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Digenea, Plagiorchiida

Opisthorchis (Genus)

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Phylum Platyhelminthes

Class Trematoda

Subclass Digenea

Order Plagiorchiida

Family Opisthorchiidae

Genus *Opisthorchis*

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Chapter 42

Opisthorchis (Genus)

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Introduction

Opisthorchis sp. are liver fluke parasites (trematodes) that humans can get by eating raw or undercooked fish from areas in Asia and Europe where the parasite is found, including Thailand, Laos, Cambodia, Vietnam, Germany, Italy, Belarus, Russia, Kazakhstan, and Ukraine. *Opisthorchis viverrini* is known as the Southeast Asian liver fluke and *O. felineus* as the cat liver fluke.

Original Description and Taxonomy

Class Trematoda Rudolphi, 1808
Subclass Digenea Caru, 1863
Order Plagiorchiida La Rue, 1957
Suborder Opistorchiata La Rue, 1957
Superfamily Opistorchioidea Looss, 1899
Family Opisthorchiidae Looss 1899
Subfamily Opisthorchiinae Looss, 1899
Genus *Opisthorchis*

The original description of the genus may be found in Blanchard (1895). See King and Scholz (2001) for a detailed discussion of the classification and taxonomy of the family Opisthorchiidae, and Scholz (2008) for a presentation of

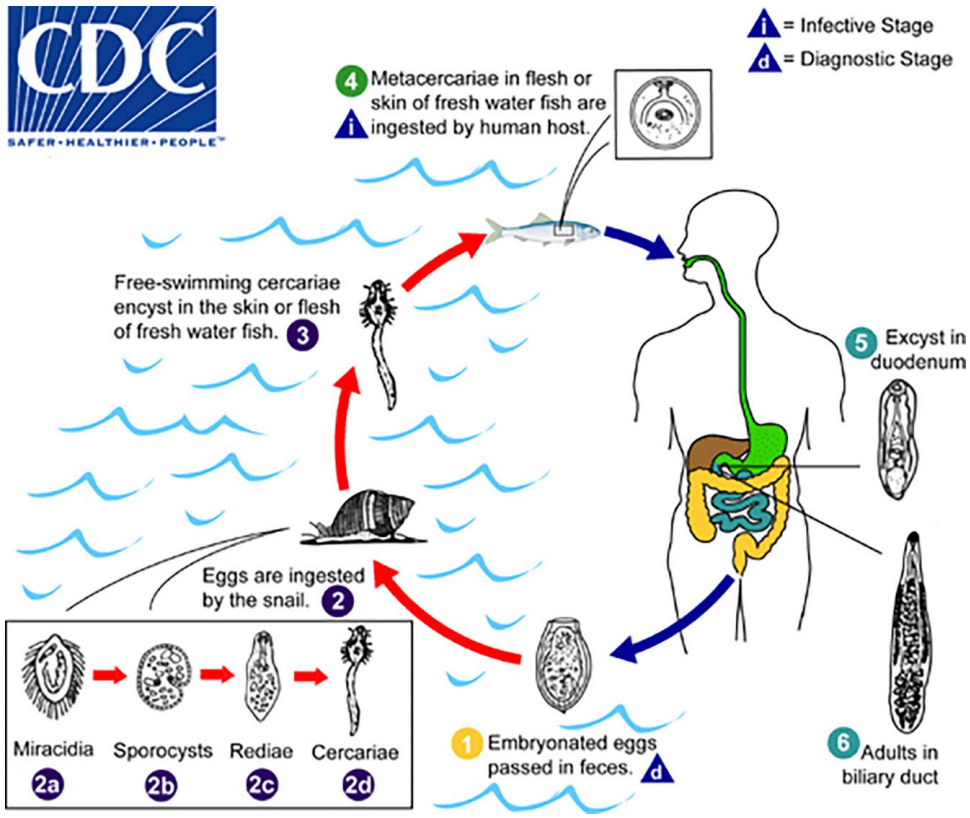

Figure 1. The adult flukes deposit fully developed eggs that are passed in the feces (1). After ingestion by a suitable snail (first intermediate host) (2), the eggs release miracidia (2a), which undergo in the snail several developmental stages (sporocysts (2b), rediae (2c), cercariae (2d)). Cercariae are released from the snail (3) and penetrate freshwater fish (second intermediate host), encysting as metacercariae in the muscles or under the scales (4). The mammalian definitive host (cats, dogs, and various fish-eating mammals including humans) become infected by ingesting undercooked fish containing metacercariae. After ingestion, the metacercariae excyst in the duodenum (5) and ascend through the ampulla of Vater into the biliary ducts, where they attach and develop into adults, which lay eggs after 3 to 4 weeks (6). The adult flukes (*Opisthorchis viverrini*: 5 mm to 10 mm by 1 mm to 2 mm; *O. felineus*: 7 mm to 12 mm by 2 mm to 3 mm) reside in the biliary and pancreatic ducts of the mammalian host, where they attach to the mucosa. United States Centers for Disease Control and Prevention, Division of Parasitic Diseases and Malaria (DPDx), 2018. Public domain.

the classification of subfamilies, including Opisthorchiinae Looss, 1899 (which includes the genus *Opisthorchis*; Gibson et al. 2021), as well as the others in the family: Allogomtiotrematinae, Delphinicolinae, Diasiellinae, Metorchiinae, Microtrematinae, Oesophagicolinae, Pachytrematinae, Plotnikoviinae, Pseudamphistominae, Ratziinae, Tubangorchiinae, and Witenbergiinae. A phylogenetic tree for some of these groups may be found in Waikagul and Thaenkham (2014).

Medical Importance

Members of the family Opisthorchiidae are known parasites of mammals, birds, fish, and reptiles. Liver flukes of the genus *Opisthorchis* may infect the liver, gallbladder, and bile duct in humans. While most infected persons do not show any symptoms, infections that last a long time can result in severe symptoms and serious illness, including cancers.

Untreated, infections may persist in humans for up to 25–30 years, the lifespan of the parasite. Typical symptoms include indigestion, abdominal pain, diarrhea, or constipation. In severe cases, abdominal pain, nausea, and diarrhea can occur. *Opisthorchis felineus*, in addition to presenting with the typical symptoms also seen in *O. viverrini* infections, can present with fever, facial swelling, swollen lymph glands, sore joints, and rash—similar to the signs and symptoms of schistosomiasis. Chronic *O. felineus* infections may also involve the pancreatic ducts.

Diagnosis of *Opisthorchis* infection is based on microscopic identification of parasite eggs in stool specimens. Safe and effective medication is available to treat *Opisthorchis* infections. Adequately freezing or cooking fish will kill the parasite.

Life Cycle

The eggs of *Opisthorchis viverrini* are ingested by snails in fresh water. After the eggs hatch, infected snails will release microscopic larvae that can enter freshwater fish. People become infected when eating raw or undercooked fish that contains the parasite. After ingestion, the liver flukes grow to adult worms that live inside the human bile duct system. The life cycle takes 3 months to complete in humans. Infected people will then pass eggs in their stool or may cough them up (see Figure 1 for a life cycle diagram).

Acknowledgement

This section includes a very brief introduction to the genus *Opisthorchis*, adapted from material in the public domain on the United States Centers for Disease Control and Prevention website as well as the other cited sources.

Use of material from United States federal agencies does not constitute its endorsement or recommendation by the US Government, Department of Health and Human Services, or Centers for Disease Control and Prevention (CDC). The material from the CDC is otherwise available on the agency website for no charge.

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