Classification Helminths

**Phylum:Nemathelminthes (Round)**

**Class: Nematoda**

**Phylum: Platyhelminthes (flat)**

**Class: Cestoda & Trematoda**

# *Tapeworms (cestodes)*

***Objectives*:**

**study the general characteristics of**

**medically important tapeworms including their**

**morphology, life cycle, pathogenesis and**

**laboratory diagnosis**

## General characters of tape worms

**All tapeworms have indirect life cycle except *Hymenolepis nana*.**

**•They have ribbon– like shape, flattened dorsoventrally & segmented .**

**•Adult tapeworm inhabits the small intestine of vertebrates. While the larvae inhabit the tissues of vertebrates & invertebrates.**

**•All tapeworms are hermaphrodites,**

**•They have no gut or digestive tract,absorbtion takes place through tegument.**

.

**Adult tapeworms produce minimal intestinal irritation and few systemic effects(mechanical and chemical effects).**

## Morphology of adult tapeworms ;

**Adult tapeworm divided in to ;**

**-Scolex or head provided with attachment organs .**

**-Neck or region of growth .**

**-Strobila or chain of segments or proglottids ;**

**1-Immature proglottids .**

**2-Mature proglottids.**

**3-Gravid proglottids.**

# Types of Cestodes larvae

**A - Bladder larvae :**

1-Cysticercus : e.g. *T. solium, T. saginata*.

2-Cysticercoid: e.g. *Hymenolepis spp.*

3-Hydatid cyst : e.g. *Echinococcus spp*.

4-Coenurus: e.g. *Taenia multiceps.*

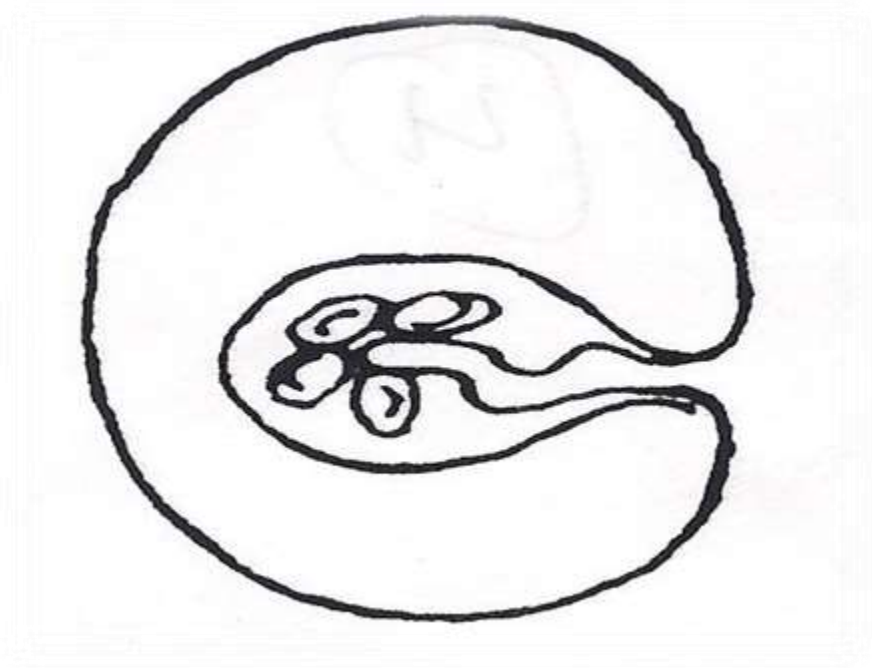
**B – Solid larvae:**

1-Procercoid: e.g. *D. latum*.

