



**Medical Analysis
Department**

Trematode (Continue) FOB test

Medical Parasitology (MA302)

Summer School

Lab 4

Lecturer: Mr. Omer Sardar Taha

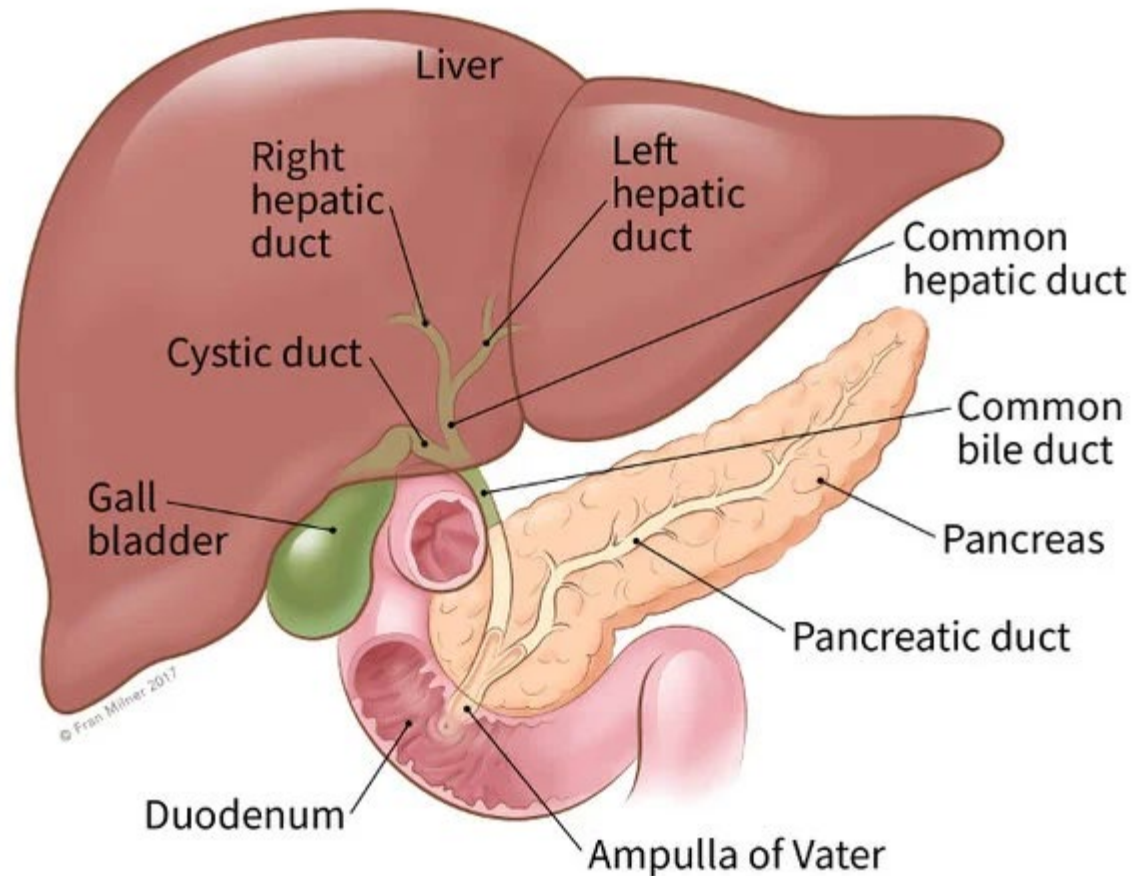
R. Assistant: Ms. Amnah Mohammad

E-mail: Omer.sardar@tiu.edu.iq

September 03, 2026

Clonorchis sinensis (Oriental Liver Fluke)

Adult worm lives in the biliary tract and sometimes in the pancreatic duct.



Morphology



Adult worm:

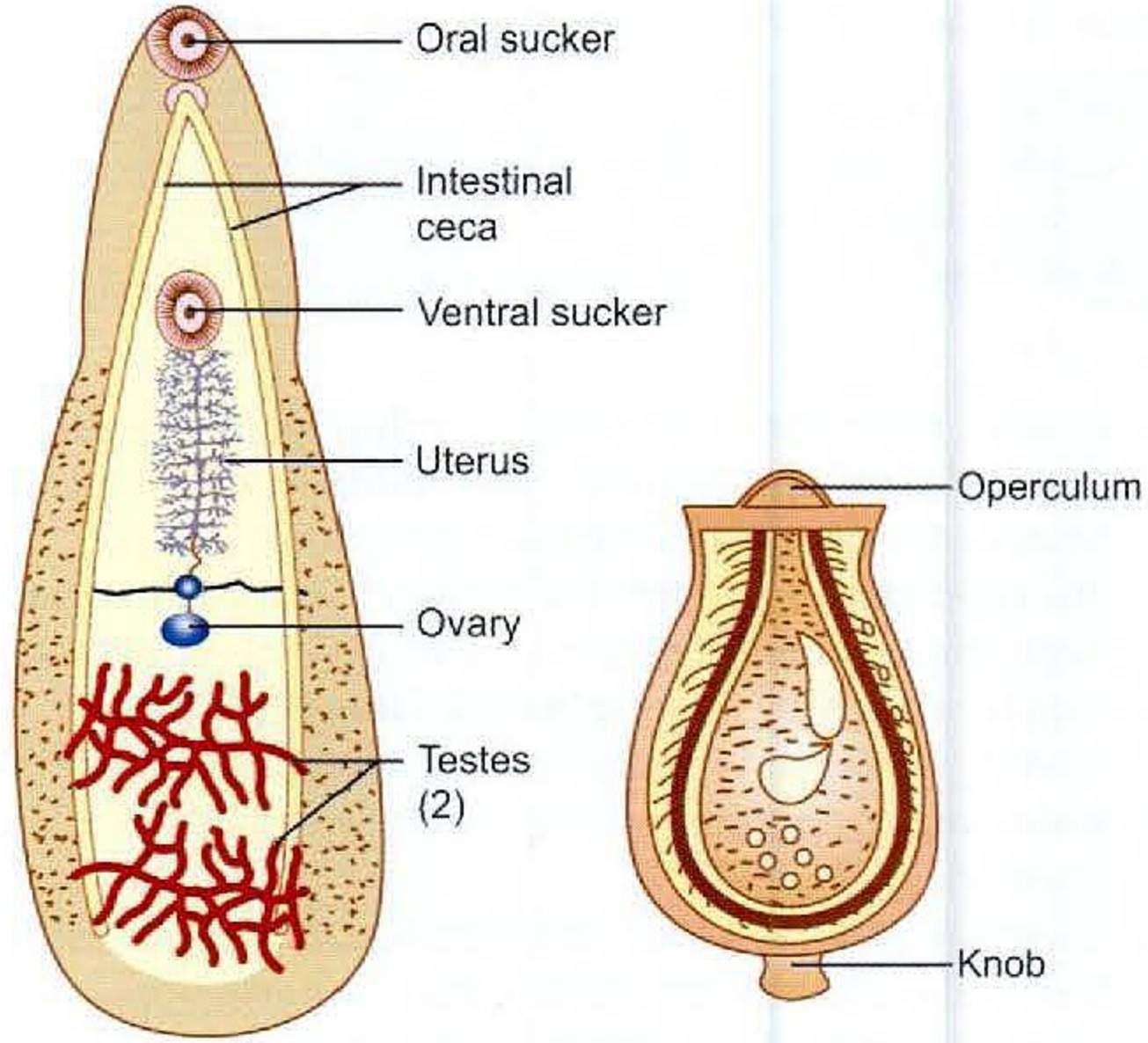
It has a flat, transparent, spatulate body; pointed anteriorly and rounded posteriorly

