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Clonorchis sinensis

Zhongdao Wu¹ and Heinz Mehlhorn²

¹Department of Parasitology, Zhongshan School of Medicine, Key Laboratory for Tropical Diseases Control, The Ministry of Education, Sun Yat-sen University Guangzhou, Guangzhou, China

²Institut für Zoomorphologie, Zellbiologie und Parasitologie Universitätsstraße 1, Düsseldorf, Germany

Name

Greek: *klon* = branching system; *orchis* = testicle (the genus names describe that the testes are branching). Latin: *sinensis* = from China. English: Chinese liver fluke.

Geographic Distribution/Epidemiology

In East and South Asia, especially in China, Thailand, Korea, and Japan, about 50 millions of humans and some more dogs and cats are infected.

Morphology/Life Cycle

The dorsoventrally flattened adult worms (Figs. 1, 2, and 3) are hermaphrodites, reach a length of 10–20 mm and a width of 3–5 mm, and

are able to stretch themselves considerably. These translucent worms live in the bile ducts of humans and fish-eating animals (e.g., also in dogs and cats), and their tegument does not contain hooks or scales (it is smooth). Characteristic for this species are the two testes, which lay in the terminal portion of the body and are branched. The anterior one shows 4 branches, the posterior one 5. Their single excretory ductules (vasa efferentia) unite themselves to form the vas deferens which has its opening (armed by a penis-like cirrus) in a furrow below the ventral sucker. This opening is situated in the close neighborhood to the opening of the uterus, which releases the fertilized eggs, but also becomes filled with sperms of another worm during copulation or with sperms from its own male system (in the absence of a foreign sexual partner). The life cycle involves two types of intermediate hosts (snails and fresh water fish), where asexual reproduction occurs and the fish eating-final host (Fig. 1). First intermediate hosts are water snails of the genera *Semisulcospira*, *Bulinus*, *Parafossarulus*, etc., while freshwater fish serve as second intermediate host. The meat of the latter contains the infectious, tail-less spherical metacercariae, which have been developed from motile cercariae after their penetration into the fish (Fig. 1). These metacercaria grow up in humans (the final hosts), where they are located inside the gall bladder system. In case dogs, cats, or even pigs ingest infected remnants of raw fish, they may become final hosts, too.

