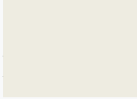


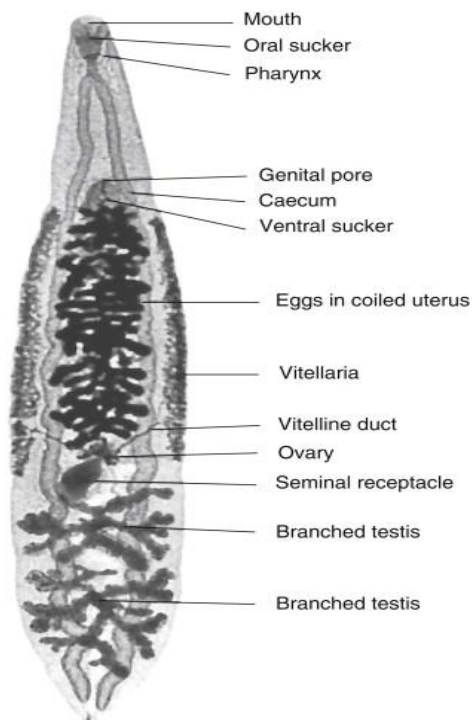
## B-Oriental liver flukes

*Clonorchis sinensis* (also known as *Opisthorchis sinensis*) and *Opisthorchis viverrini* affect about 20 million people in China and South East Asia. A related species, *Opisthorchis felinus*, occurs in Eastern Europe and Russia.

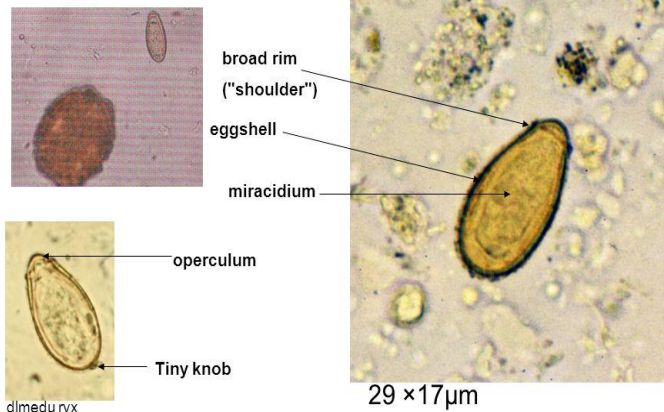
Human infection follows consumption of metacercariae in raw or undercooked freshwater fish. Metacercariae excyst in the small bowel and migrate along the common bile duct to colonize the biliary tree.

Kingdom:	<a href="#">Animalia</a>
Phylum:	<a href="#">Platyhelminthes</a>
	
Class:	<a href="#">Rhabditophora</a>
Order:	<a href="#">Plagiorchiida</a>
Family:	<a href="#">Opisthorchiidae</a>
Genus:	<a href="#">Clonorchis</a>
Species:	<i>C. sinensis</i>

## Morphology of *Clonorchis sinensis*



### Egg: the smallest



## Description

The adult worm resides in the bile ducts of the human host and varies in size from 12 to 20 mm long and from 3 to 5 mm wide.

The body is tapered anteriorly, while the posterior end is somewhat blunt. The poorly developed ventral sucker. The caeca extend to the posterior region of the body. A centrally located ovary lies just anterior to the branched, tandemly arranged testes. The vitellaria are lateral, and a loosely coiled, gravid uterus extends from the region of the ovary to the genital pore.

**The tanned eggs**, which measure 29 μm by 16 μm, are operculated, with a ridge or collar at the base of the operculum, giving them an unusual urn shape. There is also a characteristic knob at the abopercular end of the shell.

## Life cycle

Man is infected by eating raw or improperly cooked fish that carries the infective metacercaria in a cyst.

The cyst is digested and the larval worm migrates up the bile duct to liver where it matures into an adult.

The eggs deposited in the biliary duct pass in the feces and find their way to fresh water.

Upon ingestion by a suitable fresh water operculate snail, the egg hatches to produce a miracidium.

The miracidium in the snail develops into cercaria that break out in water to penetrate under scales of fish. In fish

, the cercaria encysts in the muscle and forms the metacercaria that are infectious to man.

