

Kurdistan Region -Iraq
Ministry of Higher Education and
Scientific Research
Salahaddin University –Hawler
College of Agr. Eng. Sci.
Fish Department
3nd Stage

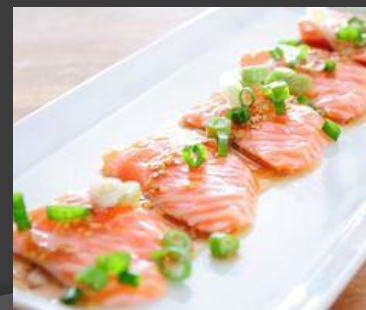


Lecturer: Dr. Ibrahim R. Ibrahim
2022-2023
Common Diseases Between
Fish and Humans

- ⦿ Common disease between humans and animal called (Zoonosis).
- ⦿ 'Zoonosis' comes from the Greek words 'zoon' (animal) and 'osis' (ill).
- ⦿ Zoonoses are any diseases or infections that is naturally transmitted from vertebrate animals to humans. Animals thus play an essential role in maintaining zoonotic infections in nature. Zoonosis may be bacterial, viral, or parasitic, or may involve unconventional agents. As well as being a public health problem, many of the major zoonotic diseases prevent the efficient production of food of animal origin and create obstacles to international trade in animal products.
- ⦿ About 75% of human infectious diseases are thought to have come from animals, including wildlife.

Zoonotic infections can be divided into:

- a) Topically acquired infections, caused by contact with aquatic animals or their products
- b) Foodborne infections, caused by the ingestion of raw or undercooked aquatic products.



Zoonosis in fish

Types of Fish zoonosis:

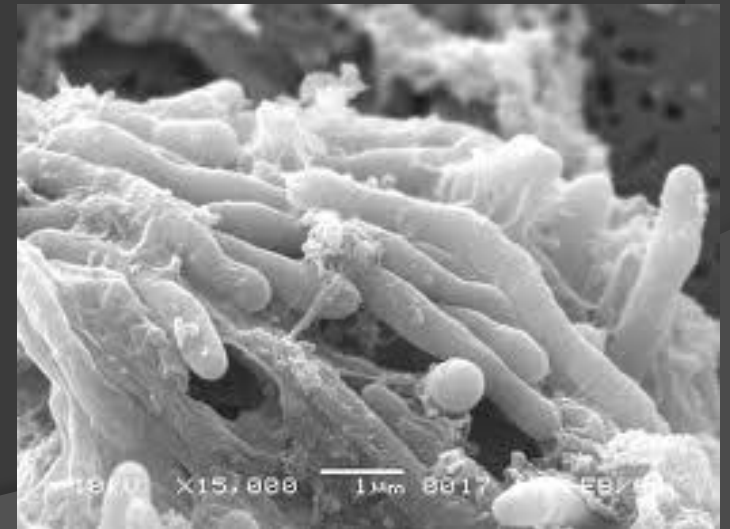
1. **Bacteria:** e.g. *Mycobacterium marinum*.
2. **Trematodes:** e.g. *Heterophyes heterophyes*.
3. **Cestodes:** e.g. *Diphyllobothrium latum*.
4. **Nematodes:** e.g. *Anisakis simplex*.

Note: There is no evidence in the literature of viral and fungal diseases transmitted from fish to man. There is concern, however, that pathogenic viruses are transmitted from shellfish and that fish may serve as reservoirs for human pathogens

Mycobacterium marinum (Bacteria)

