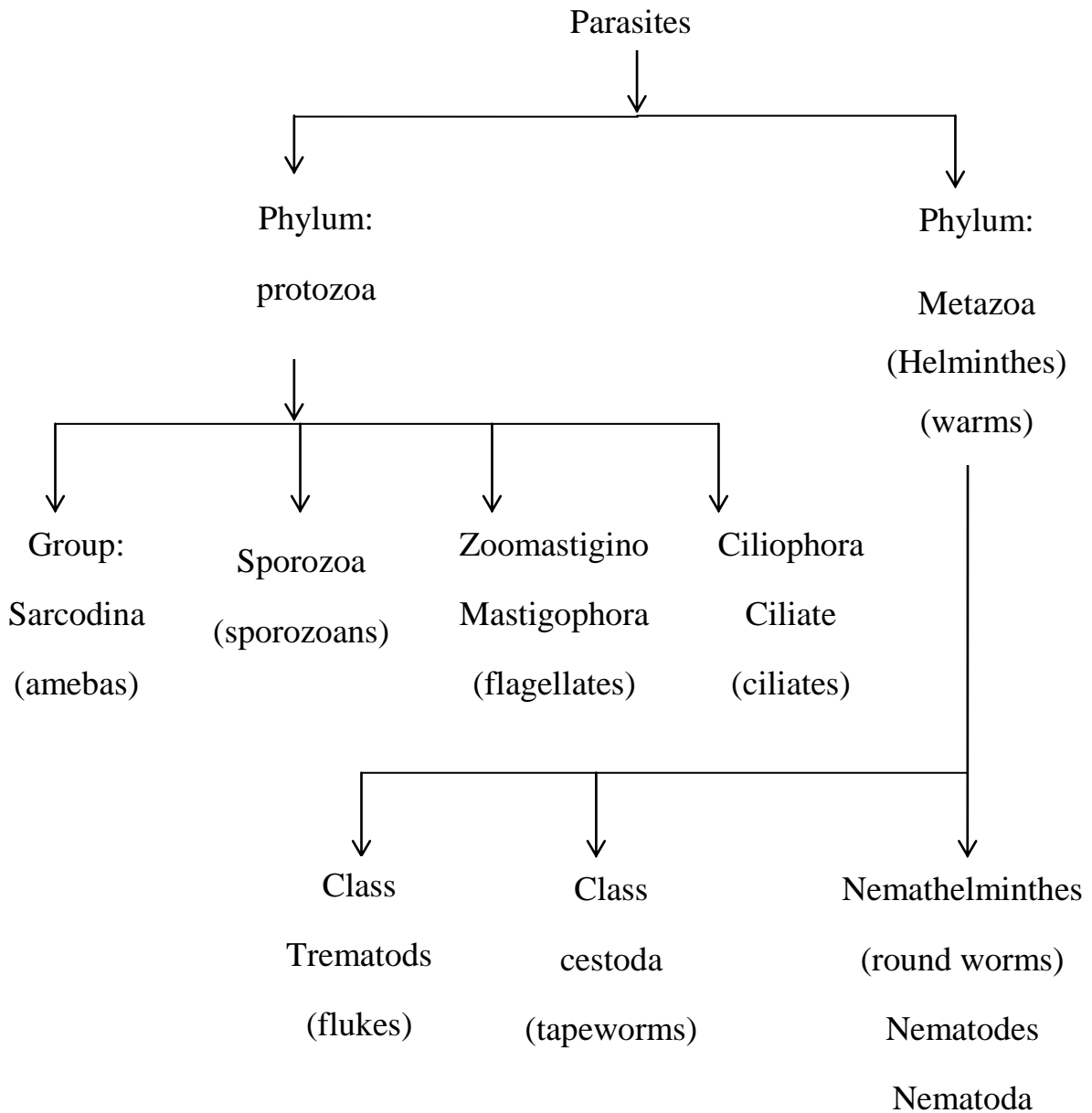


The kingdom of Protista



Parasites occurs into two distinct forms;

- 1- Unicellular called protozoa; and
- 2- Multicellular (metazoan) called Helminths or worms. For Medical purpose, protozoa can be subdivided into four groups;
 1. Sarcodina (amoeba).

