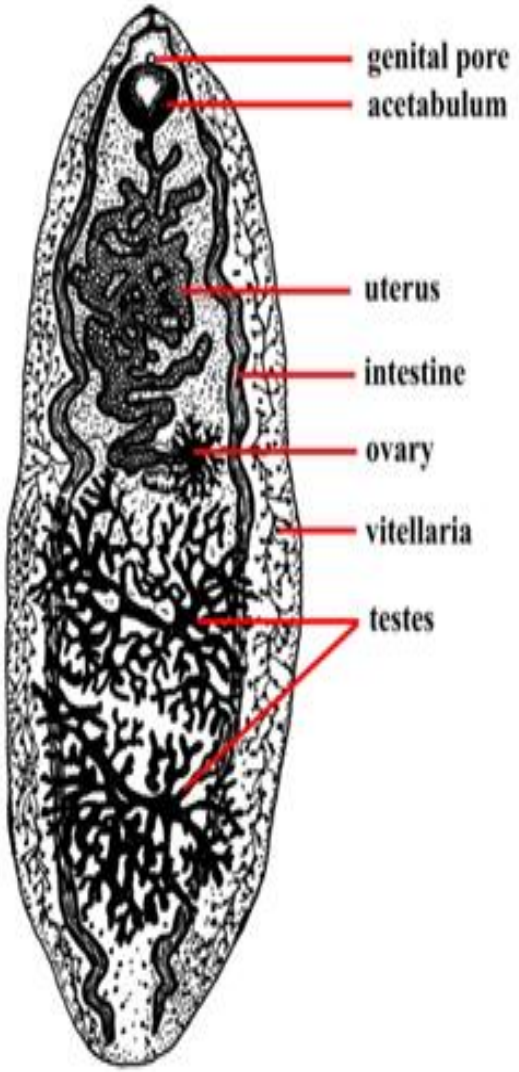
Fasciolopsis buski

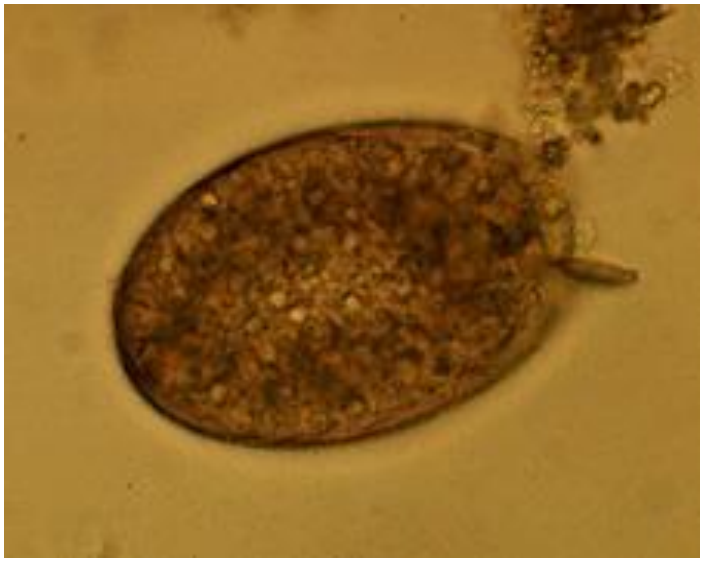
- Giant intestinal fluke of man
- Parasite of the intestines of humans and pigs
- Mode of transmission is by ingestion of encysted metacercariae on aquatic plants
- The viable metacercariae excyst in the duodenum and becomes mature in about three months
- Geographic Distribution:
  Asia and the Indian subcontinent, especially in areas where humans raise pigs and consume freshwater plants.
- *Fasciolopsis* is found in south and southeastern Asia; pigs, as well as humans, are a major reservoir of infection.

