

# **Cestodes (Tapeworms)**

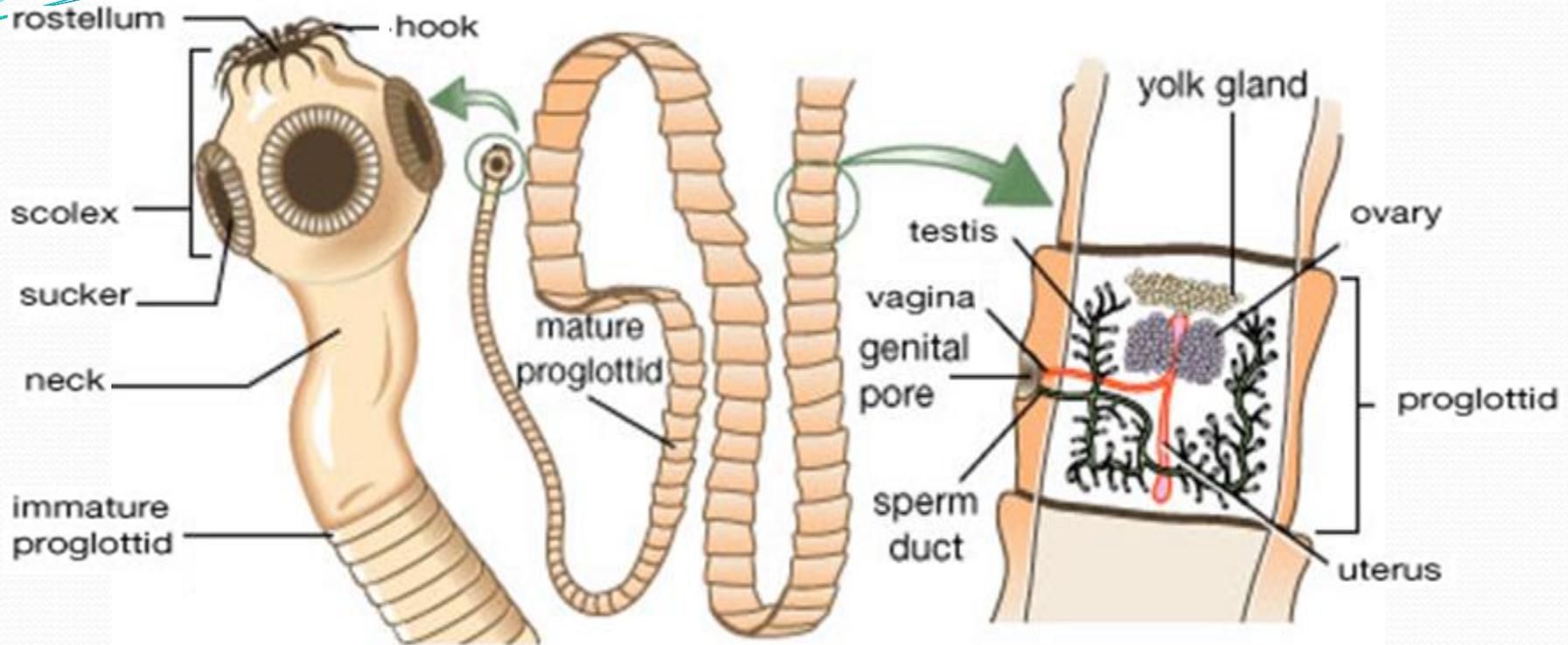
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2025-2026  
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## Intestinal cestodes including the followings

(Adult in the small intestine of man)  
(Man is the D.H)

- 1- *Diphyllobothrium latum*
- 2- *Taenia saginata* (Beef tapeworm).
- 3- *Taenia solium* (Pork tapeworm).
- 4- *Hymenolepis nana* (Dwarf tapeworm).

