

➤ **Platyhelminthes (flat worm)**

➤ Two classes: **Cestoda** (tapeworms) and **Trematoda** (flukes).

➤ Two main parts: Round head (**scolex**) and a flat body of multiple segments (**proglottids**).

➤ The **scolex** has suckers, hooks, or sucking grooves.

*to anchor to intestine*

➤ The worm **grows** by adding new **proglottids** from its **germinal center**. (*as the neck; the part after the scolex*)

\* Defenitive Host : the host that harbours the adult worm.

\* intermediate host : harbours the larvae.



• The oldest proglottids (distal) → gravid → eggs → feces → intermediate hosts (cattle, pigs, and fish).

• Humans -----infection by ingestion of undercooked meat or fish containing the larvae.

• Medically important cestodes: Taenia solium, Taenia saginata, Diphyllobothrium latum and Echinococcus granulosus. Less important: Echinococcus multilocularis, Hymenolepis nana, and Dipylidium caninum.



# TAENIA

*T. solium* (the pork tapeworm) and *T. saginata* (the beef tapeworm).

{ sheep, cattle }

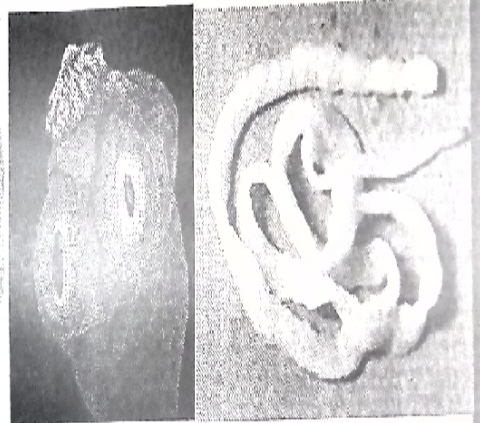
5M<sup>1</sup> one

## Taenia solium

Diseases: Taeniasis and cysticercosis.

### Characteristics:

- Cestode (pork tapeworm).
- Scolex has four suckers and a circle of hooks.
- Gravid proglottids have 5 to 10 uterine branches.



## Transmission and Epidemiology:

- **Taeniasis** → eating raw or undercooked pork.  
we ingest larvae
- **Cysticercosis** → only by ingesting eggs in  
fecally contaminated food or water. ~~So larvae in human~~



*Taenia solium* larva

- **Humans** are definitive hosts;
- **Pigs or humans** are intermediate hosts.

↳ egg hatches in intestine → larvae  
space occupying lesion ← bloodstream to brain/eye

(it won't convert to Adult worm)

eggs :

human ingests & contaminate its own  
Food  
بعدي نفسي

CUZ Pigs only have larvae  
in their Ms



## Pathogenesis:

Tapeworm in gut → little damage. (diarrhea, pain, nausea, Anorexia, colic)

Cysticerci → symptoms of mass lesions, especially in brain.

eye  
subcutaneous skin

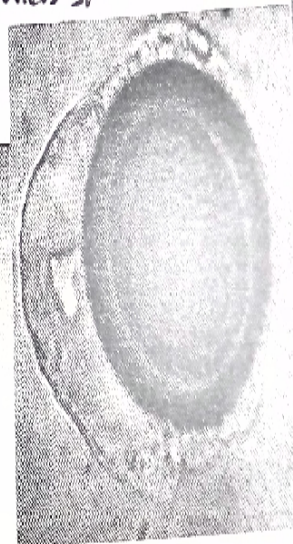
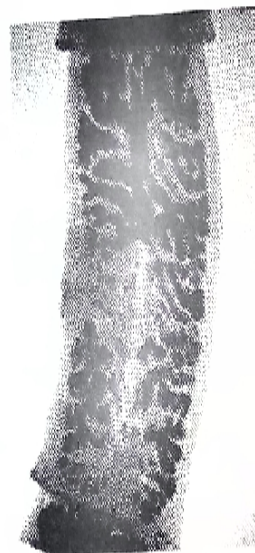
## Laboratory Diagnosis:

Gravid proglottids → visible in stool.