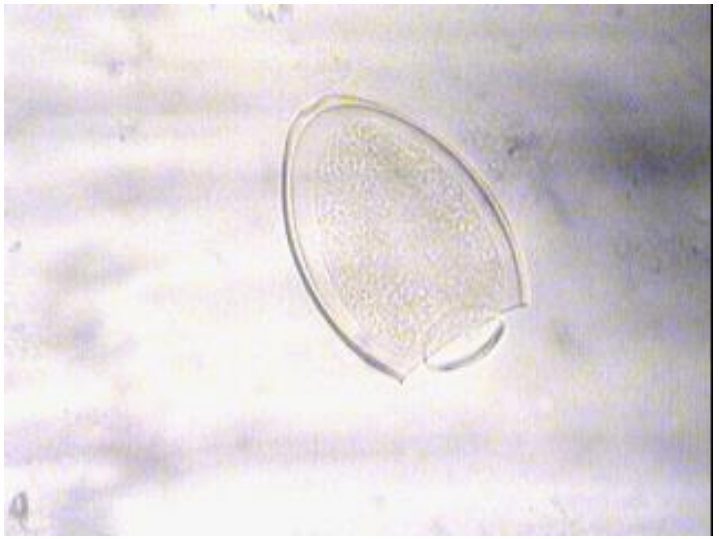
- **Adult**
- Elongated,Oval
- 20 – 75 mm in length and 8 -20 mm in width
- Covered with spines.,No cephalic cone
- Unbranched intestina caeca which reach up to the posterior end
- Testis posterior & branched.
- Attach themselves to the tissues of the small intestine of the host by means of ventral suckers; the sites of attachment may later ulcerate and form abscesses.



Egg

- Egg is practically indistinguishable from those of *F.hepatica*.
- The eggs are ellipsoidal, with a thin shell, and a usually small, operculum, range in size: 130 to 159 µm by 78 to 98 µm.