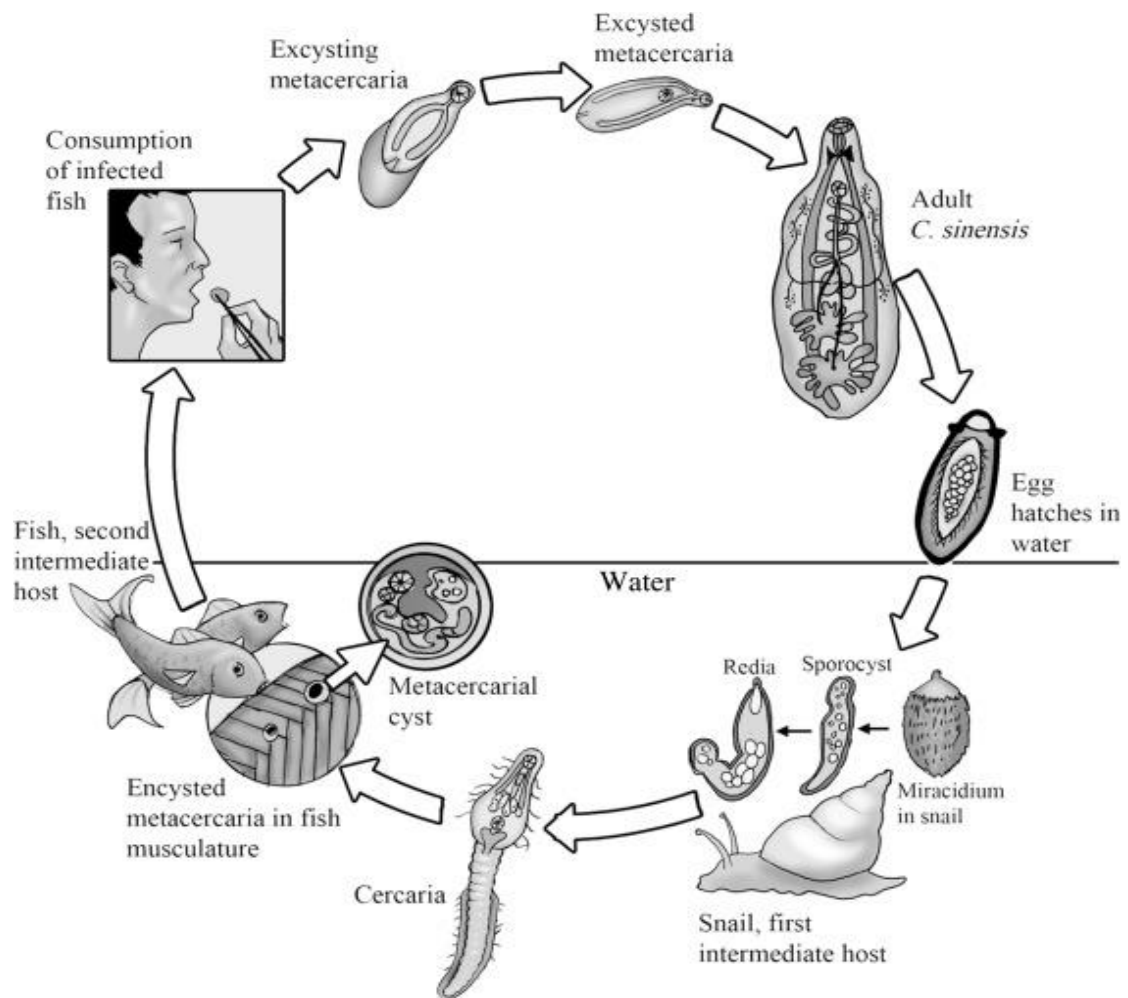
## **Symptoms**

-Most infections are asymptomatic.

- Patients with heavy initial infections may present with an illness similar to Katayama fever.

-In established infections patients may present with vague right upper quadrant abdominal pain and hepatomegaly.

-Recurrent episodes of ascending cholangitis, jaundice and pancreatitis may occur. Chronic infection may lead to biliary cirrhosis and, rarely, cholangiocarcinoma



-**Diagnosis** is established by identifying characteristic eggs in feces with the aid of concentration techniques, or in biliary aspirate. A fecal antigen test is now available for *O. viverrini*.<sup>53</sup> Serological tests are not widely available and generally lack specificity.

**Treatment** is with praziquantel 40 mg/kg as a single dose or 25 mg/kg every 8 h after meals. A 3-day course is advisable for heavy infections.

## C-Dicrocoelium dendriticum

Kingdom: [Animalia](#)

Phylum: [Platyhelminthes](#)

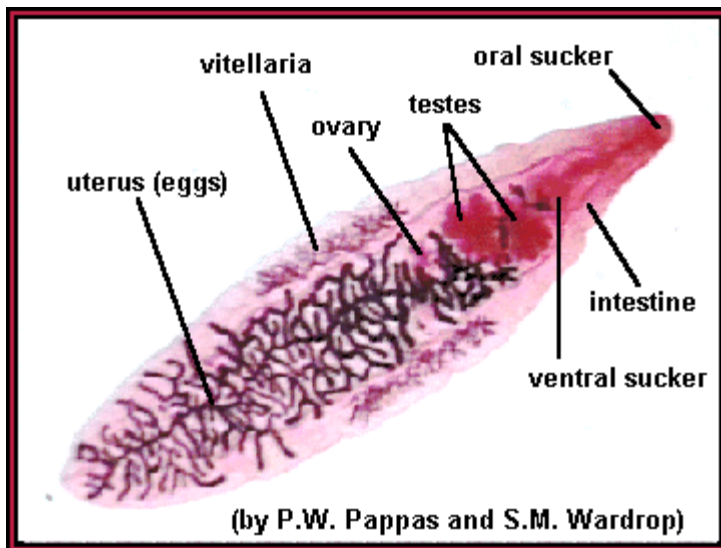
Class: [Trematoda](#)

Order: [Plagiorchiida](#)

Family: [Dicrocoeliidae](#)

Genus: [Dicrocoelium](#)

Species: *D.*



is believed to be endemic or potentially endemic in 30 countries.