Eggs → less frequently.

## Treatment:

Praziquantel



سبحان الله  
أشهر خنزيراً  
Pig

# Taenia saginata

Disease: Taeniasis.

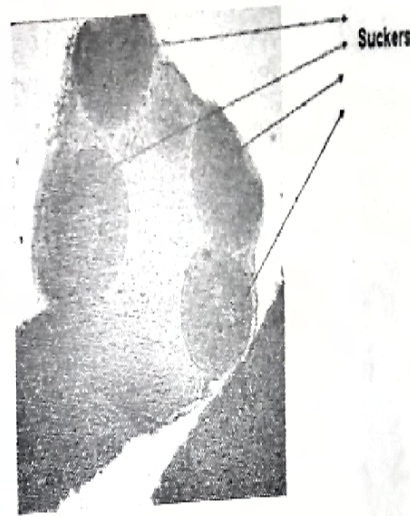
## Characteristics:

- Cestode (beef tapeworm).
- Scolex has **four suckers** but **no hooks**.
- Gravid proglottids have **15 to 20 uterine branches**.

## Transmission and Epidemiology:

- Eating raw or undercooked beef.
- Humans are definitive hosts; cattle are intermediate hosts.

infective stage: larvae





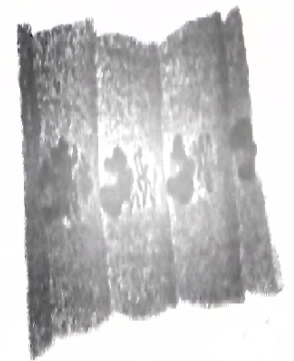
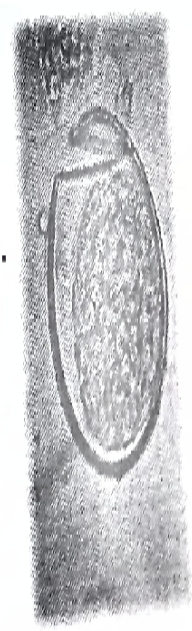
The longest Tapeworm

13 M

→ it could cause V12 deficiency

# Diphyllobothrium latum

- Disease: Diphyllobothriasis.
- Characteristics:
- Cestode (fish tapeworm).
- Scolex has two elongated sucking grooves.
- Gravid uterus forms a rosette.
- Oval eggs have an operculum at one end.

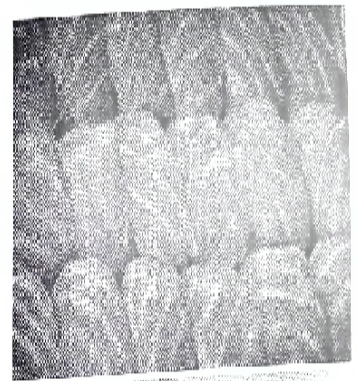


Prof. Dr. Ghada Fahmy Hefaly



## Transmission and Epidemiology:

- Eating raw or undercooked freshwater fish. *Sushi*
- Humans are definitive hosts.
- **Copepods** <sup>prolarvae</sup> are the first and fish the second intermediate hosts.



Pathogenesis: little damage.

Laboratory Diagnosis: Eggs in stool.

Treatment: Praziquantel.

Copepod first intermediate host containing the **proceroid**



Fish second intermediate host containing the **plerocercoid**

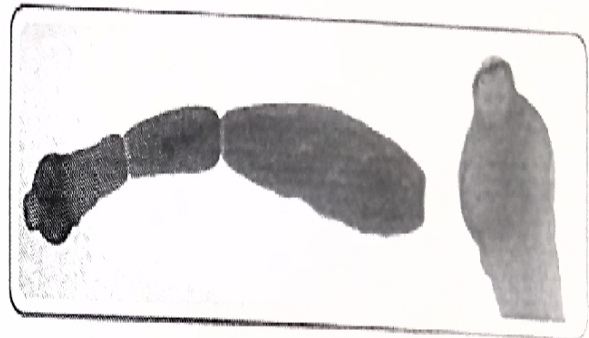


*Salmon*



→ egg looks like *Teniarctid* & *Tania saginata*  
 brownish, striated, wall double layer, some hooks  
 not in Human (Adult worm)

# Echinococcus granulosus



## Disease:

- Hydatid cyst disease.  
uniticulated cyst

## Characteristics:

- Dog tapeworm.
- Scolex has four suckers and a double circle of hooks.
- Adult worm has only three proglottids.