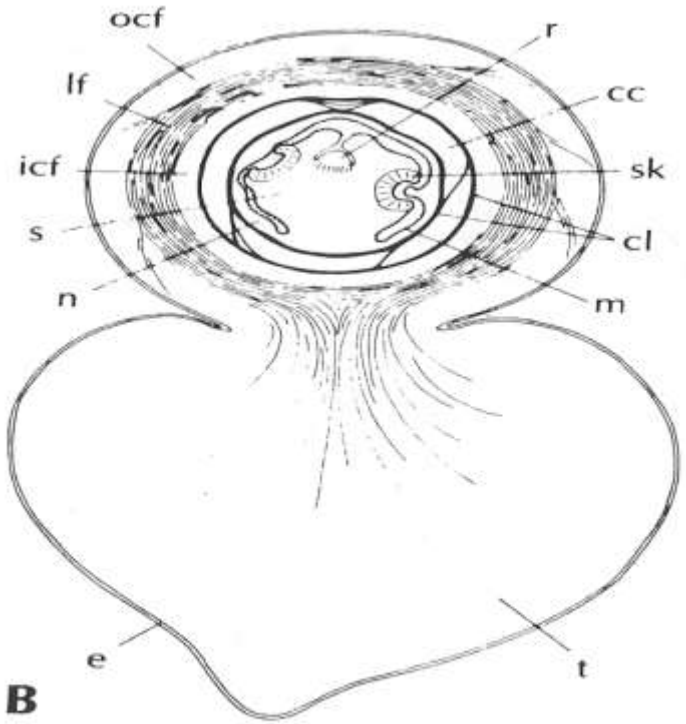
2-Plercercoid: e.g. *D. latum*.

## Bladder larvae :

- **Cysticercus : a true bladder worm, It is oval in shape, has fluid– filled membranous bladder with invaginated scolex. e.g. larvae of *Taenia solium* & *Taenia saginata***

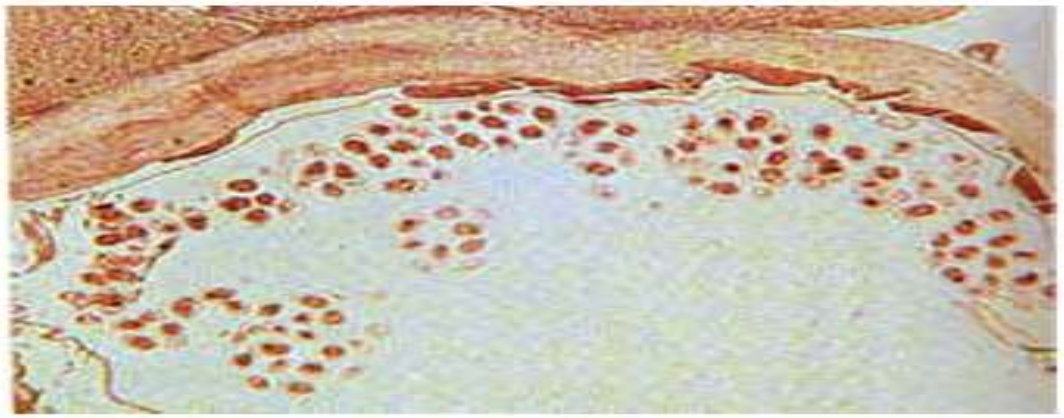


- **Cysticercoid ;is not a true bladder worm, it has bladder filled with parenchyma cells and invaginated scolex and a caudal appendage . e.g.** ***larva of Hymenolepis spp.***



Hydatid cyst: **large bladder composed of, outer laminated and inner germinal layers and filled with hydatid fluid . It is form multiple scolices and numerous daughter or brood capsules. e.g. larva of *Echinococcus spp***.

