

. 3-Lung Flukes

A-Paragonimus westermani

Paragonimus westermani, the Oriental lung fluke, belongs to the family Troglotrematidae and is one of several digeneans of the same genus that infect the human respiratory tract. The first report of human infection was from Taiwan during the latter part of the 19th century. numerous other infections were quickly diagnosed in eastern Asia where the condition remains prevalent today.

Epidemiology

The lung fluke, Paragonimus westermani, is found throughout eastern Asia and infects a wide variety of mammalian reservoir hosts. Numerous fresh water crustaceans such as crabs and crayfish serve as intermediate hosts and infection occurs when these are eaten raw or lightly cooked. Several other members of the *Paragonimus* genus routinely cause human infection, mostly in areas of eastern Asia, central and western Africa, and Latin America

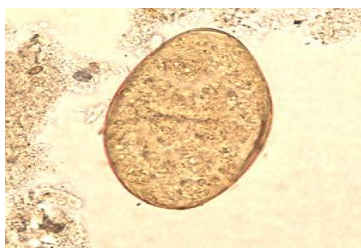
Kingdom Animalia

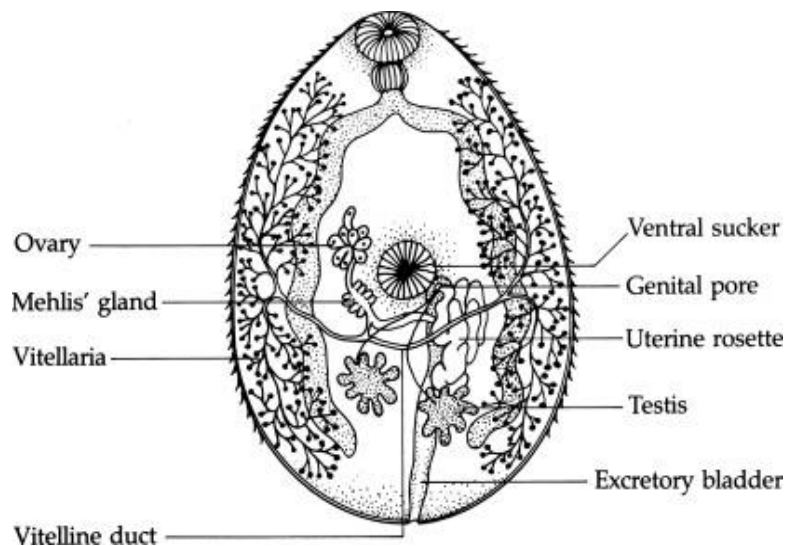
Phylum Platyhelminthes

Class Trematodes

Genus Fasciolopsis

Spices buski





Morphology

The thick-bodied, reddish-brown adult worm measures 7.5–12-mm long and 4–6-mm wide. The male reproductive system consists of two irregularly lobed testes. The lobed ovary, anterior to the right testis, is connected via the oviduct to the uterus. Vitellaria extend bilaterally along the length of the body, lateral to and paralleling the caeca. A medially located ventral sucker lies between the ovary and the uterus.

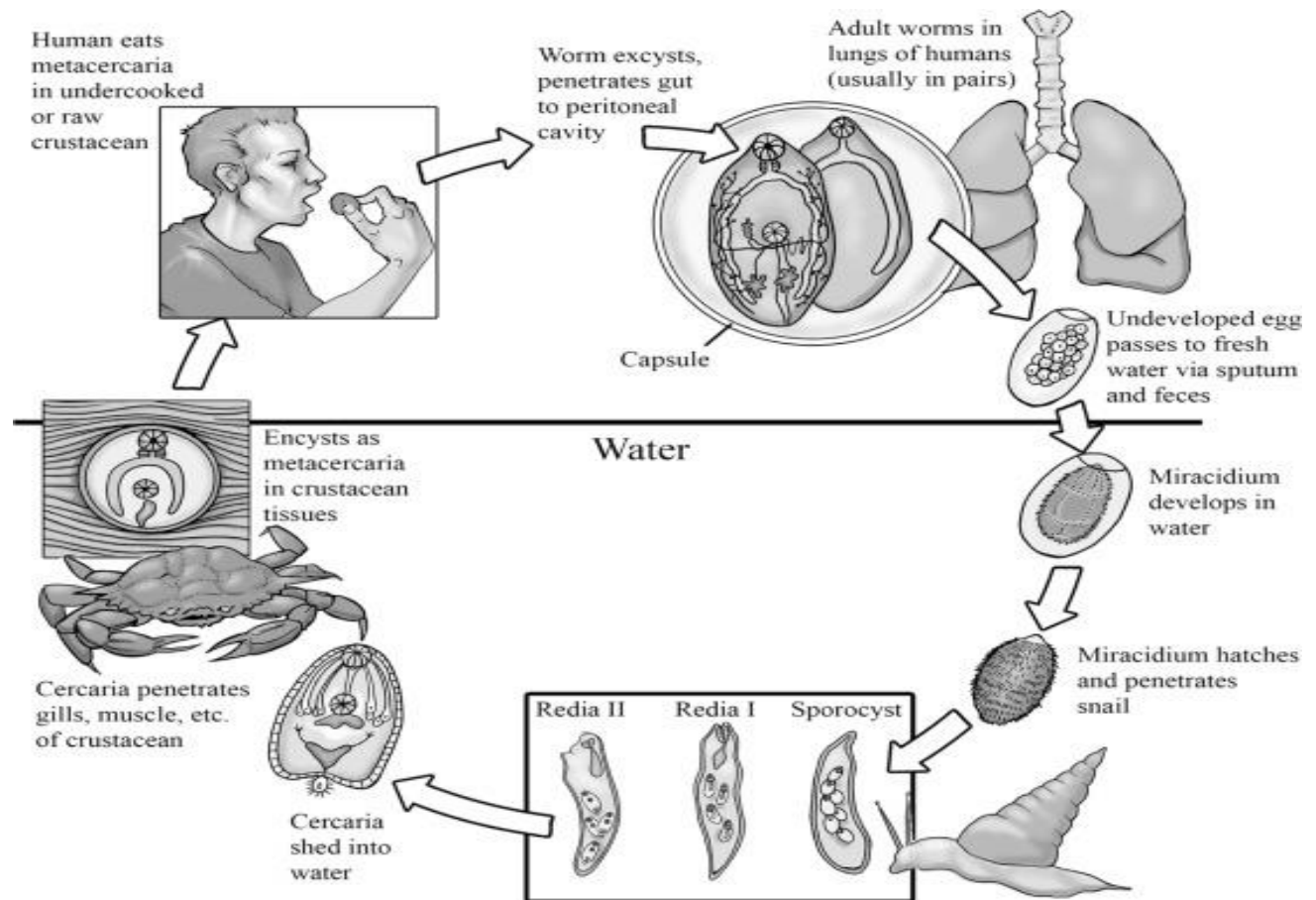
Brownish, **operculated eggs** (smaller than but similar to those of *F. hepatica*), are released through the genital pore situated in the center of the uterine rosette.