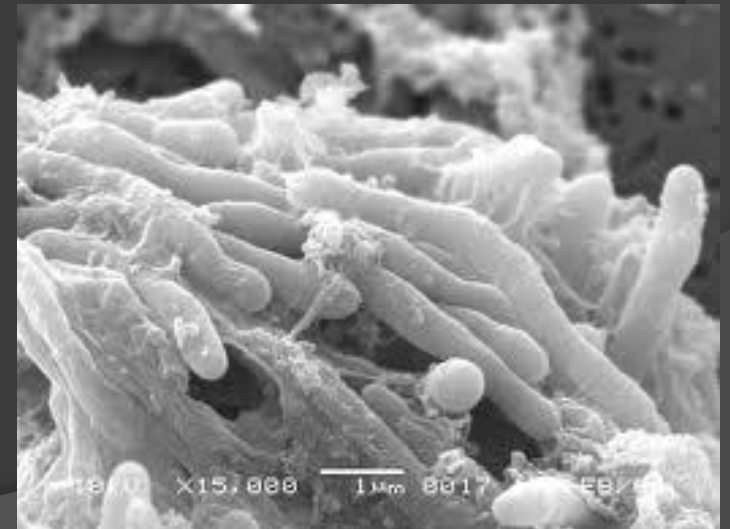
Scientific classification:

- ◉ Kingdom : Bacteria
- ◉ Phylum: Actinobacteria.
- ◉ Family: Mycobacteriaceae
- ◉ Genus: *Mycobacterium*
- ◉ Species: *M. marinum*



Mycobacterium marinum (Bacteria)

- *Mycobacterium marinum* is a free-living bacterium, found in cold or warm, fresh or salted water. which typically affects individuals who work with fish or keep home aquariums.



Symptoms in fish

In fish *M. marinum* causes:

- ⦿ Loss of scales.
- ⦿ Loss of appetite.
- ⦿ Discoloration.
- ⦿ Apathy.
- ⦿ Exophthalmus.
- ⦿ Skin lesions, ulcers fins, followed by death



Symptoms in human

In human *M. marinum* causes:

- ⦿ Granulomatous inflammation and nodular of the skin.
- ⦿ Subcutaneous tissues and tendon sheaths of fingers and hands.



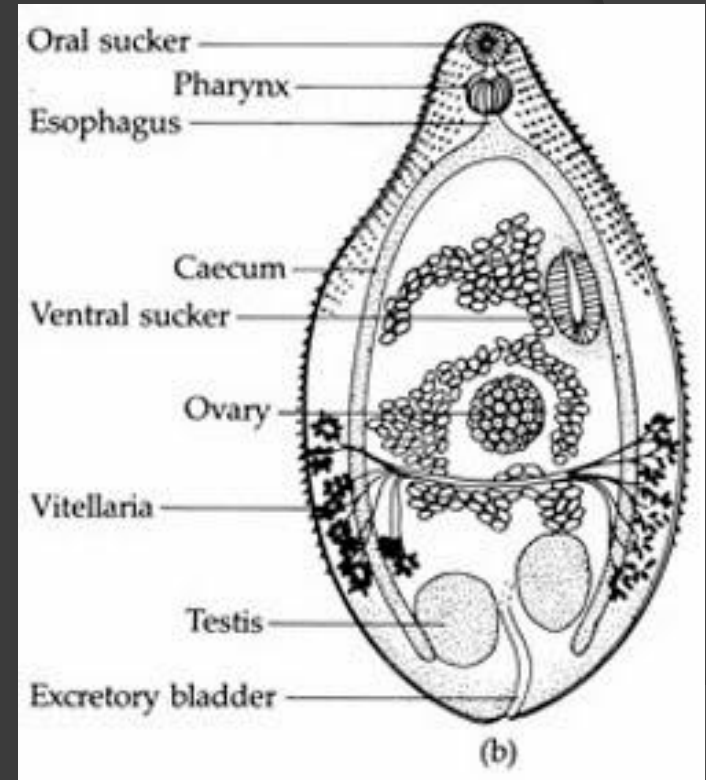
Treatment

- treatment of infection by *M. marinum* is oral antibiotics, Clarithromycin is currently the preferred antibiotic selection.