- It is 10- 25 mm long and 3-5 mm broad.
- The adult worm can survive in the biliary tract for 15 years or more.
- The hermaphroditic worm discharges eggs into the bile duct.

Eggs:

Eggs are **flask-shaped**, 35 μm by 20 μm with a yellowish brown (bile-stained) shell.

- It is operculated at one pole and possesses a **tiny knob** at the other pole and a small hook-like spine at the other.



Adult



Egg



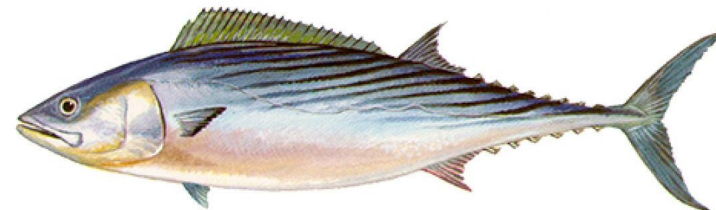
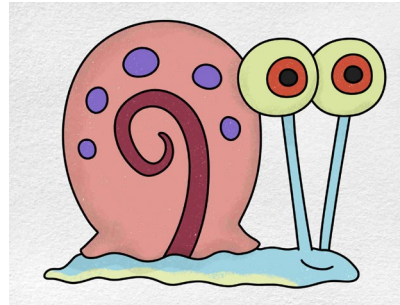
Life Cycle

Definitive host: Humans are the principal definitive host



Intermediate hosts:

- *First intermediate host: Snail*
- *Second intermediate host: Fish*

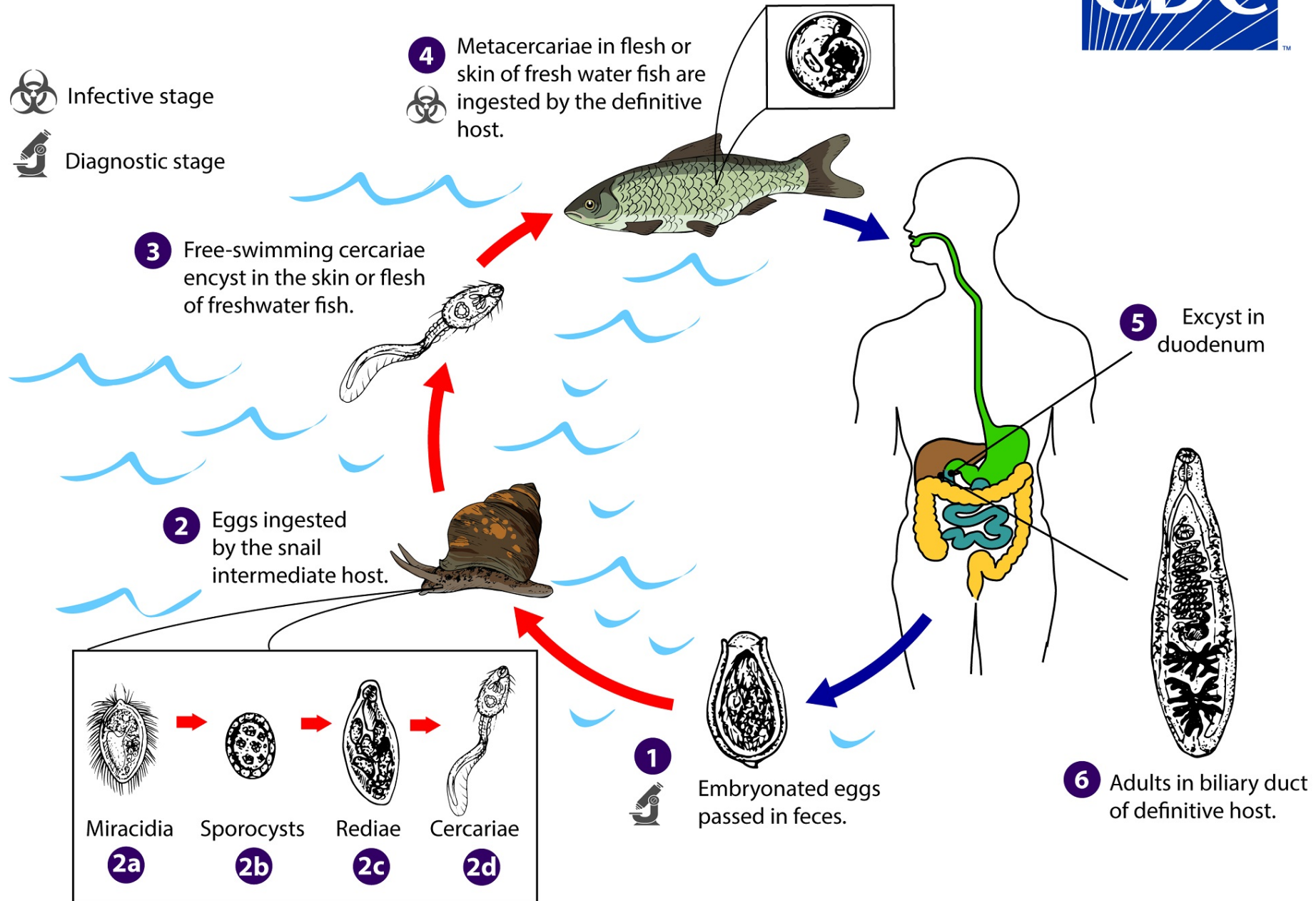


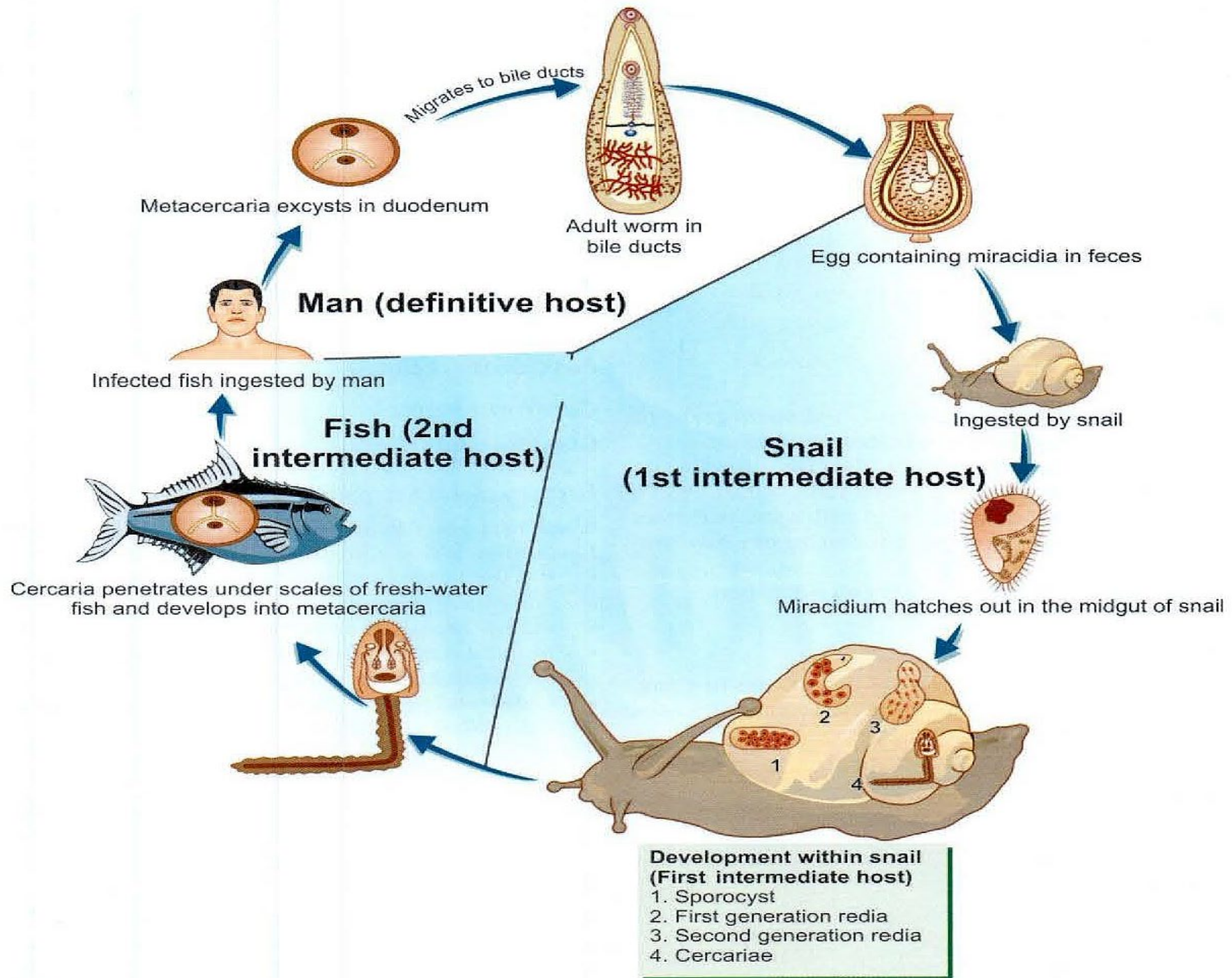


Infective stage



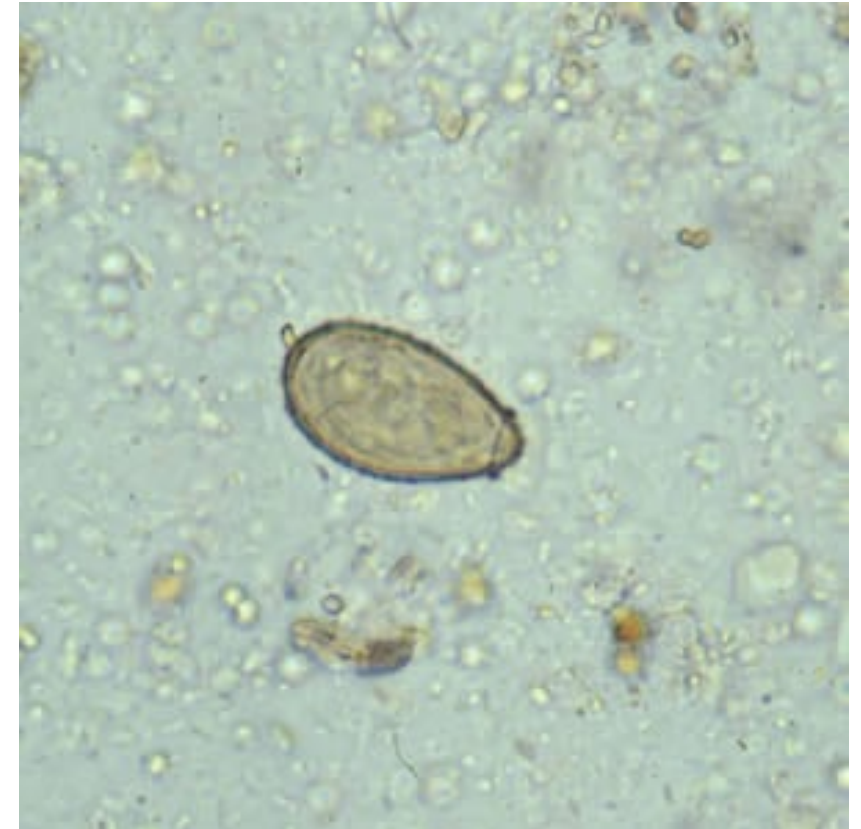
Diagnostic stage





Laboratory Diagnosis

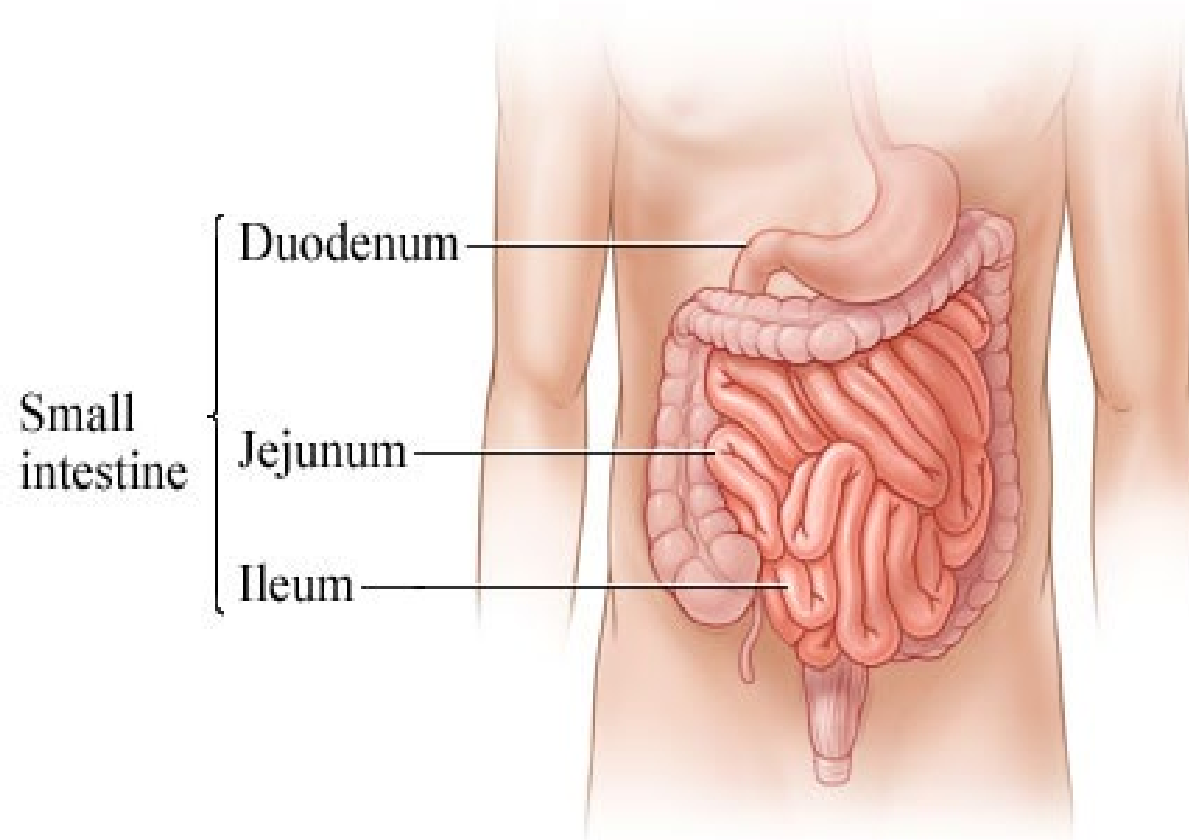