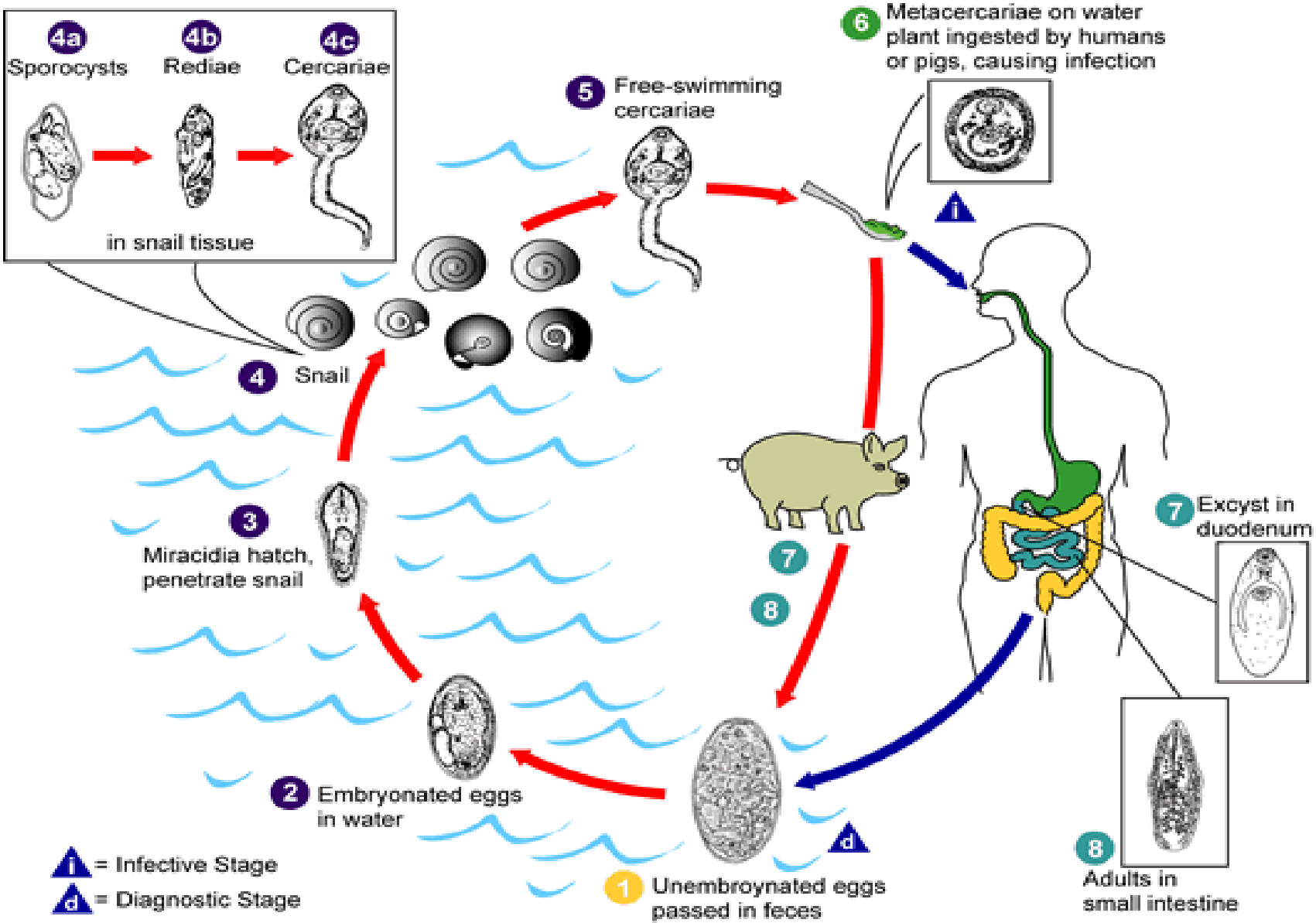




Life Cycle

The largest intestinal fluke of humans,Immature eggs are discharged into the intestine and stool . Eggs become embryonated in water , eggs release miracidia , which invade a suitable snail intermediate host . In the snail the parasites undergo several developmental stages (sporocysts , rediae , and cercariae). The cercariae are released from the snail and encyst as metacercariae on aquatic plants. The mammalian hosts become infected by ingesting metacercariae on the aquatic plants. After ingestion, the metacercariae excyst in the duodenum and attach to the intestinal wall.-There they develop into adult flukes in approximately 3 months, attached to the intestinal wall of the mammalian hosts (humans and pigs) . The adults have a life span of about one year

Life cycle


4a
Sporocysts
4b
Rediae
4c
Cercariae
in snail tissue
5 Free-swimming cercariae
6 Metacercariae on water plant ingested by humans or pigs, causing infection
i
4 Snail
3 Miracidia hatch, penetrate snail
7
8
7 Excyst in duodenum
2 Embryonated eggs in water
d
1 Unembroynated eggs passed in feces
8 Adults in small intestine
i = Infective Stage
d = Diagnostic Stage

Signs and symptoms

Many people do not have symptoms from *Fasciolopsis* infection. However, abdominal pain and diarrhea can occur 1 or 2 months after infection. With heavy infections *Fasciolopsis* flukes can cause intestinal obstruction, abdominal pain, nausea, vomiting, and fever. Allergic reactions and swelling of the face and legs can also occur -- and anemia may be present .

Diagnosis

Detection of parasite eggs in stool resemble *Fasciola* eggs provided with an operculum.

Treatment

Praziquantel 25 mg/kg for 3 doses for one day

Side effects:

Diziness,Drowsiness,Epigastric pain

Heterophys heterophyes

Minute teardrop-shaped flukes found in the small intestines of fish-eating birds and mammals, The adult flukes live burrowed between the villi of the host's small intestine. It only takes around 4 to 6 hours for H. heterophyes to get to the small intestines in the definitive host,

Geographic Distribution

Egypt, the Middle East, and Far East.