2. Mastigophora (flagellates) or Zoamastagina.
3. Sporozoa or (ciliophora) or ciliates.

Metazoan are subdivided into two groups or phyla;

1. The Platyhelminthes (flat worms).
2. The nemathelminthes (round worms and (Nematodes).

The phylum Platyhelminthes contain two medically important classes;

1. Class: Trematoda or flukes.
2. Class cestoda or tape worms.

While Nematelminthes contains one class only.

Class: Nematoda or Nematodes and round worms.

Helminthes (worms)

Helminthes or parasitic worms are division of eukaryotic parasites that unlike external parasites such as lice and fleas, live inside their host, They are worm – like organisms that live and feed of living hosts, receiving nourishment and protection while disrupting their host.

Helminthology is study of parasitic worms live inside the digestive tract. There are three types (groups) that belong two phylum; 1- platyhemintnes (flatworms) and Nematelminthes (Nematoda or round worms):

1- Phylum: Flat worms:

Known in scientific literature as Platyhelminthes or plathelminthes are a phylum of relatively simple bilaterian, unsegmented, soft – body and invertebrate animal. There are 4,500 species. Fertilize eggs internally

by copulation and a few large species produce plankton – like larvae.

These parasites consist two types;

- 1- Trematoda, (flukes); and
- 2- Cestoda.

I- Cestoda ((Tape worms)):

Consist of two main parts;

- a. A rounded head called scolex and
- b. A flat body of multiple segments called proglottids.

The scolex has specialized means of attaching to the intestinal wall; namely, suckers, hooks, or sucking grooves. The worms grows by adding new proglottids from its germinal center next to the scolex. There are four medically important cestodes;

- 1- *Taenia solium* [the pork tape worm] causes Taeniasis.
- 2- *T. saginata* [the beef tape worm].
- 3- *Diphyllobothrium latum* [the fish tape worm].
- 4- *Echinococcus granulosus* [the dog tape worm].

Their features are summarized in table 54-1 and 54-2.

II- Trematoda (Trematodes). Flukes:

Trematodes and cestoda (Tape worms) are the two large classes of parasites in the phylum Platyhelminthes. The most important trematodes are;

- 1- *Schistosoma* species [blood flukes].
- 2- *Clonorchis sinensis* [liver flukes].
- 3- *Paragonimus westermani* [lung flukes].

Features of the medically summarized in table 55-1 and 55-2.

III- Nematodes (round worms):

They are round worms with a cylindrical body and complete digestive tract, including a mouth and an anus. The body is covered with a highly resistance coating called a cuticle nematodes. Nematodes have separate sexes; The femal is usually larger than the male. The male typically has a coiled tail.

The medically important nematodes can be divided into two categories according to their primary location in the body namely;

The intestinal and tissue nematodes.