The eggs may be demonstrated in feces (*stool microscopy*) or aspirated bile.



Fasciolopsis buski (Intestinal Fluke)

Habitat

The adult worm lives in the **duodenum** or **jejunum** of pigs and man.

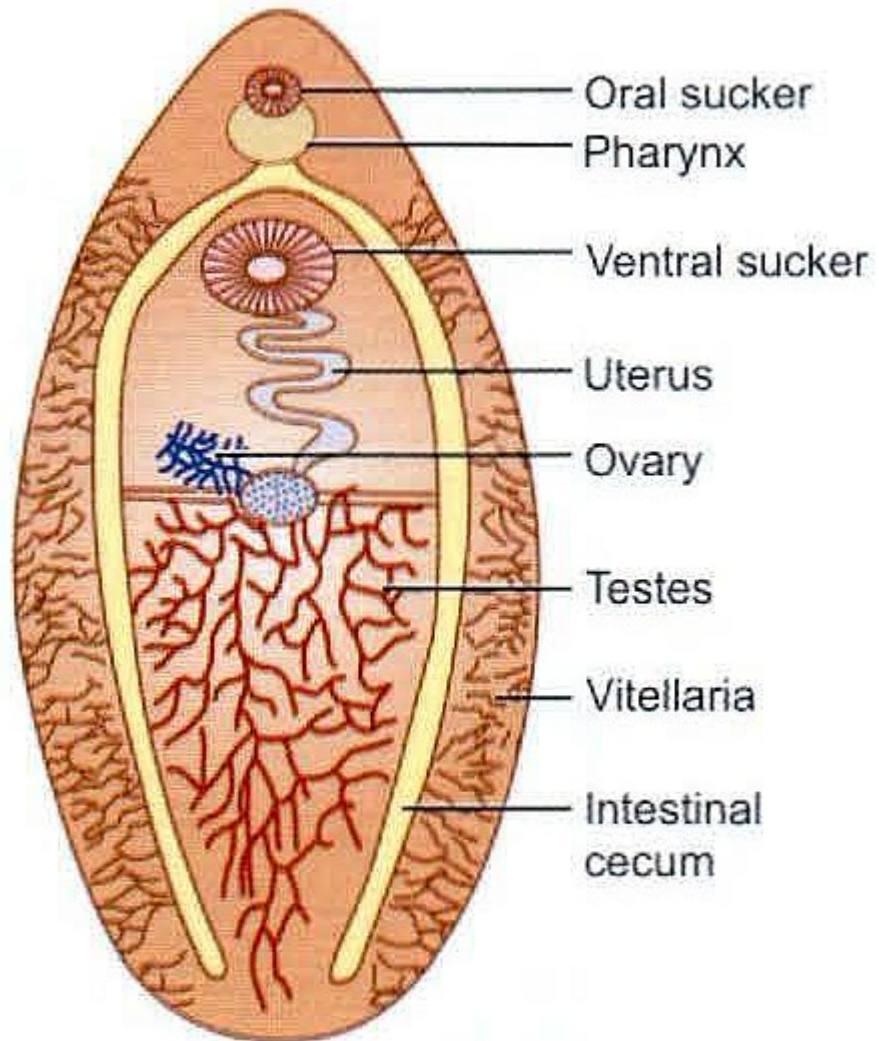


Morphology

Adult worm:

- The adult is a large fleshy worm, 20-75 mm long and 8-20 mm broad and 0.5-3 mm in thickness.
- It is elongated ovoid in shape, with a small oral sucker and a large acetabulum. It has no cephalic cone as in *Fasciola hepatica*.
- The adult worm has a lifespan of about 6 months.

Adult



Eggs:

- The operculated eggs are similar to those of *F. hepatica*.
- Eggs are laid in the lumen of the intestine



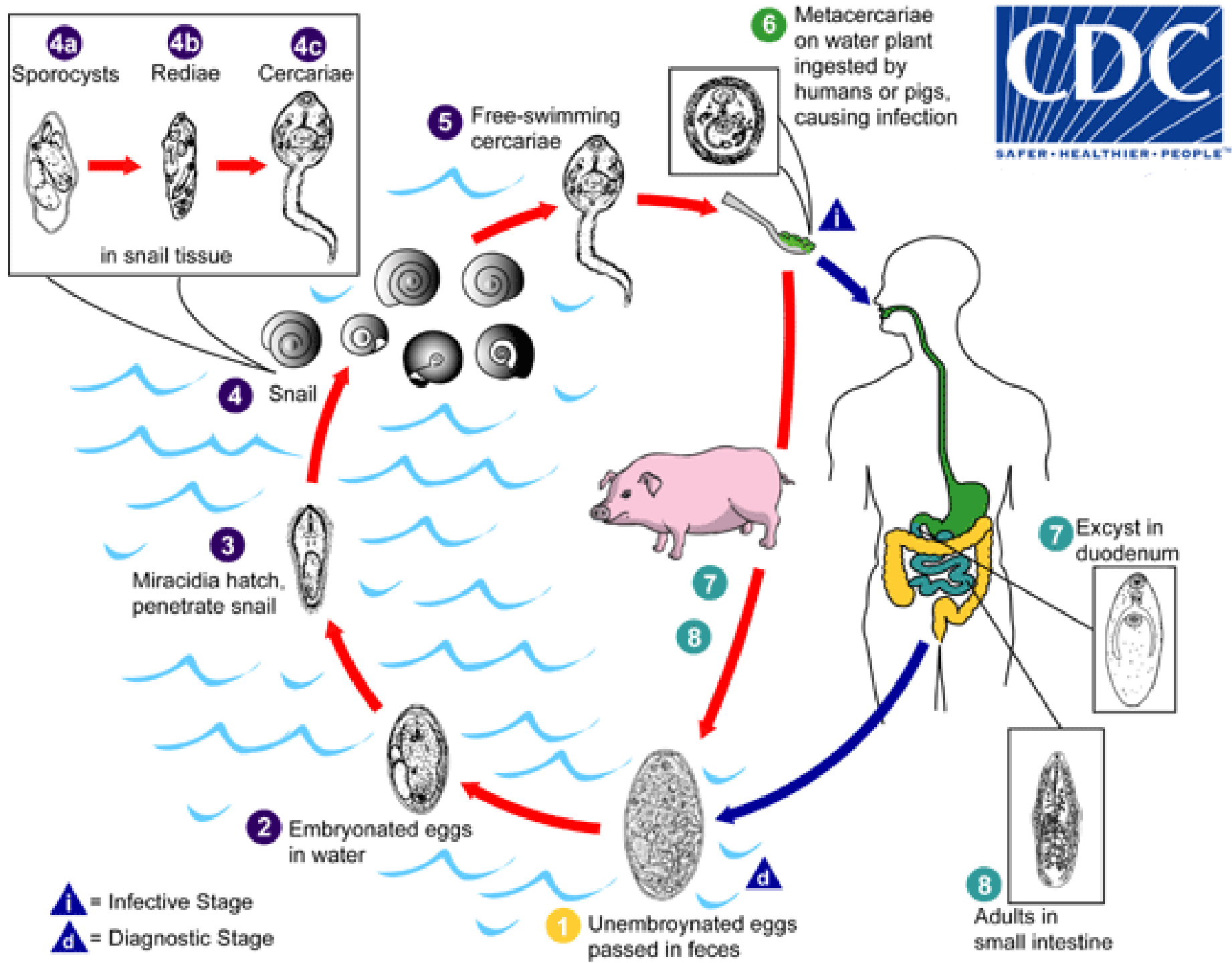
Life Cycle

Definitive host: human and pigs. Pigs serve as a reservoir of infection for man.



intermediate host: Snails of the genus *Segmentina* sp.





