



## Chapter 8-4: Phylum Nematoda

The phylum Nematoda is made up of roundworms, which are also known as nematodes. Roundworms are elongated, cylindrical individuals that may have evolved from flatworms. They display two evolutionary advances over the flatworms: They have a complete, one-way digestive tract that runs from mouth to anus, and a cavity between their digestive tract and body wall. Within this cavity, there are specialized organs.

Nematodes live in fresh and salt water as well as in soil. Most are small, but some may reach lengths of a foot or longer. Most resemble threads, and some are parasites of animals and humans.

Among the parasitic nematodes are the hookworm and roundworm, sometimes transmitted to humans through undercooked or raw pork. One such worm is called *Trichonella spiralis*. When this nematode enters human muscle tissue, it causes a disease called trichinosis. Other parasitic roundworms include pinworms and whipworms, both of which spend time in the human intestine. In this plate, we will consider a typical roundworm known as *Ascaris*, which is a parasite sometimes found in dogs.

Looking over the plate, you will notice that we show diagrams of two worms, the female and male *Ascaris*. We also show a cross section of the female roundworm to display some internal parts. As you read about the worms in the paragraphs below, locate and color the structures in the plate.

As we mentioned earlier, roundworms have a complete digestive tract, which contrasts with the digestive cavities of the two previous phyla. The roundworm's digestive tract begins with the **mouth (A)**, and continues with an enlarged opening called the **pharynx (B)**. Next comes an extremely long **intestine (C)** that extends along the entire length of the roundworm. You should use a light color for this tube. The digestive tract ends at the opening to the exterior called the **anus (D)**.

The intestinal tract of the roundworm is separated from the **body wall (E)**, and in the cross section you can see the body wall encircling the roundworm, while the digestive tract is shown as an open tube. You should use a light color for the body wall (E). Notice that, in the cross section, a space exists between the digestive tract and body wall. This space is the **pseudocoelom (F)**. The

pseudocoelom is not a true body cavity, because it is not surrounded by mesoderm-derived tissue.

We will now focus on some of the internal organs of the roundworms. Continue your coloring as you read about these organs below. Notice the relatively complicated reproductive organs as we continue.

Excretion in the roundworms is accomplished by a series of **excretory tubes (G)** which run along the left and right side of the animal and can be seen in all three figures. Waste products from surrounding cells accumulate in these tubes and pass to the **excretory pore (H)**, where they exit the body. Most species of nematodes are dioecious, meaning that separate male and female individuals exist. In the female *Ascaris*, egg cells are produced within the very thin, coiled **ovary (I)**, then enter the **oviduct (J)**, and finally pass to the **uterus (K)**, where fertilization takes place.

The male organ of reproduction in nematodes is the **testis (L)**, which, like the uterus, is a long, thin tube. Sperm cells are produced here and are stored in the coiled **vas deferens (M)**. When reproduction takes place, sperm cells enter the **seminal vesicle (N)**. They pass out of the male tract during copulation, and a **spicule (O)** holds the female reproductive organ in place while the sperm cells pass into the female. Fertilization takes place within the female, and the fertilized eggs are stored in the uterus until they are deposited in the soil or another environment. The eggs are surrounded by a thick shell and are deposited in enormous numbers; a single female worm may deposit up to 200,000 fertilized eggs in the course of one day. Pinworms, whipworms, hookworms, and animal roundworms also multiply in this fashion. *Ascaris* eggs are very resistant to environmental change, and may live for years under adverse conditions.

The final structures we will consider are the two nerve cords that transmit impulses to various cells and tissues of the animal's body. A **dorsal nerve cord (P)** is shown as a spot in the cross section above the digestive tract. Below the digestive tract is the second nerve cord, which is called the **ventral nerve cord (Q)**. The presence of two nerve cords is another specialized development in the roundworms that distinguishes them from the more simple flatworms.

### Phylum Nematoda

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|---|---|--|
| <input type="radio"/> Mouth.....A         | <input type="radio"/> Excretory Tube .....G | <input type="radio"/> Testis .....L            |
| <input type="radio"/> Pharynx.....B       | <input type="radio"/> Excretory Pore .....H | <input type="radio"/> Vas Deferens .....M      |
| <input type="radio"/> Intestine.....C     | <input type="radio"/> Ovary.....I           | <input type="radio"/> Seminal Vesicle.....N    |
| <input type="radio"/> Anus .....D         | <input type="radio"/> Oviduct.....J         | <input type="radio"/> Spicule.....O            |
| <input type="radio"/> Body Wall.....E     | <input type="radio"/> Uterus .....K         | <input type="radio"/> Dorsal Nerve Cord.....P  |
| <input type="radio"/> Pseudocoelom .....F |   | <input type="radio"/> Ventral Nerve Cord ....Q |

