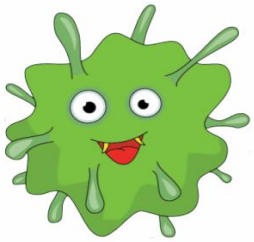
Gastro Intestinal System

Stool Collection & culture



* The doctor must warn the patient on how to collect the sample.
  → Patient should follow important steps:
  - make sure the sample doesn't touch the inside of the toilet
  - Place the sample into the container with disposable small spoon
  - Don't overfill the container
  - Avoid getting urine mixed up with stool

* Note: Collected Stool mustn't exeed 30 minutes without use → إذا ما رح استخدمها دايركت

(مشروح عنه بالسلايد اللي) بنحطها بال Selenite broth

* Stool is collected when the patient comes with any G.I symptoms (diarrhea lasts for days, stool with blood or mucus, crampings, nausea, throwing up and fever)

- ❑ **Stool should be collected in clean wide mouth container not sterile** → بكون نظيف بس مش sterile لل urine لازم sterile

* Stool sample can't be kept in the patients refrigerator for more than 24 hours (meaning it must be returned to the lab as soon as possible)

Stool should be added to Selenite broth

Why? ?

- ❑ Inhibits the growth of coliforms
- ❑ Enhances the growth of Pathogen

Normal flora

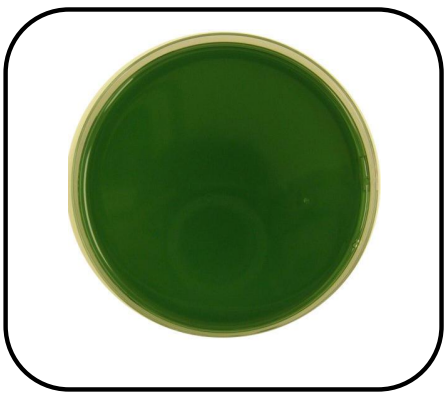
- Most common pathogens (Bacteria) :
  - E.coli
  - Salmonella
  - Shigella
  - Vibrio
  - Proteus
  - Yersinia , Campylobacter , Clostridium, Bacillus …etc

Stool sample should be cultured on the following media using streak plate method

S-S agar

↳ selective and differential media for salmonella and shigella

Hekton agar



T.C.B.S

↳ selective for vibrio

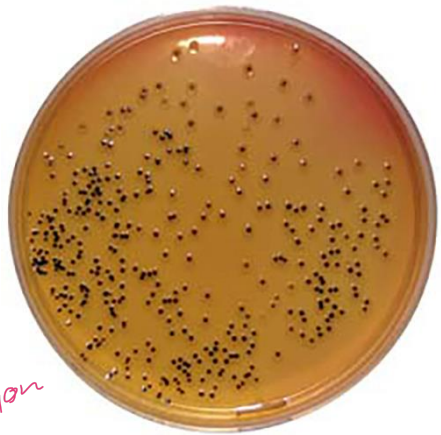
S-S agar

SS Agar Plate
(Salmonella–Shigella Agar)

↳ Contains an indicator to detect H_2S Production

Salmonella

↓ H_2S Production

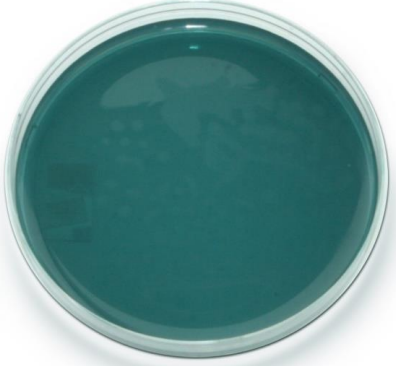


Shigella

↓ no H_2S

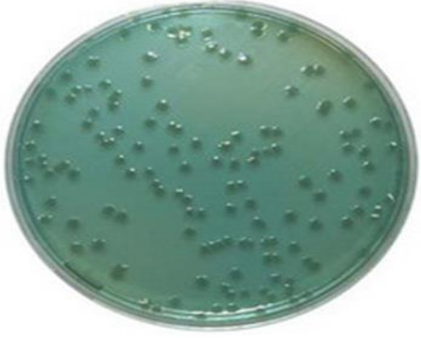
Hekton enteric agar

This media is considered a highly selective and differential media for Salmonella and Shigella containing an indicator for H_2S producing bacteria



Salmonella

Shigella

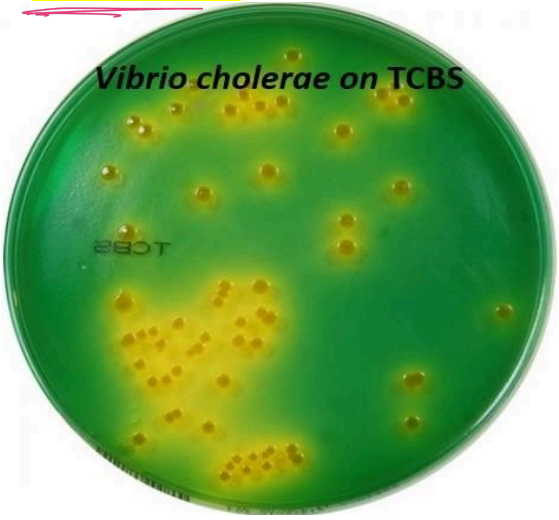


T.C.B.S media

Thiosulfate - citrate - bile salt - sucrose media

- Selective for Vibrio Spp.
- Ph (8.5-10) → alkaline → Cholera, Parahaemolyticus
- When Vibrio ferment sucrose → leading to acid production it turns the media from green to Yellow