Heterophyes heterophyes (Trematoda)

Scientific classification:

- Kingdom: Animalia
- Phylum: Platyhelminthes
- Class: Trematoda
- Order: Opisthorchiida
- Family: Heterophyidae
- Genus: *Heterophyes*
- Species: *H. heterophyes*



Heterophyes heterophyes (Trematoda)

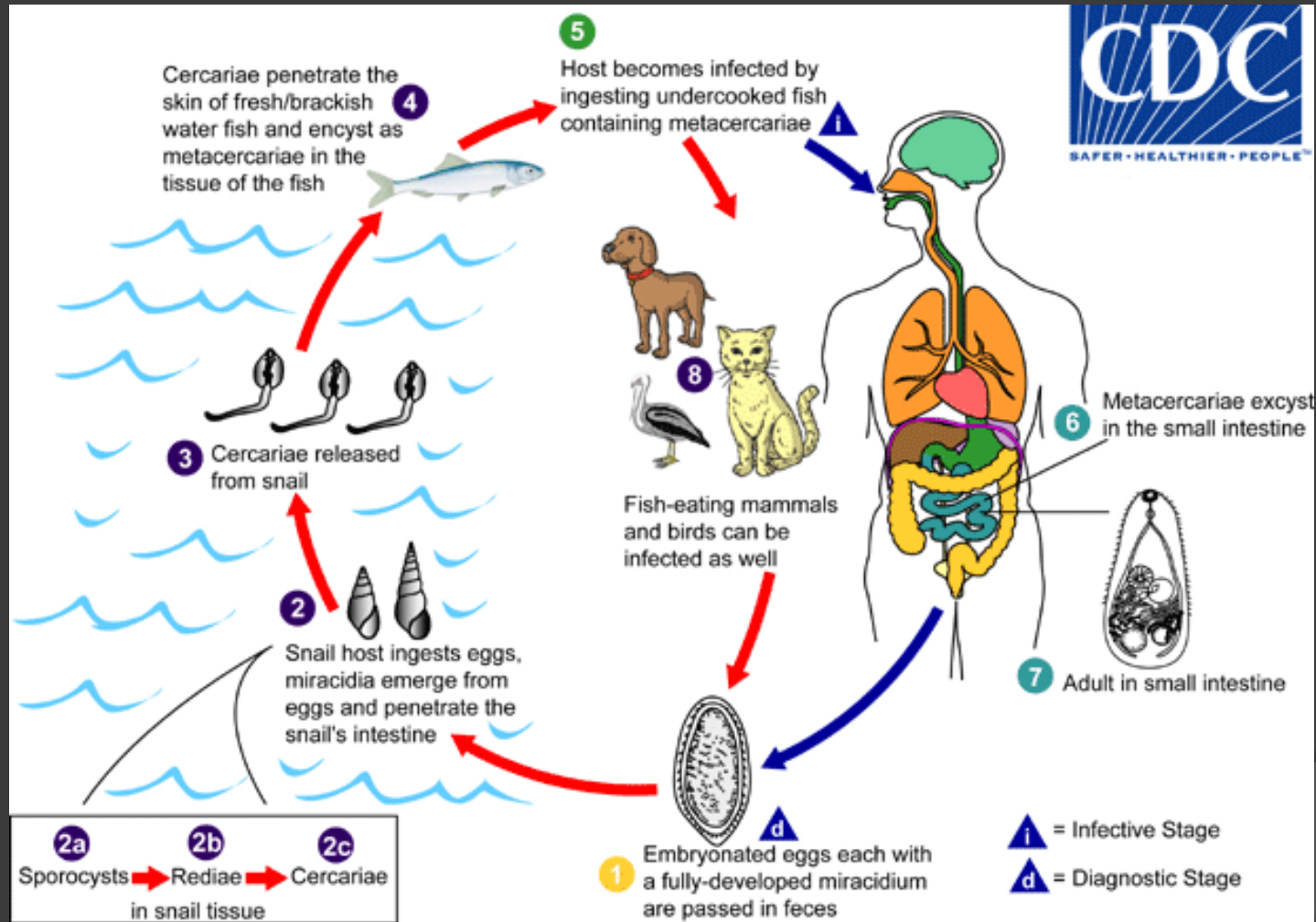
- Is a parasitic worm very small (only 1.7–2 mm long) and live attached at the wall of the intestine. Their body is covered with many spiny scales. Their ventral sucker lies laterally away from the median line.
- Infects human by ingesting undercooked or salted fish containing metacercariae



The egg of *Heterophyes heterophyes* is very similar to that of *Clonorchis sinensis*. Like *Clonorchis sinensis* it has a small knob at the abopercular end with a seated operculum at the other end that produces a shoulder appearance.



