

Filarial worms in wild mammals in Alberta

Summer 2024

Significance

These nematodes (roundworms) cause little or no damage to wildlife or humans. They can be quite visible in harvested animals and may lead to unnecessary concerns.

What? Where? How?

Filarial worms are long, thin, white roundworms (like flexible white threads) that live in a wide range of birds and mammals. Most species have narrow habitat requirements as adults and live only in one or two closely related vertebrate species. This fact sheet is limited to the primary filarial worms often seen in wild mammals in Alberta.

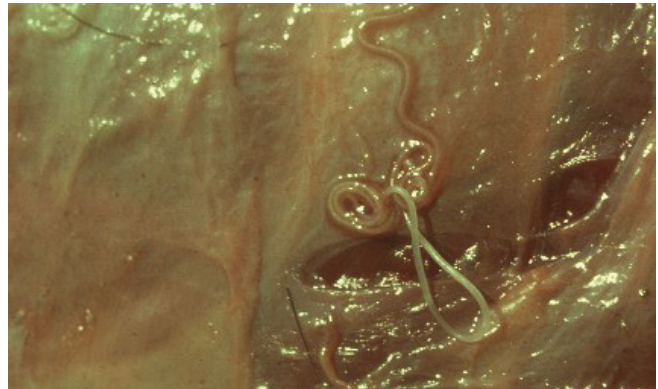
For hunters, depending on what you hunt, and how closely you look, you may or may not find filarial worms. Adult worms are the only stage big enough to see with the naked eye. These thread-like worms are nearly always found in a flat coil embedded in a thin film of connective tissue. Exactly which connective tissues differ with each worm species.

Dirofilaria scapiceps prefers connective tissues in the ankles of cottontail rabbits and snowshoe hares (now that's a specific habitat!).

Dirofilaria ursi in bears lives in connective tissues of fat that accumulates in the neck around the trachea and esophagus, and in the abdominal cavity around the kidneys.

Oslerus osleri lives in canids in nodules at the lower end of the trachea and the upper end of the bronchi, in other words, where the windpipe joins the major airways of the lungs.

Onchocerca cervipedis, also called legworm, lives in connective tissues under the skin, particularly on the lower legs of moose and deer. This species is fairly common and we have a separate fact sheet that provides information about [legworms in Alberta](#).



Dirofilaria ursi in connective tissue of a black bear

Species of *Setaria* are not very choosy and can survive in the abdominal cavity or occasionally the thoracic cavity of moose, deer, elk, bison, and pronghorn. They are most often seen among the sheets of connective tissue (omentum) draped around the stomach and intestines, or stuck to the surface of the liver or diaphragm.

Transmission cycle

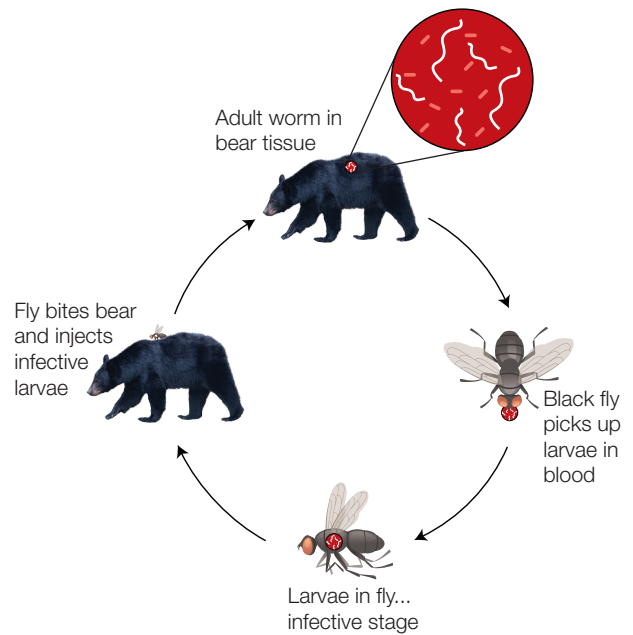
Filarial worms share a common and fascinating life history.

How does an animal that lives hidden away in connective tissues inside an individual mammal manage to get into another individual? The answer is a wonderful tale of evolution and adaptation. Since adult worms themselves cannot get out, they rely on biting insects to transport their larvae to another individual!

All living tissues have a blood supply and that includes connective tissues. An adult female worm pokes her tail into a nearby blood vessel and releases swimming larvae called microfilariae into the blood. The tiny larvae are (relatively) long and thin, just perfect for being sucked up by biting insects such as mosquitoes, black flies, and horse flies. Much like the adult worms, the microfilariae have specific habitat needs and will only develop if they are collected by specific insects: *D. ursi* and *Onchocerca* sp. develop in one or two species of blackflies, *D. scapiceps* in certain mosquitoes, and *Setaria* in other species of mosquitoes.

After 1-2 weeks in the insect, the larvae have grown, moulted twice, and are ready to be released (injected) into the blood of a new individual when the insect feeds again. If the larvae get into the right species of mammal, they find their favourite connective tissues, mature into adult worms, mate, and females produce more microfilariae. The cycle of each species is finely tuned so that the maximum number of microfilariae circulate in the blood at the specific time of day and time of year when their preferred insects are most likely to bite!