:Mnemonic
TCBS = The Cholera Becomes Sunny
.Sunny = yellow



* 4 confirmatory biochemical tests are done after using S-S agar for salmonella ; (we use them after culturing the bacteria)

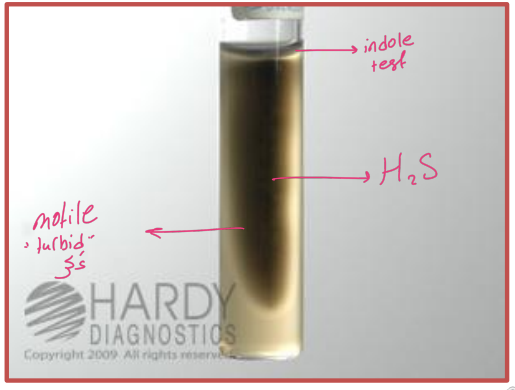
Salmonella

1. Kligler : red/Yellow + H2S

2. Urease : Negative

3. Citrate : Positive

4. SIM : Positive / Negative / Positive



Urease test → remains yellow

citrate test → from green to blue

SIM test

Proteus

- Gram negative rods , non lactose fermenter
- **Swarming motility (flagellated)** → highly motile
- Prevent swarming by culturing it on CLED or MacConkey media

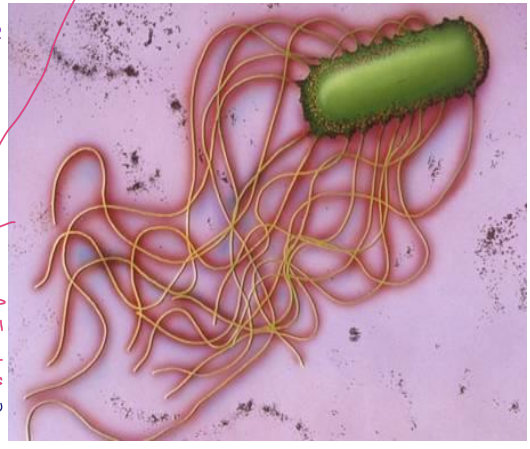
Swarming:

blood agar media

انه البكتيريا
بتعزيش حالها
(the culture results will be wrong on blood agar that's why we use other culture media)

بس نستخدم البكتيريا
بتخير تطلع colony زي باقي البكتيريا
(بتعمل قارة تعيش حالها)

في أملاح
موجودة
بالبكتيريا بتعطي
حركة السوط



جملة
بتخليني نتذكر
خصائص هاي
البكتيريا من الدكتورة:
يا أرض اهدي ما
عليكي حد قدي.
لانها انه البكتيريا بتعزيش
حالها على الـ
blood agar

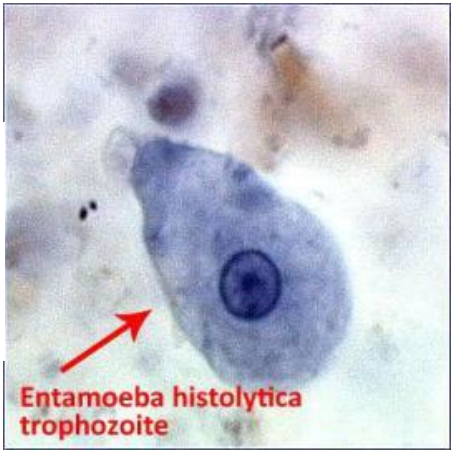
Parasites that are pathogenic to GI system

* طلع التمييز بين ال trophozoite وال cyst ،
و بين nemalode وبين cestode ، أشكال ال eggs ، إلخ ..

