



Winter tick

(*Dermacentor albipictus*.)

in Alberta

Common name

winter tick, moose tick, ghost moose, "ticky" moose

Scientific name

Dermacentor albipictus

What's Bugging Wild Critters?

Fact sheet #21:
Winter tick



Significance

Most tick species live in harmony with the mammals on which they spend their time. However, in a few situations, the presence of certain species can result in significant damage to the hair of some individuals. The increased energy used to remove the ticks or to maintain body temperature in such individuals may contribute to loss of body condition or death.

What? Where? How?

Ticks (and mites) are related to spiders and, although they do not spin webs, they usually do have eight legs. Ticks are superbly adapted to living on the outside of other species and not falling off! They have specialized mouthparts that allow them to bore into skin surfaces and extract blood and other fluids. Once attached, they produce a cement-like substance that glues them in place. In addition, their bodies are flattened so they can lie close to the skin, making it more difficult for them to be removed by an irritated mammal. And, they have those eight legs with which to hang on!

The majority of ticks on Alberta wildlife are members of a family called "hard ticks" because they have a tough shiny outer cuticle. Many species of wildlife provide habitat for various ticks, particularly moose, elk, rabbits, and hares. The number of ticks on individual animals can be highly variable, from just a few on most animals to tens of thousands on some moose. The current record high number for Alberta is approximately 140 000 winter ticks on one moose calf!

Transmission Cycle

Hard ticks have four distinct life stages (egg, larva, nymph, adult). Each stage is larger than the previous one and all except the egg use blood as the primary source of nutrition. After they eat, each stage sheds its cuticle, much like a snake sheds its skin. In many species, each stage also has different habitat requirements and thus lives on different mammal species. The general pattern is for each stage to take a blood meal, drop to the ground, shed its cuticle, and then grab on to a species different than the one they just left. Thus, up to three different species may offer habitat for different tick stages. However, having said that, winter tick is unusual in that all three bloodsucking stages stay on one individual, generally a cervid (member of the deer family). Occasionally, in years and locations where ticks are particularly numerous, they may try to live on cattle and horses. But these species provide marginal habitat for winter tick, so the number of ticks per individual remains low (generally 1-200) and they rarely mature to the adult stage.

The timing of the life cycle in Alberta is finely tuned to maximize the chance of success for winter ticks. Each adult female may lay up to 5000 eggs in the leaf litter and under the grass thatch in June, well after the snow has melted (snow has not been a problem in recent years!!) and after the winter sun has gained strength and heat, thus speeding up the development of the eggs. The eggs hatch in about a month and the larvae live on the ground during the summer.

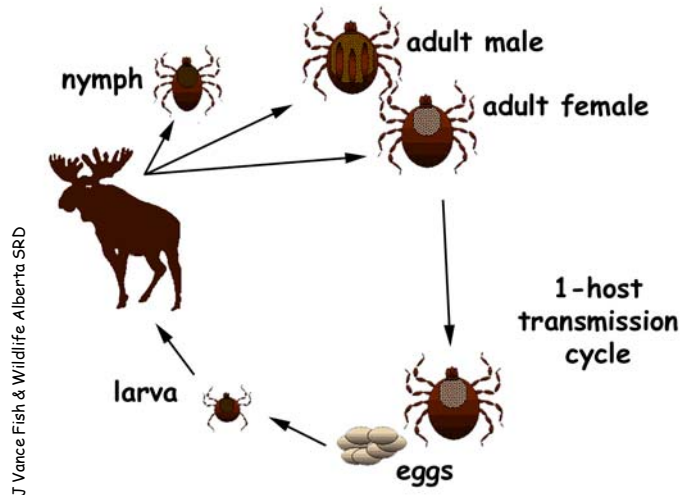
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In late September/early October, the larvae go looking for a new place to live. They climb up any available vegetation and, although they apparently have the ability to climb to any height, it seems they prefer to stay between 1 and 2 m from the ground—just about the perfect height to wait for a deer or moose. It hardly seems coincidental that this is exactly the time of year when deer and moose are in the rut and thus wander extensively as they look for potential mates. Similarly, it is not just coincidence that the larvae “happen” to find a deer or moose. Each larva has the ability to detect increased levels of heat and carbon dioxide in the air. So when a moose, for example, passes by a clump of larvae, its breath is warm and full of CO₂. The larvae detect this and immediately wake up, grab their neighbours, and wave their tiny front legs high in the air. On the end of each leg is a little hook exactly like the hooks on a Velcro® strip. If a moose or deer passes within reach, the hair on their body acts as the “fuzzy” part of the Velcro® and the tiny little hooks get caught. This drags not only the larva whose leg got stuck but also a chain of other larvae who happen to have their legs linked together!! We can all thank Dr. Bill Samuel and his amazing observational skills for this tiny tidbit of knowledge!!