# General characters



## Adults:

- Flat, ribbon like and segmented.
- Cestodes have **neither a body cavity nor an alimentary tract.**
- Cestodes are **hermaphrodites.**

# General characters

➤ The body is formed of :-

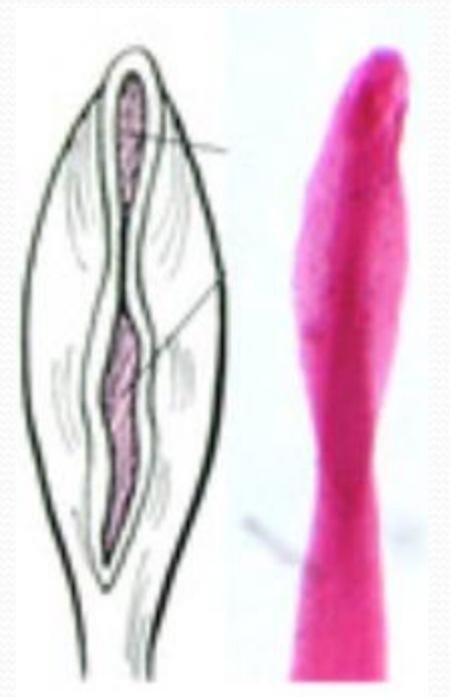
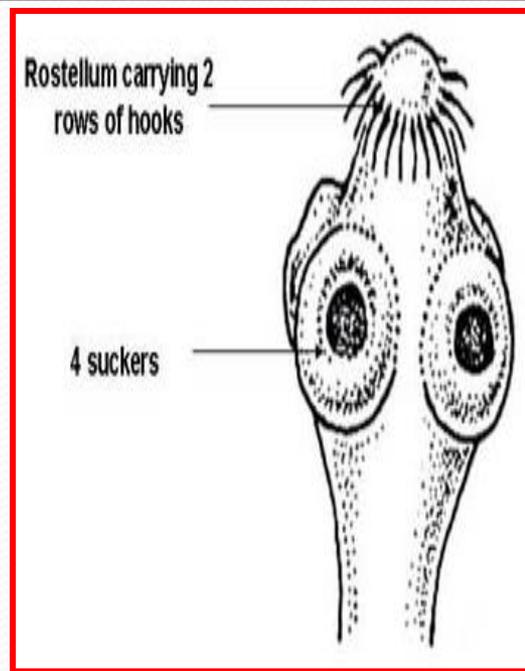
**1- Scolex (head) with organs of fixation :-**

**A. Suckers** either :-

- 4 true cup shaped muscular sucker , or
- false suckers as grooves (bothria).

**B. Rostellum** with one or more circles of hooks.

**2- Neck** is the region of growth.

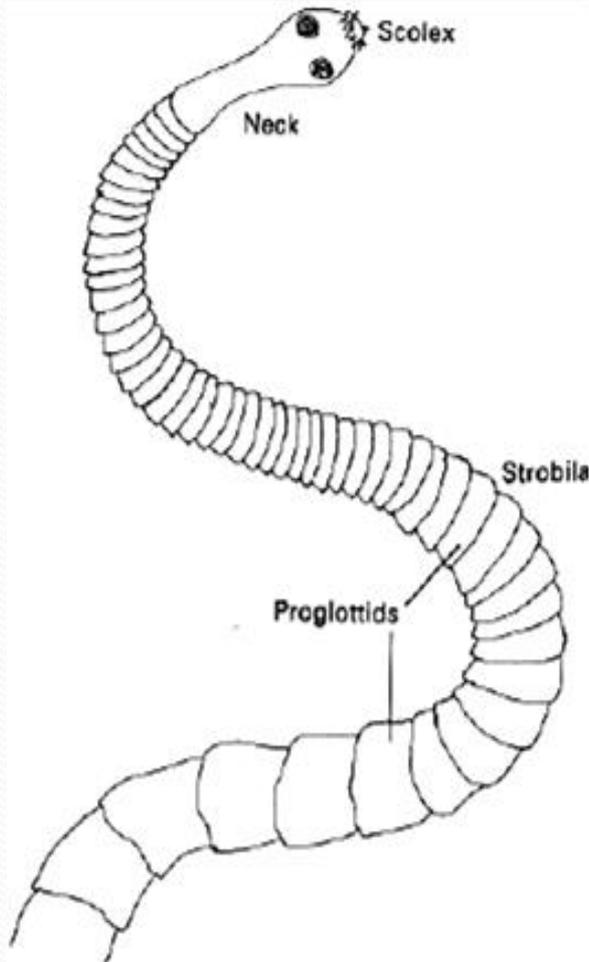


# General characters

**3- Strobila:** the segmented part of the body of a tapeworm that consists of a long chain of segments.

- **Immature segments:** They lie anterior and contain immature genital organs.
- **Mature segments:** Follow the immature ones and contain fully developed genital organs.
- **Gravid segments:** They lie posterior and contain uteri filled with eggs.