Life Cycle

- adult *P. westermani* are usually found encapsulated in the bronchioles of the victim's lungs.
- eggs containing uncleaved embryos or zygotes are coughed up and expelled with sputum when the capsules enclosing the adult worms rupture
- However, some eggs may be swallowed with sputum, pass through the digestive system, and be expelled with feces; others become trapped in the surrounding lung tissue and produce bronchial abscesses.

- Once the egg reaches water, several weeks are required for the miracidium to develop. Fully developed miracidia hatch spontaneously,

- and each must then locate and penetrate a suitable snail host of the genera *Semisulcospira*, *Tarebia*, or *Brotia* within 24 h or perish.
- Following penetration of the snail host and metamorphosis into a sporocyst, two redial generations are produced
- Cercariae, emerge from the snail tissue into the surrounding water approximately 11 weeks after the snail is infected.
- The cercariae possess knoblike tails useless for swimming; instead, the cercariae crawl over solid surfaces until they encounter suitable crustaceans, such as freshwater crabs and crayfish as a second intermediate host., they can penetrate the crustacean's exoskeleton
- There is evidence that the crustacean second intermediate host may also acquire infection by eating infected snails.
 - Once inside the host, the cercariae encyst in muscles, gills, and viscera) where they develop into metacercariaThe encysted metacercaria is not folded over ventrally, as are most encysted metacercariae, but lies in an extended position within the cyst wall. Humans acquire infection by eating freshwater crustaceans raw, inadequately pickled, or incompletely cooked.
 - The metacercaria excysts in the small intestine and partially penetrates the intestinal wall. Young adults remain at this site for several days before entering the coelom. Then, traversing the diaphragm and pleura, they enter the peribronchiolar tissues of the lungs, where they become encapsulated in pairs by host connective tissue and develop to sexual maturity within 8–12 weeks. During migration,
 - young adult worms often become lodged in other organs, producing ectopic lesions before succumbing to host reactions



• **Symptomatology**

- *Paragonimus westermani* adults and eggs stimulate formation of connective tissue capsules in the host, both in the lungs and at ectopic sites.
- . Early symptoms include a cough producing blood-tinged sputum, pulmonary pain, and even pleurisy. A low-grade fever usually accompanies these symptoms.
- At present, paragonimiasis is difficult to distinguish from other pulmonary disorders such as pneumonia and tuberculosis.
- Encysted worms may be found at such ectopic sites as the abdominal wall, lymph nodes, heart, and portions of the nervous system.
- Infection of the abdominal wall may produce abdominal pain, diarrhea, and bleeding. In the brain, infection may produce a variety of neurological symptoms such as epilepsy and paralysis.

- Fatalities have been recorded from cardiac involvement as well as from heavy pulmonary infection

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- **Diagnosis**

- Identification of eggs from sputum, pleural aspirate, or feces is the most reliable diagnostic procedure. Patients from endemic areas who show such symptoms as pulmonary distress, blood-tinged sputum, and eosinophilia should be examined carefully.

-For ectopic infections, immunological tests with antigens derived from *Paragonimus* have proven useful.

Treatment

-Praziquantel has proven effective.

-Water chestnuts from contaminated waters should be avoided.

- Sewage should be treated before disposal.