Laboratory Diagnosis

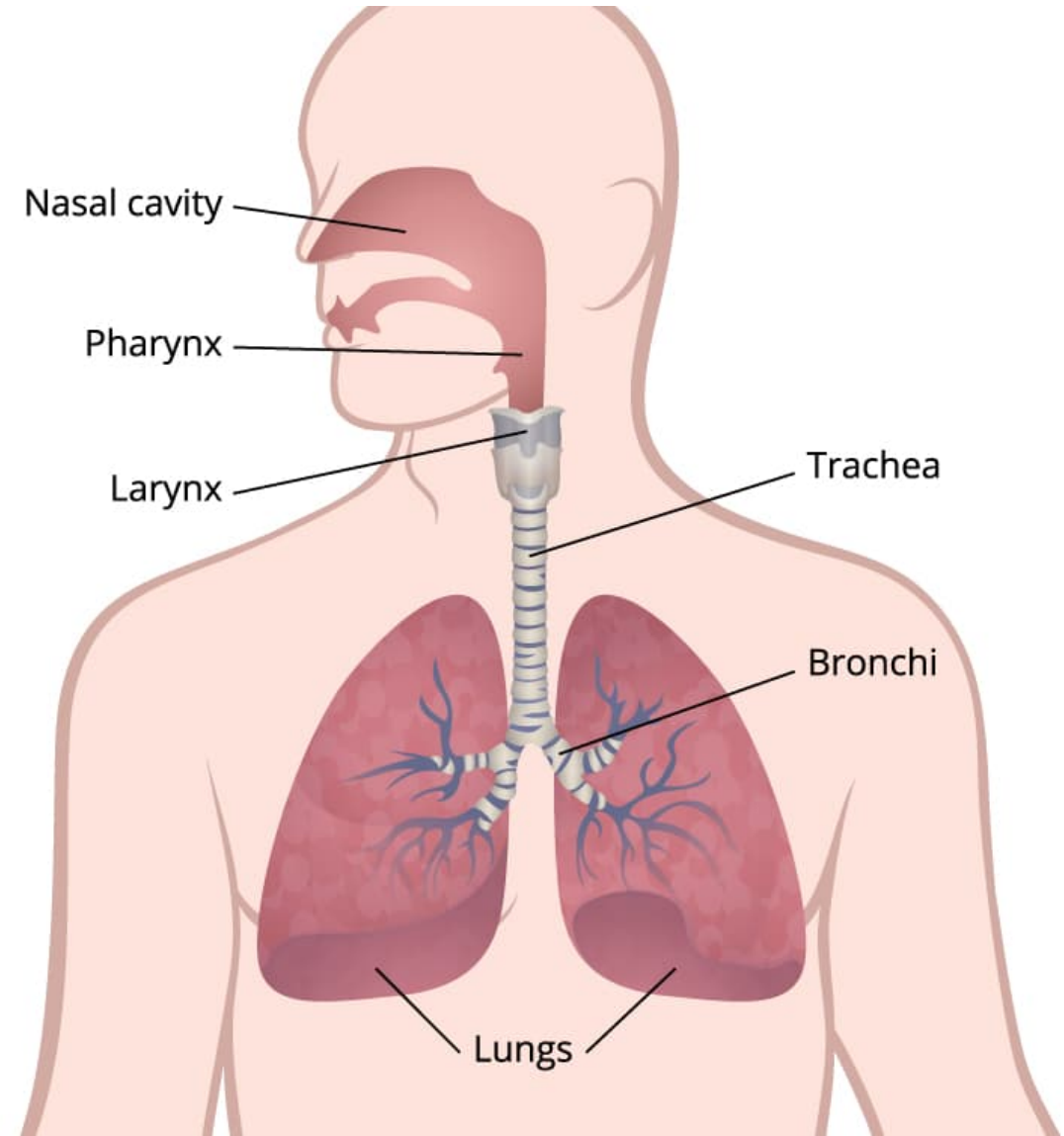
The diagnosis is made by stool microscopical examination finding the flukes or their eggs in the feces.



Paragonimus Westermani (Oriental lung fluke)

Habitat

- Adult worms live in the **lungs**, usually in pairs in cystic spaces that communicate with bronchi

