



Common name

liver blisters, water blisters, bladderworms, liver cysticercosis

Scientific name

a tapeworm (cestode), the thin-necked bladderworm, *Taenia hydatigena*

What's Bugging Wild Critters?

Fact sheet #14:
Liver blisters

Liver blisters

(*Taenia hydatigena*)

in Alberta

Significance

Larvae of this tapeworm live in the liver of a variety of big game species. It causes only minimal damage to the liver and does NOT infect humans. Unfortunately, some hunters discard the liver and meat of infected animals. This is completely unjustified and it is illegal to waste meat of big game animals.

What? Where? How?

Tapeworms are ancient animals that long ago gave up a free and unfettered life and evolved to use habitats that occur inside other animals. Adult tapeworms live in the intestine of something. The big challenge was to develop means of getting from one intestine to another in order to maintain a population of tapeworms! Many species solved the problem by taking advantage of the fact that all animals eat and thus, if you (as a tapeworm) can get into the food of your preferred host (i.e., habitat), then success will be yours. So much for the philosophy of being a tapeworm!

Tapeworms often have complicated life cycles. As they develop from eggs to adults, they pass through a number of different life stages, often with different habitat requirements for each stage. The intestine provides an easy means of getting out of the primary habitat. Once on the ground, tapeworm eggs may be eaten directly by another individual (usually a different species than the one whose intestine was used) or they may hatch on the ground and the larvae eaten by another species.

In some cases, this cycle happens two or three times as the tapeworm changes stages and moves up the food chain on its way back to where it started. The relationship between predators and prey provides a perfect means for tapeworms to find new habitats.

Adult *Taenia hydatigena*, like most tapeworms, are long, thin, flat white worms (much like a piece of white ribbon). However, people seldom see them. On the contrary, the larvae (cysticerci) are often obvious because they live in a clear or white blister on the surface of a liver. The white larvae stand out against the dark background of the liver. If you open the blister, you will find it contains clear thin fluid (much like water) and a white fleshy mass that is actually the head of a larval tapeworm attached to a transparent balloon-like sac. *Taenia hydatigena* occurs in North America, Europe, and parts of Africa. Adults live in wild canids (dog family), occasionally in wild felids (cat family), and perhaps in other species not yet identified. Larvae live primarily in cervids (deer family). Closely related tapeworms *T. krabbei* and *T. pisiformis* are also common residents of Alberta.



Liver blisters in Alberta

(*Taenia hydatigena*)

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Transmission Cycle

Timber wolves provide the preferred habitat of adult *T. hydatigena* in North America. However, adults also occur in coyotes, bobcats, and cougars. Eggs are shed from the intestine and persist in the faeces, on the ground, or on the vegetation. Grazing herbivores, particularly moose, pick up the eggs when they eat contaminated vegetation or faeces. Larvae hatch from the eggs and move to the liver, where they form the water-filled blisters and then wait to be eaten by a carnivore. Larvae can survive in the liver of a variety of cervids (especially moose) and other wild herbivores.

Distribution in Alberta

The primary life cycle of *T. hydatigena* in Alberta involves the predator/prey relationship between wolves and moose. In Elk Island National Park, where wolves do not occur, coyotes are a suitable substitute habitat for the adult tapeworms. Similarly, in areas where moose are scarce, mule deer, white-tailed deer, elk, caribou, and rarely bighorn sheep and mountain goats are used to complete the cycle. Although these tapeworms may occasionally be seen in animals from the grassland and aspen parkland ecosystems, most occur in big game from the boreal forest, foothills, and mountain areas.

Summary

Taenia hydatigena commonly lives in the intestines of wolves and the liver of big game, particularly moose, of the western and northern parts of the province. The parasite is harmless to both people and wildlife.

Additional Information

Parasitic Diseases of Wild Mammals, Second Edition. Edited by William M. Samuel, Margo J. Pybus and A. Alan Kocan. 2001. Chapter 7 - Taeniasis and Echinococcosis.

University of Northern British Columbia:

http://www.unbc.ca/nlui/wildlife_diseases/taenia_hydatigena.htm

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

Alaska Department of Fish and Game: <http://www.wildlife.alaska.gov/aawildlife/disease/guide/internal2.cfm>

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Importance for Wildlife Management

Tapeworms are not harmful to wildlife and generally are not a management concern. Adult worms simply lie in the gut and absorb nutrients from whatever food is in the intestine. Larvae spend most of their time in moose as a resting stage waiting to be eaten by a wolf. Bladderworms are very common and can occur in up to 70% of a local moose population; however, the number of larvae in each moose generally is less than ten. Older individuals have had more opportunity to eat contaminated vegetation thus are more likely to be infected and to contain more larvae.

Public Significance

Taenia hydatigena does NOT infect humans and consequently is completely harmless to people. If you do not like the looks of the larvae, simply cut them out before you cook the liver. Similarly, it cannot survive in pets or livestock.

Prevention/Control

Taenia hydatigena cannot be prevented or controlled in natural ecosystems, nor are control measures warranted.

