

Baylisascariasis

caused by the raccoon roundworm, *Baylisascaris procyonis*

Neil W. Dyer
DVM, DACVP

Director, NDSU Diagnostic Laboratory

Charles L. Stoltenow
DVM, DACVPM
Extension Veterinarian

Baylisascariasis is an uncommon but well described infection in humans caused by ingestion of the eggs of the raccoon roundworm, Baylisascaris procyonis (B. procyonis). B. procyonis is a common parasite of raccoons in the United States and Canada. A similar species, Baylisascaris columnaris, is found in skunks.

B. procyonis has three primary life cycle options:

1. In most cases, the roundworm egg is ingested by a raccoon, passes into the intestine, hatches and matures into an adult worm. It then produces more eggs and passes them in raccoon fecal material. Raccoons are considered the reservoir host and maintain the infection in nature.
2. In some cases, the roundworm egg is ingested by a different kind of mammal (typically a rabbit or rodent) or bird. The egg hatches and releases a larva that migrates through the mammal or bird tissues but never develops into an adult worm. The larva may migrate to the brain of the mammal or bird, resulting in a debilitated state. This debilitated state may allow the animal to be easier to catch and kill. If a raccoon eats a mammal or bird containing the larva, the larva develops into a normal adult worm and begins passing eggs in the raccoon's fecal material.
3. In rare cases, the roundworm egg is ingested by a human (often a child) that is working or playing in an area contaminated by raccoon feces. *B. procyonis* eggs are not infective when they are initially passed in raccoon feces. It takes two to four weeks for the eggs to embryonate or become

infective. Their thick shell makes the eggs highly resistant and the eggs may persist in the environment for years. The egg hatches in the human intestine and releases a larva that never develops into an adult worm, but migrates to different tissues in the body. Frequently the brain and eye are affected. The larva does not mature, but continues to grow and causes tissue damage. The condition of the person is often severe, depending on the extent of tissue damage and the tissue affected.

The disease in humans

- Infected humans may be asymptomatic.
- Human infections occur when embryonated eggs are accidentally ingested. Eggs are picked up from the soil (children playing in the dirt), water, hands, food or objects contaminated by raccoon feces.
- Larva that grow and migrate in the human can cause severe diseases such as:
 - “Visceral larval migrans” – infection of internal organs, particularly the brain and spinal cord.
 - “Ocular larval migrans” – infection of the eye, which can lead to blindness due to retinal involvement.

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North Dakota State University
Fargo, North Dakota 58105

- No definitive diagnostic test is available.
- Serologic tests (blood tests for antibody to the parasite) are not routinely used.
- No effective cure for human disease is currently accepted.

The disease in animals

B. procyonis can cause infection in virtually any animal host if the egg is ingested. Clinical signs are often associated with the migration of the larva in tissue. As in humans, the nervous system is a preferred site. Affected animals may exhibit signs of central nervous system disorder such as seizures, disorientation, ataxia, and coma. Rabies suspect animals, if tested for and proven negative for having rabies, would also be a suspect for *B. procyonis* infection.

Diagnosis of the disease in animals

There is no ante mortem (live animal) test for *Baylisascariasis* infection in animals. Diagnosis is made by microscopic examination of selected tissues, observation of characteristic lesions and presence of *B. procyonis* larvae.

EXPOSURE POINT!

Close contact between raccoons and humans presents the highest risk. Scavenging raccoons may prowl near homes and buildings. Raccoon defecation sites are dangerous exposure areas for humans. Because the eggs are resistant to environmental conditions and disinfectants, once an area becomes contaminated, it is difficult to clean it up completely. Pet raccoons can also harbor this parasite and may be a potential exposure point for humans.

According to NDCC § 36-01-08.4 it is illegal to own a pet raccoon in North Dakota. In particular, do not “adopt” orphaned raccoon babies from the wild as they can present a source of infection. Instead, contact your local animal control officer or Fish and Wildlife representative for proper disposition of the animal.

Preventative measures

- Educate the public concerning sources and origin of infection.
- Prevent contamination of soil by raccoon feces.
- Remove raccoon feces from contamination sites.
- Wash hands thoroughly.

For more information on this and other topics, see: www.ag.ndsu.nodak.edu