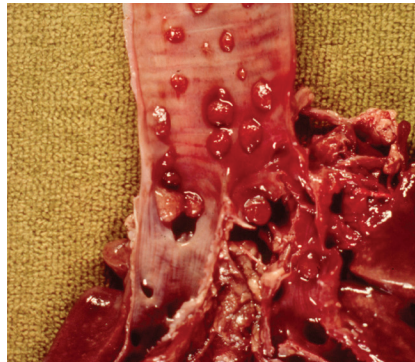
Of course there are always exceptions to most patterns in nature. The filarial worm in the lungs of coyotes has a very different, and unique, way of infecting another coyote. Eggs hatch inside adult female worms that live in nodules at the base of the trachea. Once released by females, the larvae move up the trachea into the mouth of the coyote. But rather than being swallowed, these larvae are transferred along with regurgitated food directly into the mouth of young pups. This filarid takes advantage of the canid behaviour of adults sharing food directly with youngsters who have not yet learned to catch their own prey.



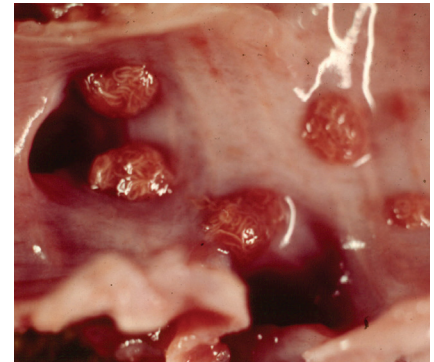
Filarial worms gallery



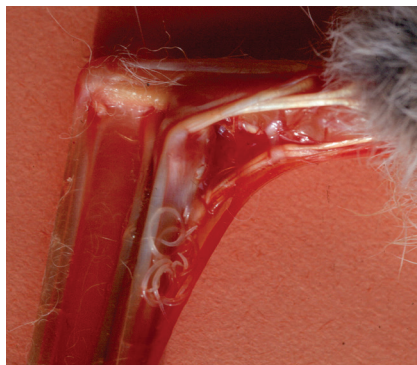
Legworm in moose



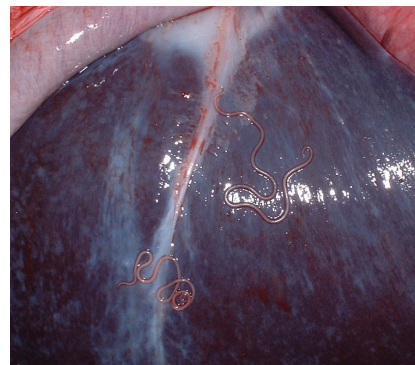
Oslerus in coyote



Closeup of *Oslerus* in coyote



Dirofilaria in hare



Setaria on elk liver



Dead *Setaria* on moose liver

Distribution in Alberta

Each of these species is a natural component of many ecosystems throughout the province.

Dirofilaria scapiceps was found in approximately 50% of snowshoe hares examined near Rochester and probably lives in hares wherever they occur in Alberta. So long as the right species of mosquitoes also live there.

Dirofilaria ursi can be found in almost every black bear or grizzly bear that is more than two years old and lives in an area where black flies occur.

Setaria sp. is quite common in elk and moose, particularly in the northern and western parts of the province. A few also are seen in deer, bison, and pronghorn.

Importance for wildlife management

Like most of the species we call ‘parasites’, these filarial worms have a well adapted relationship with the animals in which they live. Generally, they exist without causing harm to their wildlife hosts. After all, the ‘host’ provides the habitat and resources that are essential for the worms to survive. A balanced relationship allows both partners to maintain sustainable populations. Filarial species contribute to the biodiversity of our ecosystems but are of no particular concern for wildlife management.



Setaria in the abdomen of an elk.

Public significance

Filarial worms found in wild mammals in Alberta do not infect people and are readily killed by heat or cold. If you find them in your bear, or moose, or hare, simply enjoy them for what they are and where they live. Remove them or ignore them. They are after all, there for a reason and are very good at what they do.

Extremely rare cases of bear filarial worm in people have been reported. However, biting flies containing infective larvae were the source of the infections. Not the adult worms in a bear.

Prevention/control

There is no need to prevent or control these naturally-occurring filarial worms in wildlife.

Summary

Filarial worms are long, white, thread-like nematodes that live in a variety of tissues in many species of wildlife. They do not harm wildlife and are no threat to human health.

Additional Information

Alaska Department of Fish & Game
adfg.alaska.gov/static/home/library/pdfs/wildlife/brochures_newsletters/moose_health_disease_pocket_guide_2020.pdf

Michigan Department of Natural Resources
michigan.gov/dnr/0,1607,7-153-10370_12150_12220-26367--,00.html

Primary filarial worm species in wildlife in Alberta

Filarial worm	Primary habitat	Adult location	Life cycle
<i>Dirofilaria scapiceps</i>	Cottontail rabbit, snowshoe hare	Under the skin in the ankle	Indirect
<i>Dirofilaria ursi</i>	Black bear, grizzly bear	Various connective tissues	Indirect
<i>Oslerus (Filaroides) osleri</i>	Coyote, wolf	Trachea (windpipe)	Direct
<i>Onchocerca cervipedis</i>	Moose, deer, caribou	Connective tissue in lower legs	Indirect
<i>Setaria</i> spp.	Bison, deer, elk, moose, pronghorn	Abdominal cavity	Indirect