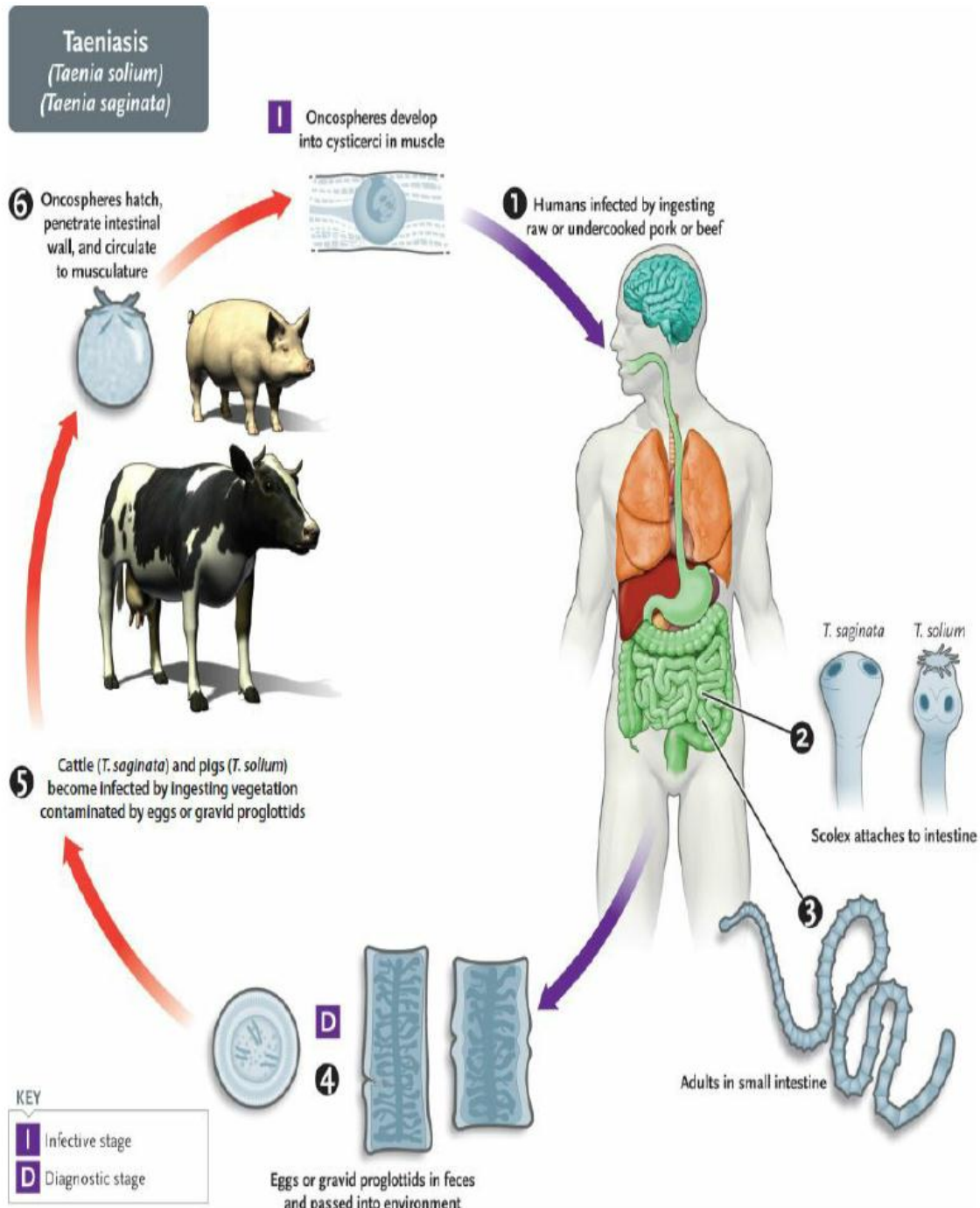
The intestinal nematodes include:

- 1- Entrobisus ((pinworms)).
- 2- Trichuris ((whip worm)).
- 3- Ascaris ((giant round worm)).
- 4- Necator and Ancylostoma [the two hook worms].
- 5- Strongyloides ((small round worms)).
- 6- Trichinella.
- 7- Wucheria ((filariasis)).
- 8- Loa ((loiasis)).

