioxide, or shadows will get their little legs flying, as they try to catch hold of anything



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Figure 4 Ticks “questing:” the female holds on with two legs and flings the other six out to be caught by an unsuspecting passerby.

passing by. They do not drop from trees. (Just think about how long it would take a tick to climb the trunk and out on a branch, and imagine the complicated nervous system it would need to allow the tick to fall on a moving object below.) An unlucky tick may survive for a year or so without feeding. Survival depends on temperature and humidity; most unlucky ticks eventually die from desiccation. Once on the body, the tick may settle anywhere, but seems to prefer areas such as the groin, axillae, and scalp (Figure 5). On dogs, the ticks are usually picked up on the chest, but if not detected, end up around the head and neck. You often notice the males more readily, as they spend more time scrambling about looking for a mate. They will also feed but do not take as much blood.

***Dermacentor albipictus* (Winter Tick, also known as Moose or Elk Tick)**

This tick is similar in size and appearance to the Rocky Mountain Wood Tick. The winter tick is a serious pest of moose, elk, cattle, sheep, and horses. Whereas one might occasionally find several Rocky Mountain Wood Ticks on a pet dog, it is normal to find about 30 000 Winter Ticks on a single moose during late winter.

Excessive grooming by the moose, to dislodge these parasites, damages the hair, sometimes giving the moose a whitish appearance and leading to the name, “Ghost Moose.” The tick tends not to carry too many serious diseases, but the large mass of feeding ticks can cause a significant loss of blood and weaken the animals at a time when they are already at their lowest in energy reserves, i.e., late winter. Thus, this tick can greatly increase winter moose mortality.

Larvae (seed ticks) of this species are picked up by large animals during the fall. Hundreds of seed ticks often cluster so densely on the top of a grass stem that it looks like a black-topped cattail. Once on the host, the ticks feed and go through their life cycle without dropping to the ground. Thus, an animal carries them for the winter, making this a “one host tick.” By early spring, pregnant female ticks are ready to drop to the ground to lay eggs. Interestingly, this is a weak link in the life cycle. Female ticks begin to drop in March, peaking in early to mid-April. If there is still snow on the ground most will die, reducing the numbers of larvae ready in the fall. In the winter of 1997-98 the light snow load gave rise to a bumper crop of Winter Ticks; many moose suffered from this legacy. Fortunately, a heavy snow load in the winter of 1998-99 should have greatly increased tick mortality and given the moose some relief for this winter.

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Figure 5. Ticks congregate along the mane or on top of the head of a cow.

While this tick can be a pest of horses, regular fall grooming by owners removes many of the ticks before they can cause much trouble (Figure 6). It is a more significant pest of cattle and sheep throughout British Columbia. Failure to treat cattle and sheep with pesticides will result in consequences similar to those seen in moose. In turn, this can result in a 10-20% increase in feed requirements for the stressed animals.



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Figure 6. About half of the winter ticks taken from this horse.

***Ixodes pacificus* (Pacific Coast Tick or Pacific Black-Legged Tick)**

Look at a dime. Notice where the denomination is printed. Look at the zero in the "10." This is about the size of an adult female Pacific Coast Tick (males are half as big). Very close examination of this species of tick will show that they lack the festoons typical of *Dermacentor* and have a red-brown body and black legs. In 1956, Jack Gregson published the last survey reporting on the distribution of this tick in British Columbia. It was shown to be localized to the area of the Pacific Coast and Fraser Valley up to about Boston Bar. In 1997, a brief search by Dr. M. Morshed (pers. comm.) with the British Columbia Centre for Disease Control found the tick in the Creston and Cranbrook areas (finding all life stages) and turned up a solitary adult near Prince George. (The fact that other life stages of the species were not found

prevents official recognition of this distribution.) Larvae and nymphs were believed to feed on the Northern Alligator Lizard, but they have now been found on mice. Adults attach to larger hosts such as deer, dogs, cattle, sheep, and humans. The bite of this species can be quite painful and leaves sores that heal slowly. The adults are active in the fall and spring. This species is significant because it can be a vector of Lyme disease.

***Ixodes* spp.**

Two other *Ixodes* species bear a quick mention. *I. angustus* is one of the most common ticks in Canada and is found up into Alaska (although it seems not to like our drylands). This species has been shown to carry Lyme disease, but rarely bites humans. Finally, in our drylands, we have the tick *I. hearlei*. This species can probably also act as a vector of Lyme disease, but it has not been shown to have any interest in humans.

TICK BORNE DISEASES

Tick paralysis

For some reason, some individuals of the Rocky Mountain Tick can secrete a neurotoxin (poison) that can cause paralysis. (Or, is the "neurotoxin" produced by all of these tick species, with only a few hosts susceptible to its effects?) A local vet in Williams Lake informs me that they see one or two cases of this each year in dogs. (Interestingly, cats appear immune.) This disorder manifests as a progressive paralysis (without fever or pain), which can lead to death within a week. The simple removal of the tick can bring about a complete recovery from symptoms within an hour or so, as long as the respiratory system has not been involved. Unfortunately, symptoms may be confused with polio in humans or may be suspected as resulting from a car injury in dogs. Debra Palin (pers. comm.), a William Lake emergency room nurse, remembers one case of human tick paralysis diagnosed about 20 years ago, while Dr. Morshed (pers. comm.), based on calls to his office,

estimates that two or more cases occur each year in the province. A Williams Lake doctor (J. Grace pers. comm.) has no recollection of ever treating a tick-related illness. Thus, despite the presence of this disease in the Cariboo-Chilcotin, it appears to be extremely rare in humans.

