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Locations of Moose in Northwestern Canada with Hair Loss Probably Caused by the Winter Tick, *Dermacentor albipictus* (Acari: Ixodidae)

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ABSTRACT: Five hundred two trappers representing 389 registered traplines in northern Alberta, northern British Columbia, Northwest Territories and Yukon Territory (Canada) responded to a questionnaire on the occurrence of hair loss and the winter tick (*Dermacentor albipictus*) on moose (*Alces alces*). Results suggested that winter ticks may occur as far as 62°N. Several sightings of moose with presumed tick-induced hair loss near Kluane Lake, Yukon Territory, suggest the possibility of introduction of this serious pest into the moose population in Alaska.

Key words: Winter tick, *Dermacentor albipictus*, Acari, Ixodidae, northern distribution, western Canada, prevalence, moose, *Alces alces*.

The winter tick (*Dermacentor albipictus*) is distributed widely in North America (Cooley, 1938; Gregson, 1956). It is the northernmost species of the genus, being reported in western Canada to 60°N (Wilkinson, 1967). It is an abundant and serious pest of moose (*Alces alces*) in southwestern Canada (Cameron and Fulton, 1926-1927; Hatter, 1950; Samuel and Barker, 1979).

The northern distribution of *D. albipictus* is not known. Wilkinson (1967) attempted to show an association between the known distribution of winter ticks in Canada and bioclimatic zones by isopleths of mean annual number of day-degrees above 42 F (5.6 C). His conclusions were hampered by a lack of distribution data.

Winter ticks on moose induce characteristic premature, sequential damage to or loss of the winter hair (McLaughlin and Addison, 1986; Samuel et al., 1986; Glines and Samuel, 1989). At present, there are no other known causes of this form of hair loss on moose; lice and scab mites are not present on moose of Alberta (W. M. Samuel, unpubl. data) and have not been reported on moose of North America (Lankester, 1987). The characteristic alopecia was the focus of a short questionnaire

sent to trappers in northern Alberta, northeastern British Columbia and the Yukon Territory in February-March 1987. Trappers were asked if they had seen moose on their traplines in late winter/early spring (March, April) with the hair loss patterns depicted in a set of photographs (Fig. 1), and if so, in what years. They were asked also if they had found any dead or dying tick-infested moose.

Questionnaires were sent to a trapper selected at random from each of the 550 registered trap lines in northern Alberta in February 1987. Park wardens of Wood Buffalo National Park, northern Alberta, personally presented the questionnaire orally to 21 trappers (representing eight trap lines) in the Park in March-April 1987. Questionnaires were sent to approximately 220 trappers in northeastern British Columbia in February 1987 and to approximately 300 trappers from throughout the Yukon Territory (as part of a larger questionnaire distributed by the Yukon Territory Game Branch).

Seventy-six of 135 (56%) trappers in Alberta, representing 74 of 125 trap lines (Fig. 2), responded that they had seen moose with alopecia similar to that shown in Figure 1. Of the 67 trappers that provided information on when (in what years) they had seen alopecia on moose, 21 (31%) saw it "every year" or "nearly every year." Twenty-four (32%) had found dead or dying hairless, tick-covered moose.

Forty-five of 83 (54%) trappers in British Columbia representing 44 of 77 trap lines (Fig. 2) reported seeing moose with alopecia (Fig. 1); 12 of 42 (29%) saw it on moose every year or nearly every year. Fifteen (33%) had found dead or dying moose with alopecia and many ticks.

Eleven of 283 (4%) trappers from Yukon

Territory, representing 11 of 186 trap lines (Fig. 2), had seen moose with alopecia (Fig. 1). All sightings were south of 62°N. One trapper had seen moose with alopecia in the 1930's, one in the 1940's, and five between 1979 and 1987. An additional sighting of a moose with "moderate" loss of hair was made at Kluane Lake (Fig. 2) in March 1987 by a University of Alberta graduate student (D. Murray, pers. comm.). One of the 11 trappers from the Yukon had found dead hairless moose, but did not mention the presence of ticks.

A few pieces of skin (100 to 550 cm²) from 12 moose killed by predators in southern Yukon Territory were collected between November 1985 and March 1986. They were digested in 5% potassium hydroxide in a standard search for ticks (Samuel and Barker, 1979). Ticks were not found.

A trapper from the southern Northwest Territories saw an adult male moose with "moderate" loss of hair in March 1987, near Fort Providence (Fig. 2).

Northern records of alopecia possibly associated with winter ticks reported here do not extend significantly those of Wilkinson (1967), who found *D. albipictus* on a moose and wolf from Fort Liard and Fort Smith, Northwest Territories, respectively (Fig. 2). However, they do provide the first indication that *D. albipictus* may be in the Yukon Territory. A survey for winter ticks of moose hides from the southern Yukon Territory should be initiated to confirm the distribution of *D. albipictus*.

It is not known whether the northern edge of winter tick distribution fluctuates in response to short term changes in weather, such as the shorter milder winters of recent years, or whether it has been stable for many years. It is possible that a natural barrier to *D. albipictus*, related to climate, has existed in northwestern British Columbia and/or the Yukon Territory and kept *D. albipictus* out of Alaska. If results of the present study do reflect the distribution of the winter tick, this natural barrier, if it exists, is not very broad.