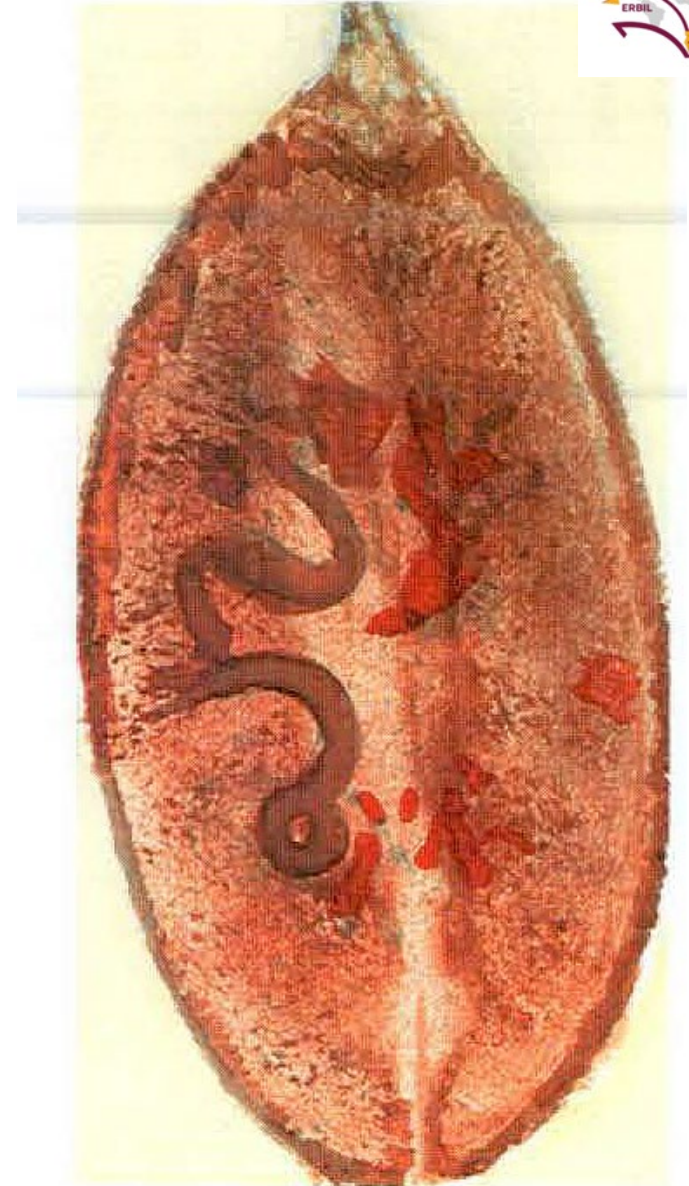


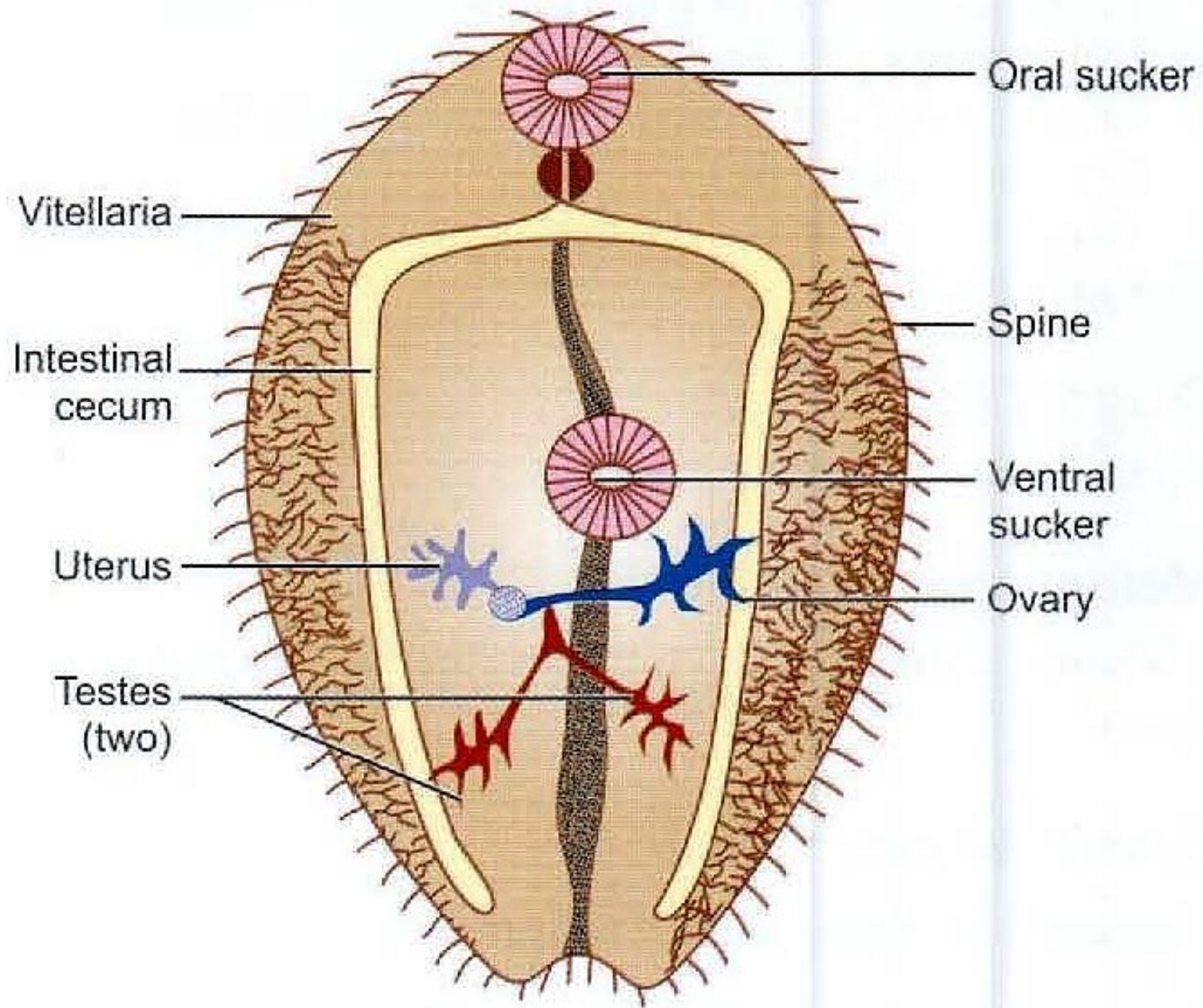
Morphology

Adult worm:

The adult worm is **egg-shaped** about 10 mm long, 5 mm broad and 4 mm thick and reddish-brown in color

- The integument is covered with scale-like spines.
- It has an oral sucker placed anteriorly and a ventral sucker located towards the middle of the body.
- It has two unbranched intestinal caeca which end blindly in the caudal area.



