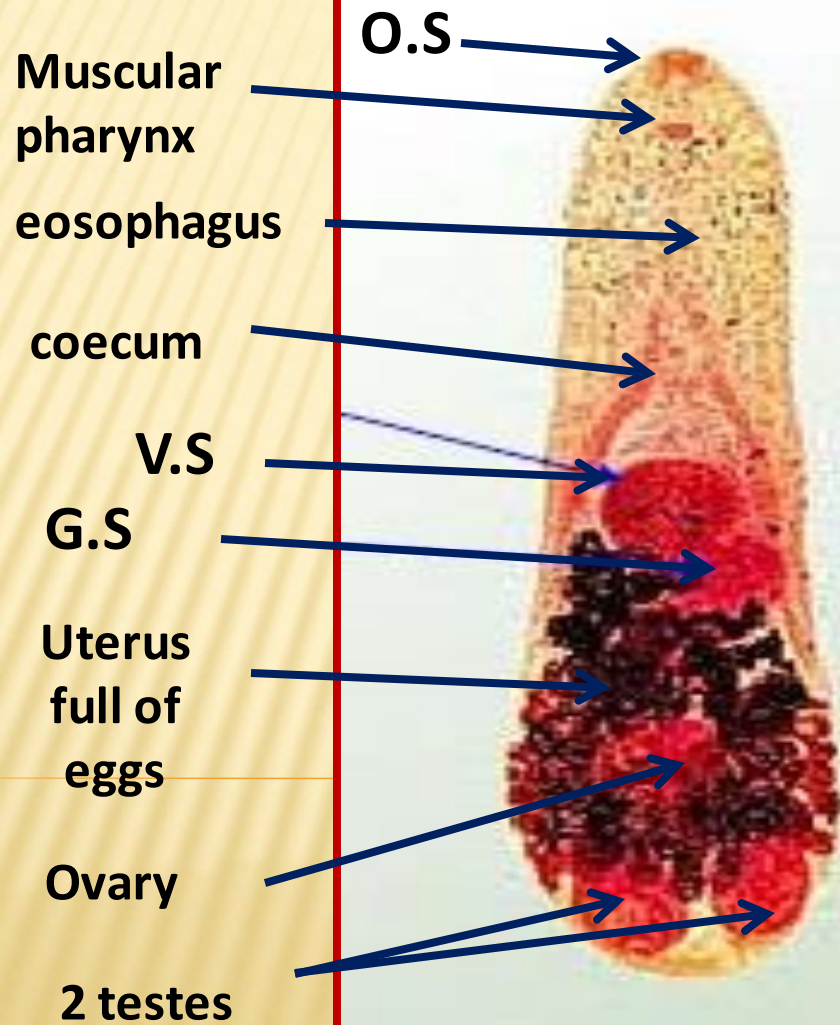


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Parasites 4
PRACTICAL REVISION

Heterophyes heterophyes Adult



Heterophyes heterophyes Egg

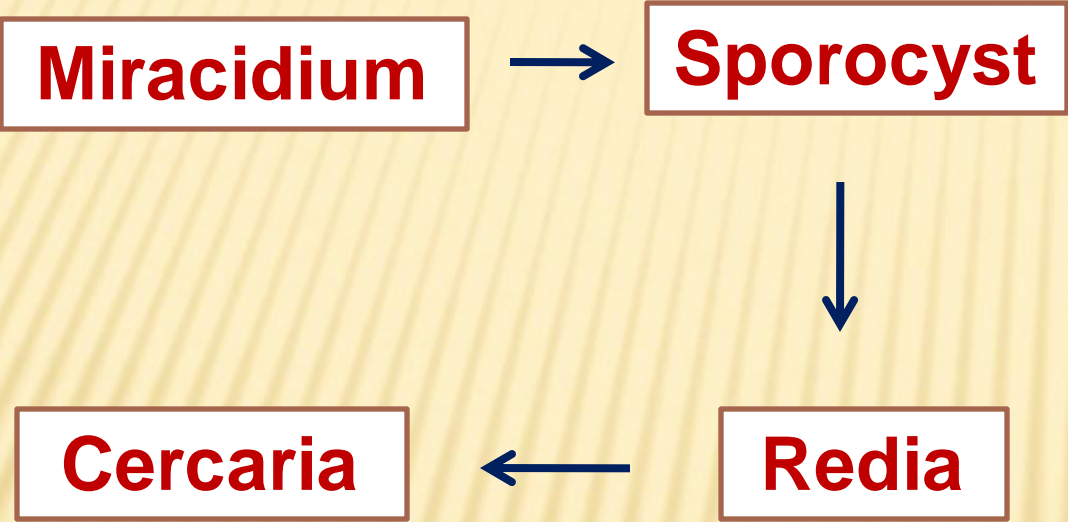
❖ Eggs (D.S) :-

- **Size** : 30 x 15 µm.
- **Shape** : Oval.
- **Shell** : Thick with anterior operculum and a small knob at posterior end.
- **Color** : Yellowish brown.
- **Content** : Mature (miracidium).



Pirenella conica snail

Inside the snail:

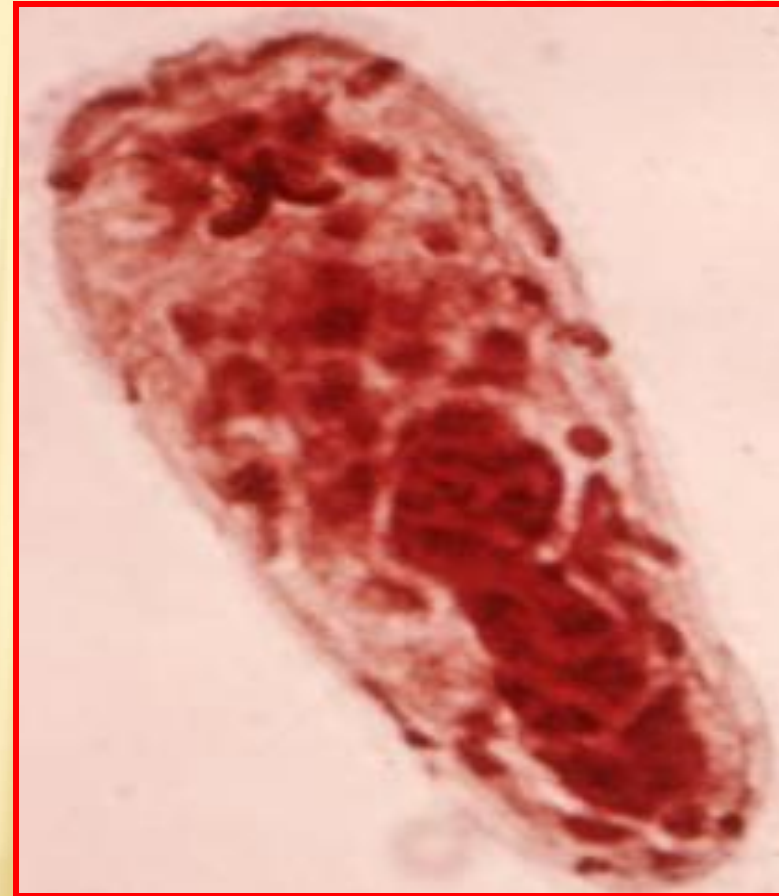


1st I.H
of *H. heterophyes*

H. Heterophyes miracidium

❖ **Miracidium:-**

- **Pyriiform ciliated larva.**
- **Germinal cells develops into sporocyst.**



❖ **Sporocyst:-**

Simple elongated sac filled with germ cells. sporocyst develops into rediae.