# General Body Shape of a Tapeworm

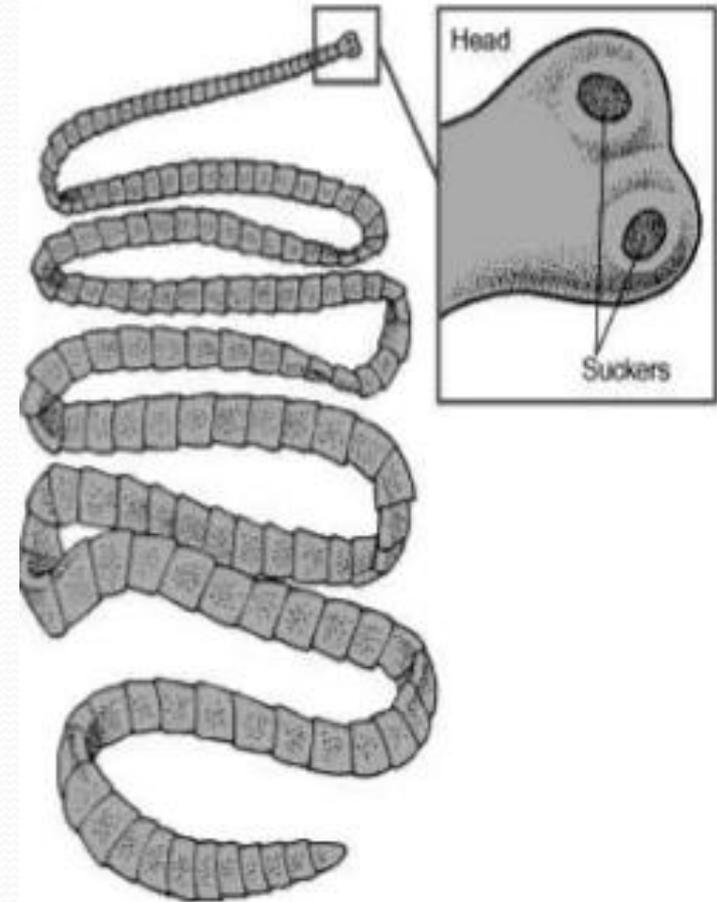


'head'  
(scolex)

neck

body  
(strobila)

segments  
(proglottids)



# Life cycle of cestodes :-

## ➤ Habitat :

**-Intestinal:** The adult worm lives in the small intestine of man (D.H).

➤ They require one or two intermediate host (I.H).

➤ Gravid segments or eggs are passed in faeces of the D.H.

# ① Intestinal cestodes

## 1) *Diphyllobothrium latum* (broad tapeworm , fish tapeworm)

### ➤ Geographical distribution :-

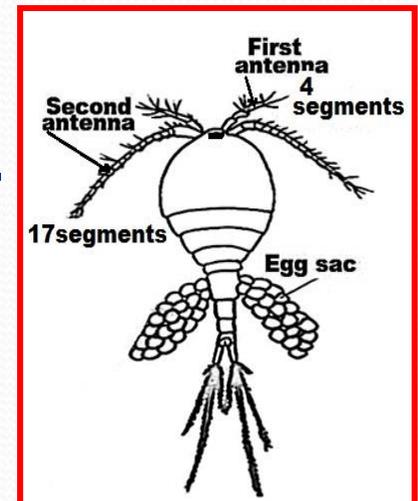
Lake regions in Europe, America, Russia, Japan and Central Africa.

### ➤ Habitat : Small intestine.

### ➤ D.H : Man and fish eating animals e.g. dogs and cats.

### ➤ I.H : • 1<sup>st</sup>: *Cyclops*.

- 2<sup>nd</sup>: Fresh water fish (Salmon).