Once on a deer or moose, the larvae quickly bury themselves in the hair and settle down for a long but warm winter nestled against the body of their obliging companion. Food is not far away and, at their leisure, the larvae take a blood meal and moult to nymphs. The nymphs begin to take blood in January. They eventually moult and most adults appear in March and April—just as the weather begins to warm and the snows begin to melt. Adult males and females feed on blood, but the females need a lot more blood in order for their eggs to develop properly and so they feed extensively. Female ticks have an elastic abdomen and may swell to 2 cm long (the size of a really big grape—the big purple ones, not the little green ones)! When everything feels just right, the females drop off onto the ground.

Those that land in snow often do not survive. Those that land on leaf litter or grass quickly burrow down to the soil surface where they eventually lay their eggs in June.



Distribution in Alberta

Winter ticks are common inhabitants of the foothills and boreal forest areas of the province. They are increasingly seen in the parkland region. Within these areas, their preferred habitat is moose; however, they will also use elk, white-tailed deer, and mule deer. Moose regularly accumulate thousands of ticks, while deer rarely have many at all.

Dr. Samuel and his students did a wonderful experiment that helped to explain the differences. They put tick larvae on hand-raised moose, elk, white-tails, and mule deer. The deer immediately started to lick and lick until most (but not all) of the larvae were removed. The moose completely ignored the larvae and went back to sleep. The elk licked its hair for a little while and then lost interest. The result was very few ticks left on the deer, a moderate number on the elk, and lots of ticks on the moose.

It is likely that each year some, perhaps most, moose and deer carry some winter ticks in Alberta.

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Importance for Wildlife Management

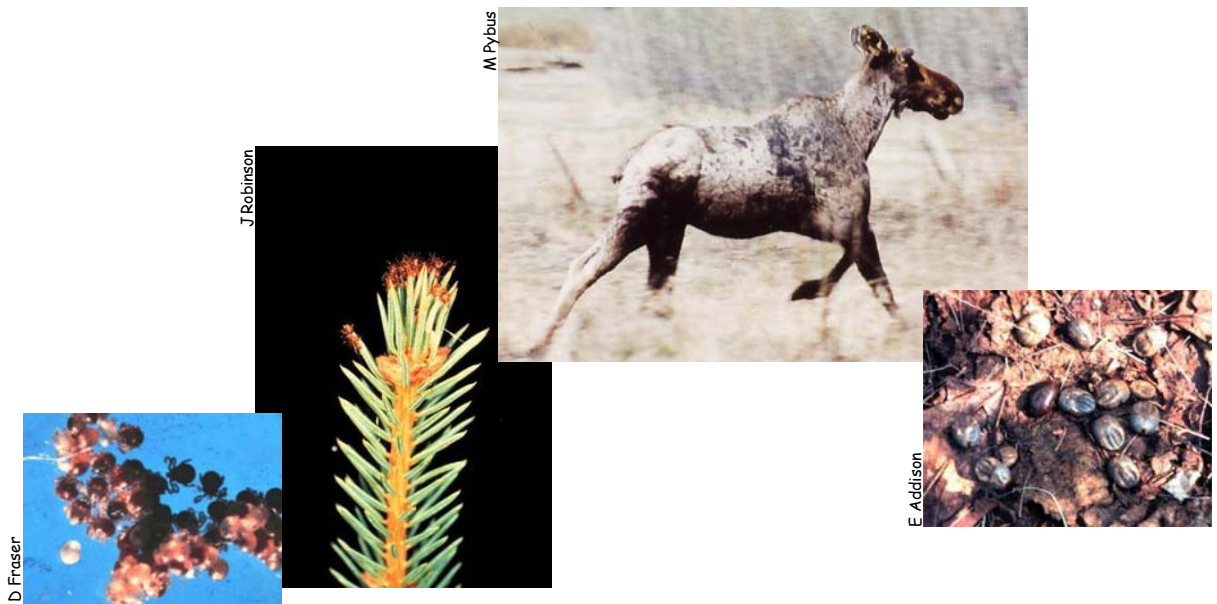
Generally, winter tick is not a management concern. However, every now and again we see large die-offs of moose in Alberta at the same time as we see lots of ticks on moose.