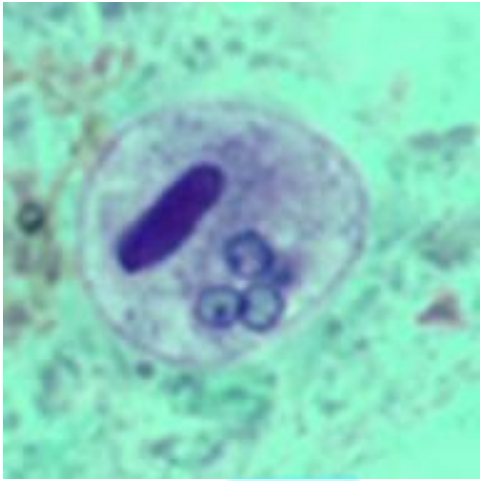
Entamoeba histolytica

Trophozoite

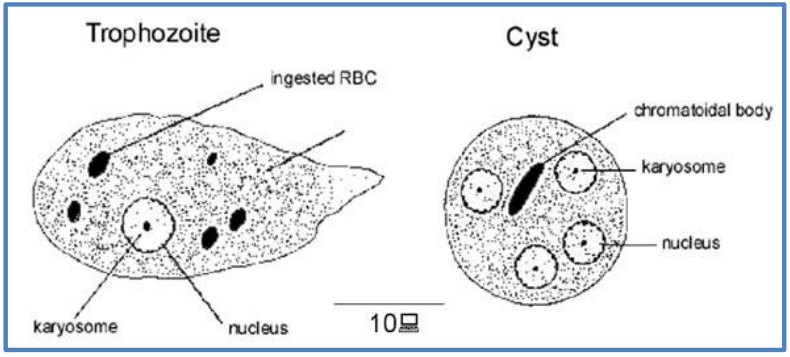
- trophozoites
  - 15-20 μm
  - extended pseudopodia
  - progressive movement



Cyst



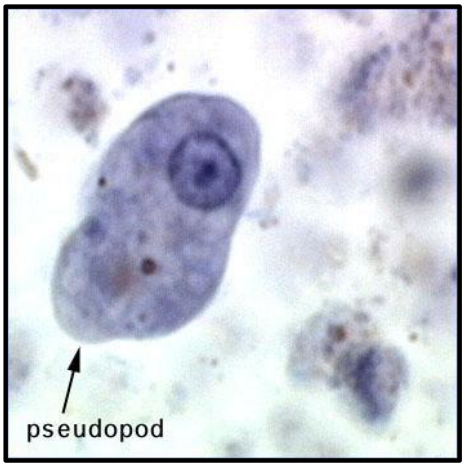
- cysts
  - 12-15 μm
  - 4 nuclei (mature)
  - blunt chromatoid bodies



Entamoeba Coli

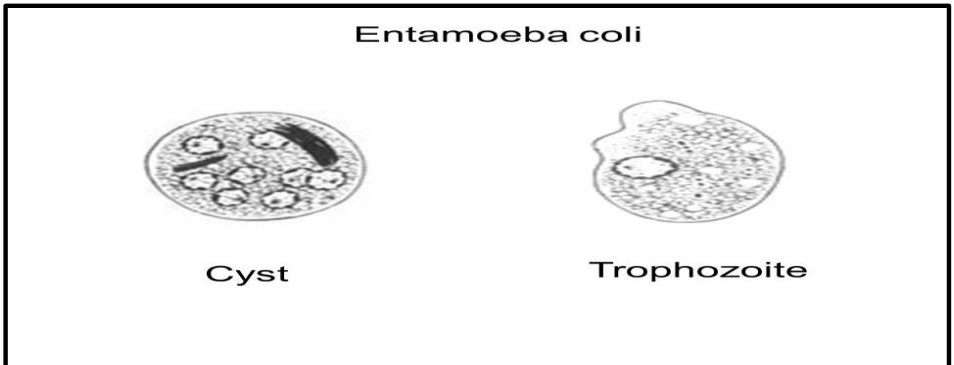
Trophozoite

- trophozoites
  - 20-25 μm
  - broad blunt pseudopodia



Cyst

- cysts
  - 15-25 μm
  - 8 nuclei (mature)
  - pointed chromatoid bodies (less prominent)