❖ **Redia:-**

➤ **Cylindrical larva.**

➤ **Germ cells develop into cercariae.**



H. Heterophyes sporocyst

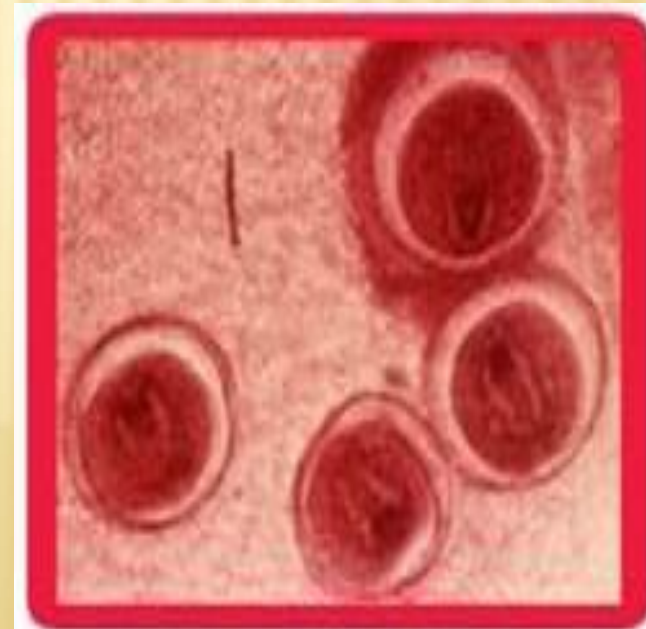
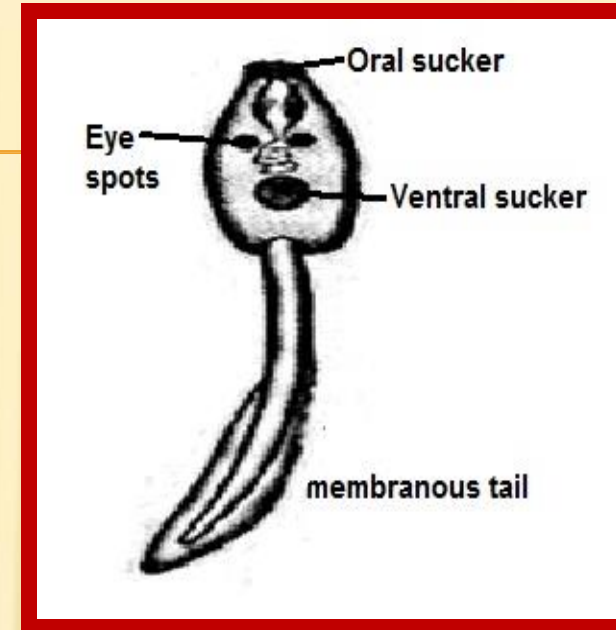


H. Heterophyes Redia

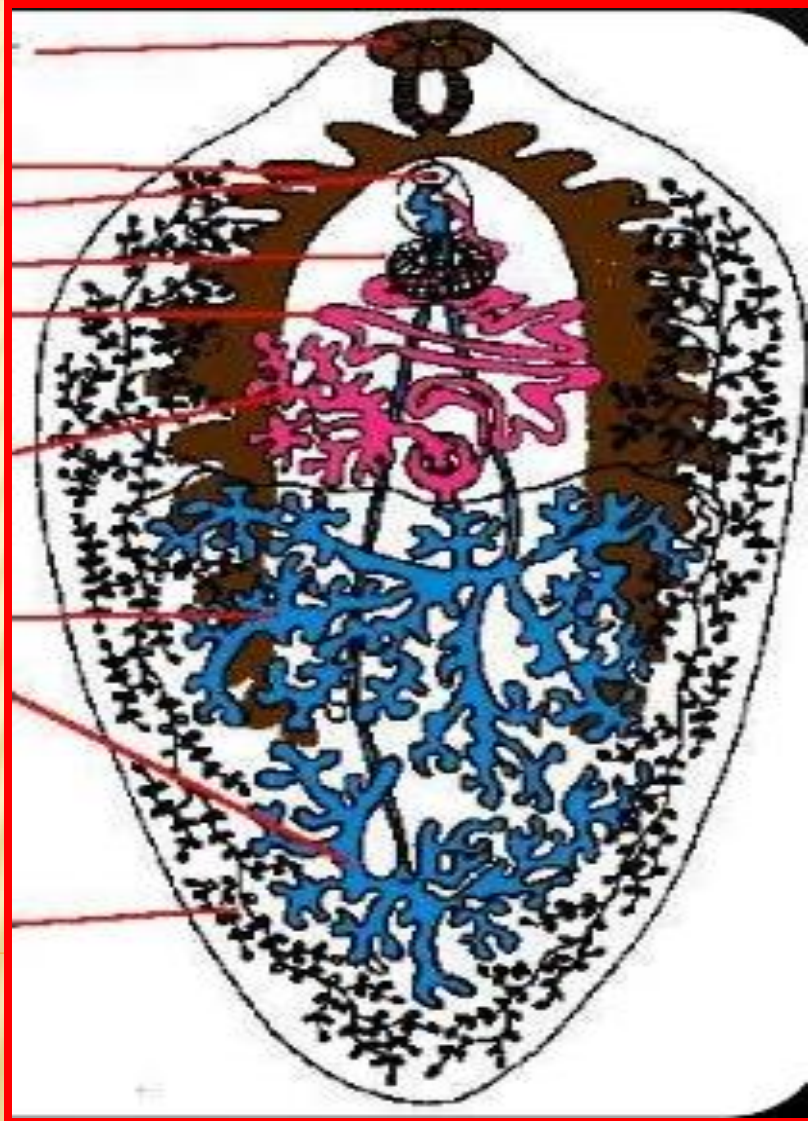
Lophocercous cercaria of *H. heterophyes*

- Has body and membranous tail

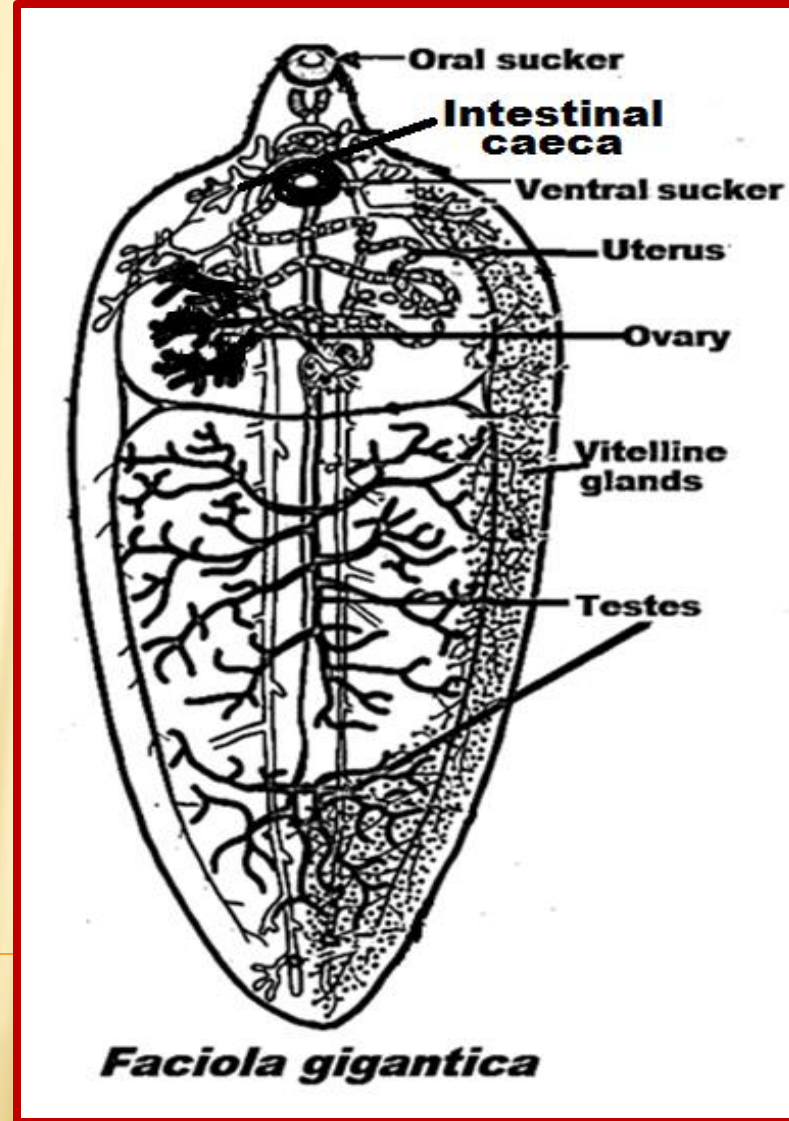
(I.S)
Encysted metacercaria
of *H. heterophyes* in
brackish water fish (2nd
I H)



