

Ascaris Dissection Lab

Instructors Guide

Pre-lab Discussion:

There are over 15,000 species in the Phylum Nematoda. They are round, unsegmented worms. Members of this phylum are free-living or parasitic. The parasitic species can live in or on animals, including birds, fish, crustaceans and insects. Nematodes can be found anywhere; in the soil, in trees, water and even Bavarian beer mats! Nematodes have two separate sexes. In this investigation, you will be studying a parasitic nematode which lives in pigs and humans.

Before the dissection, it is recommended that the life cycle of the Ascaris (explained in the attached CDC fact-sheet) be explained to students. It is also important that you explain the external characteristics of the male and female sexes.

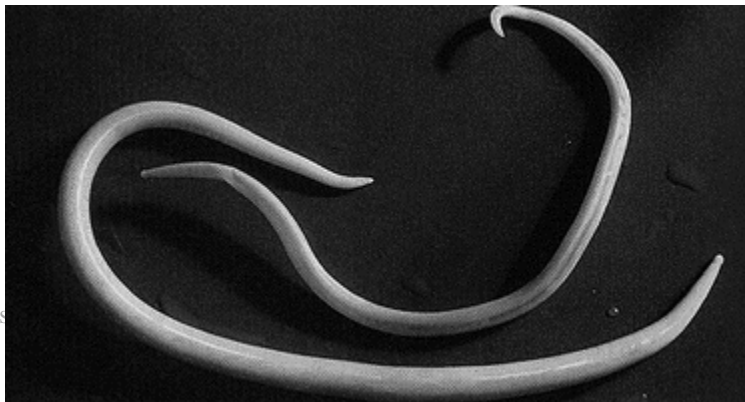
Purpose: To observe the different structures of a male and female *Ascaris lumbricoides*.

Materials:

- One specimen of *Ascaris lumbricoides*
- Rubber gloves
- Dissection kit
- Dissection tray
- Pins

Safety:

Put on a laboratory coat if desired. Make sure you handle all specimens with rubber gloves. ****Ascaris eggs are extremely resistant to chemical treatment. Although it is unlikely, some eggs may survive immersion in preservatives for short periods. For this reason you should keep your hands away from your mouth and nose while performing this dissection and wash your hands afterward.**** Handle all dissection equipment carefully.



Ascaris Dissection Lab

Pre-Lab Questions:

1. Please fill in the following classification information on *Ascaris*:
(use <http://www.itis.gov/index.html>)

- a. Kingdom: *Animalia*
- b. Phylum: *Nemata*
- c. Class: *Secernentea*
- d. Order: *Ascaridida*
- e. Family: *Ascarididae*
- f. Genus: *Ascaris*
- g. Species: *lumbricoides*

2. How will you know if your specimen is male or female?

The female Ascaris is generally larger than the male. The most telling external feature distinguishing male and female is the hooked posterior end of the male.