Unfortunately, this may not be the case in all regions of British Columbia. For example, the incidence of tick paralysis is highest in the Thompson-Nicola region and there, it should not be disregarded.

Tick paralysis is also of significance to cattle, sheep, and horses (Figure 7). However, most ranchers treat their livestock with broad spectrum pesticides thus reducing the chances of contracting the disease or picking up the Winter Tick during the fall. Horse owners should regularly groom their animals to reduce this risk.

Rocky Mountain Spotted Fever.

This bacterial disease caused by *Rickettsia rickettsii* is also vectored by the Rocky Mountain Wood Tick. Case histories suggest that the infecting tick must be attached for at least a few hours before it transmits the bacterium into the host. Symptoms consist of a sudden fever, headache, muscle pain, and often a rash on the palms and soles. British Columbia sees perhaps half a dozen cases a year (which are possibly contracted while travelling out of the province), but it is much more common in the United States, where it seems to occur generally east of the Rocky Mountains. Antibiotics are usually successful in treating this disease.

Borrelliosis (Lyme disease)

This is the only “reportable” (i.e., a reportable disease is one that must be reported to public health authorities upon diagnosis) tick borne disease in British Columbia. It is caused by the bacterium *Borrelia burgdorferi*, which is passed on by the bite of *Ixodes* spp. ticks. It is a common disease in Europe, and was first diagnosed in North America during the mid-1970s in Lyme, Connecticut. Since then the disease

has been found in people throughout the United States and Canada and is currently the most commonly diagnosed tick borne disease in Europe and North America (although it is still rare in British Columbia). In British Columbia, there have been a total of 60 diagnosed cases although only 20 of these involved people with no recent history of travel, and who thus must have contracted the disease here in British Columbia. To date, no cases have been reported in the Cariboo-Chilcotin. The symptoms vary and some people may not show the early signs of the infection. However, it is commonly characterized by severe flu-like symptoms, muscle and joint pain, fatigue and weakness of the muscles of the face, and may present initially as a bull’s-eye rash around the site of the bite (which arises as the bacteria spread out through the skin). Antibiotics are effective in halting the infection.

PREVENTION

Wrapping your body in plastic and hiding under your bed will reduce your chances of picking up a tick (at least hard-bodied ticks....unfortunately this is exactly where one might expect to find soft-bodied ticks). Given the extremely low incidence of tick borne disease in humans and the ability to successfully treat the diseases that do arise, the best protection is knowledge.

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Figure 7 Paralyzed cattle (1957).

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The Rocky Mountain Wood Tick is most abundant in the grasslands, although it may be picked up anywhere east of the Coast Mountains and south of the Peace region. Wearing light coloured pants and tucking them into your socks will improve your ability to flick off the occasional tick. Some authorities recommend spraying the pant legs with an insect repellent. With these precautions it will still be necessary to carefully examine your body at the end of the day, paying particular attention to the groin and scalp. Immerse any ticks you find in alcohol for a few hours to kill them. They are quite resistant to squeezing and resist all but the most energetic efforts at crushing them. Place the clothes you wore that day aside in a pyramidal pile. Commonly, any ticks in the clothing will climb to the top of the pile during the night and can be removed easily.

Rob Higgins is a biologist teaching at the University College of the Cariboo in Williams Lake. He is currently active in investigating the role of ants in control of forest pests.

Jack Gregson is an entomologist internationally recognized for his work on ticks. He was officer in charge of the Federal Veterinary and Medical Entomology Laboratory in Kamloops from 1944-71. His photographs and some of the captions are from that period.

REMOVAL

If you find a tick on your body that has bitten, it can be removed by gently lifting the tick with a pair of forceps and firmly, but gently, pulling back. Do not squeeze the body of the tick as it may cause the tick to lose fluid into the wound, thus increasing the chance of passing on infection. The tick will usually dislodge in 1.5 to 2 minutes if you maintain a steady gentle pull. Ticks do not burrow into the skin, although inflammation around the bite site sometimes makes it look this way. They secrete a yellowish/white cement-like substance around the bite site to reduce the ability of any animal to dislodge them (Figure 8).

When they come loose, this substance will also come off sometimes making it look like you have pulled off a bit of skin. Do not apply alcohol, gasoline, or heat to the tick before removal. Any of these can increase the chance of the irritated tick passing infectious secretions into the wound. Tick mouth parts are not spirally shaped and do not require twisting to remove. Should it appear that mouth parts remain in the wound, apply an antiseptic to the wound and see your doctor to ensure complete removal. The broken mouth parts will not continue to dig deeper into the skin. For those that have a frequent need for tick removal, you might consider purchasing a pair of special tick tweezers, available in certain outdoor stores. ♦

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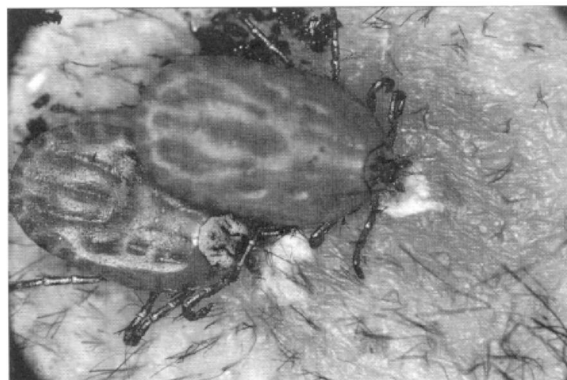


Figure 8. Tick cement at engorging tick mouth parts.