*Cyclop*

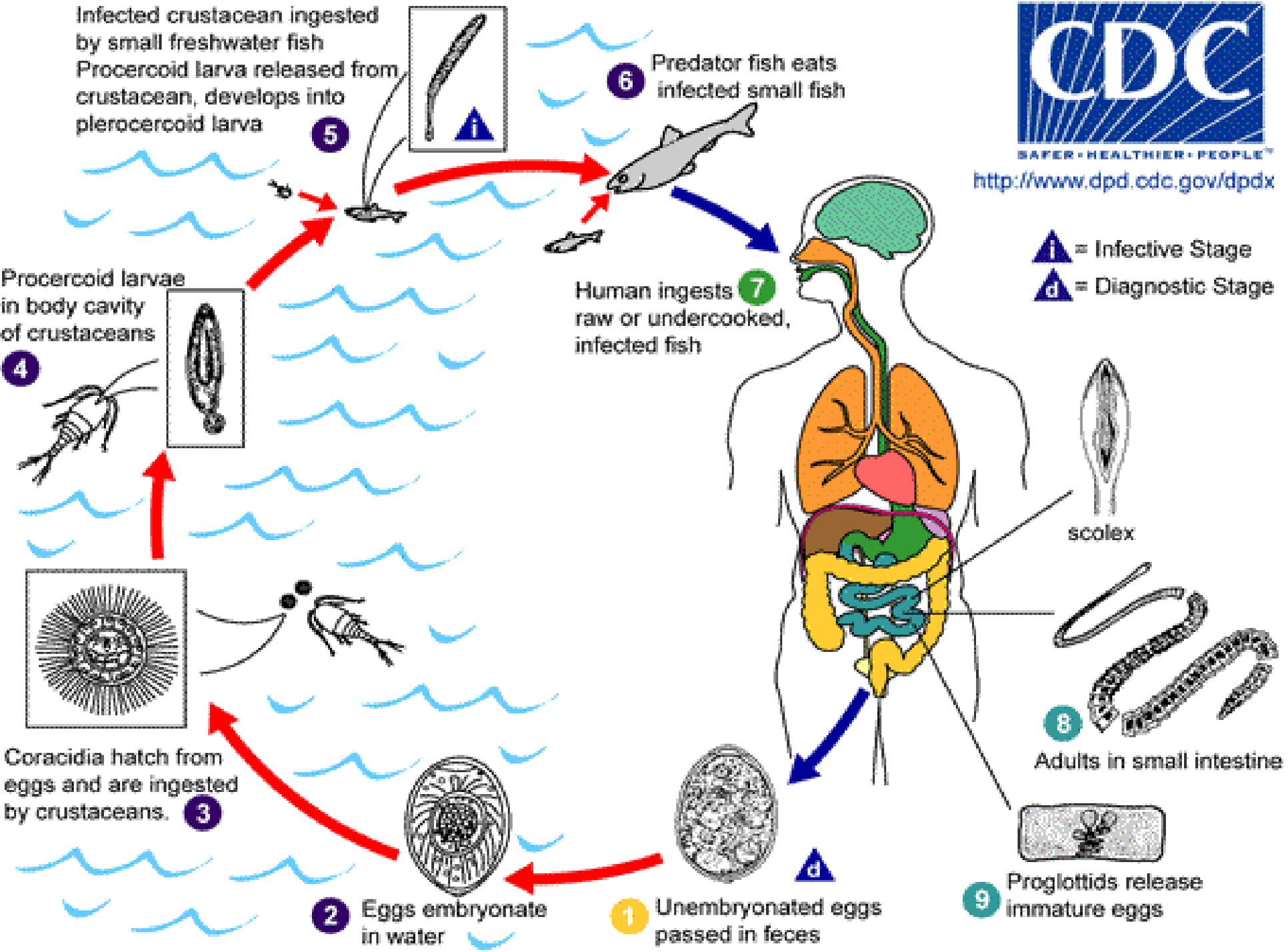
# Morphology

## Adult :-

- **Size** : 3 - 10 meters.
- **Scolex** : Elongated, almond like with two grooves (bothria), one dorsal & one ventral.
- **Strobila** : More than 3000 segments:
  - a- Immature segments
  - b- Mature segments
  - c- Gravid segments: Not present.