Fasciola adult



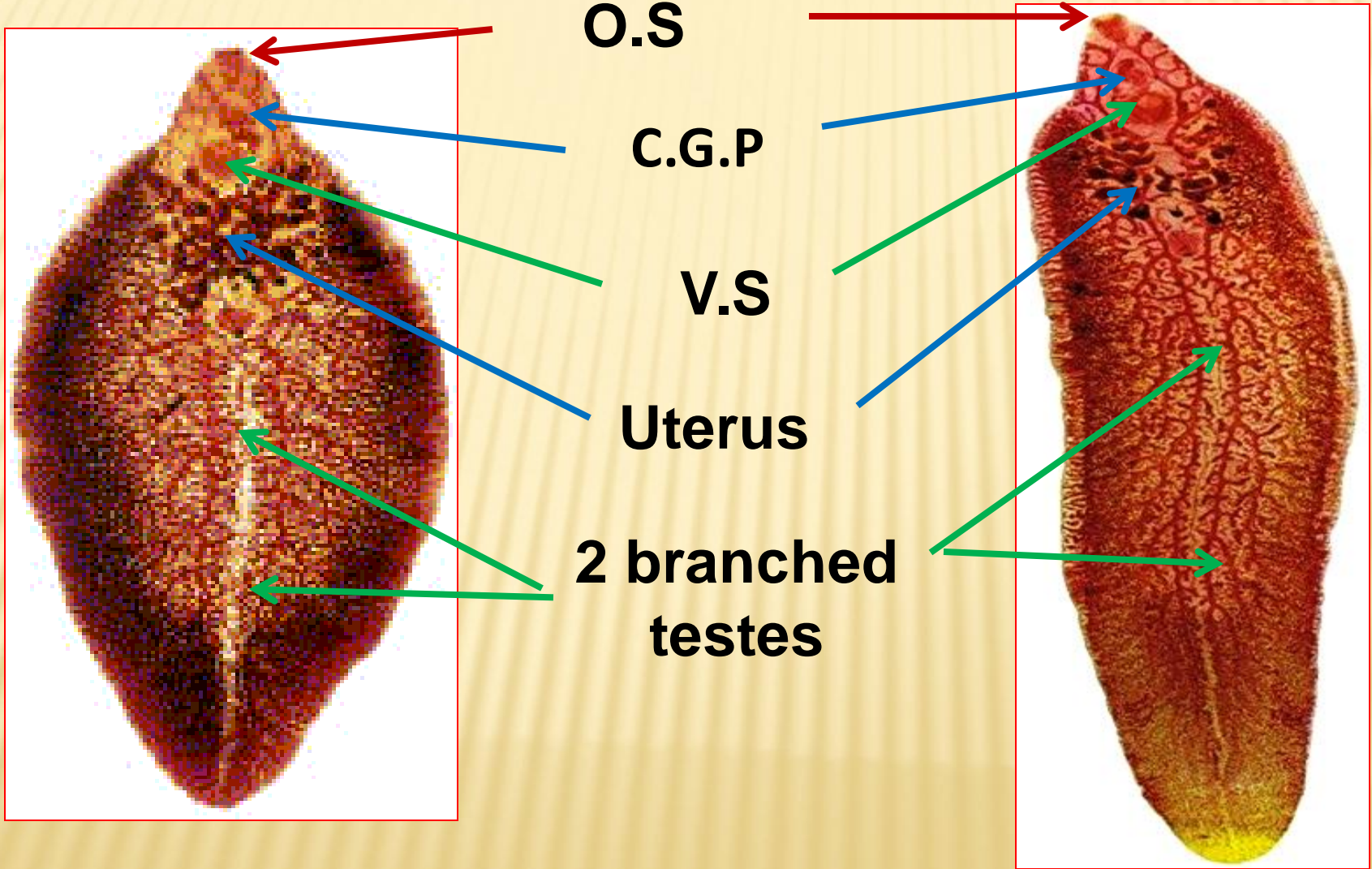
Fasciola hepatica



Fasciola gigantica

Fasciola gigantica

Fasciola adult



F. hepatica

F. gigantica

Fasciola hepatica

It differs from *F.gigantica* in the following:-

Items	<i>F. gigantica</i>	<i>F. hepatica</i>
Distribution	Africa , Asia	Common in Europe
Reservoir host	Cattle and sheep	Sheep
Size	6 x1.5 cm	3x1 cm
Shape	Longer and slender with small anterior cone and parallel sides	Wide anteriorly and pointed posteriorly (converging) with large anterior cone
Shoulder	Less prominent	More prominent
Suckers	Ventral larger than oral	Equal in size
Testes	In the middle third	Extended to posterior third
Intestinal caeca	Medial branches are Y or T	Medial branches are simple
Intermediate host	<i>Lymnaea cailliaudi</i>	<i>Lymnaea truncatula</i>



***Fasciola* egg (D.S)**

- **Size** : 140 x 70 μm .
- **Shape** : Oval.
- **Shell** : Thin operculated.
- **Color** : Yellowish brown.
- **Content** : Immature
(ovum & yolk cells).



cercaria of *Fasciola* & *Fasciolopsis*

- Formed of body and tail.
- Body with oral and ventral suckers, simple intestinal caeca.
- Tail : Simple (leptocercous cercaria).



***Lymnaea cailliaudi* snail**

I.H of *Fasciola gigantica*

Inside the snail :

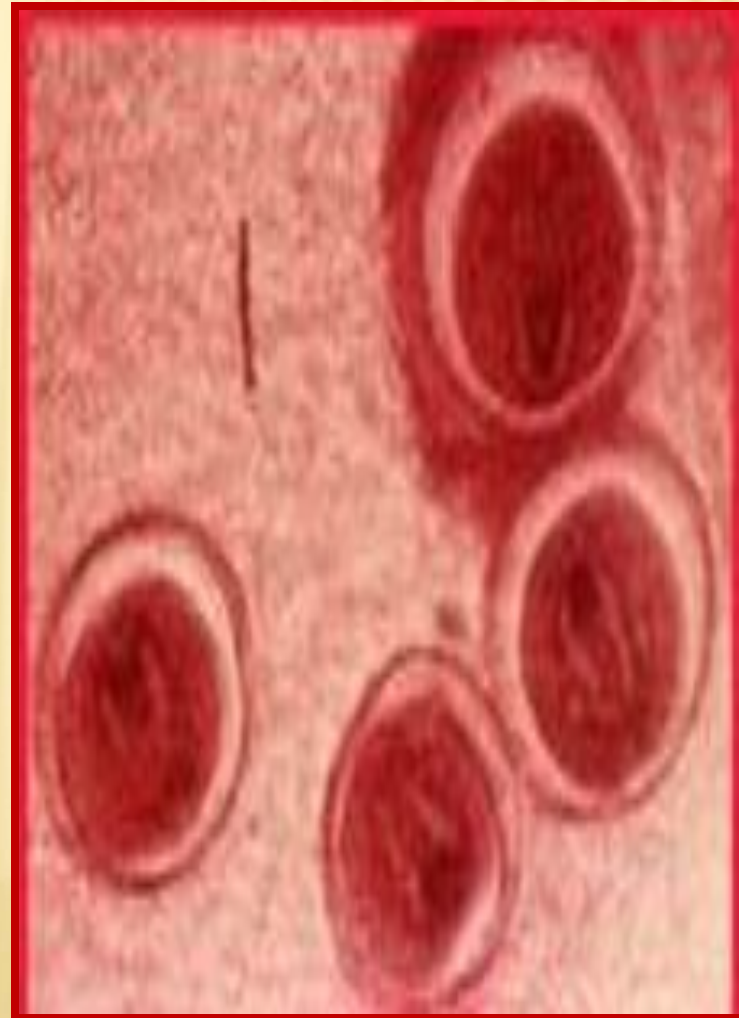
Miracidium → Sporocyst

→ Redia → Cercaria

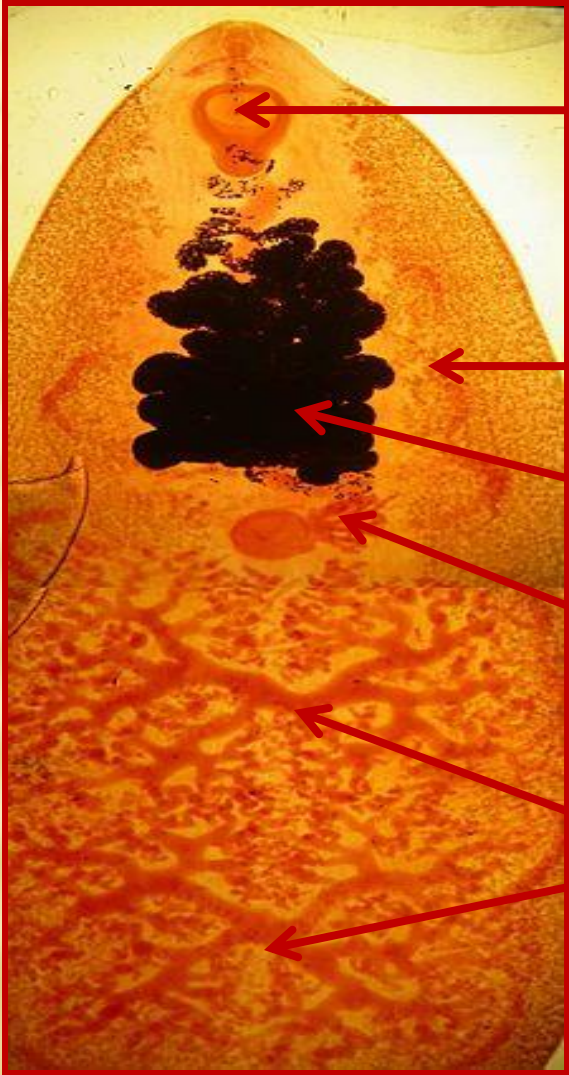


Encysted metacercaria (I.S) of *Fasciola* & *Fasciolopsis*

- Spherical in shape.
- The cercaria loses its tail and secretes a thick cyst wall.
- Present in green water vegetations and water.



