

Parasites in Dogs: Tapeworms

Tapeworms are parasites that require a host and live in the digestive tract of all groups of vertebrates. Dogs harbour several different tapeworms in their intestines. Depending on the species of tapeworm, the adult stage can range in length from a few millimetres to 20 metres. The larval stages of the tapeworms develop in various intermediate hosts and are the source of infection to dogs.

Tapeworms infect dogs in different ways (see Figure 1):

Domestic cycle

- when grooming (*D. caninum*)

Rural cycle

- when dogs are fed scraps from contaminated livestock (*T. hydatigena*; *T. multiceps*)

Sylvatic cycle

- when dogs are fed contaminated offal or scraps from wildlife (*Echinococcus*, *Diphyllbothrium*)
- when dogs hunt on their own (*T. pisiformis*; *T. serialis*)

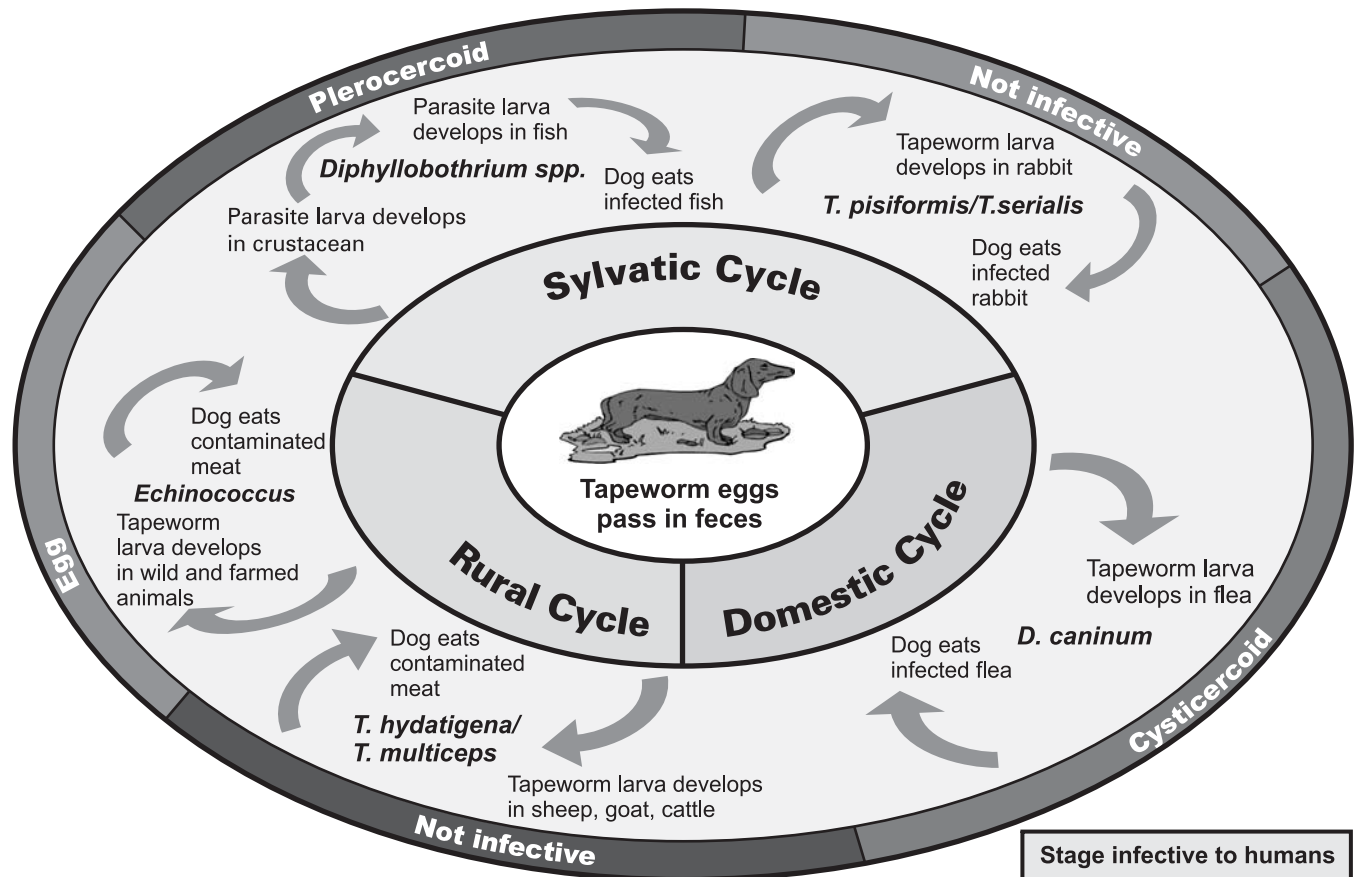


Figure 1. Types of tapeworm infection

Determining the source of infection to dogs is important during the control of the parasite. Although tapeworms can be placed into more than one cycle the approach is used to give the reader an appreciation of how the parasites are usually transmitted.

The prevalence of each tapeworm will vary depending on the dog's diet, behaviour, geography and presence and abundance of infected intermediate hosts.