**Hydatid cyst**

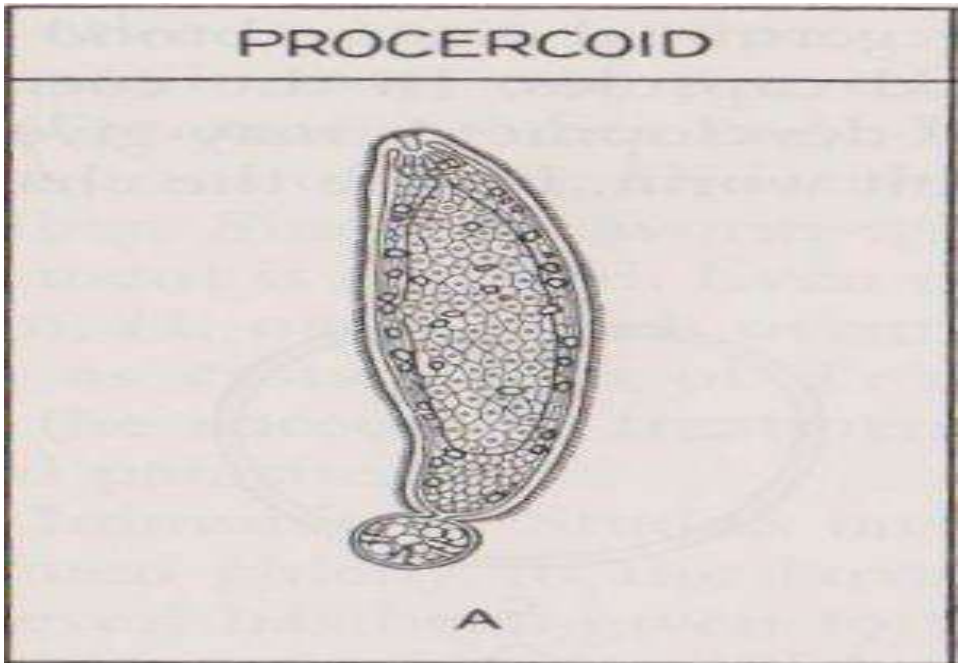


**Hydatid cyst showing a row of brood capsules** attached to the germinal layer.

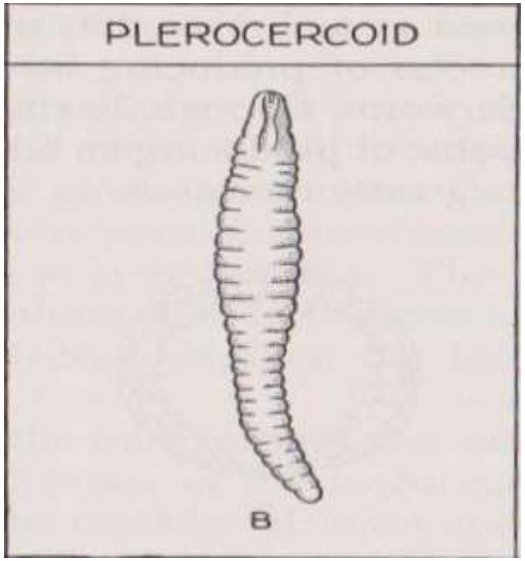
Coenurus : **A bladder worm resembles Cysticercus except that its bladder generally is much larger and bears numerous scolices rather than one e.g.** ***larva of Taenia multiceps*** **.**

- B–solid larvae;
- Procercoid : **sac – like solid body with cephalic invagination and caudal spherical appendage at its posterior end which contain 6 hooks e.g.**

***Diphylobotherium latum*.**



**Plerocercoid (sparganum) : chalky white solid structure with pseudo segmentation composed of caudal solid appendage and invaginated head in the neck e.g.Diphyllobotherium latum.**



-Diagnosis.

1-Infection with adult:

-Scolex, egg , segment.

2-Infection with larvae:

-Serology

-Histopathology

-Classification ;Class Cestoidea has two orders

1-Cyclophyllidea

2-Pseudophyllidea

.