Ova

Light brown in color
Ovoid in shape
Operculated
A fully developed
symmetrical miracidium
is already presentOperculum
fits into the egg smoothly

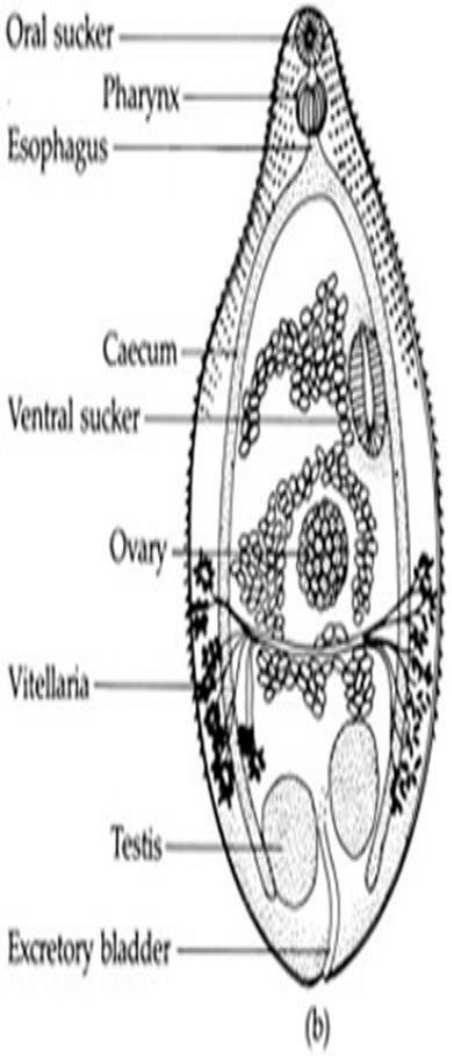
Morphology

• Minute teardrop-shaped ,the adult flukes range from 1.1mm to 1.7mm,The body of the fluke is covered in scales concentrated at the anterior end Also have at the anterior end is an oral sucker. Located in the anterior of the body is the acetabulum

• At the posterior end of the fluke are two oval testes.

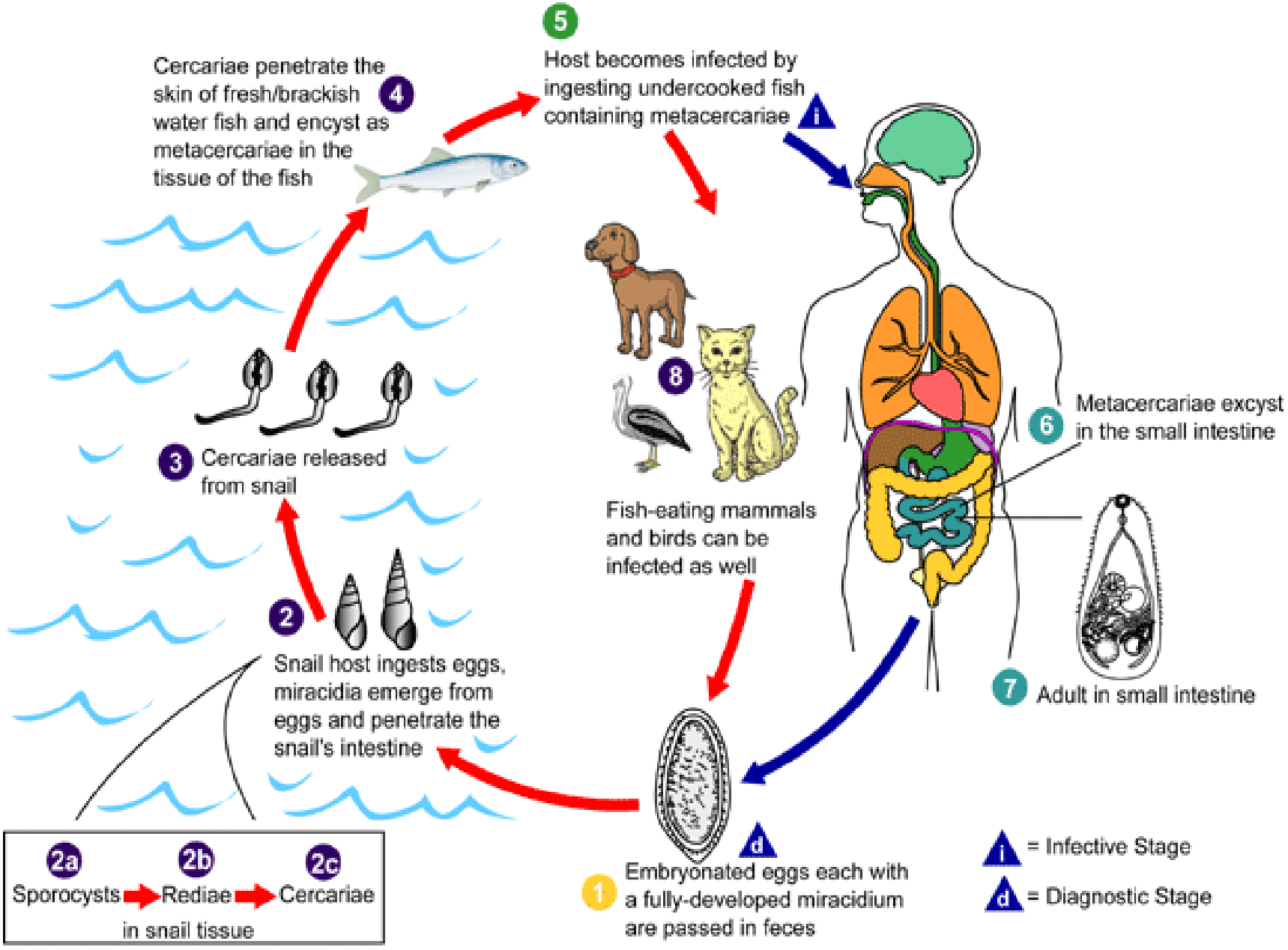
• The uterus is a long tube like structure that also leads away from the ovary and joins up with the ejaculatory duct to form the genital duct which leads to a genital pore .