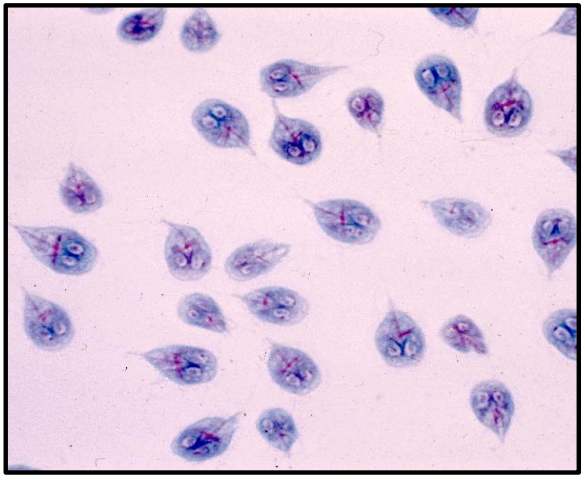


Giardia lamblia

Pear - shaped ← ال ← 2 nuclei كل العينيات

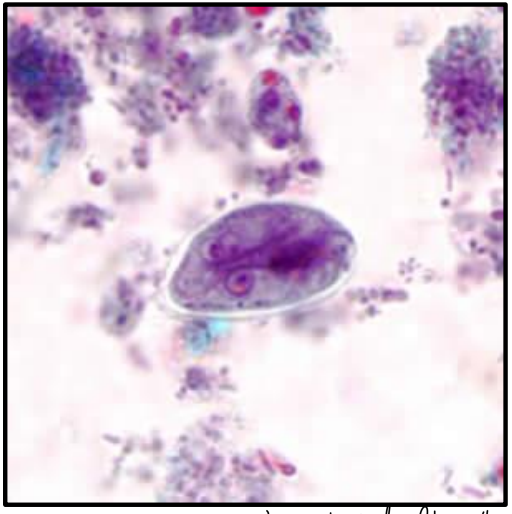
:Mnemonic
"Giardia has a "guard face

Trophozoite



ال flagella ال لـ

Cyst



↳ internal flagella

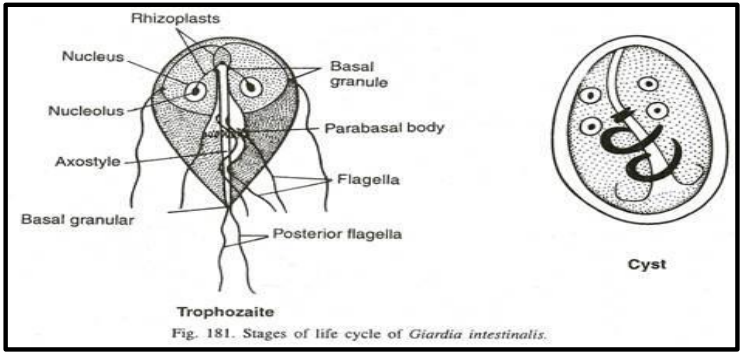


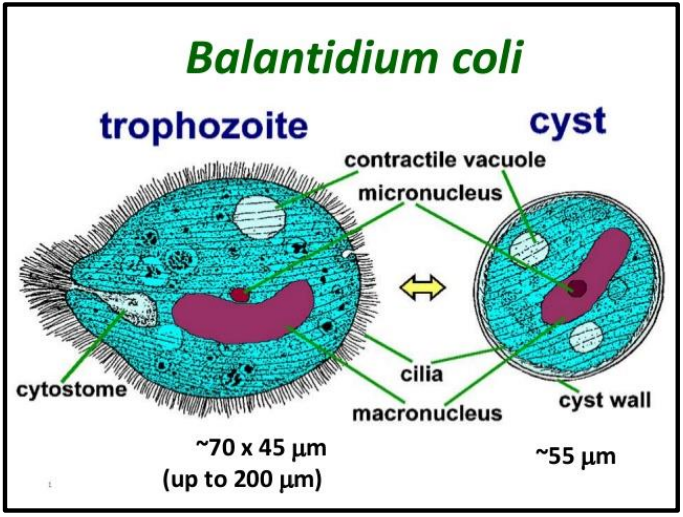
Fig. 181. Stages of life cycle of *Giardia intestinalis*.

Balantidium coli → kidney shaped nuclei

Trophozoite

أكبر من الـ cyst وبيضاوية وعليها cilia
Ciliated

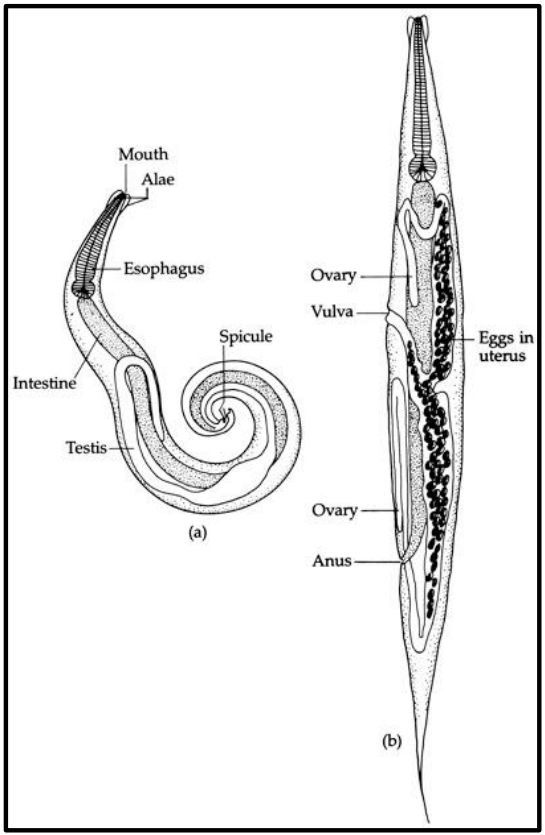
Cyst



Enterobius Vermicularis (Nematode)

