

The first observation of the louse, *Tricholipeurus lipeuroides* (Psocodea: Trichodectidae), infesting mule deer, *Odocoileus hemionus* (Artiodactyla: Cervidae), in the Yukon, Canada

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ABSTRACT

Mule deer, *Odocoileus hemionus* (Artiodactyla: Cervidae), have dispersed into the Yukon relatively recently, less than 100 years ago; however, ectoparasites of deer in the Yukon have not been well documented. Hides from salvaged and harvested mule deer were examined as part of a territorial government survey for the presence of the winter tick, *Dermacentor albipictus* (Packard) (Ixodida: Ixodidae). During routine examination of a hide from a mule deer buck in 2020, two female biting lice, identified later as *Tricholipeurus lipeuroides* (Mégnin) (Phthiraptera: Trichodectidae), were detected. The buck had been harvested approximately 25 km north of Whitehorse. These specimens represent the first record of this species infesting mule deer in the Yukon.

The mule deer, *Odocoileus hemionus* (Artiodactyla: Cervidae), is a wild cervid species widely distributed across western North America (Hygnstrom *et al.* 2008); this species was first documented in the Yukon in the late 1930s (Hoefs 2001). The population in the Yukon is currently estimated at approximately 1000 individuals (Western Association of Fish and Wildlife Agencies 2023) distributed from the British Columbia border to the latitude of Dawson City (about 64° N; Hoefs 2001). Despite the presence of mule deer in the Yukon for almost a century, little is known about the parasites of this species at its northern range limit.

Biting lice are usually specific to their host and have been reported from a number of Canadian wildlife mammal species (see Kennedy and Newman 1986). The lice typically feed on various skin products, such as the outer layer of the hair shafts, dermal scales, and blood scabs (Urquhart *et al.* 1996). Clinical signs and lesions associated with biting lice on mule deer have not been reported; however, heavy infestation with biting lice was associated with hair loss syndrome in wild ungulates such as black-tailed deer in Washington and Oregon, United States of America (Bildfell *et al.* 2004; Foreyt *et al.* 2004). Species of biting lice that have been observed infesting mule deer in Canada's western

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provinces are *Tricholipeurus lipeuroides* (Mégnin) and *T. parallelus* (Osborn) (both Phthiraptera: Trichodectidae) in Alberta (Samuel *et al.* 1980) and British Columbia (Spencer 1939; Cowan 1946; Hopkins 1960). Both species are specific to hosts of the *Odocoileus* genus, including mule deer (see Kennedy and Newman 1986).

In the Yukon, hides from harvested or otherwise found dead wild ungulates, including mule deer, are submitted to the Animal Health Unit, Department of Environment, Government of Yukon, for examination for the presence of winter tick, *Dermacentor albipictus* (Packard) (Ixodida: Ixodidae). This examination also permits the detection of other ectoparasites of interest. Here, we provide the first report of biting lice on mule deer in the Yukon.

A male mule deer was harvested on 30 November 2020, approximately 25 km north of Whitehorse, Yukon, in Game Management Subzone 8–13 (Government of Yukon 2020), at a latitude of approximately 60.9° N. The hide was submitted to the Animal Health Unit on 8 December 2020 and examined on 9 December 2020 using a standard line transect method for surveying ectoparasites on hides (Sine *et al.* 2009), as described by Chenery *et al.* (2022): the hide was laid on a flat surface, five equal transects 70 cm long and spaced approximately 2.5 cm apart were taken on either side of the midline, running from the neck and down the shoulders and back. Ticks were counted along each transect.

During the examination, three *D. albipictus* nymphs were observed. In addition to the ticks, three unidentified lice were found on the shoulder area of the hide. Two of the lice were placed in 70% ethanol; the third specimen was damaged during the examination and was discarded. The two retained lice were submitted to the Department of Entomology, University of Manitoba (Winnipeg, Manitoba, Canada), where they were identified as *Tricholipeurus lipeuroides*. Once they were identified (Price and Graham 1997), processed, and mounted on slides (see Richards 1964), one specimen was deposited in the J.B. Wallis/R.E. Roughley Museum of Entomology, Department of Entomology, University of Manitoba, and the second specimen was deposited in the Animal Health Unit of the Department of Environment, Government of Yukon.

Tricholipeurus lipeuroides has previously been observed infesting mule deer and white-tailed deer in Alberta and British Columbia (Spencer 1939; Hopkins 1960; Russell 1967, Samuel *et al.* 1980; Colwell *et al.* 2008); *T. lipeuroides* has also been reported infesting white-tailed deer in Manitoba (Galloway, unpublished data), Ontario (Scholten *et al.* 1962; Watson and Anderson 1975), and Quebec (Webster and Stewart 1964). It is widely distributed in deer populations throughout North America (Strickland *et al.* 1981) and northern Mexico (Estrada-Souza *et al.* 2020) and was recently observed in the U.S. Virgin Islands (Mertins *et al.* 2017). To our knowledge, this is the first record of this parasite on any cervid species in any of the three northern Canadian territories.

This case is the first detailed investigation completed on unidentified ectoparasites found incidentally during routine examination for winter tick monitoring in the Yukon. Since the identification of *T. lipeuroides* was confirmed, the examiners were able to collect more louse specimens. These include specimens from a mule deer hit by a vehicle in February 2024 and from several mule deer captured during a collaring program in February–March 2024, all at approximately the same latitude and in the same area as the original deer. Clinical signs associated with the presence of *T. lipeuroides* have not been

reported for mule deer in the Yukon, but the presence and potential effects of this parasite in wildlife will be monitored. Winter tick surveillance continues on ungulate hides in the Yukon, and, as a result of this finding, any other species of parasitic lice will be further investigated.

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