Fasciolopsis buski adult



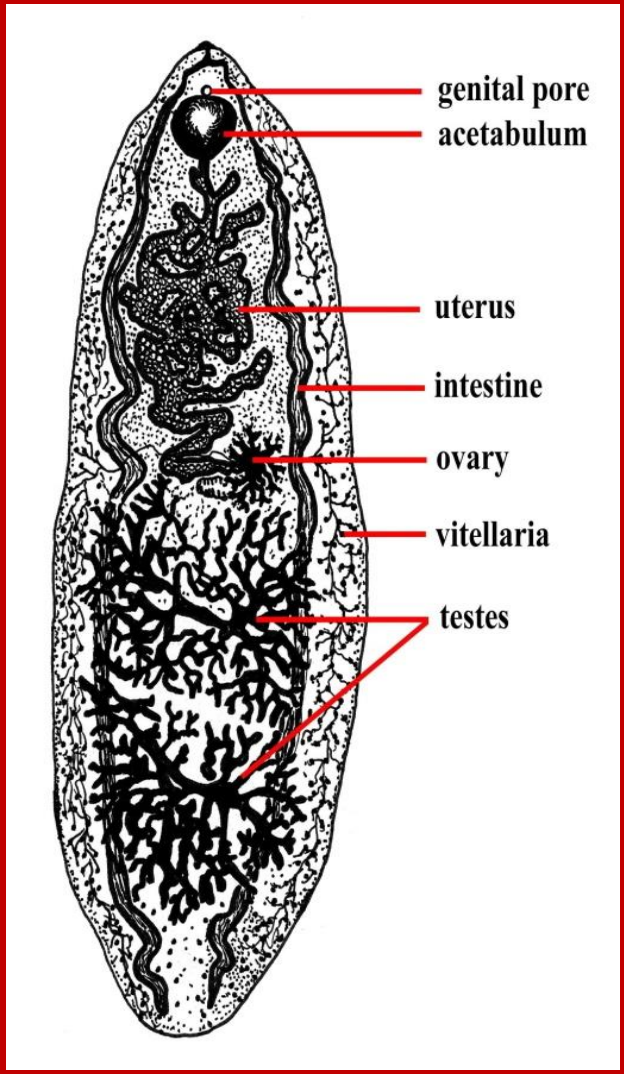
V.S

Simple Intestine

Uterus

Ovary

2 testes



genital pore
acetabulum

uterus

intestine

ovary

vitellaria

testes

***Fasciolopsis buski* egg (D.S)**

- **Size** : 140 x 70 μm .
- **Shape** : Oval.
- **Shell** : Thin, operculated.
- **Color** : Yellowish brown.
- **Content** : Immature
(ovum & yolk cells).



Segmentina snail

❖ I.H of *Fasciolopsis buski*

(miracidium →

sporocyst → redia

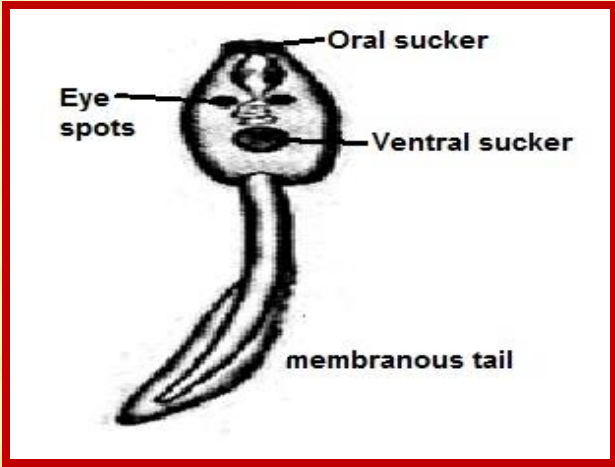
→ cercaria

(leptoceous cercaria).



Types of cercaria of Trematodes

Heterophyes



Fasciola & Fasciolopsis



Lophocercous cercaria

leptocercous cercaria

Paragonimus



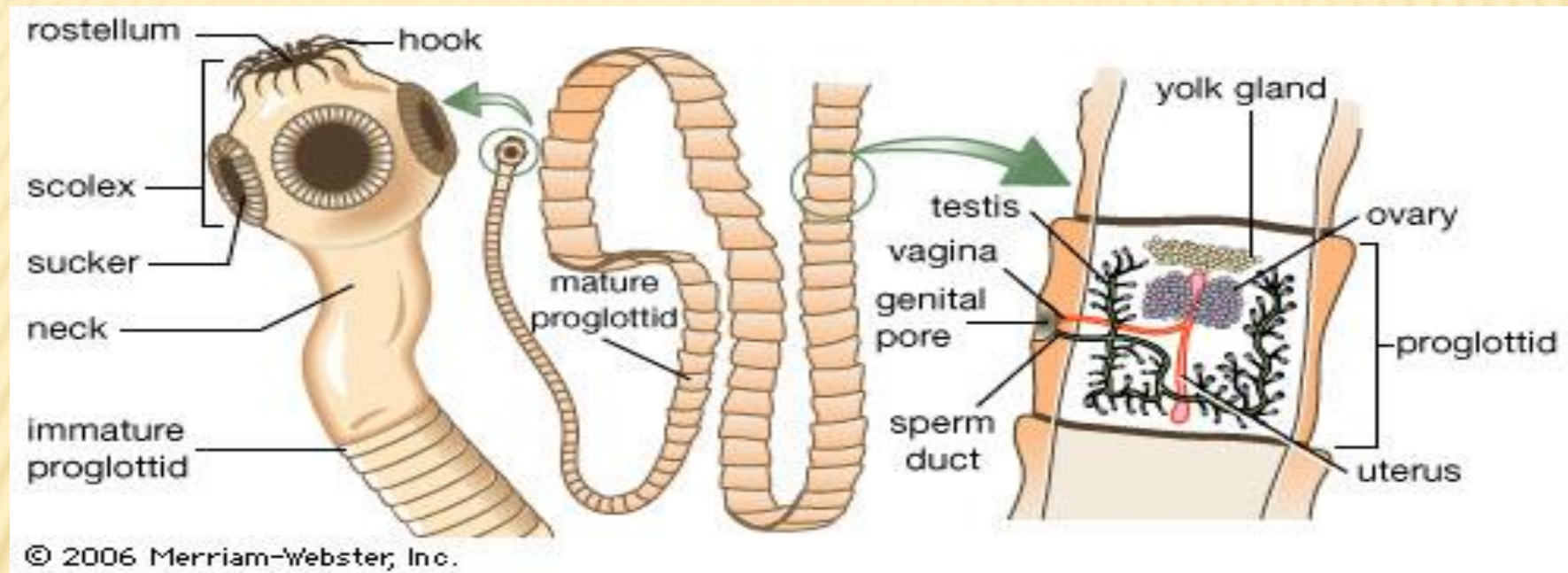
Schistosoma



Microcercous cercaria

Furcocercus cercaria

General characters



Adults:

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

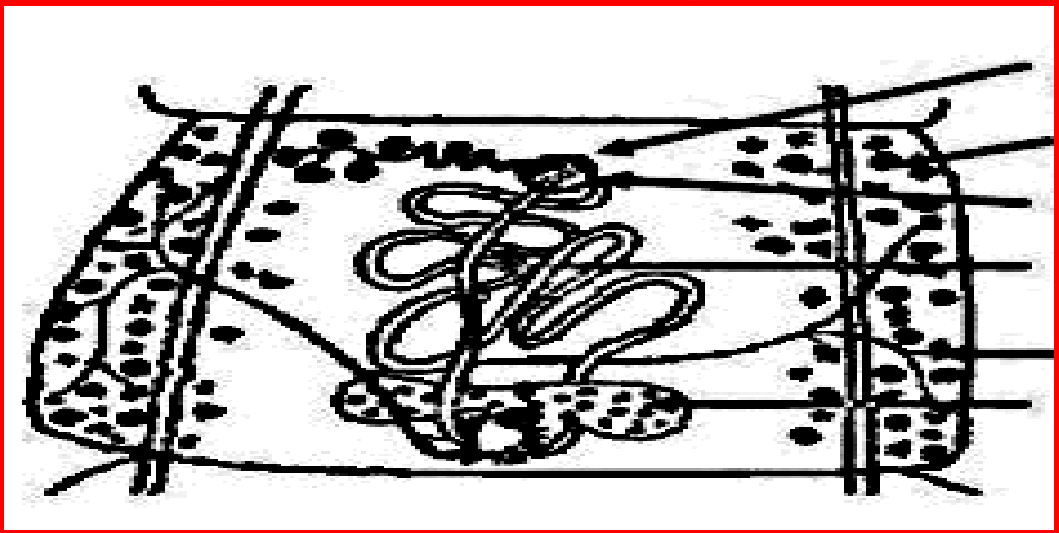
Diphyllobothrium latum
(broad tapeworm , fish tapeworm)