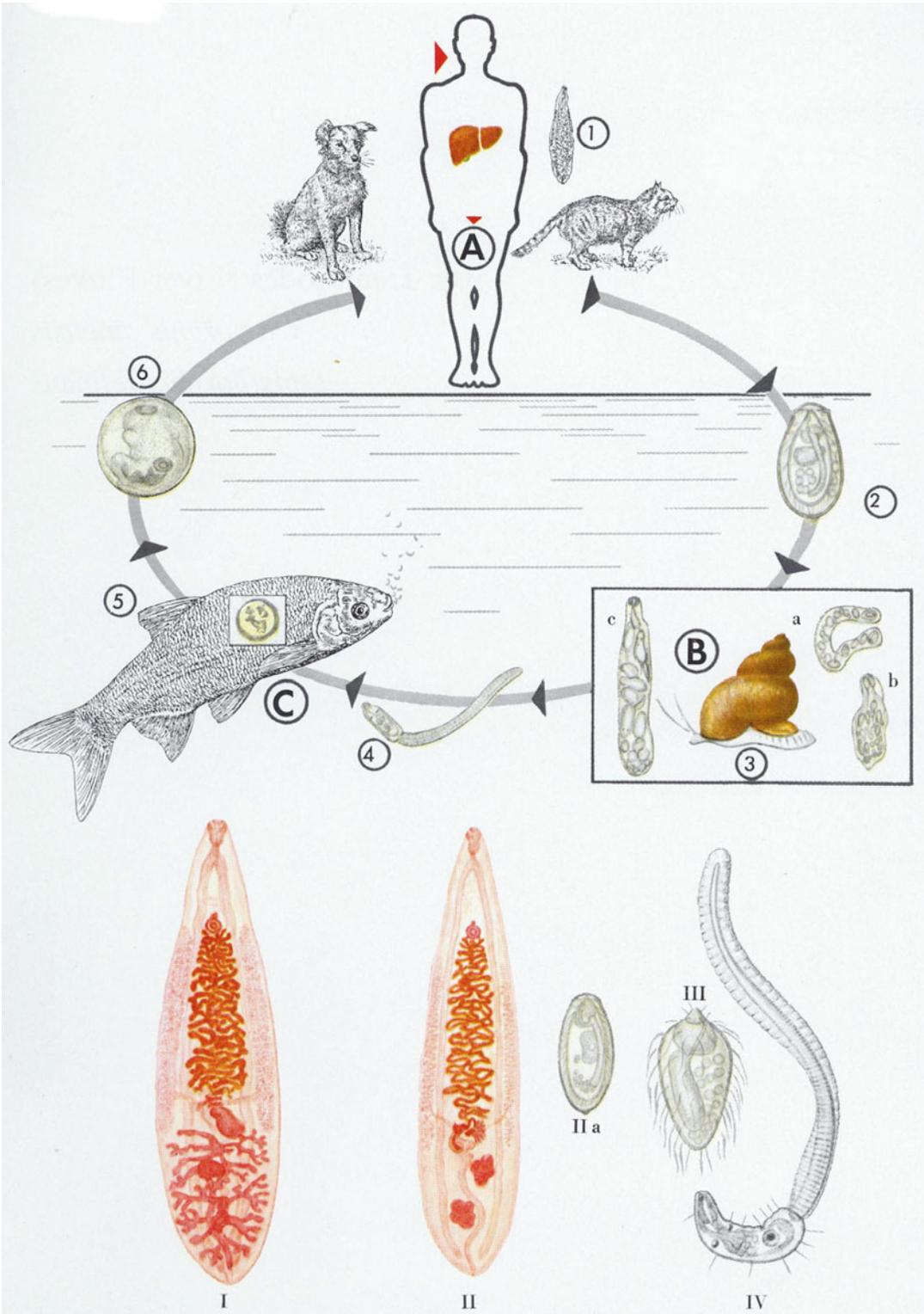


Fig. 1 (continued)



Clonorchis sinensis, Fig. 2 Light micrograph of an adult worm of *C. sinensis* being laterally stretched

Symptoms of Disease (Clonorchiasis)

The symptoms and their severity depend on the number of ingested worm larvae. Infections with 20–200 adult worms are common in humans living in endemic regions and lead to abdominal pain, liver swelling, slight icterus, and problems in digestion. However, infections with 1,000 or more worms lead to massive, i.e., bloody diarrheas, ascites, anemia, formation of edemas, and also liver cirrhosis. All these symptoms may result in the death of the patients, which may also develop liver abscesses or collagenous carcinomas before.



Clonorchis sinensis, Fig. 3 Scanning electron micrograph of the ventral side of an adult worm of *C. sinensis*. Note the oral and ventral suckers and the two openings which are situated in a small furrow below the ventral sucker

Diagnosis

Microscopical determination of the tiny, operculated, brownish eggs, which reach a length of about 35 μm (Fig. 4). These eggs can be obtained from the fluid of the bile ducts or when using concentration methods (i.e., S.A.F.C.) from feces. Serodiagnosis is not species specific,

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Clonorchis sinensis, Fig. 1 Diagrammatic representation of the life cycles of *Clonorchis sinensis* (Loos 1907) and *Opisthorchis felineus*. (A) **Final host:** Man and also cat and dog (as well as other animals in households and on farms). (I) Sexually mature liver fluke. (2) Egg (with miracidium of *Clonorchis sinensis*). (B) 1. **Intermediate host:** Snails of the genus *Bulinus* (*Bythinia*) and others. (3) (a) Young sporocyst. (b) Mother redia. (c) Daughter

redia with rudiments of cercariae. (4) Cercariae which had been excreted from snails. (C) 2. **Intermediate host:** Chiefly Cyprinidae. (5) Fish with cercariae. (6) Metacercariae. (I) *Clonorchis sinensis*. (II) *Opisthorchis felineus*. (IIa) Egg of *O. felineus* with miracidium. (III) Free miracidium from a snail. (IV) Cercaria as it typically appears when it is swimming (From Pierkarski (1965)

Clonorchis sinensis,
Fig. 4 Light micrograph
 of an egg of *Clonorchis*
sinensis



while PCR shows good results as well as sonography of liver and bile ducts.

Infection

Orally ingestion of infectious metacercariae in raw or undercooked fish. Due to lacking immunity, the amount of adult worms may become constantly increased.

Prophylaxis

Avoidance of eating raw or undercooked freshwater fish in endemic regions.

Incubation Period

In cases of severe infections: ~2 weeks; in cases with only a few worms, no symptoms may occur.

Prepatent Period

~ 2 weeks.

Patency

Up to 25 years.

Therapy

Drug of choice is praziquantel (3×25 mg/kg bodyweight on a single day).

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Further Reading

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