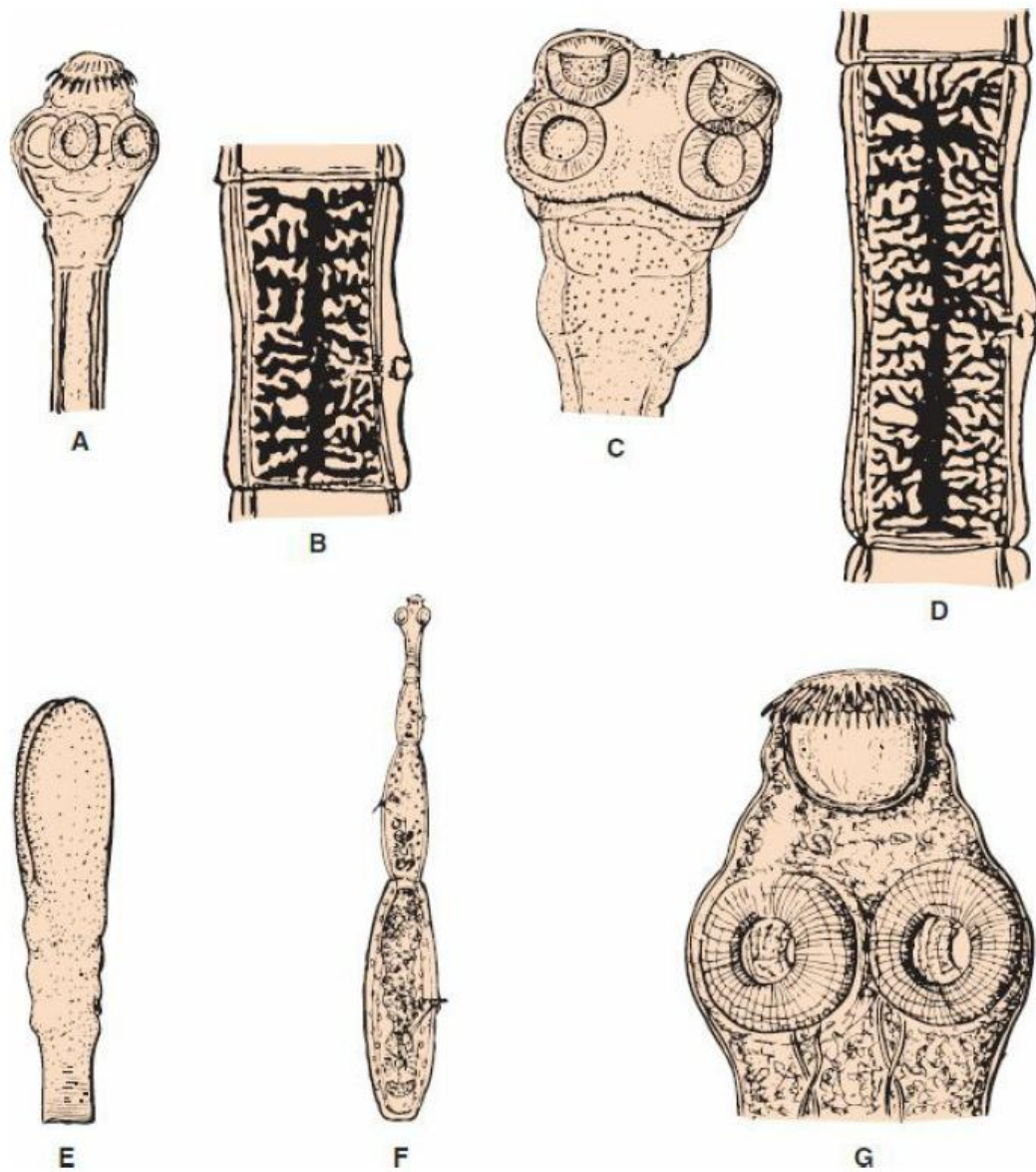
These nematodes are transmitted by ingestion of eggs, except wucheria is transmitted by Mosquito bite and Loa is transmilted by deer fly bit. The others are transmitted as larvae. There are two larval forms; The first form and the second – stage ((rabditiform)) larvae are non-infectious, Feeding forms; third – stage (filariform)); larvae are infectious, non-feeding forms, as adults, thes nematodes live with in the

human body; except for strongyloides; which can also exist in the soil.