Scolex

**Elongated, almond like with
two grooves (bothria), one
dorsal & one ventral.**



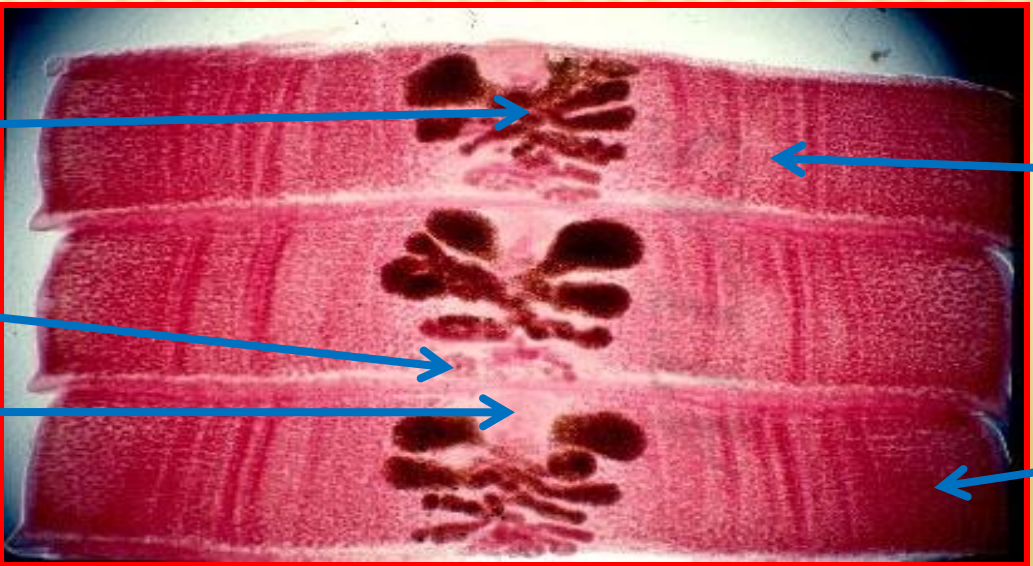
***Diphyllobothrium latum* mature segment**



Uterus

Ovary

C.G.P



Testes

Vitteline glands

Diphyllobothrium latum egg

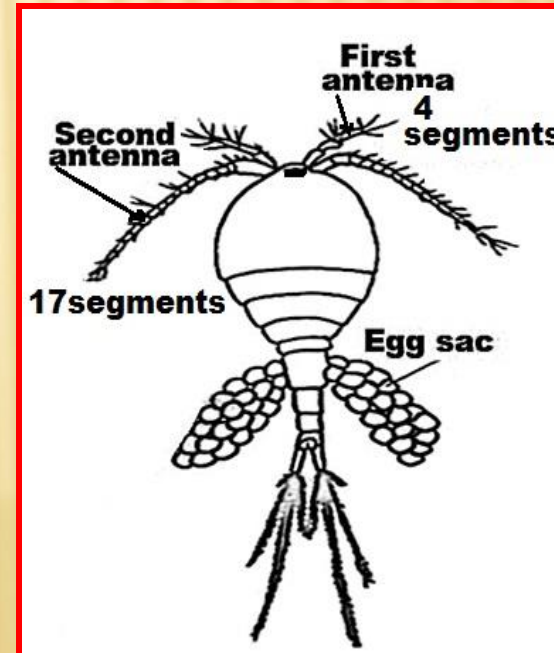
- **Size** : 70×45 μm
- **Shape** : Oval.
- **Shell** : Thick and operculated.
- **Color** : Yellowish brown.
- **Content** : Immature (ovum and yolk cells).



➤ **Coracidium** : Onchosphere larva with ciliated epithelium containing hexacanth embryo.

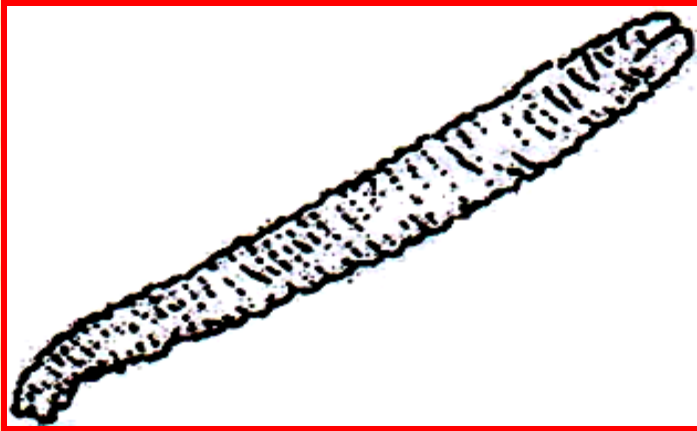


Cyclop: 1st I.H of *Diphyllobothrium latum* containing proceroid larva.



Larvae of *Diphyllobothrium latum*

Plerocercoid (I.S)



Solid larva with striated
body found in 2nd I.H
(Salmon fish).

Procercoid



Solid elongated larva,
with posterior spherical
end having 6 hooks found
in 1st I. H (Cyclop).

***Taenia saginata*
scolex**



***Taenia solium*
scolex**

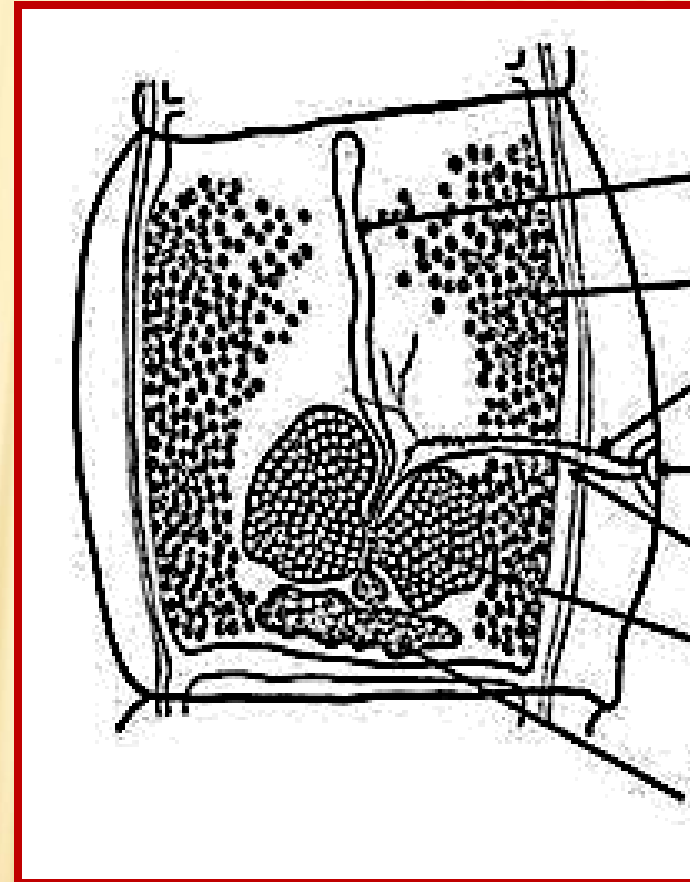
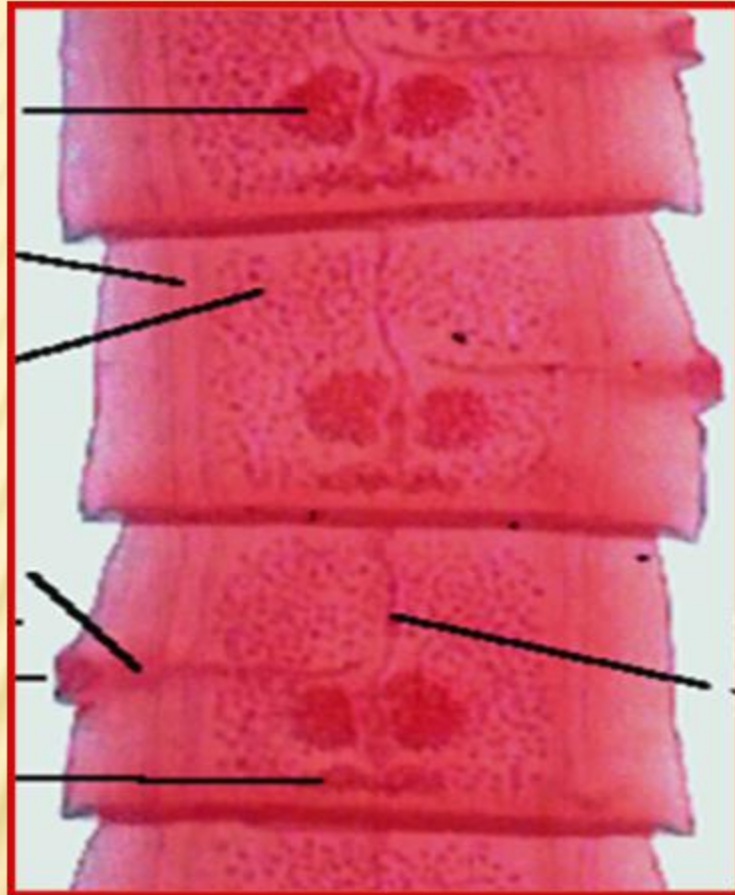