Some species have or genital sucker .



Life Cycle

Adults release embryonated eggs each with a fully-developed miracidium, and eggs are passed in the host's feces . After ingestion by a suitable snail (first intermediate host), the eggs hatch and release miracidia which penetrate the snail's intestine . Genera *Cerithidia* and *Pironella* are important snail hosts in Asia and the Middle East respectively. The miracidia undergo several developmental stages in the snail, i.e. sporocysts , rediae , and cercariae . Many cercariae are produced from each redia. The cercariae are released from the snail and encyst as metacercariae in the tissues of a suitable fresh/brackish water fish (second intermediate host) . The definitive host becomes infected by ingesting undercooked or salted fish containing metacercariae . After ingestion, the metacercariae excyst, attach to the mucosa of the small intestine and mature into adults. In addition to humans, various fish-eating mammals (e.g., cats and dogs) and birds can be infected by *Heterophyes heterophyes*.


5
Host becomes infected by ingesting undercooked fish containing metacercariae
i
Cercariae penetrate the skin of fresh/brackish water fish and encyst as metacercariae in the tissue of the fish
4
8
Fish-eating mammals and birds can be infected as well
6
Metacercariae excyst in the small intestine
7
Adult in small intestine
3
Cercariae released from snail
2
Snail host ingests eggs, miracidia emerge from eggs and penetrate the snail's intestine
2a
Sporocysts
2b
Rediae
2c
Cercariae
in snail tissue
d
1
Embryonated eggs each with a fully-developed miracidium are passed in feces
i = Infective Stage
d = Diagnostic Stage

Clinical Presentation

The main symptoms are diarrhea and colicky abdominal pain. Migration of the eggs to the heart, resulting in potentially fatal myocardial and valvular damage, has been reported from the Philippines. Migration to other organs (e.g., brain) has also been reported.

Diagnosis

The diagnosis is based on the microscopic identification of eggs in the stool. However, the eggs are indistinguishable from those of *Metagonimus yokogawai* and resemble those of *Clonorchis* and *Opisthorchis*.

Treatment

Praziquantel

Lung Flukes

Paragonimus westermani (Oriental Lung Fluke)

Among the more than 10 species reported to infect humans, the most common is *P. westermani*, the oriental lung fluke.

Paragonimus is a lung fluke (flatworm) that infects the lungs of humans after eating an infected raw or undercooked crab or crayfish. but more serious cases of paragonimiasis occur when the parasite travels to the central nervous system.m where it can cause symptoms of meningitis.