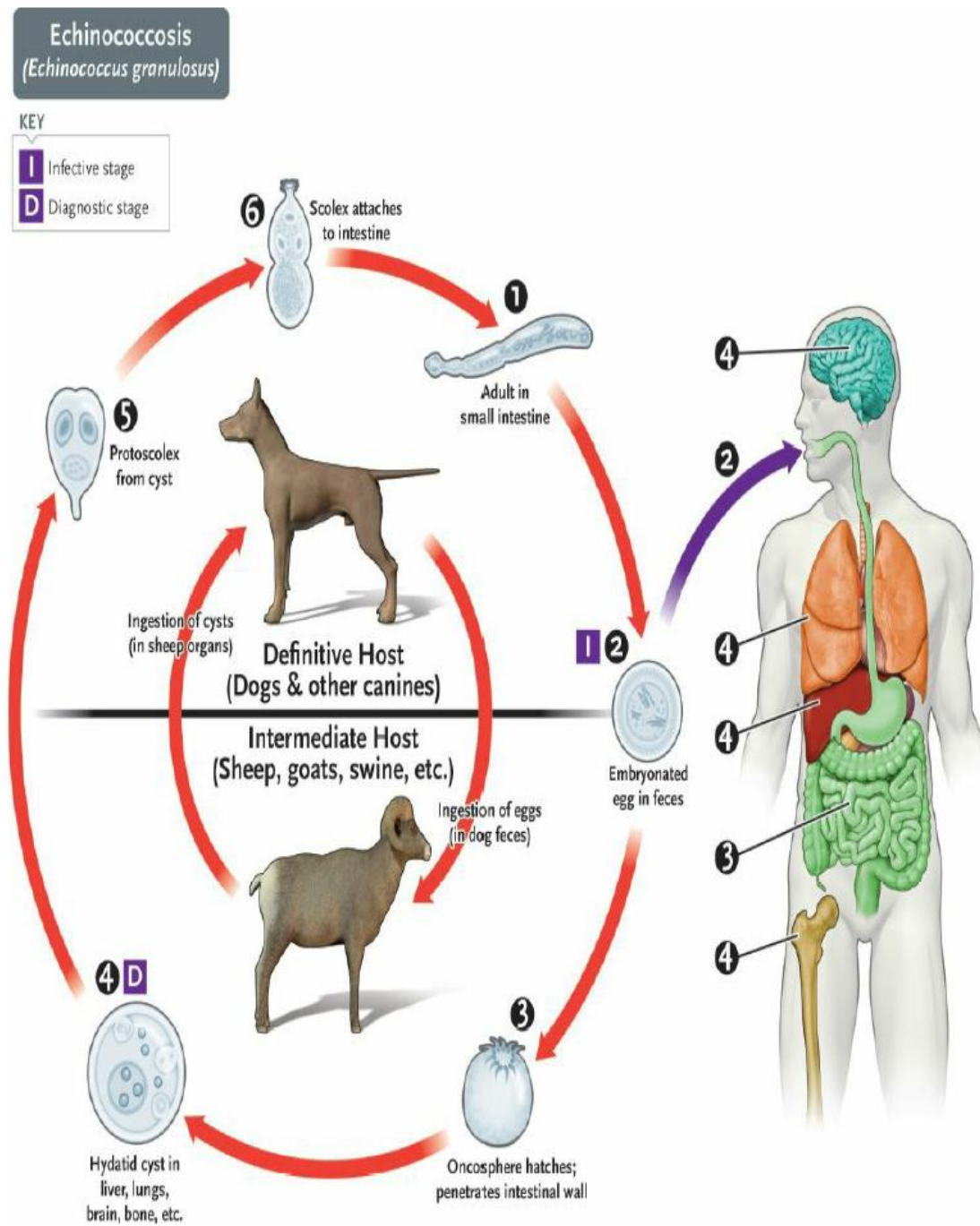
Features are summarized in table 56-1, 56-2 and 56-3.