↳ Pinworm

Worm



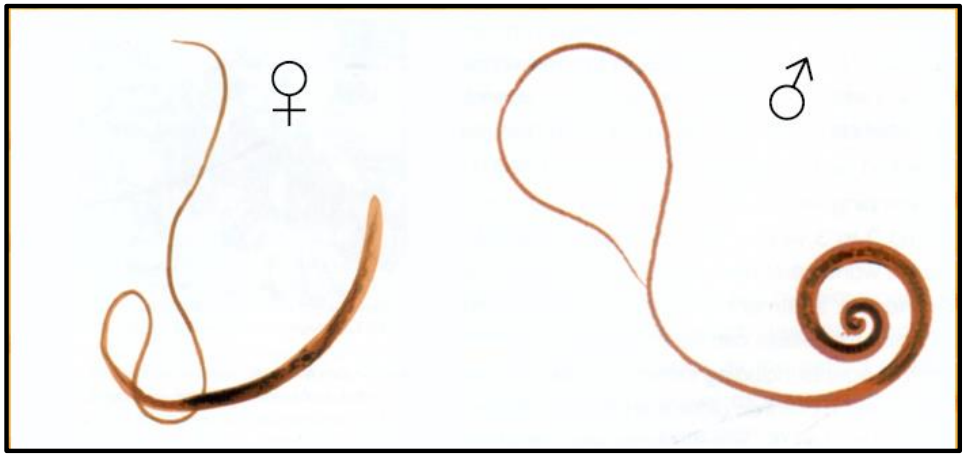
Egg

↳ D-Shaped (capital letter D)

Trichuris Trichiura (whipworm)

↳ nematode

Worm



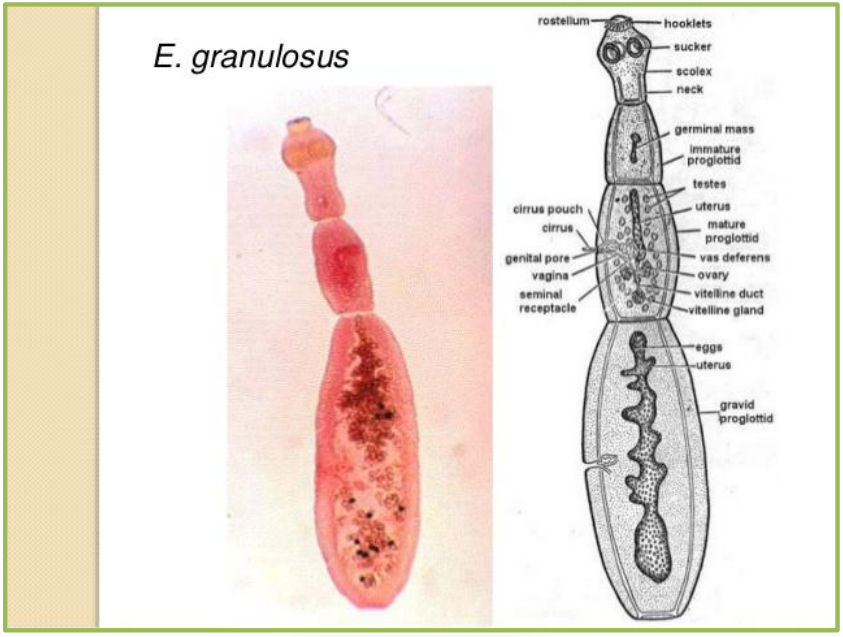
Egg

بتشبه العينة
or barrel-shaped

Echinococcus granuloses (cestode)

لـ بتكون عبارة عن قطع

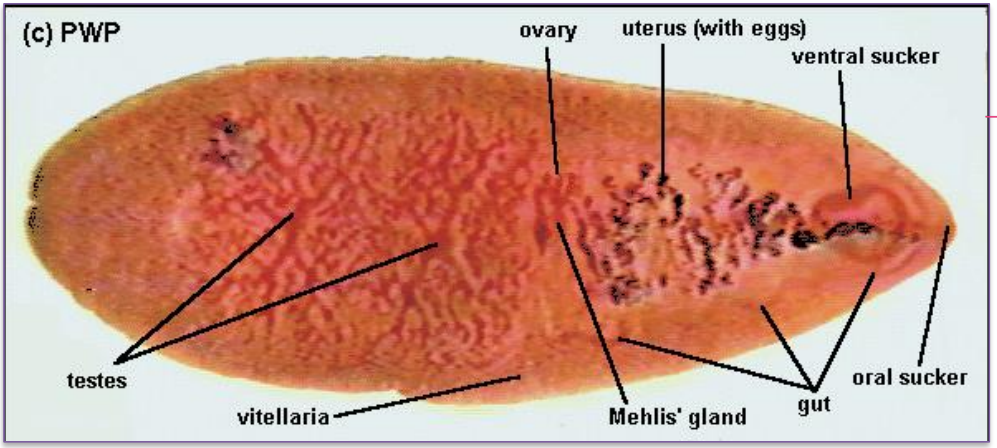
Ova



Worm

fasciolosis buski (Trematode)

Worm



التفاصيل
مش مطلوبة
بس مطلوب
تعرف الشكل

Trematode / fluke.

worm: flat leaf-like worm شكل.

Egg: oval كبير.