**Rostellum
with 2 rows
of hooks**

Suckers

**Globular, with 4 cup shaped suckers at the
angles of the head**

Mature segment of *T. saginata*



Squarish in shape
Contains male & female genital systems

Gravid segment of *T. saginata*

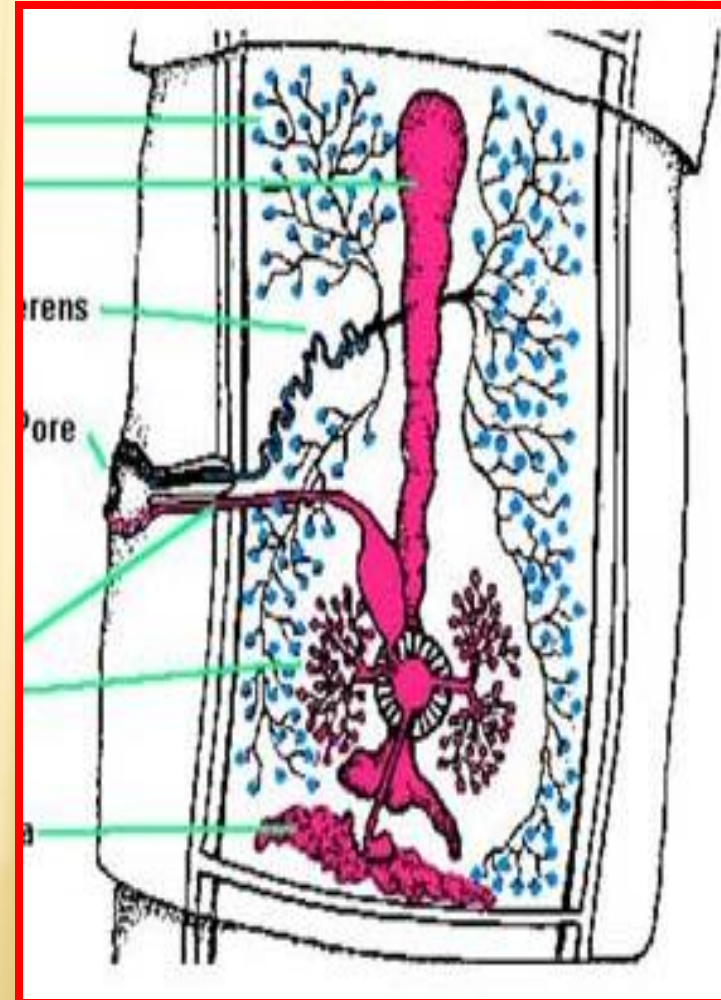
- Longer than broad
- Uterus with 15 - 30 (18) lateral branches on each side
- Full of eggs.
- Detached **singly** out of the anus (with feces or actively migrate).



Mature segment of *T. solium*

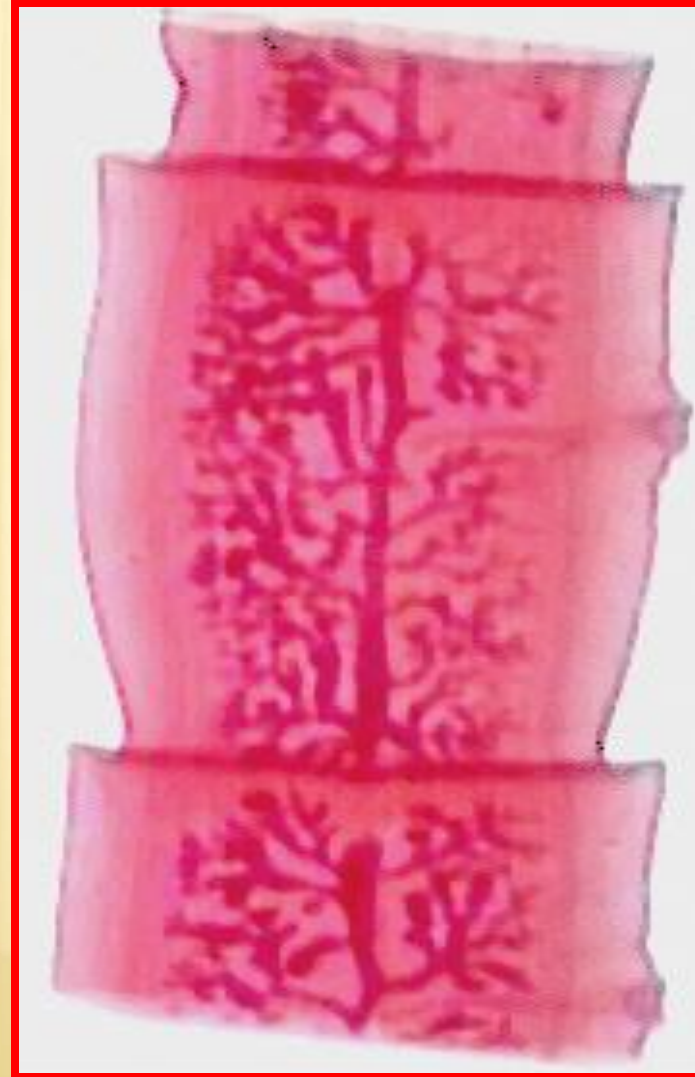
Strobila : About 1000 segments:-

- Immature segments.
- Mature segments :
- Similar to *T. saginata* except :-
 - *Smaller.
 - *Testes : Fewer.
 - *Ovary : Trilobed.



Gravid segment of *T. solium*

- **Gravid segments :**
- **Similar to *T. saginata* except:-**
 - 1 - Smaller.**
 - 2 - Uterus: About 9 lateral branches on each side.**
 - 3 - Segments detach in groups.**



Egg of *Taenia* (D.S)

Size : 30- 40 μm in diameter.

Shape : Spherical.

Shell : Thick, radially striated.

Color : Yellowish brown.

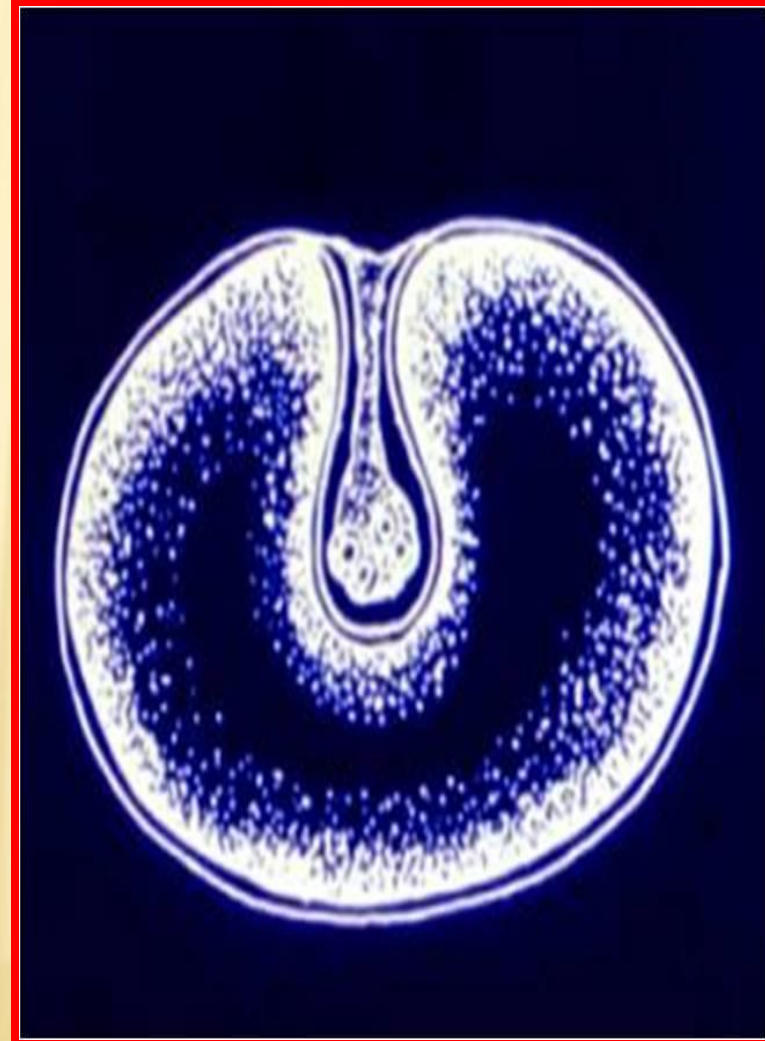
Content : Mature hexacanth embryo.