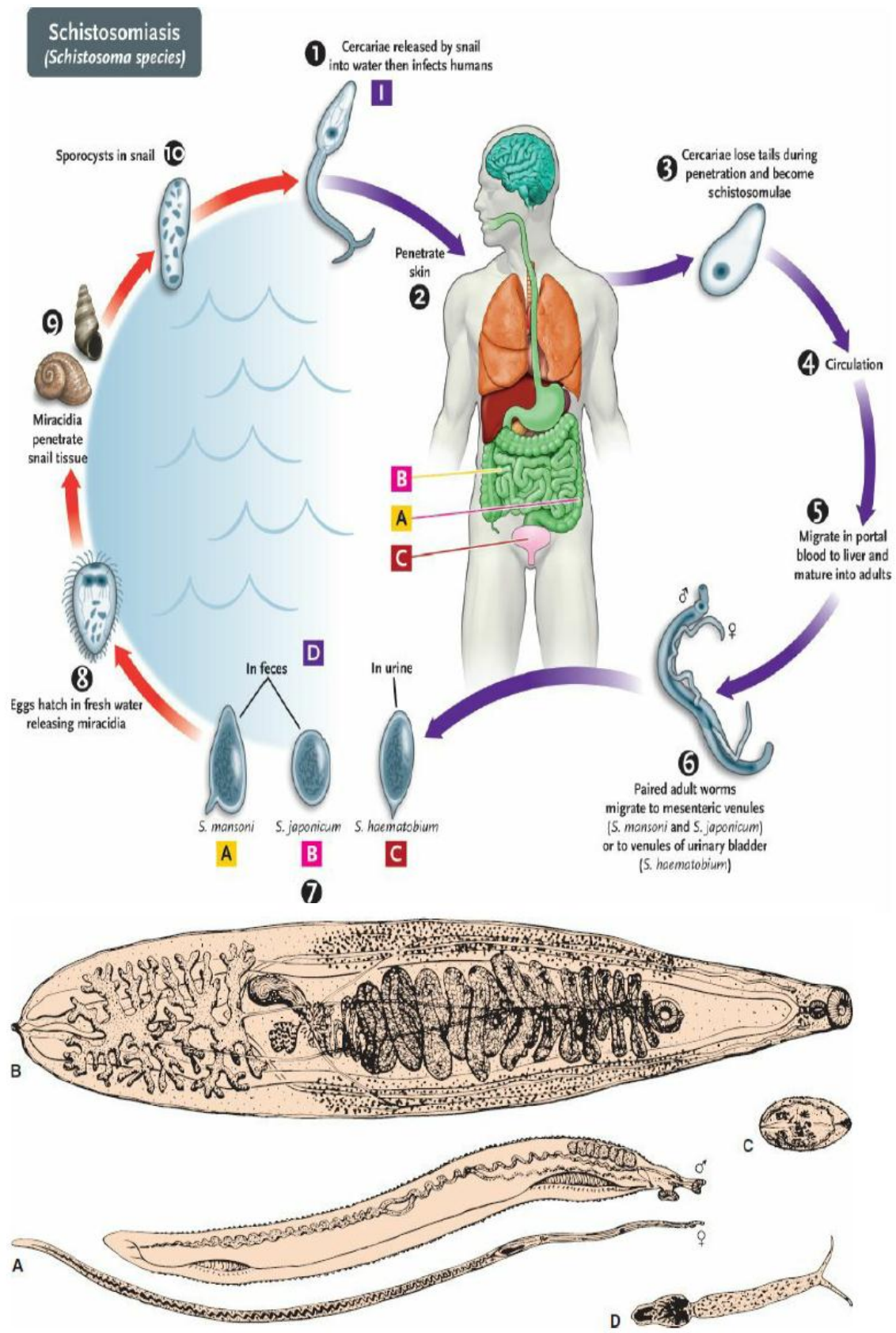
Taenia solium and *Taenia saginata*. Life cycle. Right side of

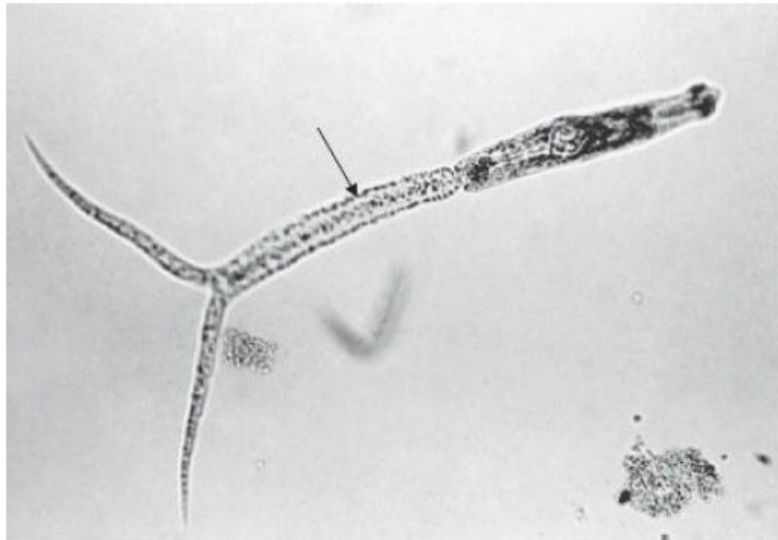


A: *Taenia solium* scolex with suckers and hooks (10×). **B:** *Taenia solium* gravid proglottid. This has fewer uterine branches than does the



Echinococcus granulosus. Life cycle. Center and left side of





Schistosoma—cercaria. Arrow points to a cercaria of *Schistosoma*. Note the typical forked tail on the left side of the image. (Figure courtesy of Minnesota Department of Health, R.N. Barr Library; Librarians M. Rethlefsen and M. Jones; Prof. W.Wiley, Public Health Image Library, Centers for Disease Control and Prevention.)



Schistosoma haematobium—egg. Long arrow points to an egg of *S. haematobium*. Short arrow points to its terminal spine. (Figure courtesy of Public Health Image Library, Centers for Disease Control and Prevention.)

The End