*Dicrocoelium dendriticum* is found throughout Europe, the Middle East (Iran), Asia (China, Japan, Vietnam), Africa (Ghana, Nigeria, Sierra Leone) and in North and South America and Australia. The parasite tends to be found in areas that favor the intermediate hosts, such as fields with dry, chalky and alkaline soils

A small (less than 1 cm) lancet like fluke infects sheep and cattle. A number of species of land snails serve as the first intermediate host and *Formica* ants are the second intermediate host of *D. dendriticum*.

## Morphology of *Dicrocoelium dendriticum*

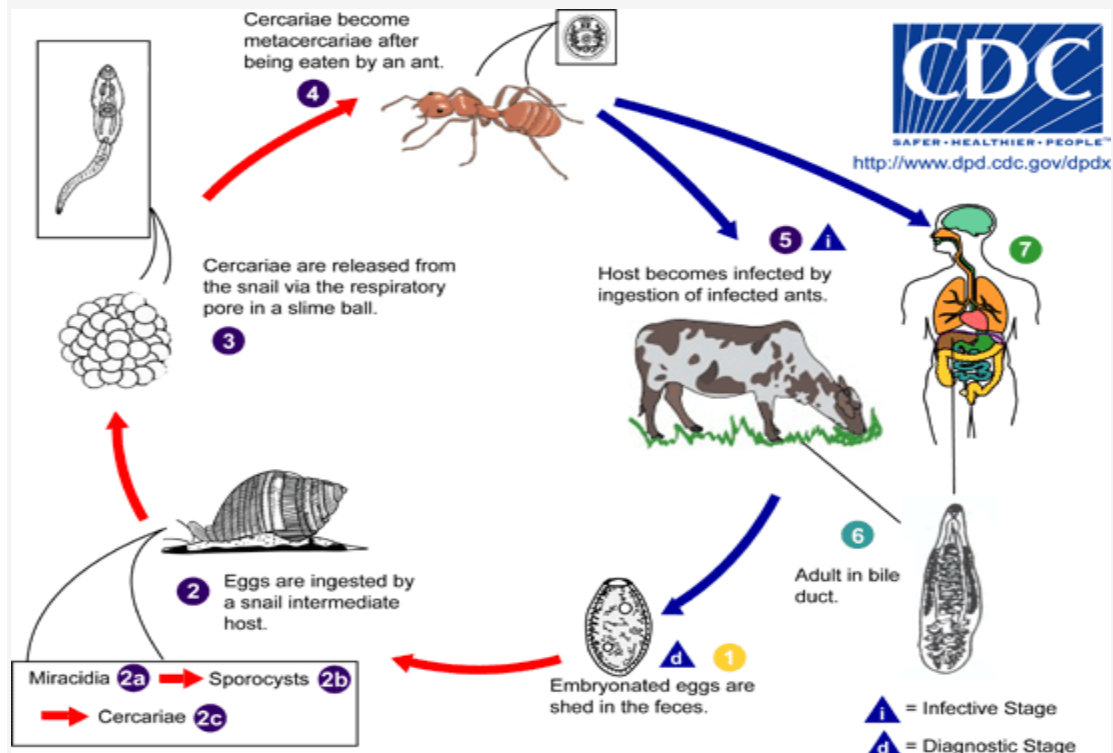
The lancet liver fluke is flat, transparent, and spindle-shaped. The oral and ventral suckers resemble each other. The ventral sucker is located in the first third of the worm.

In the fluke's anterior part, the testes can clearly be seen. They are located between the caecal branches. The ovary is caudal to them, close to the midline. The genital pore is located in front of the ventral sucker. The vitellar glands can be distinctly seen at the lateral edges, posterior to the testes.

## Life cycle

Adult flukes that live in the bile ducts expel eggs that are infective to snails, which ingest the eggs. Later the cercariae are expelled from the snail in pulmonary exudates known as the "slime ball." Ants ingest the slime ball, and metacercariae are formed in the ant's brain. When the ant forages on vegetation it will grasp the forage and hang on until ingested by a grazing sheep.

The immature flukes travel directly from the small intestine up the bile ducts.



## **The pathology, symptomatology,**

With hundreds of flukes present in the bile ducts, there is no change in the liver tissues.

-, when thousands of flukes are present there may be fibrosis of the small bile ducts and subsequent **cirrhosis**.

There are usually no clinical signs except with liver cirrhosis when edema and emaciation are seen.

The finding of the small, brownish eggs on fecal examination or adult worms in the bile ducts is the **diagnostic method**.

**The treatment** is benzimidazole given at higher rates than for other helminths or Praziquantel at double the dose for tapeworms.



*Dicrocoelium dendriticum* egg in an [unstained](#) stool [wet mount](#) slide