كيف أعرفه بالصورة؟

إذا شفتِ worm عريض ومسطح مثل ورقة → trematode/fluke.

egg

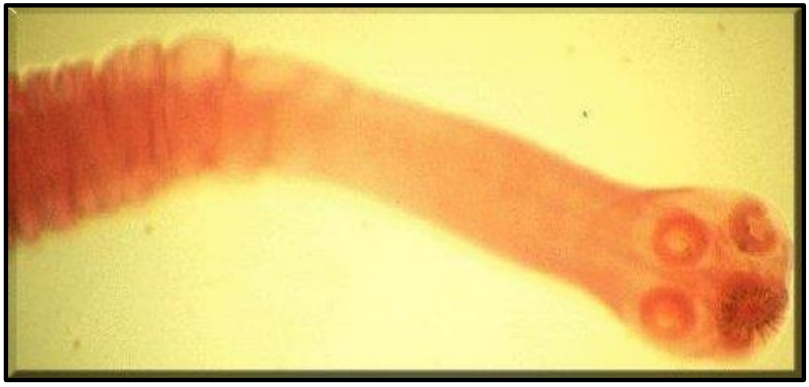
~~Worm~~

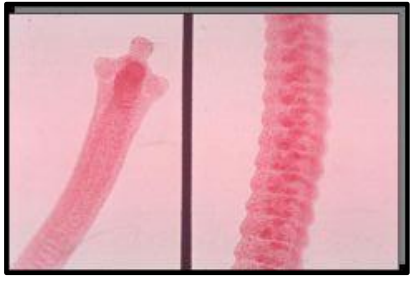
* bile – Stained egg with an operculum *

lid / غطاية

(operculum)

Hymenolepis Nana (Cestode)





Ova

Worm

* note: the doctor didn't explain in details, but this is an external explanation to make memorization easier:

Dwarf tapeworm / Cestode.

Egg

أهم علامة: egg فيه polar filaments.

كيف أعرفها بالصورة؟

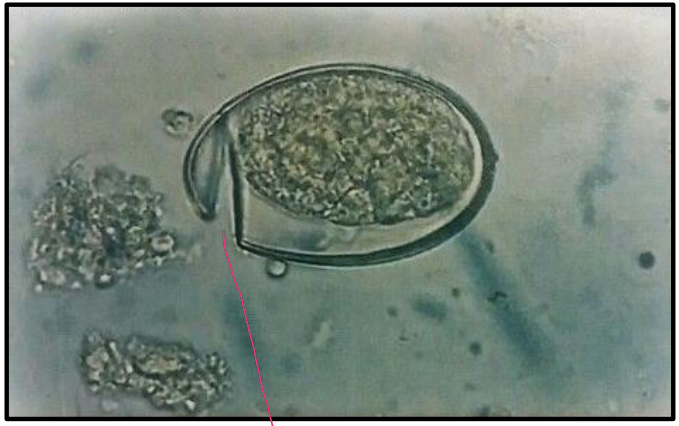
بيضة دائرية/بيضاوية وبداخلها oncosphere ومعها خيوط من القطبين ← Hymenolepis nana.

Mnemonic:

H. nana has hair-like filaments.

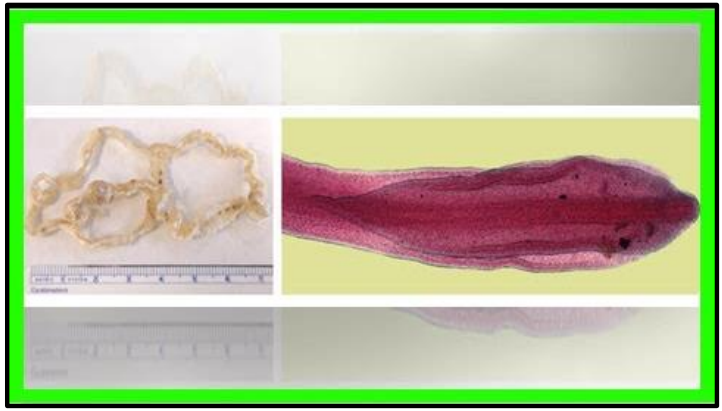
Diphyllobothrium latum(Cestode)

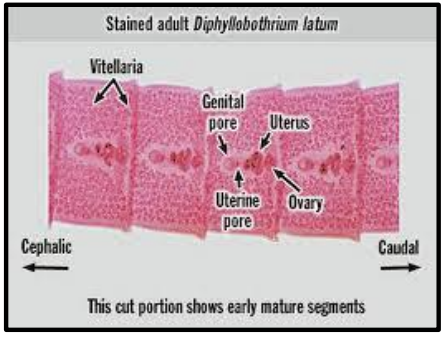
→ fish tapeworm



just to remember:
fish mouth like egg

Egg

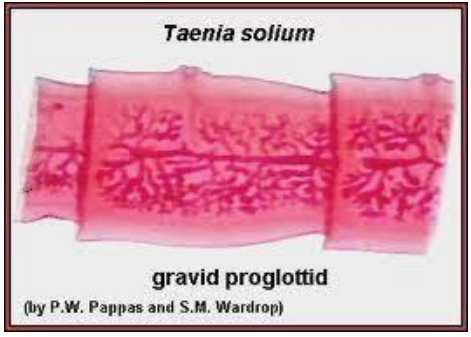




Worm

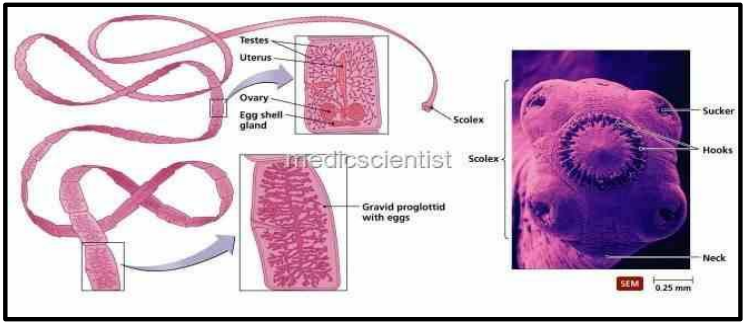
Taenia solium (Cestode)