3. Define the following terms (can be found in textbook)

- a. Anterior: *Front end/head*
- b. Posterior: *Back/tail*

4. Read the CDC fact sheet on *Ascaris* infection in humans.

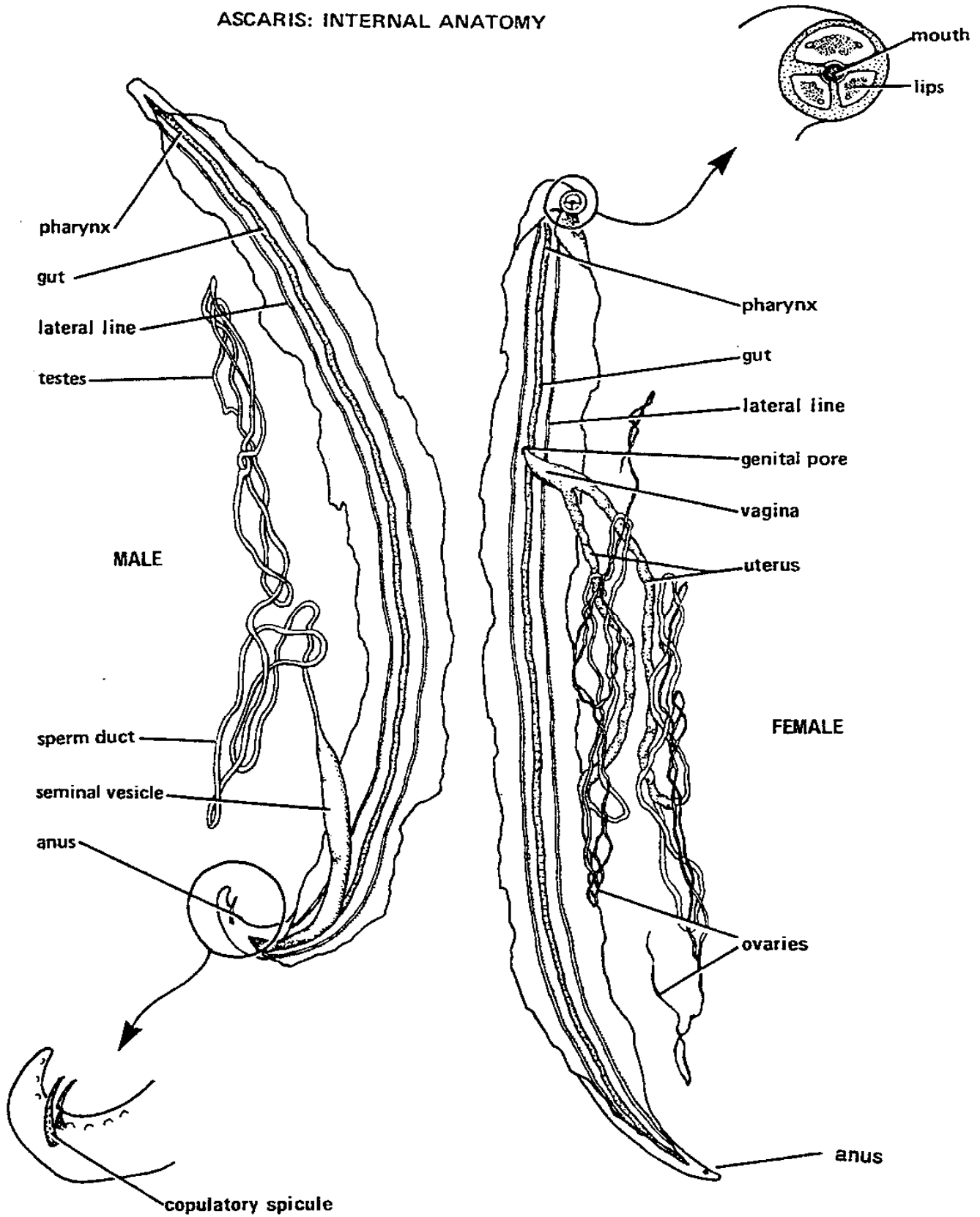
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Procedure:

1. Use forceps to obtain one specimen of *Ascaris* for your group and place it in a dissecting tray.
2. Identify the anterior and posterior ends. **Determine if your specimen is male or female.**
3. Pin the anterior and posterior ends of the animal to the tray and carefully slit the body wall longitudinally (mouth to anus) using the scalpel in your dissection kit.
4. Pin the sides of the wall open to expose the internal contents. **Be very careful not to remove or disturb any organs you will need to identify.**
5. After pinning the specimen, separate the different internal structures as best you can. Be cautious not to break them into small pieces.
6. In your observations, you will be observing the parts below. Once you have located them, please highlight the corresponding term on the diagram on pg. 4.
 - a. Mouth, intestine, anus
 - b. **Female specimen only:**
 - i. Ovaries
 - ii. Oviduct
 - iii. Uterus
 - iv. Vagina
 - v. Genital pore
 - c. **Male specimen only:**
 - i. Testes
 - ii. Seminal vesicle
 - iii. Spicules
7. Unpin the specimen and using forceps, place the dissected specimen into the disposal container.
8. Wash all dissecting equipment with soap and water.
9. **WASH YOUR HANDS WITH HAND SANITIZER!**
10. Wipe down lab surface.

Ascaris Dissection Lab

ASCARIS: INTERNAL ANATOMY



Ascaris Dissection Lab

Post Lab Questions:

1. Based on its structure, what do you think the pharynx is for?

The pharynx contains both a mouth and lips to serve the dual purpose of attaching to the intestinal wall of the host and absorbing digested food into the gut.