Scolex



**i** = Infective Stage

**d** = Diagnostic Stage

scolex

8

Adults in small intestine

9

Proglottids release immature eggs

6

Predator fish eats infected small fish

7

Human ingests raw or undercooked, infected fish

5

Infected crustacean ingested by small freshwater fish  
Proceroid larva released from crustacean, develops into plerocercoid larva

4

Proceroid larvae in body cavity of crustaceans



3

Coracidia hatch from eggs and are ingested by crustaceans.

2

Eggs embryonate in water

1

Unembryonated eggs passed in feces

# Pathogenesis and Symptomatology

**Disease:** Diphyllbothriasis.

1. **General toxic manifestations and intestinal disturbances** in the form of nausea, vomiting, hunger pain, dyspepsia, diarrhea & loss of weight.
2. **Manifestations pernicious anaemia** due to consumption of vit.B12 and folic acid by the parasite.
3. **Intestinal obstruction** by large number of worms.
4. **Neurological manifestations** are common (headache, insomnia & convulsions).

# *Diphyllobothrium latum*

## Laboratory Diagnosis

### ➤ **Direct:-**

1. Stool examination for detection of eggs (direct and concentration methods).
2. Finding mature segments in faeces.

### ➤ **Indirect:** Blood picture for anaemia.

## Treatment

- 1) Niclosamide.
- 2) Praziquantel (Biltricide).
- 3) Atebrine.
- 4) Vitamin B12 & folic acid for **pernicious anaemia**.