## *Taenia saginata (beef tapeworm)*

*-Disease ; Taeniasis*

*Beef tapeworm infection*

*-Habitat ;Upper part of small intestine*

-Morphology

**1-Scolex (unarmed)**

**2-Neck**

## 3-Strobila •

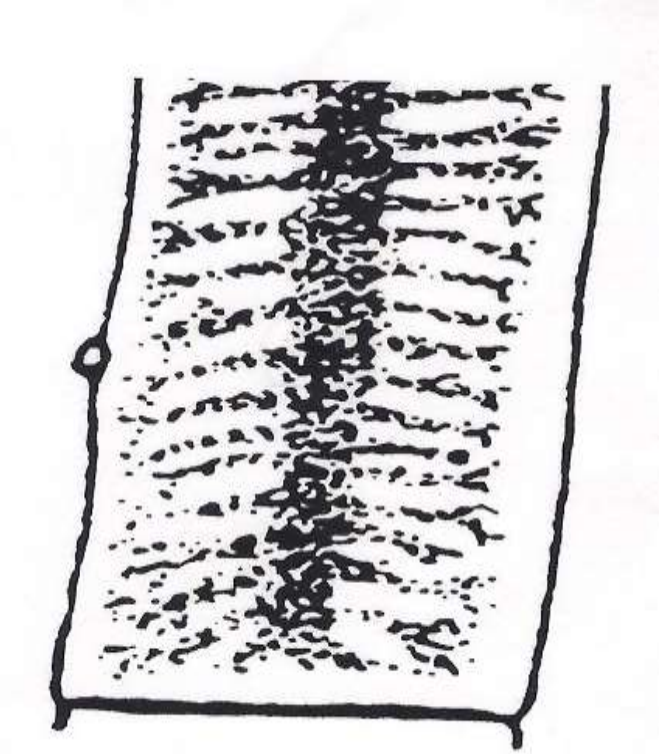
-Immature segment •

-Mature segment •

-Gravid segment

15-30 lateral branch.

