

Weird Worms: Horsehair Worm and the Grasshopper Nematode

Fact Sheet No. 5.610

Insect Series | Home and Garden



by W. Cranshaw*

Two unusual, very long ‘worms’ that are occasionally encountered are horsehair worms and the nematode parasite of grasshoppers, *Mermis nigrescens*. Both are harmless to humans but may attract attention and cause concern.

The Grasshopper Nematode (*Mermis nigrescens*)

A roundworm of the phylum Nematoda, *Mermis nigrescens*, develops as an internal parasite of grasshoppers (and perhaps earwigs). It is extremely large, 5 to 20 cm, far larger than the nearly microscopic entomopathogenic nematodes often used to control various soil insect pests (see fact sheet 5.573, *Insect Parasitic Nematodes*). The overall body color is very pale brown. The head area of females is reddish-brown.

The adult nematodes are sometimes seen as they crawl on plants, usually following rainy periods in late spring. During this time they lay tiny golden-brown eggs which they attach to plants.

Grasshoppers become infected when they incidentally consume the eggs as they feed. Within the grasshopper, the egg hatches and the young nematode burrows into the body cavity of the insect. There it feeds on the blood (hemolymph) and grows, completing this stage of development in one to three months. Several nematodes may develop within a single insect and when they have completed development they may pack the body. The feeding by this nematode seriously stresses the infected grasshopper, functionally sterilizing it and usually causing premature death. Upon death the nematodes exit the host and move into the soil. Recently exited nematodes are sometimes seen in mid to late summer, often in a small puddle of water.

Within the soil the nematode molts to the adult stage. It then has a long period as a free

living nematode in the soil, living many years. Mating occurs at this time and ultimately the egg-bearing females emerge to lay eggs on foliage to repeat the cycle.

Moist conditions are favorable to the development of this nematode and highest populations develop in relatively wet, grassy areas.

Horsehair Worms

Horsehair worms share the very elongated worm-like body of many other ‘worms’ (e.g., certain nematodes, annelids), but they have some unique physical features that cause them to be classified in the phylum Nematomorpha.

Horsehair worms may be extremely long, with the common species (*Gordius robustus*) found in Colorado typically measuring around 30 to 40 cm in length. Their color ranges from light to very dark brown and all are nearly uniform in body appearance, with a slightly blunt head and small cleft in the hind end. With very few exceptions, horsehair worms will only be found in water.

In spring, tremendous numbers of eggs are laid in water in the form of long, gelatinous masses. After egg hatch, the minute first stage is free-swimming. If incidentally ingested by a susceptible insect as it drinks, the horsehair worm larva penetrates the gut and moves into the body



Figure 1: Grasshopper nematode, *Mermis nigrescens*. (Photo courtesy of John Capinera.)

Quick Facts

- Horsehair worms and the grasshopper nematode parasite, *Mermis nigrescens*, are both harmless to humans.
- Moist conditions are favorable to the development of *Mermis nigrescens* and highest populations develop in relatively wet, grassy areas.
- With very few exceptions, horsehair worms will only be found in water.
- The common name ‘horsehair worm’ is derived from its occasional occurrence in livestock water troughs.

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Figure 2: *Mermis nigrescens*, climbing. (Photo courtesy of John Capinera.)



Figure 3: *Mermis nigrescens*, emerging from grasshopper. (Photo courtesy of John Capinera.)

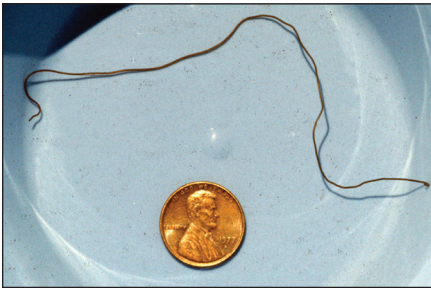


Figure 4: Horsehair worm in cup.

cavity, where it feeds on host tissues and blood. A wide range of insects may be infected by horsehair worms. Grasshoppers, crickets, katydids (including Mormon cricket), beetles and caddisflies are most commonly observed as hosts. Insect predators (e.g., mantids) sometimes are secondarily infected when they consume a previously infected insect. Infected insects continue to develop but rarely produce eggs and die prematurely.

When the horsehair worm has completed its development, it exits the host as an adult. Emergence occurs in water and behavior of infected insects apparently is altered so that they seek out and move to water. Outdoors, horsehair worms typically emerge in small ponds or livestock watering tanks. Around homes, infected crickets may move indoors and the horsehair worms emerge in sinks, toilets or other water sources.

The common name 'horsehair worm' derives from its occasional occurrence in livestock water troughs, combined with its superficial similarity to a bit of horsehair. Nematomorphs are sometimes also called 'Gordian worms.' This relates to their occasional appearance as a mass of worms highly twisted in a knot-like manner, resembling the 'Gordian knot.' (This was a rope knot of such complexity that it defied unraveling, associated with the Greek mythological story involving the Phrygian King Gordius (ca. 330 B.C.).)

Other Worm-like Animals

A few other worm-like organisms sometimes raise questions of identification. Perhaps most common are immature stages of various earthworms. Although older stages of these well-known creatures are recognized by all, very young earthworms are very small and pale colored. These are usually found in soil or compost.

Immature millipedes sometimes are mistaken for worms. Older stages of the common millipedes found in Colorado are dark-colored, with a clearly segmented hard exoskeleton. However, young millipedes are quite pale with a thinner body form. On close examination they can be distinguished by segmentation and minute legs.

Some fly larvae found in soil are worm-like, including larvae of fungus gnats and march flies. They are legless, pale to nearly translucent, but are distinguishable by having a distinct dark head.



Figure 5: Horsehair worm with cricket.

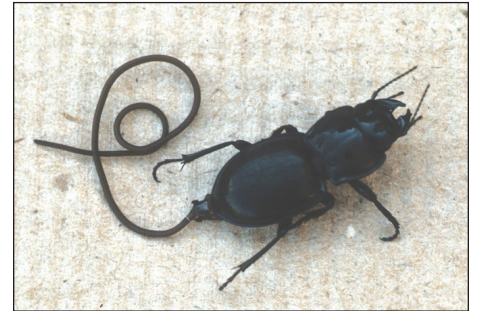


Figure 6: Horsehair worm and ground beetle.