*Taenia saginata*

*(Beef tapeworm, Bald tapeworm)*

# **Taenia saginata** (Beef tapeworm)

## ➤ **Geographical Distribution:**

**Cosmopolitan, especially in cattle-raising countries.**

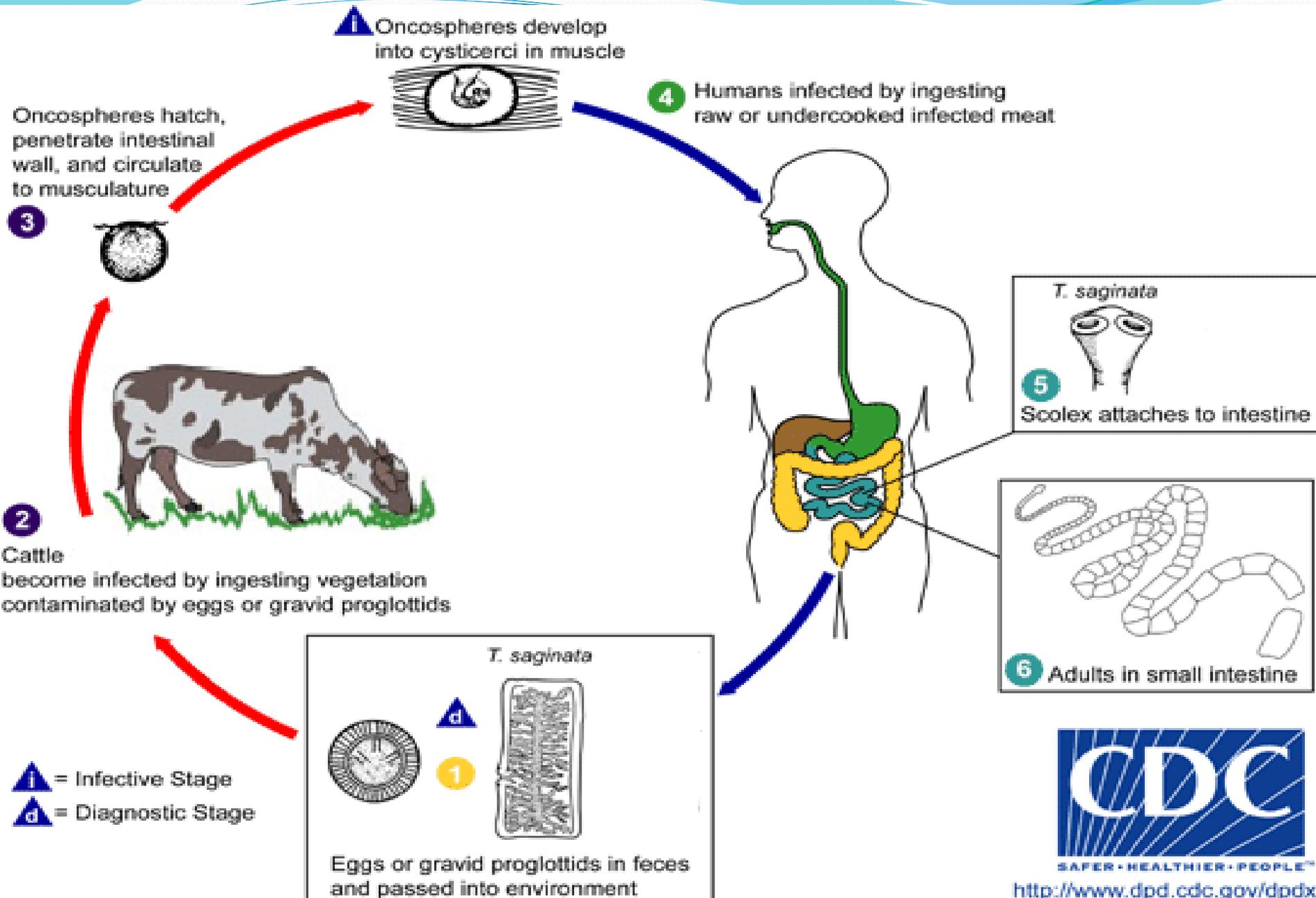
➤ **D.H** : Man

➤ **I.H** : Herbivorous animals (cattle, sheep and camels).

➤ **Habitat:** Small intestine.

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# Taenia saginata life cycle



# Taenia saginata

## Mode of Infection

- Man infected by **eating beef** either raw or improperly cooked e.g. steaks, hamburgers or grilled (kabab) containing **viable *cysticercus bovis***.

## Pathogenesis and Symptomatology

- **Disease** :*Taeniasis saginata*

- 1) **Intestinal disturbance** e.g. nausea, vomiting, hunger pains, colic, diarrhea or constipation.