Simplified life cycles

The anterior end of the adult tapeworm (the scolex) attaches to the intestinal wall of the dog. The body of an adult tapeworm (termed the strobila) consists of segments known as proglottids. New segments form by budding from the posterior end of the scolex. Older, mature segments at the terminal end of the strobila are filled with eggs. These gravid segments can be found singly or in short chains as they break off and are expelled in feces.

Some tapeworms can release proglottids within 2 to 3 weeks following infection, while others take one to two months to shed proglottids. Each egg contains an embryo that bears six tiny hooklets to help it enter the intestinal wall of the intermediate host after hatching from the egg.

The life cycles of tapeworms in dogs require at least one intermediate host to support larval development.

Domestic cycle

Dipylidium caninum

Dipylidium caninum, the most common tapeworm in dogs in Alberta, can grow up to 50 cm (20 inches) in length. The method of transmission differs from the other tapeworms discussed.

In *D. caninum*, the gravid segments break off and pass in the feces. These segments contain thousands of egg packets, each with 20 to 30 eggs. The eggs within the segments are released and are eaten by the larvae of the cat and dog flea, the human flea or the dog louse. The eggs hatch within the flea larva or louse and develop into a cysticercoid larva.

Dogs become infected when they accidentally swallow the infected intermediate hosts. There are a few reports of human infection with this parasite.

Rural cycle

Taenia hydatigena/*T. multiceps*

Adult *T. hydatigena* and *T. multiceps* occur in the intestines of the dog, coyote and fox. Although adult *T. hydatigena* grow to 500 cm long, and *T. multiceps* to 40 to 100 cm long, they are generally harmless.

The larval stage of *T. hydatigena*, a golf-ball-sized fluid filled bladder called a cysticercus, is attached to the abdominal organs of sheep, goats and pigs. Dogs become infected when they are fed scraps from infected livestock or when they feed on dead livestock they find.

The life cycle of *T. multiceps* is similar to that of *T. hydatigena* except the larval stage (coenurus) develops in the brain or spinal cord of sheep, goats, cattle, horses and other ungulates. The coenurus grows into a large fluid filled cyst measuring 5 to 6 cm in diameter containing several hundred protoscolices.

Sylvatic cycle

Taenia pisiformis/*T. serialis*

Rabbits, mice and other small rodents are the intermediate hosts for two tapeworms found in dogs in Alberta.

The egg of *T. pisiformis* hatches in the intestines of a rodent and migrates through the liver before developing into a 5 to 7 mm long cysticercus attached to the surface of the liver or intestine. The cysts of *T. serialis* are up to 4 cm in diameter and contain many tapeworm heads. These cysts are located under the skin or between muscle layers of rabbits rather than inside the body cavity. Cysticercosis does not necessarily produce illness in rabbits, but it can interfere with movement and speed, making the rabbit easier prey.

Dogs become infected when they eat uncooked meat or organs from infected rabbits or by scavenging dead rabbits. The adult tapeworm of *T. pisiformis* may grow up to 200cm (79 inches) in length.

T. pisiformis does not infect people; however, there are reports of human cysticercosis involving *T. serialis*.

Echinococcus spp.

This is the smallest tapeworm (2-6 mm long) of dogs. Dogs can be a reservoir for infecting domestic animals and man. Humans accidentally ingest eggs by close contact with infected dogs.

Sheep, cattle and elk are the usual intermediate hosts, but goat, swine and horses may also become infected. A cyst (called a hydatid) develops in the intermediate host. The cyst is a fluid filled bladder 5 to 10 cm in diameter, containing many tapeworm heads. Hydatid cysts are usually found in the lungs of sheep and cattle but primarily in the liver of horses. Infected animals usually do not show signs of infection.

Diphyllobothrium

This tapeworm is usually found in temperate areas where freshwater fish is eaten undercooked or raw. The adult lives in the small intestine of dogs and can infect man. Humans become infected by accidentally ingesting a plerocercoid larva in fish.

Do tapeworms harm my dog?

Normally, infections are not harmful to dogs. However, heavy worm burdens may cause inflammation of the intestine, diarrhoea or constipation. Other signs may include gas, vomiting, weight loss, and a dull coat.

How will I know my dog has tapeworms?

Infected dogs may scoot along the ground on their rear or lick their hindquarters excessively to relieve the itching produced by migrating segments of *D. caninum*. Segments may be seen around the anus or in the feces of dogs.

How can I be sure my dog is infected?

Diagnosis is based on identifying the gravid segments collected from stool samples or around the dog's anus, or in bedding. Tapeworms may live in the gut for several years but do not shed segments regularly. The number of segments passed is no indication of the number of worms present.

How can I treat my dog?

There are several anthelmintics available, including niclosamide and praziquantel. Consult your veterinarian for the drug of choice and treatment program.

How can I prevent my dog from becoming infected?

The following are the main features of prevention:

- Do not feed condemned meat to dogs.
- Dogs should not be allowed to catch and eat wild animals.
- Dogs allowed to roam should be examined for worms on a regular basis, and de-wormed when necessary.
- Cook any meat trimmings, organs or offal thoroughly before feeding it to dogs.
- Uncooked meat should be deep frozen for at least 10 days before feeding to dogs.
- Eliminate fleas and lice.

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