Life cycle



Symptoms :

- ◉ No symptom **on fish** (fish is a medium host). Cercariae penetrate the skin of fish and encyst as metacercariae in the tissue of the fish.
- ◉ **In human** (final host):
 - Diarrhea and abdominal pain.
 - The lining of the small intestine may break down.
 - Permitting the parasite's eggs to enter the bloodstream and be carried to other organs, especially to the heart, liver, and brain, where they can cause serious disease.
 - Eggs present in the stool (clinical test).



Treatment

- Treatment is with anthelmintic Praziquantel

Diphyllobothrium latum (Cestoda)

Scientific classification

- ◉ Kingdom: Animalia
- ◉ Phylum: Platyhelminthes
- ◉ Class: Cestoda
- ◉ Subclass: Eucestoda
- ◉ Order: Pseudophyllidea
- ◉ Family: Diphyllobothriidae
- ◉ Genus: *Diphyllobothrium*
- ◉ Species: *Diphyllobothrium latum*

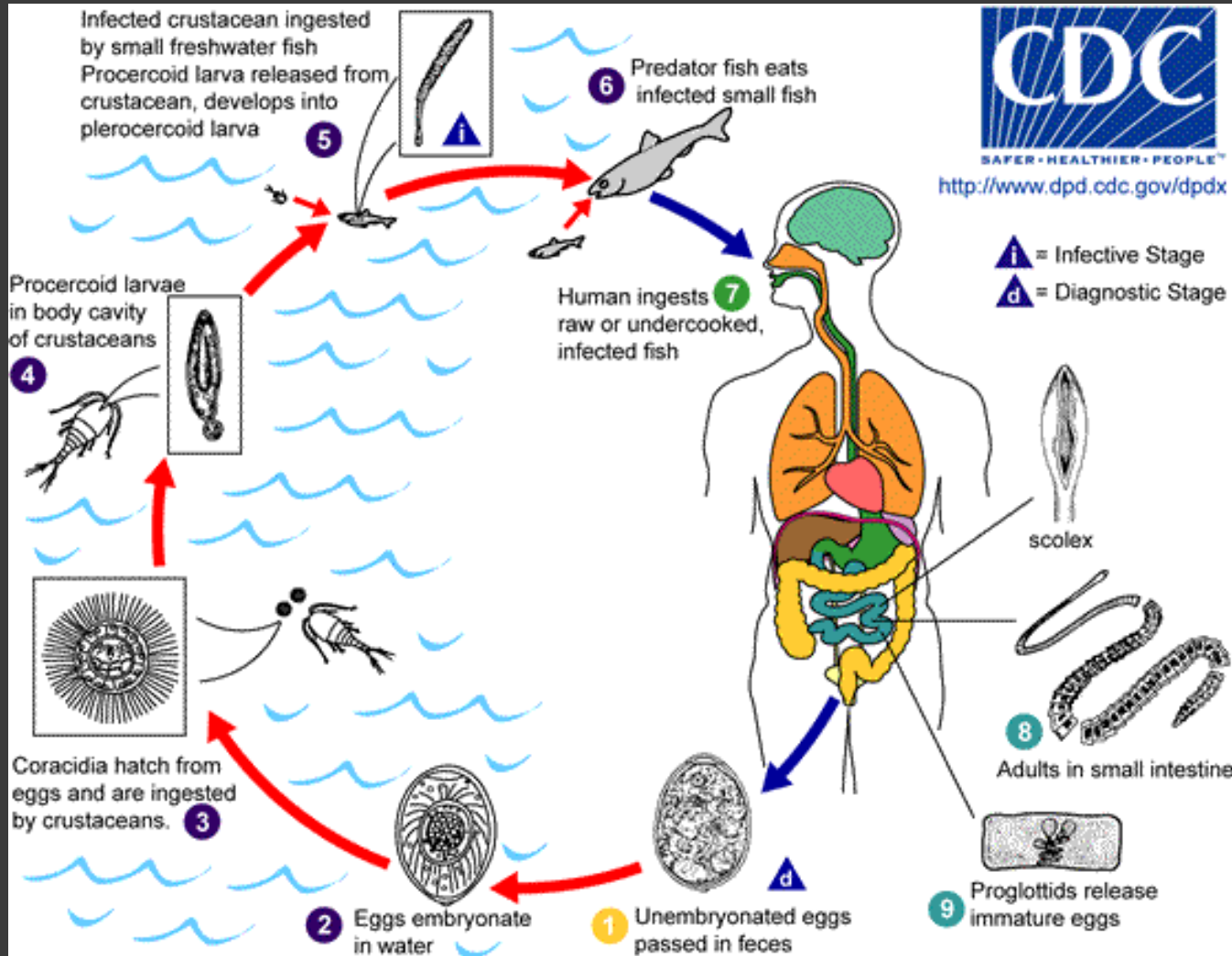


Diphyllobothrium latum (Cestoda)

- The largest tapeworms that can infect people, can grow up to 30 feet long.