Gravid segment



**Egg of Taenia spp.(S S C C)**

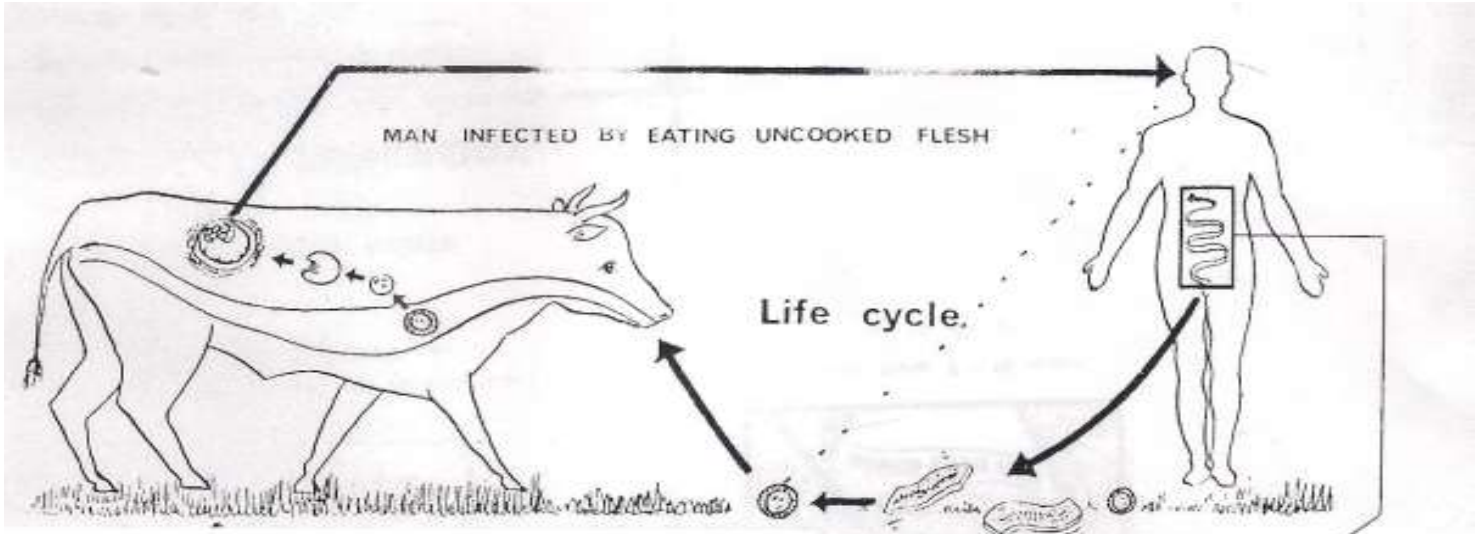
**size;36 micron,**

**shape;globular or spherical,**

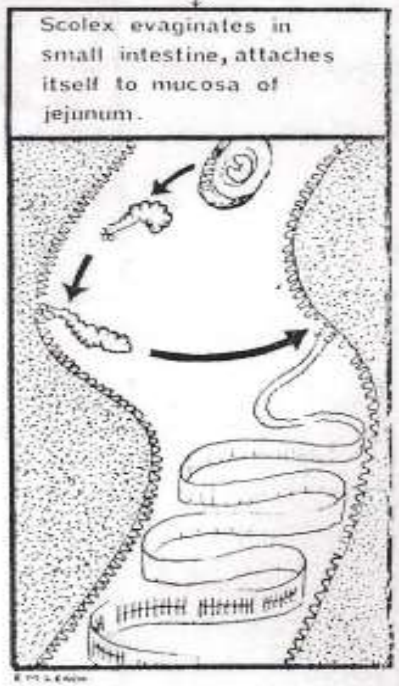
**color; yellowish brown**

***contents;Taenia spp. eggs contain an embryo that is called an oncosphere or hexacanth embryo***

**,surrounded by striated embryophore.The egg surrounded by delicate egg shell.**



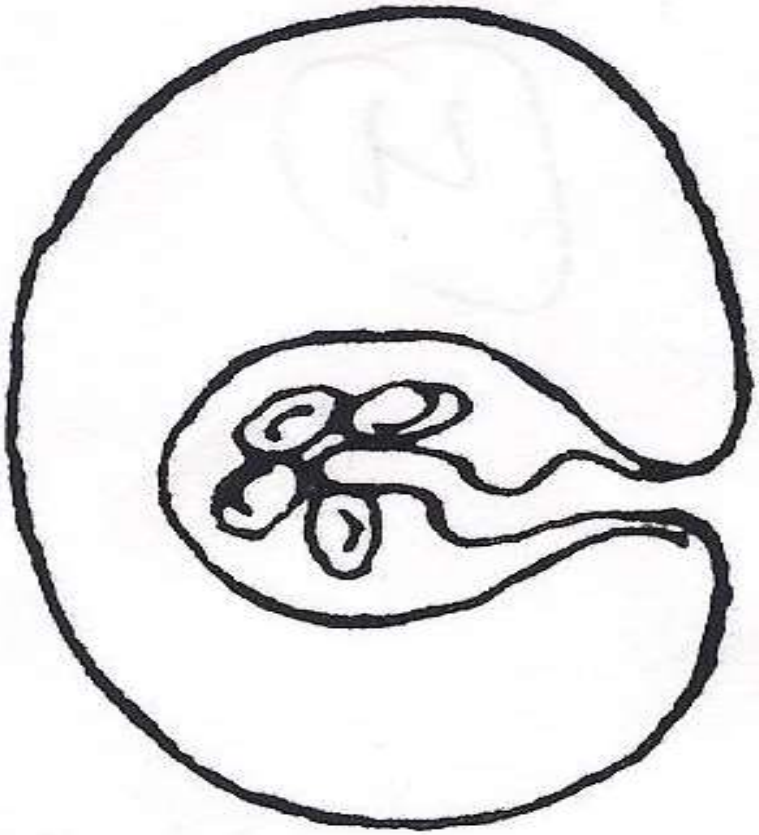

Motile segments rupture and release eggs.




Maturation time 8 – 10 weeks

Life span up to 25 years.

**Membranous bladder filled with a fluid with invaginated unarmed scolex.**



**Cysticercus bovis**

**- Pathogenesis, pathology & symptomatology**

**Little damage result from the presrnce of adult worm in small intestine**

**-Intestinal disturbance**

**-Acute intestinal obstruction**

**-Appendicitis**

**-Hunger pain**

**-Systemic intoxication**

**-Mental worried and embarrassment ,the proglottids are motile and may cause anal purities as they move on the skin adjacent to the anus.**

## Diagnosis

1-General stool examination ( egg and gravid segment )

2-Perianal swab (Scotch tape slide technique)

3-Examination of scolex (after medication)

## Treatment

Niclosamide, praziquantel and mebendazole.