## Transmission and Epidemiology:

- Ingestion of eggs in food contaminated with dog feces.
- Dogs are main definitive hosts; sheep are intermediate hosts; humans are dead-end hosts.



Echinococcus granulosus, ova in faeces of dog

قطيع خرفان  
 كلب

جوانه  
 Larvae

cuz no one will eat human



# Hymenolepis nana

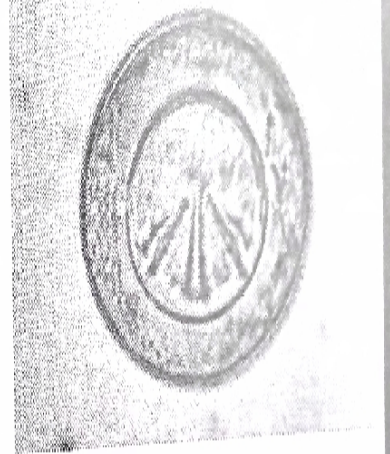
- Usually in children.
- It is only 3 to 5 cm long. *the shortest not only one worm*
- Autoinfection.

## Diagnosis:

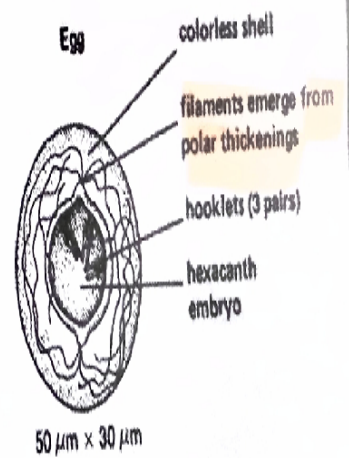
- Eggs in stools: 8 to 10 polar filaments

## Treatment and prevention:

- praziquantel.
- Good personal hygiene and avoidance of fecal contamination of food and water.



Hymenolepis nana, ova from faeces.





# *Echinococcus multilocularis*

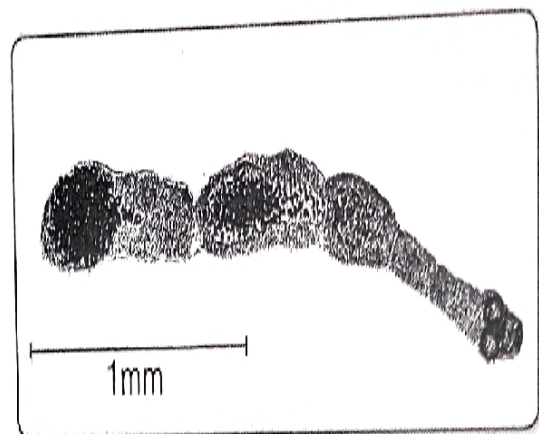
- **Definitive hosts:** foxes - **Intermediate hosts:** rodents.
- Humans ---ingestion of food contaminated with fox feces. "dead end"
- In the liver, the larvae form multiloculated cysts with few protoscoleces. No outer fibrous capsule.

## • Clinical picture:

Jaundice. Poor prognosis.

## Treatment:

Albendazole, Surgical removal ??



## Dipylidium caninum

- Tapeworm of **dogs** and **cats**.
- Occasionally infects humans, usually **young children**.
- **Dog or cat fleas** (cysticerci) are ingested → adult tapeworms in the small intestine.  
*حشرات*
- **Asymptomatic**, but **diarrhea** and **pruritus ani** can occur.
- **Diagnosis**: “**barrel shaped**” proglottids in the stool or diapers. *itching*  
*↳ motile always*
- **Niclosamide** is the drug of choice.