- Humans can acquire the disease by eating intermediate infected host fish raw or undercooked



Life cycle



Symptoms

- **Fish** is only a medium host. ingestion of infected crustaceans with larva. Then penetrate the muscle tissue of fish.
- In **human** causes:
 - Diarrhea.
 - Abdominal pain.
 - Vomiting.
 - Weight loss and fatigue.
 - Anemia
 - can survive for 10 years or more in the human intestine without being detected.
 - vitamin B₁₂ deficiency due to the parasite absorbing 80% or more of the host's B₁₂ intake.
 - Eggs present in the stool (clinical test).

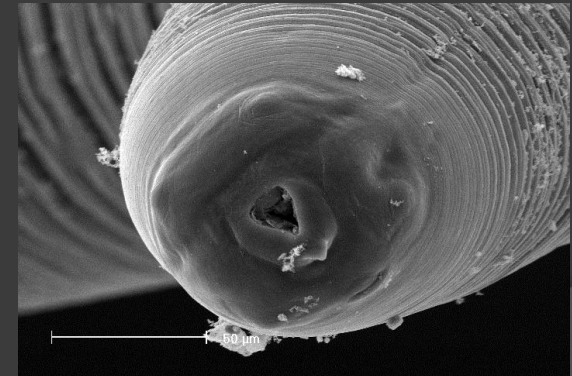


Treatment

- ◎ Praziquantel took orally.
- ◎ vitamin B12 injections or supplements to treat the vitamin B12 deficiency and anemia that can occur with this infection.

Anisakis simplex (Nematoda)

- Scientific classification
- Kingdom: Animalia
- Phylum: Nematoda
- Order: Ascaridida
- Family: Anisakidae
- Genus: *Anisakis*
- Species : *Anisakis simplex*