Egg of *T. solium* similar to *T. saginata* but it is the infected stage to human causing cysticercosis



Cysticercus bovis of *T. saginata* (I.S)

- **Cystic larva of *T. saginata* found in beef.**
- **Lined with germinal epithelium & contain fluid.**
- **Has invaginated scolex with 4 suckers (without hooks).**



Cysticercus cellulosa of *T. solium* (I.S)

Similar to cysticercus bovis, but detected in pork and the invaginated scolex carries 4 suckers, rostellum and hooks.





***Entrobium vermicularis*
female**



***Entrobium vermicularis*
male**

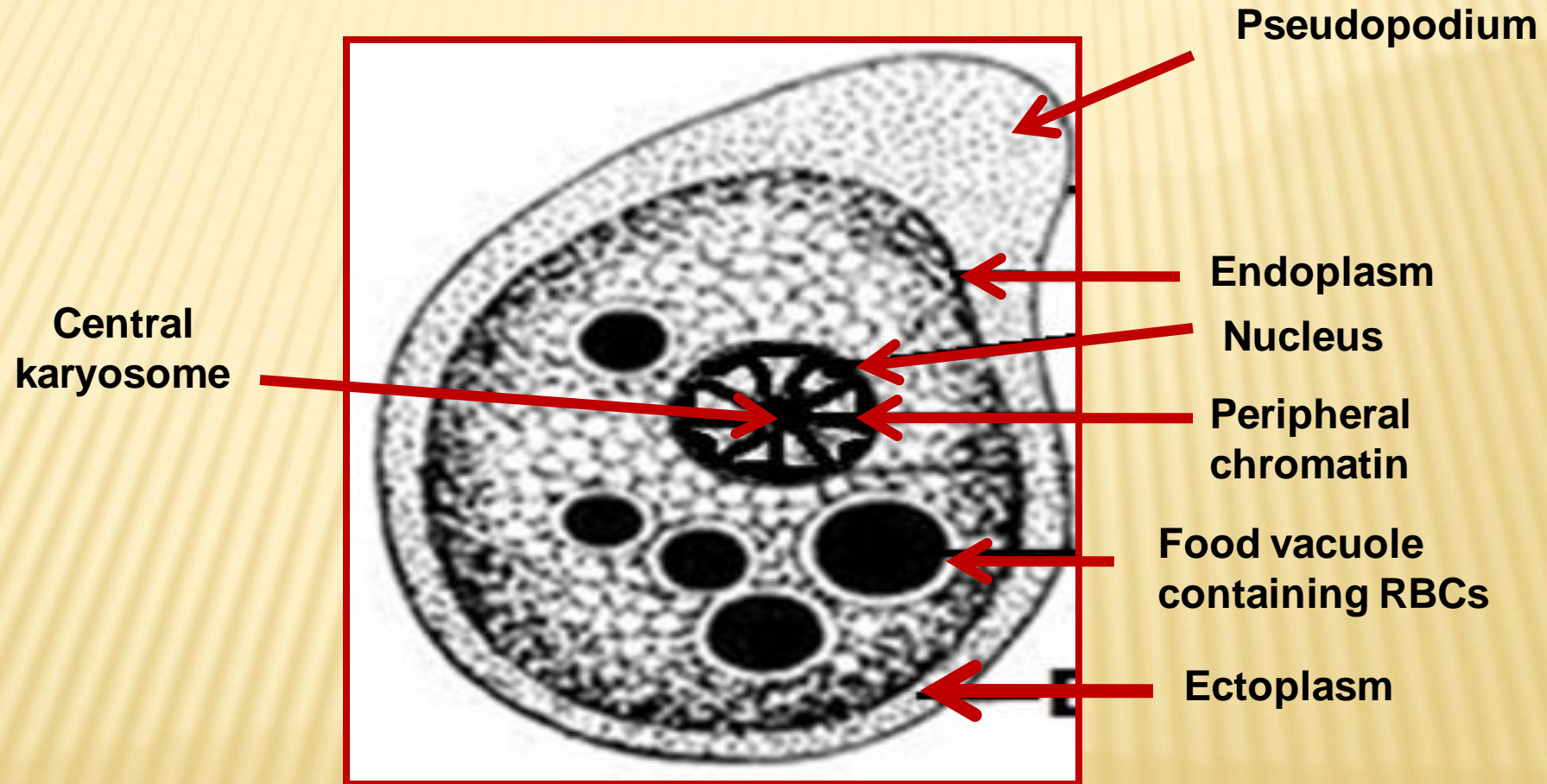
Entrobium vermicularis
egg

(D.S & I.S)

- **50 x 25 μm in diameter**
- **Oval.**
- **D-shaped or planoconvex**
- **Thick shell.**
- **Translucent**
- **Mature (fully developed larvae).**

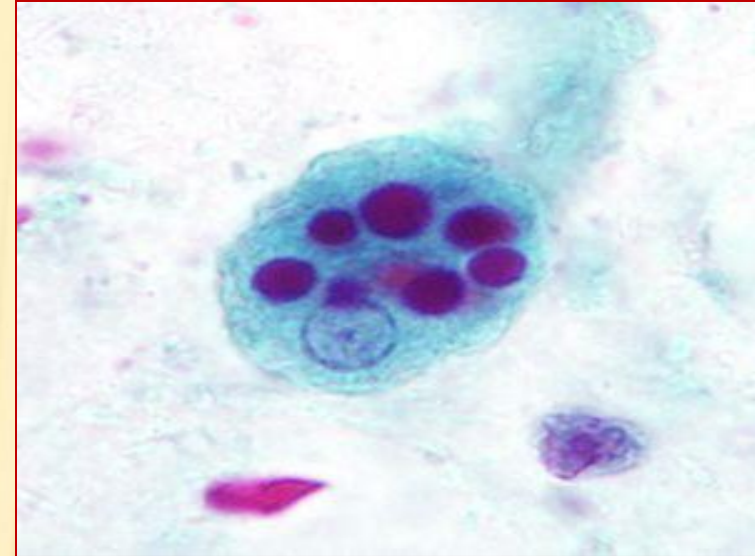


Entamoeba histolytica
Trophozoite



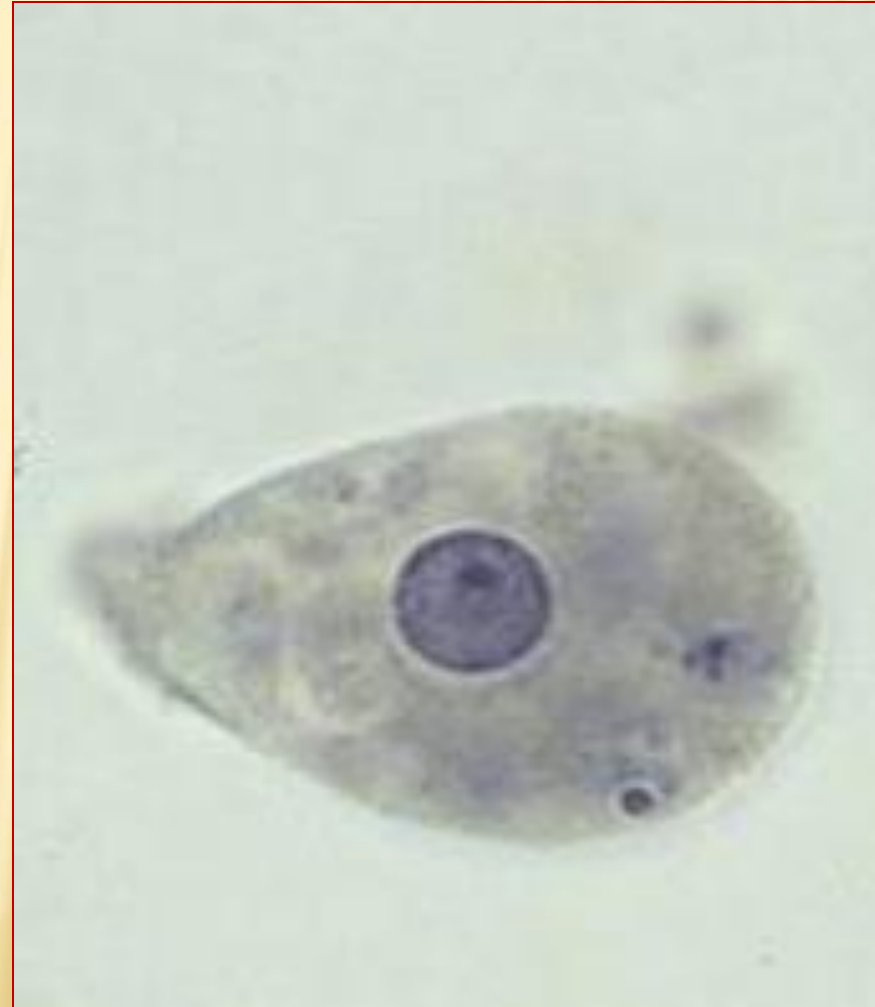
Entamoeba histolytica Trophozoite

- 20 um
- **Cytoplasm:** differentiated
- Pseudopodia: finger shaped
- RBCs: present
- Bacteria: absent
- **Nucleus:** one with small central karyosome & fine regularly arranged peripheral chromatin granules
- **Motility:** active