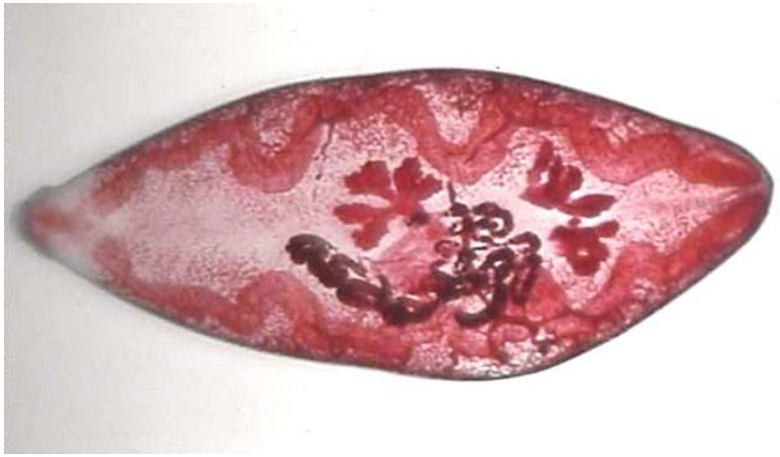
Trasmission

The infection is transmitted by eating infected crab or crawfish that is either, raw, partially cooked, pickled, or salted. The larval stages of the parasite are released when the crab or crawfish is digested. They then migrate within the body. In 6-10 weeks the larvae mature into adult flukes.

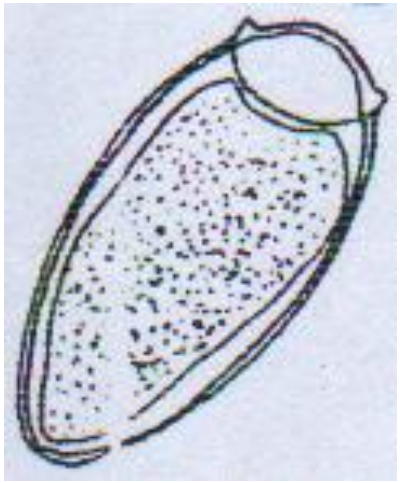
epidemiology

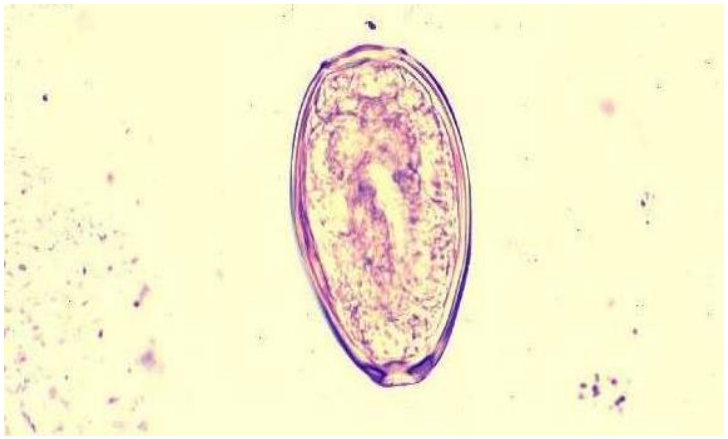
Paragonimus westermani and several other species are found throughout eastern, southwestern, and southeast Asia; (including China, the Philippines, Japan, Vietnam, South Korea, Taiwan, and Thailand). *P. africanus* is found in Africa, and *P. mexicanus* in Central and South America. There are several species of*Paragonimus* in other parts of the world that can infect humans. *P. kellicotti* is found in the midwestern and southern United States living in crayfish. Some human cases of infection have been associated with eating raw crayfish on river raft trips in the Midwest.