Thousands of ticks crawling around your skin and eventually sucking out little sips of blood must be very irritating (to say the least!) and by early winter, moose begin to scratch and lick and rub up against things and chew their hair and do just about anything to try to remove the pesky ticks. It is not unusual to see moose in late winter that have large white patches on their body where the long dark hair has been broken off and only a short white "crew cut" remains. The time and energy spent trying to get rid of the ticks, as well as the loss of the insulating hair and the loss of blood taken by feeding female ticks, can put individual moose in serious jeopardy. They may lose body condition and many die. Even when the ticks are not affecting moose populations by directly causing death of individuals, they may significantly affect the survivors.

Moose with large numbers of ticks sometimes have reduced stores of fat. This loss of condition may, in turn, reduce the number or survival of calves produced by pregnant females or the ability of bulls already stressed during the rut to make it through a long winter.

Major die-offs of moose in Alberta seem to occur every 12-15 years. The most recent, in 1998/99, was widespread throughout the northern and western portions of the province. Population survey data suggest that up to 30% of some local populations may have died during a period when winter ticks were the only significant contributing mortality factor. Weather appears to be the ultimate driving force behind the moose-tick relationship. A series of mild winters and warm dry summers in the mid-1990s resulted in increased numbers of moose and ticks as well as increasingly stressed trees and shrubs that were not adapted to the conditions.

The die-off of moose removed not only moose but many many ticks from the ecosystem and also reduced some of the ecological pressure on the stressed vegetation.



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Public Significance

Winter ticks very rarely bite humans and are not known to transmit diseases to humans. They are not conspicuous to hunters because the larvae are tiny (about the size of the head of a pin) during hunting seasons. They occasionally grab onto cattle and horses but do not seem to cause problems for these species. Fortunately, they cannot live on cats or dogs.

Prevention/Control

Although they may be associated with mortality in moose, there seems to be no real reason to try to control tick populations, even if we knew how to do this (which we do not). The impacts of ticks on moose occur only when moose numbers increase in a local population. The ticks may be one of a number of regulating factors that are important in preventing an overabundance of moose in such areas.



Summary

By far the majority of ticks and tick species in Alberta pose no threat or concern to wildlife or human health. However, large numbers of winter ticks may contribute to the death of individual moose and significant reductions in local populations of moose.

Additional Information

Parasitic Diseases of Wild Mammals, Second Edition. Edited by William M. Samuel, Margo J. Pybus and A. Alan Kocan. 2001. Chapter 4 - Ticks.

Canadian Cooperative Wildlife Health Centre: http://wildlife1.usask.ca/ccwhc2003/wildlife_health_topics.php?width=1280&height=1024

University of Northern British Columbia: http://www.unbc.ca/nlui/wildlife_diseases_bc/winter_tick.htm

Northwest Territories Resources, Wildlife and Economic Development: <http://www.nwtwildlife.rwed.gov.nt.ca/Publications/diseasepamphletweb/winterticks.htm>

Saskatchewan Agriculture, Food and Rural Revitalization: <http://www.agr.gov.sk.ca/apps/insectPest/pests/wintertick.asp>

Merck Veterinary Manual - Online: <http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/72104.htm>

Hinterland Who's Who: <http://www.hww.ca/hww2.asp?pid=1&id=93&cid=8>

US Fish & Wildlife Service: <http://midwest.fws.gov/agassiz/moose/moose/wintertick.html>