2. What feature of *Ascaris* do you think allows it to survive in so many different environments?

*The tough outer covering of the adult *Ascaris* is unaffected by the harsh acids of the digestive system. The eggs are very resilient as well and can withstand both the harsh of the digestive system and external environment.*

3. *Ascaris* is a parasite which lives in pigs and humans. What do you think it feeds on? How does the food source of an *Ascaris* relate to its digestive system?

*The *Ascaris* feeds on the digested food of its host. Because this food is already digested, the *Ascaris* does not need a complex digestive system. All it must do is absorb the nutrients from the pre-digested food.*

***Ascaris* Infection**

(Ass-kuh-ris)
Ascariasis

What is an *Ascaris* infection?

Ascaris is a worm that lives in the small intestine. Infection with *Ascaris* is called ascariasis (ass-kuh-rye-uh-sis). Adult female worms can grow over 12 inches in length, adult males are smaller.

How common is ascariasis?

Ascariasis is the most common human worm infection. Infection occurs worldwide and is most common in tropical and subtropical areas where sanitation and hygiene are poor. Children are infected more often than adults. In the United States, infection is rare, but most common in rural areas of the southeast.

What are the signs and symptoms of an *Ascaris* infection?

Most people have no symptoms that are noticeable, but infection may cause slower growth and slower weight gain. If you are heavily infected, you may have abdominal pain. Sometimes, while the immature worms migrate through the lungs, you may cough and have difficulty breathing. If you have a very heavy worm infection, your intestines may become blocked.

How is an *Ascaris* infection spread?

Ascaris eggs are found in human feces. After feces contaminates the soil, the eggs become infectious after a few weeks. Infection occurs when a person accidentally ingests (swallows) infectious *Ascaris* eggs. Once in the stomach, immature worms hatch from the eggs. The larvae are carried through the lungs and then to the throat where they are swallowed. Once swallowed, they reach the intestines and develop into adult worms. Adult female worms lay eggs that are then passed in feces; this cycle will take between 2-3 months.

Pigs can be infected with another species of *Ascaris*. Occasionally, a pig *Ascaris* infection can be spread to humans; this occurs when infective eggs, found in the soil and manure, are ingested. Infection is more likely if pig feces is used as fertilizer in the garden; crops then become contaminated with *Ascaris* eggs.

How can I get ascariasis?

You or your children can become infected after touching your mouth with your hands that have become contaminated with eggs from soil or other contaminated surfaces or by ingesting contaminated food or water.

What should I do if I think I have ascariasis?

See your health care provider.

How is diagnosis of *Ascaris* made?

Your health care provider will ask you to provide stool samples for testing. Some people notice infection when a worm is passed in their stool or is coughed up. If this happens, bring in the worm specimen to your health care provider for diagnosis. There is no blood test used to diagnose an *Ascaris* infection.

What is the treatment for ascariasis?

In the United States, *Ascaris* infections are generally treated for 1-3 days with medication prescribed by your health care provider. The drugs are effective and appear to have few side effects. Your health care provider will likely request additional stool exams 1 to 2 weeks after therapy; if the infection is still present, treatment will be repeated.

I am pregnant and have just been diagnosed with ascariasis. Can I be treated?

Infection with *Ascaris* worms is generally light and is not considered an emergency. Unless your infection is heavy, and your health may be at risk, treatment is generally postponed until after delivery of the baby.

How can I prevent infection with *Ascaris*?

- Avoid contacting soil that may be contaminated with human feces.
- Do not defecate outdoors.
- Dispose of diapers properly.
- Wash hands with soap and water before handling food.
- When traveling to countries where sanitation and hygiene are poor, avoid water or food that may be contaminated.
- Wash, peel or cook all raw vegetables and fruits before eating.

Should I be concerned about spreading infection to the rest of my household?

No. Infection is not spread from person to person.

This fact sheet is for information only and is not meant to be used for self-diagnosis or as a substitute for consultation with a health care provider. If you have any questions about the disease described above or think that you may have a parasitic infection, consult a health care provider.

Revised September 23, 2004