→ Pork meat

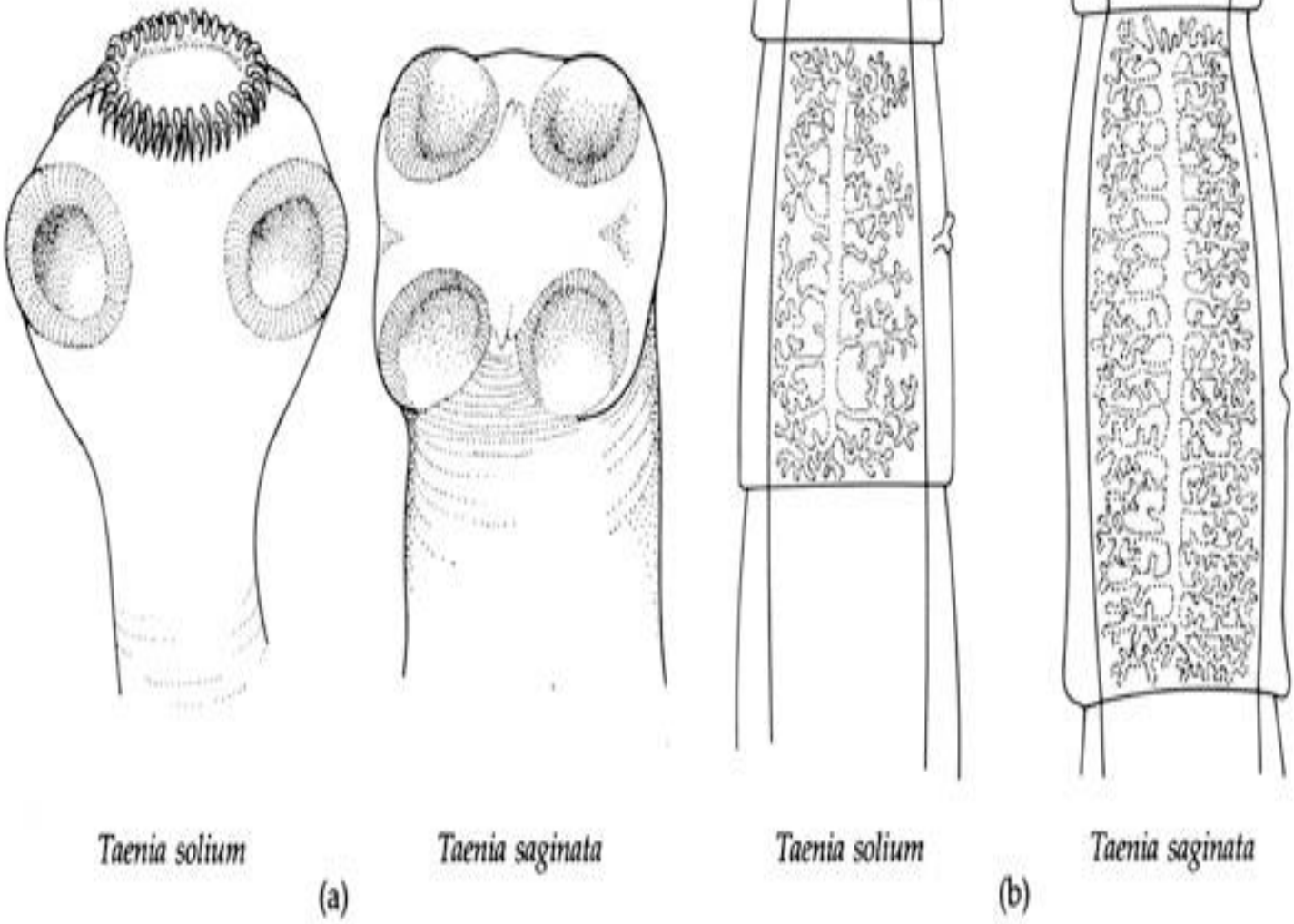


Taenia saginata (Cestode)