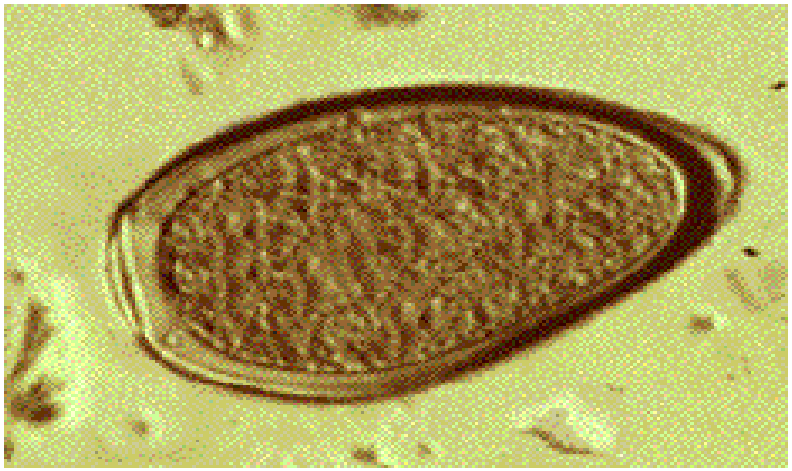
- **Adult**
  - Hermaphroditic
  - Body covered with spines
  - Reddish brown
  - Measures 4-6 mm in width and 3.5-5 mm in thickness
  - Resembles a coffee bean
  - Adult worms are found in pairs or in threes in fibrotic capsules or cysts in the lungs



Golden brown in colour, oval in shape and are provided with flattened opercula, each egg contains an unsegmented ovum surrounded by yolk cells







Paragonimus westermani Egg (sputum smear, eggs have also been detected in the stool) 55 – 80 µm