- 2) **Toxic manifestations**: Due to worm products e.g. dizziness, headache, insomnia & delirium.
- 3) **Intestinal obstruction**.
- 4) **Loss of weight**.
- 5) **Anxiety and nervousness** due to continued migration of G. segments out of the anus ➔ irritation & itching.

# Diagnosis

- 1- Detection of eggs by stool examination (direct and concentration methods).
- 2- Detection of gravid segments in the stool to differentiate between *Taenia* species.

# Treatment

- 1) Niclosamide (Yomesan).
- 2) Praziquantel (Biltricide).
- 3) Atebrine.

*Taenia Solium*

*(Pork Tapeworm)*

# Taenia Solium

## ➤ Geographical distribution :-

-Pork-eating countries e.g. America, Europe.

➤ **D.H:** Man.

➤ **I.H:** Pigs and occasionally man.

➤ **Habitat:** Small intestine.

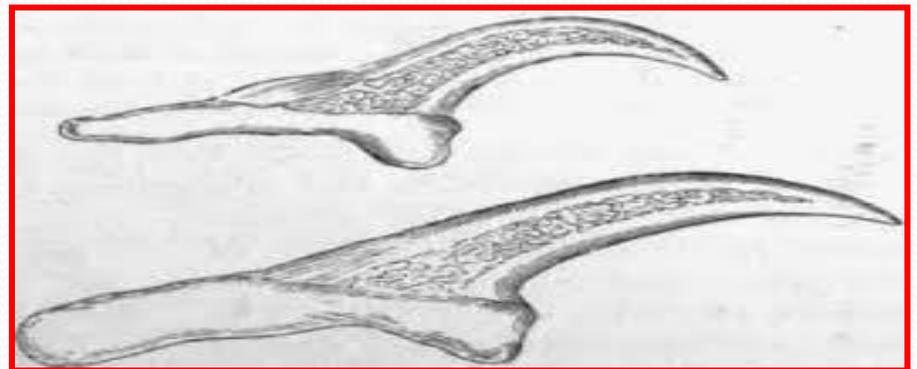
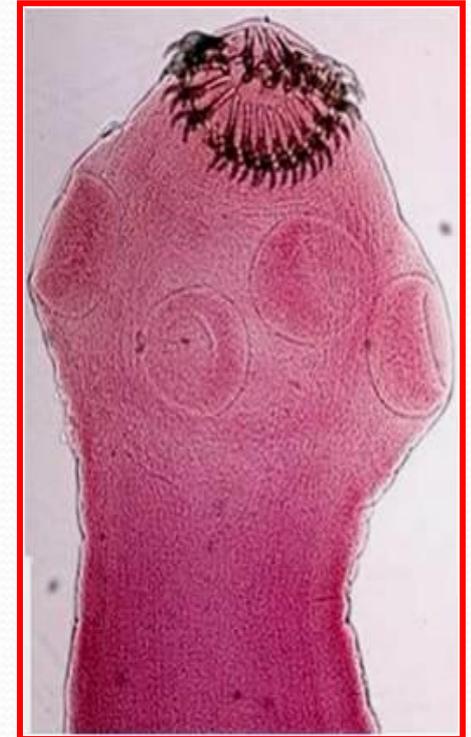
# Morphology