↳ beef meat

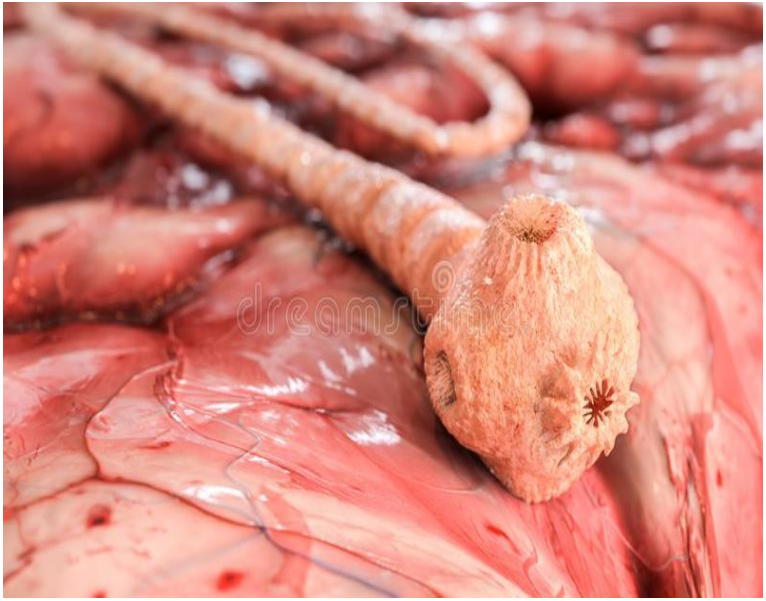


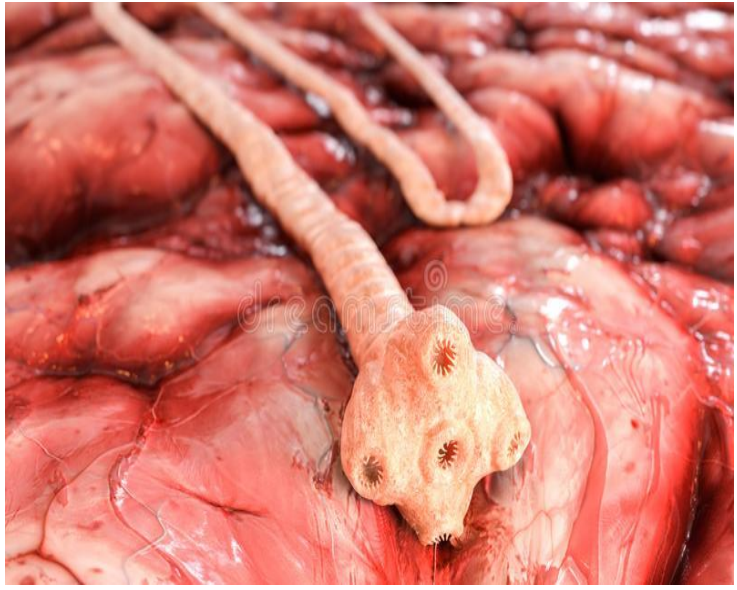
لا مهم تعرف الفرق بينهم :



Taenia Solium

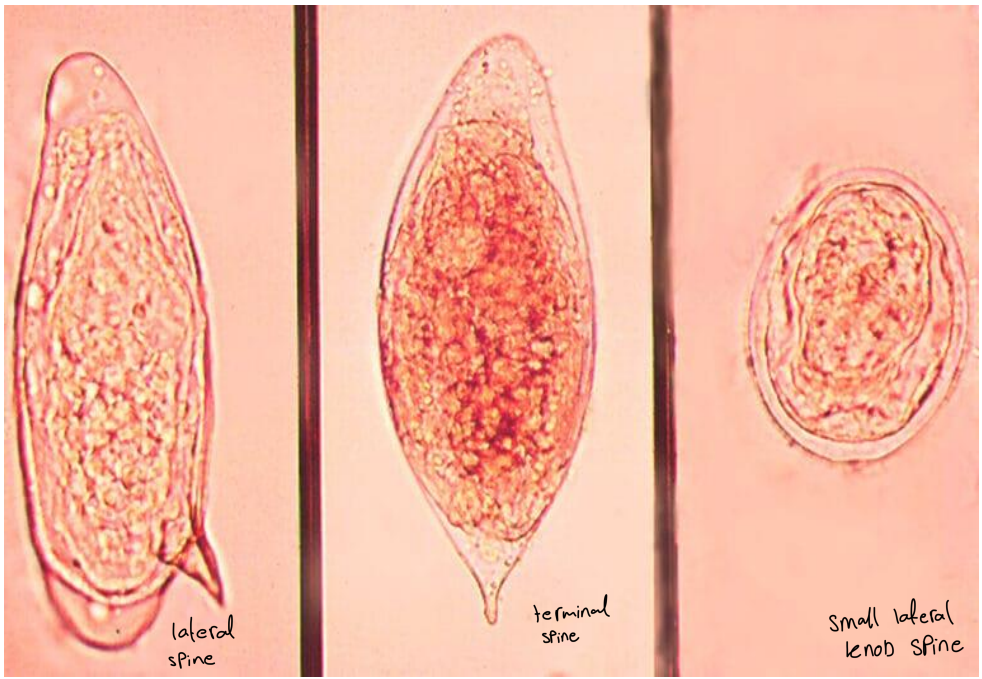
Taenia saginata





Schistosoma (Trematode)

* They differ in their spine location:



Schistosoma mansoni (stool)

Schistosoma haemotobium (urine)

Schistosoma japonicum (stool)

→ معم البراز