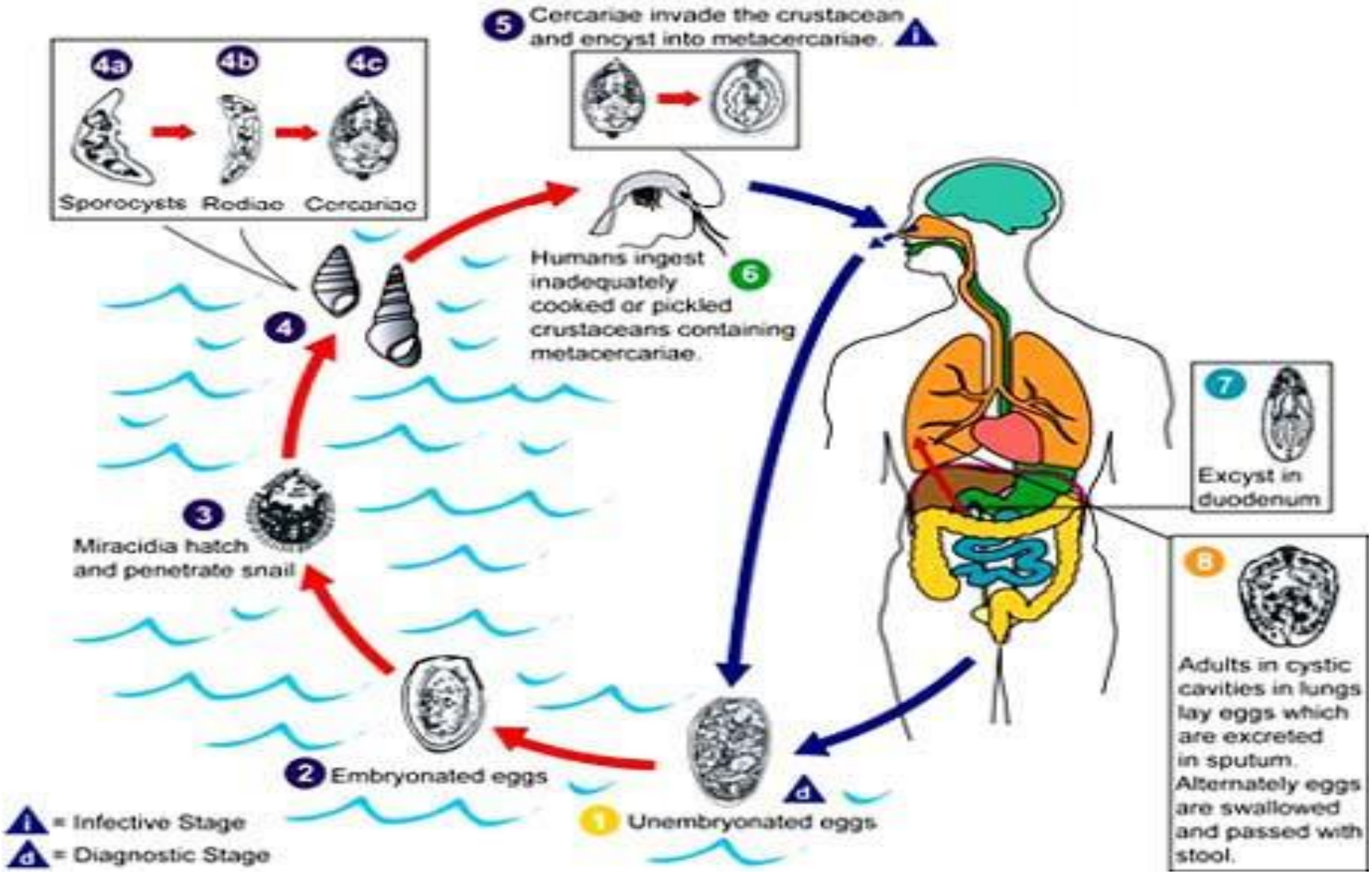
Life Cycles

The eggs are excreted in the sputum, or alternately they are swallowed and passed with stool . In the external environment, the eggs become embryonated , and miracidia hatch and seek the first intermediate host, a snail, and penetrate its soft tissues . Miracidia go through several developmental stages inside the snail : sporocysts , rediae , with the latter giving rise to many cercariae , which emerge from the snail. The cercariae invade the second intermediate host, a crustacean such as a crab or crayfish, where they encyst and become metacercariae. This is the infective stage for the mammalian host . Human infection with *P. westermani* occurs by eating inadequately cooked or pickled crab or crayfish that harbor metacercariae of the parasite

The metacercariae excyst in the duodenum .penetrate through the intestinal wall into the peritoneal cavity, then through the abdominal wall and diaphragm into the lungs, where they become encapsulated and develop into adults The worms can also reach other organs and tissues, such as the brain and striated muscles, respectively. Time from infection to oviposition is 65 to 90 days.

Infections may persist for 20 years in humans. Animals such as pigs, dogs, and a variety of feline species can also harbor *P. westermani*.

Life Cycle


5 Cercariae invade the crustacean and encyst into metacercariae. i
4a
4b
4c
Sporocysts
Rediae
Cercariae
Humans ingest inadequately cooked or pickled crustaceans containing metacercariae.
6
4
7
Excyst in duodenum
3
Miracidia hatch and penetrate snail
8
Adults in cystic cavities in lungs lay eggs which are excreted in sputum. Alternately eggs are swallowed and passed with stool.
2 Embryonated eggs
d
1 Unembryonated eggs
i = Infective Stage
d = Diagnostic Stage

Signs and symptoms

Adult flukes living in the lung cause lung disease. After 2-15 days, the initial signs and symptoms may be diarrhea and abdominal pain. This may be followed several days later by fever, chest pain, and fatigue. The symptoms may also include a dry cough initially, which later often becomes productive with rusty-colored or blood-tinged sputum on exertion. The symptoms of paragonimiasis can be similar to those of tuberculosis.

Diagnosis

The infection is usually diagnosed by identification of *Paragonimus* eggs in sputum. The eggs are sometimes found in stool samples (coughed-up eggs are swallowed). A tissue biopsy is sometimes performed to look for eggs in a tissue specimen.

Specific and sensitive antibody tests based on *P. westermani* antigens are available,and serologic tests using a variety of techniques are available through commercial laboratories.

Treatment of Paragonimiasis

- Praziquantel
  - Drug of choice
  - 25 mg/kg body weight 3x a day for three day
- Bithionol
  - 15 – 25 mg/kg / day on alternate days for a total of 10-15 days