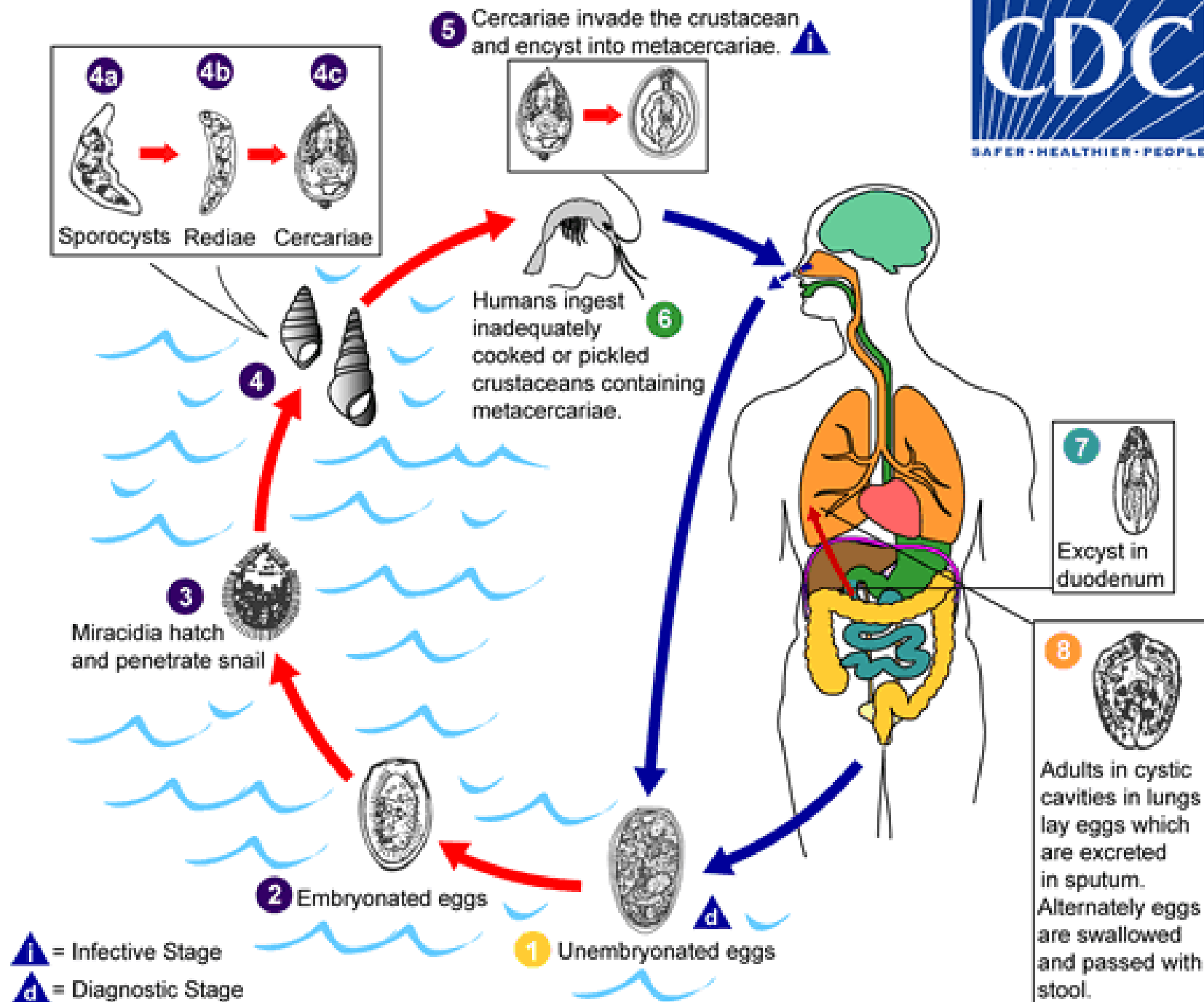


Egg:

The eggs are operculated, golden-brown in color and about 100 μ m by 50 μ m in size.

- They are unembryonated when freshly laid.



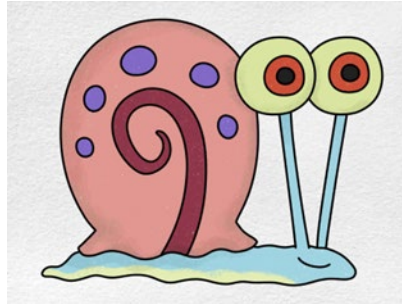


Life Cycle

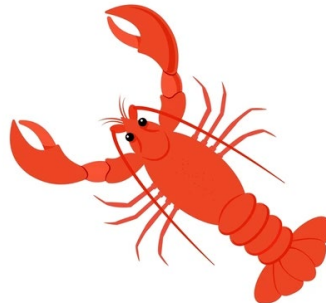
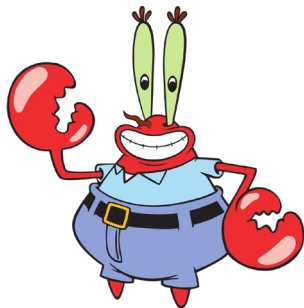
Definitive host: Human.



First intermediate host: Freshwater snail, belonging to the genera *Semisulcospira* and *Brotia*.



Second intermediate host: Freshwater crab or crayfish.



Laboratory Diagnosis

Microscopy: Demonstration of the eggs in sputum or feces provides definitive evidence. Sputum examination should be repeated for 7 consecutive days.

Serology: ELISA

Imaging: Chest X-ray reveals abnormal shadows (nodular, cystic, ring infiltrative) in the middle and lower lung field.



Artifacts in Stool

Fecal Calprotectin test

Introduction

Fecal calprotectin is a biomarker for intestinal inflammation. It is a calcium- and zinc-binding protein predominantly found in neutrophils and is released into the intestinal lumen during inflammation. This test is useful in distinguishing between inflammatory and non-inflammatory gastrointestinal conditions, including infections caused by parasites.

Clinical significance of the test

- Certain parasitic infections, such as *Entamoeba histolytica*, *Giardia lamblia*, can cause significant intestinal inflammation.
- Helps in differentiating between inflammatory and functional gastrointestinal disorders (e.g., irritable bowel syndrome vs. inflammatory bowel disease).
- Useful for monitoring disease activity and treatment response in chronic parasitic infections.

Result Interpretation

- **<50 $\mu\text{g/g}$ feces:** Normal (no significant inflammation)
- **50–200 $\mu\text{g/g}$ feces:** Mild inflammation (requires further clinical correlation)
- **>200 $\mu\text{g/g}$ feces:** Significant inflammation (suggests active infection or inflammatory bowel disease)

Fecal Occult blood test

Introduction

The Fecal Occult Blood (FOB) test is a laboratory test used to detect small amounts of blood in stool that cannot be seen by the naked eye. The presence of occult blood may indicate bleeding somewhere in the gastrointestinal tract.

Principle

1. The test strip contains antibodies specific to human hemoglobin.
2. When a prepared stool sample is added to the test device:
3. If human hemoglobin is present, it binds to labeled anti-human hemoglobin antibodies.
4. The antigen-antibody complex migrates along the membrane by capillary action.
5. The complex reaches the test line (T), where additional antibodies capture it and produce a visible colored line.
6. A control line (C) should appear to confirm that the test has worked correctly.

Specimen

The specimen is a **stool sample** collected in a clean, dry container.

The sample should not be contaminated with:

- Urine
- Water
- Menstrual blood or other external blood sources

Procedure

1. Collect a small amount of stool using the sampling stick provided with the kit.
2. Insert the sampling stick into the sample extraction buffer/tube and mix thoroughly.
3. Add the required amount of the prepared stool suspension to the sample well of the test cassette/strip.
4. Allow the sample to migrate through the membrane.
5. Read the result within the time specified by the manufacturer.
6. Record the result as positive, negative, or invalid.

Result interpretation

Result	Appearance	Interpretation
Positive	C + T lines	Human hemoglobin detected
Negative	C line only	Human hemoglobin not detected
Invalid	No C line	Test is invalid and should be repeated

Clinical Significance

A positive FOB test indicates the presence of human hemoglobin in the stool. It may be associated with gastrointestinal bleeding caused by conditions such as:

- Colorectal polyps
- Colorectal cancer
- Gastrointestinal ulcers
- Inflammatory bowel disease
- Other gastrointestinal lesions

References

- Paniker, C. K. J. & Ghosh, S. 2021. *Paniker's textbook of medical parasitology*, New Delhi, Jaypee Brothers Medical Publishers.