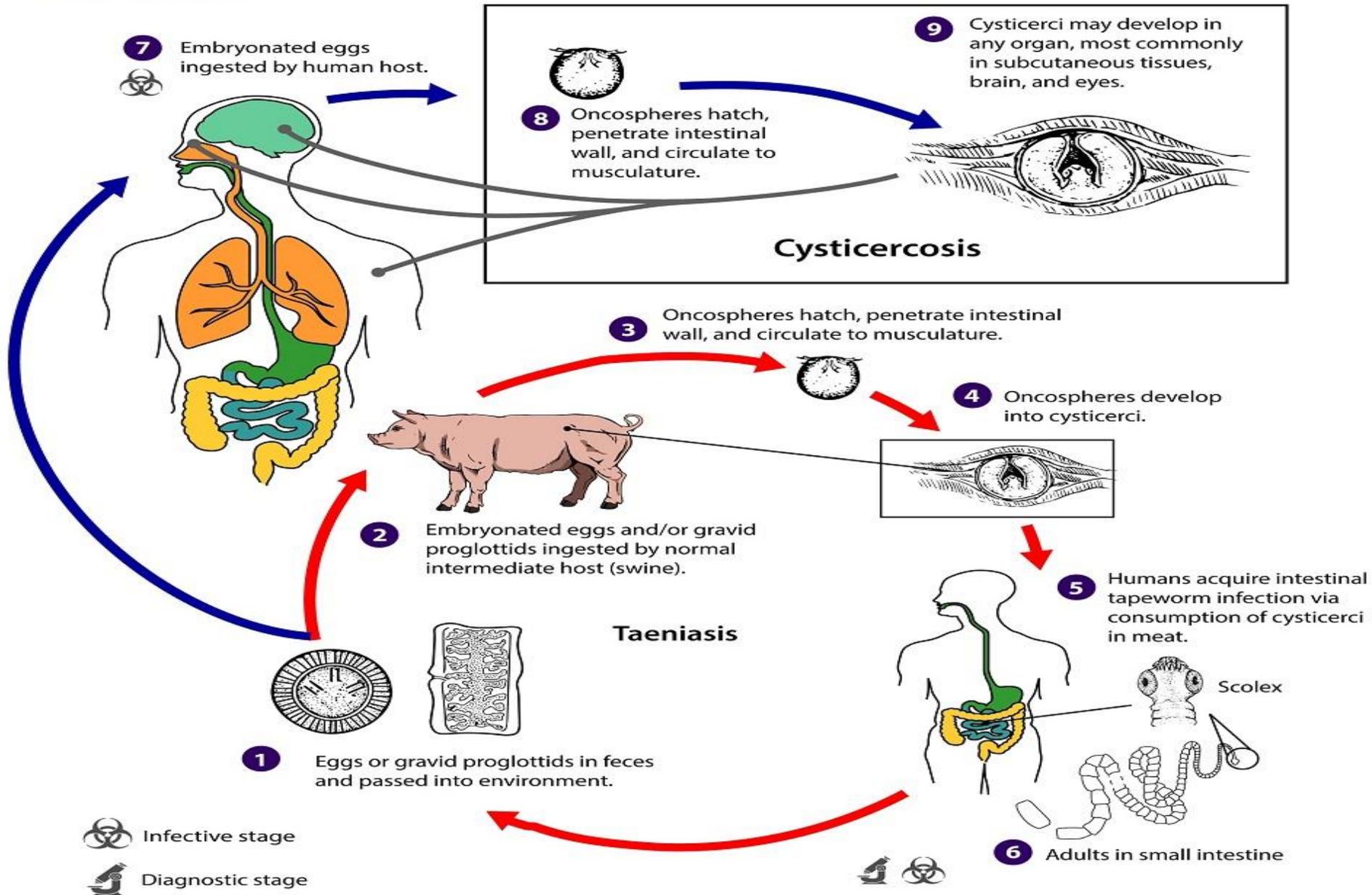
## Adult :-

➤ **Size:** 4-6 meters.

➤ **Scolex :-**

- Globular.
- 4 cup shaped suckers.
- Rostellum with 2 rows of taenoid hooks





# Pathogenesis and Symptomatology

**Taeniasis *solium*:** Due to ingestion of undercooked pork containing *cysticercus cellulosa* (the same clinical pictures as *taeniasis saginata*).

**Cysticercosis:** It develops when man ingested the *T. solium* eggs with food or drink or autoinfection → development of larvae (*cysticercus cellulosa*) in his tissues (ms, brain, eye, cutaneous tissues).

# Symptomatology of cysticercosis

Symptoms depends on the size of cyst, number & site affected:

- **Muscle:** Myositis with fever, muscle swelling → later, progresses to atrophy and fibrosis.
- **Brain :** Increase of intracranial pressure, epileptic fits and headache.
- **Eye :** Retinal oedema, haemorrhage, decreased vision or even visual loss.
- **Subcutaneous tissues:** Firm, mobile painful nodules mainly on the trunk and extremities.

# Diagnosis of Cysticercosis

## A. Direct methods:

- Biopsy from nodules for detection of larvae.
- CT and MRI for brain infection.
- X ray for calcified cyst.
- Ophthalmoscope for eye infection.
- Surgical removal for detection of the larvae.
- Stool examination for detection of eggs or gravid segments (only in patients having the adult worm).

## B. Indirect methods:

- Serological tests.
- Eosinophilia.

# Treatment of Cysticercosis

- 1) **Brain cyst:** Anticonvulsant and antiparasitic drugs as praziquantel in combination with corticosteroids to reduce inflammatory reaction.
- 2) **Eye cyst:**
  - Cyst within the eye → surgical removal.
  - Cyst outside eye globe → antiparasitic drugs with corticosteroids.
- 3) **Subcutaneous cyst:** Surgical excision.
- 4) Vitamin D and calcium to help calcification.

# Treatment of *Taeniasis solium*

Anti-cestodal drugs for adult as *taeniasis saginata* but:

1) **Niclosamide** is contraindicated because it disintegrates the worms, releasing large number of eggs in the intestine which increase the possibility of cysticercosis (internal autoinfection).

2) **Atebrine** causes nausea and vomiting. Anti-emetic must be given one hour before administration of Atebrine to avoid antiperistalsis and internal autoinfection.

**\*Difference s between *T. saginata* and *T. solium*:**

| Item       |  | <i>T.saginata</i>  | <i>T.solium</i>   |
|------------|--|--|-------------------|
| Life cycle | D.H  | Man in both  |                   |
|            | Egg  | Morphologically similar  |                   |
|            |  | Infect cattle only   | Infect pigs & man |
| I.H        | Cattle, sheep & camel only   | Pigs & occasionally man  |                   |
| Larva      | <i>Cysticercus bovis</i>   | <i>Cysticercus cellulosa</i>   |                   |
| I.S to man | <ul style="list-style-type: none"> <li>• <i>Cysticercus bovis</i> in undercooked beef</li> </ul> | <ul style="list-style-type: none"> <li>• <i>Cyeticercus cetllulosa</i> in undercooked pork</li> <li>• Eggs → cysticercosis.</li> </ul> |                   |