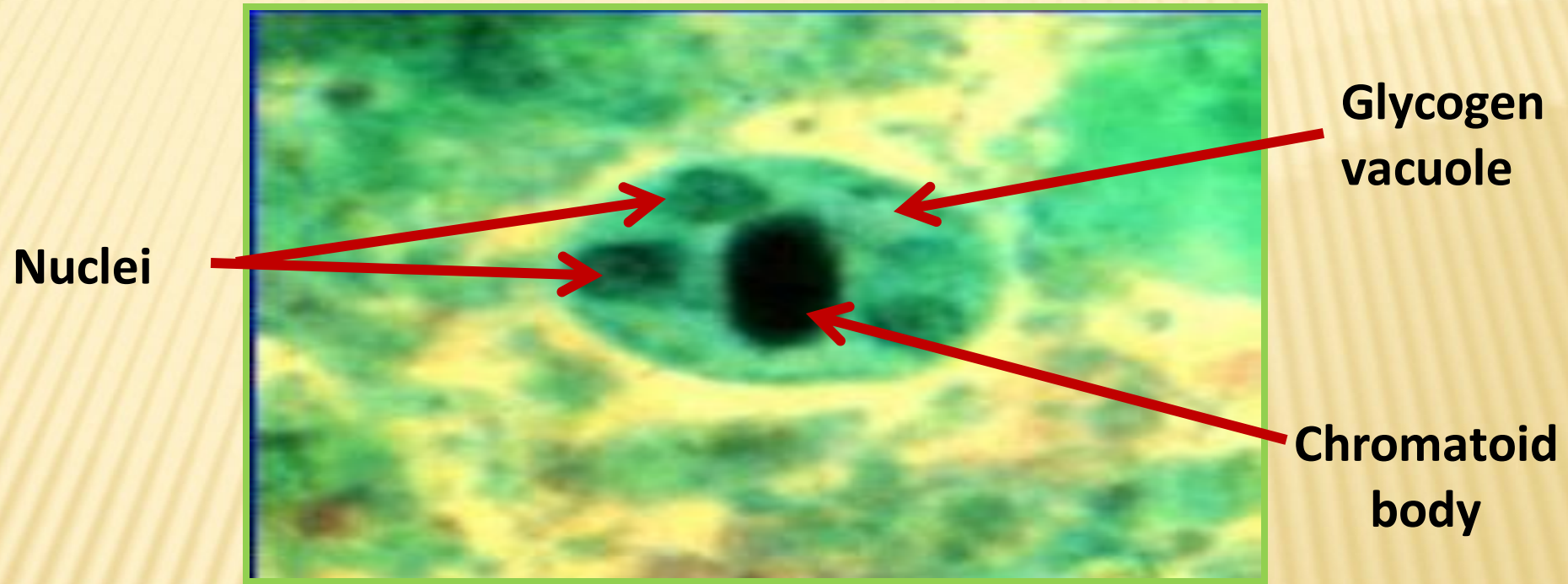


Entamoeba coli trophozoite

- 25 μm
- **Cytoplasm:** not differentiated
- **Pseudopodia:** Short & blunt.
- **RBCs:** absent
- **Bacteria:** present
- **Food vacuoles :** present
- **Nucleus:** one with large eccentric karyosome & coarse irregularly arranged peripheral chromatin granules
- **Motility:** sluggish

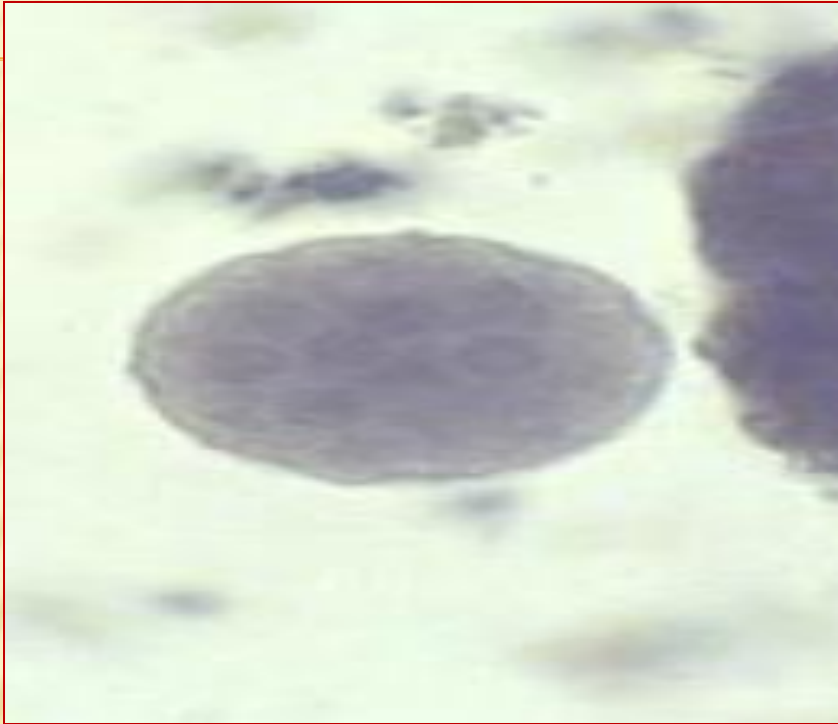


Entamoeba histolytica
mature cyst

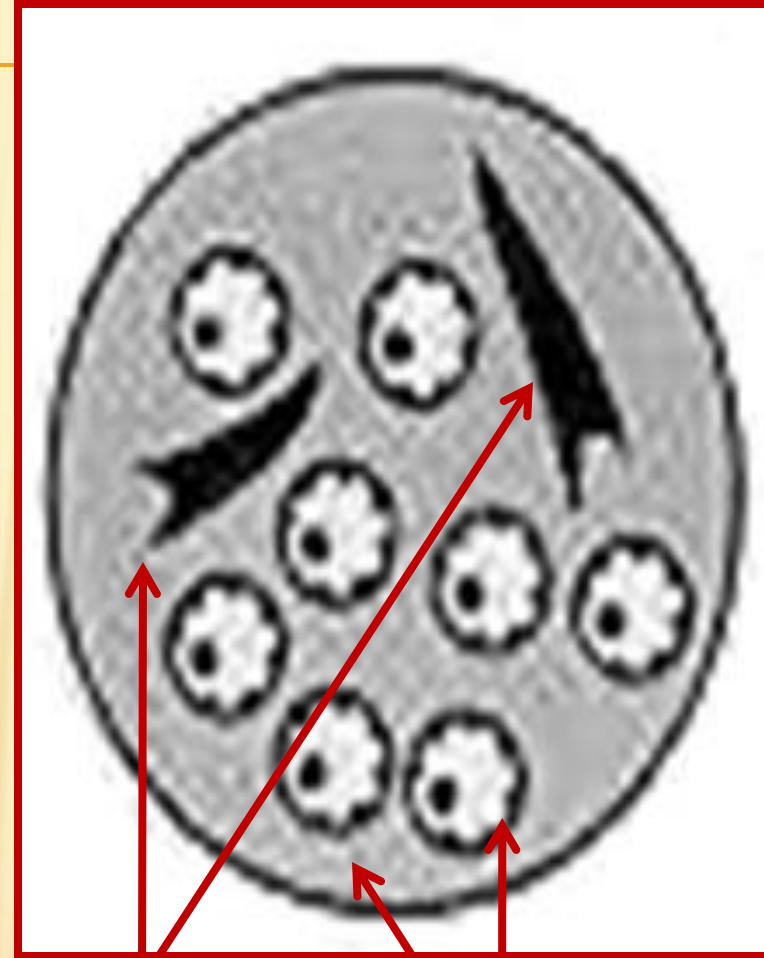


- D.S & I.S
- 15 um
- Rounded with thick cyst wall.
- Contain 4 nuclei.
- One chromatoid body.
- Glycogen vacuole.

Entamoeba coli cyst



- 20 um
- Rounded.
- Contain 8 nuclei
- Bundle or splinter shaped chromatoid bodies.



Chromatoid
bodies

Nuclei