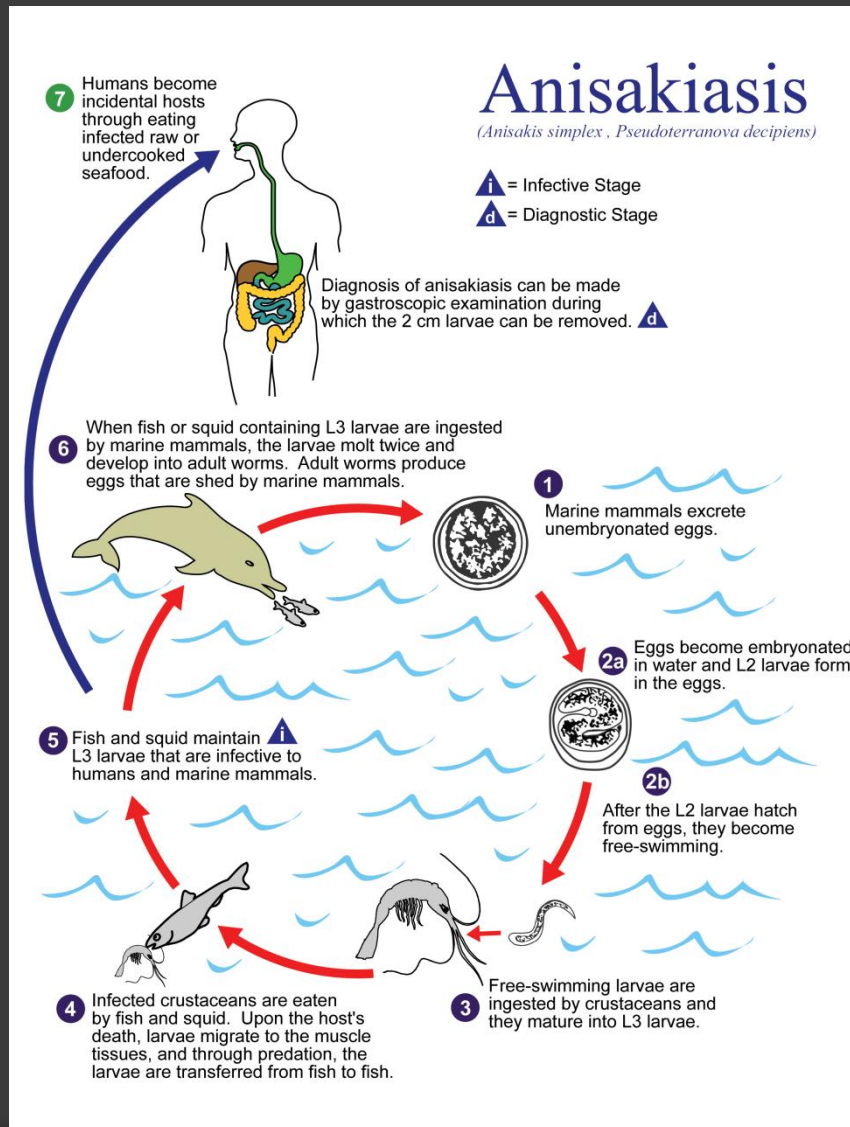


Anisakis simplex (Nematoda)

- ⦿ Is parasitic nematodes, which have life cycles involving fish and marine mammals.
- ⦿ Caused by the eating of raw or undercooked seafood containing larvae of the nematode.



Life cycle



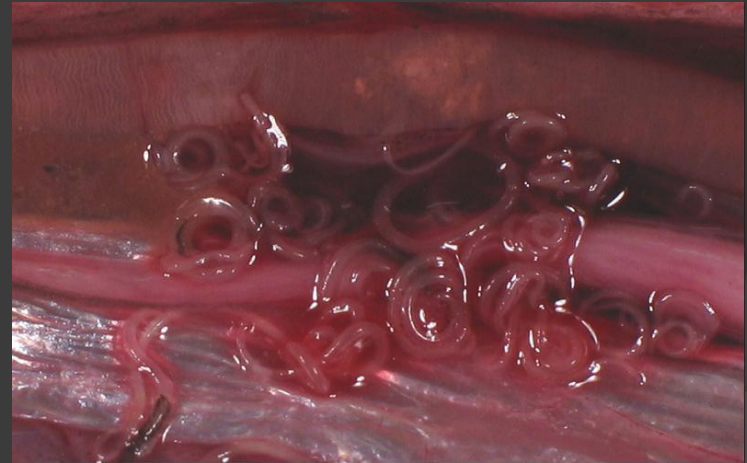
Symptoms

◎ In fish:

- Larva can be seen in the muscle tissue.
- Can transmit from fish to another.

◎ In human:

- Abdominal pain.
- Nausea
- Vomiting
- Diarrhea
- Blood and mucus in stool
- Mild fever
- Allerg



Treatment

- Infection can lead to small intestinal obstruction, which may require surgery in case of intestinal perforation.