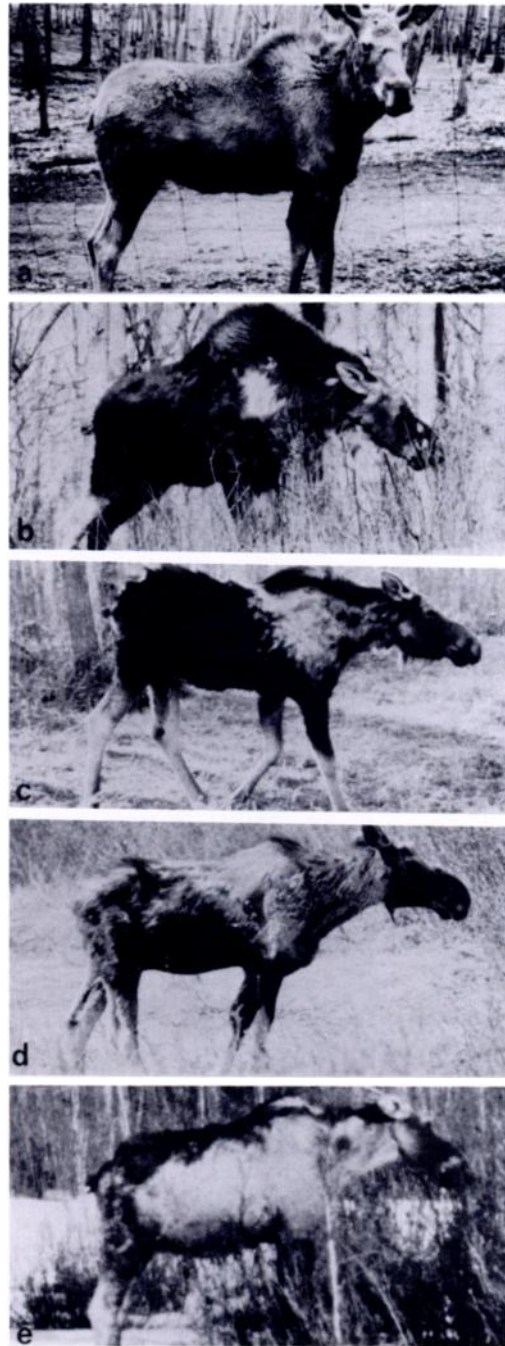


FIGURE 1. Sequence of premature loss of winter hair on moose infested with *Dermacentor albipictus*. a. No loss. b. Slight loss; approximately 5 to 20% of winter hair lost or broken at or near skin level. c. Moderate loss; approximately 30 to 40% lost or damaged. d. Severe loss; approximately 40 to 80% lost or damaged. e. Ghost moose; over 80% lost or damaged.

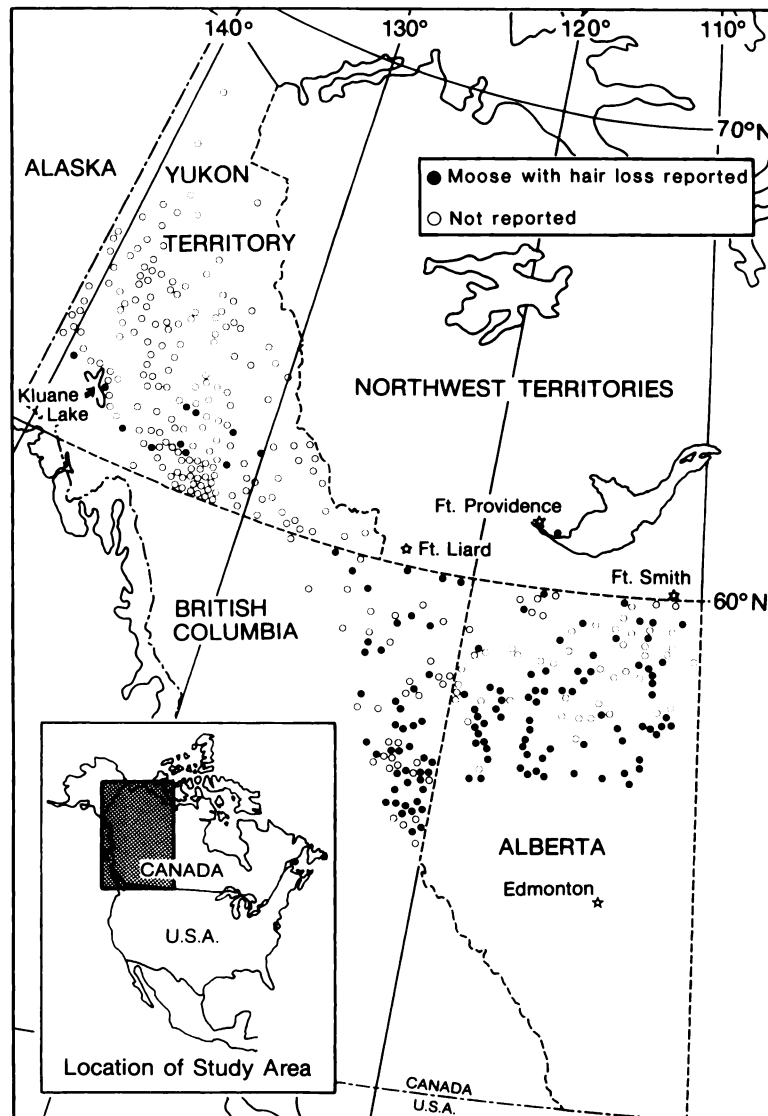


FIGURE 2. Locations of trap lines where moose were or were not observed in late winter/early spring with apparent tick-induced alopecia.

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Wildlife Service, provided information from trappers. Doug Larsen, Yukon Wildlife Branch provided pieces of moose hides and coordinated the distribution of questionnaires in the Yukon. Fred Harper, Fish and Wildlife Branch, British Columbia, provided maps, an enthusiastic covering letter, address labels and information. Dwight Welch, University of Alberta, and

Rolf Peterson, Michigan Technological University, each provided a photograph used in Figure 1.

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