

Stool examination

Collection of sample

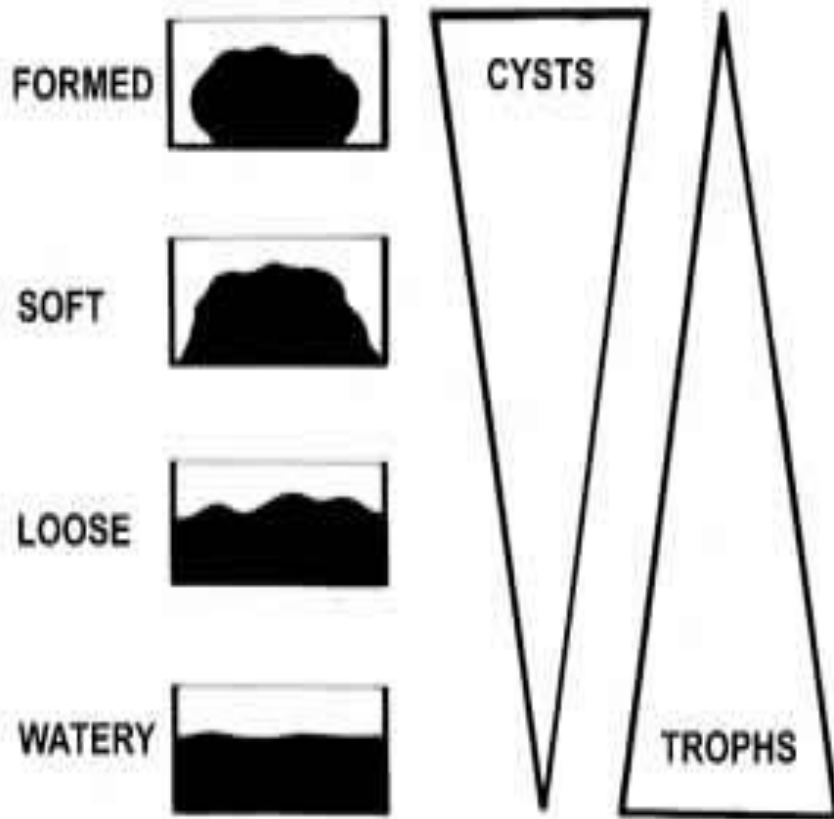
- Wide mouth container with spoon before starting antiparasitic drugs
- Frequency : if first sample is negative, 3 consecutive samples on alternate days
- Time to examine :
 - Liquid – 30 min
 - Semisolid – 1 hour
 - Solid – same day



Parasites can be present in stool

- Macroscopic :
 - Worms or segments
- Microscopic :
 - Motile: Trophozoites, larvae
 - Non motile: Cysts, Ova (egg)

Gross Examination



- Consistency
- Mucus
- Blood
- Pus
- pH
- Large parasites

Blood in stool

- E.histolytica
- B.coli
- Schistosoma
- T.trichiura (severe)
- Hookworm (Occult blood)

Parasites found in gross examination

- Adult worms
 - *A.lumbricoides*
 - *E.vermicularis*
 - *F.buski*
- Segments
 - *Taenia*
 - *D.latum*

Microscopic examination

- Wet examination
 - Saline preparation
 - Iodine preparation
 - After concentration technique
- Stained preparation
 - Trichrome stain
 - Modified Z-N stain

Wet preparation

- Saline preparation
 - Eggs, larvae & protozoal trophozoites
 - Characteristic motility of trophozoites is seen
 - Used to differentiate bile stained & non-bile stained eggs
- Iodine preparation
 - Kills organism so motility is lost
 - Stains glycogen & nuclei – mainly used for cyst
 - Difficult to differentiate bile & non-bile stained eggs

Wet Preparation

12-C THE ATLANTA CONSTITUTION, Thu

Unfurn. Apts., Duplexes 635	Unfurn. Apts., Du
MANHETTA— New duplex, 2 BR, 1 1/2 ba. fully equipped, dishwasher, disposal, washer, dryer, full attic, \$225 month. Fannie McElreath, 252-6793 weekdays, after 5:30, weekends, 67-8011	Mablet Villag
Unfurn. Apts., Duplexes 635	1- AND 2 BR. — A.A. shag carpet, total elec Adjacent to Hawthorn Center. 948-6459
What Makes Quail Creek Quail Creek?	MT. LEON APTS. — 1 Rd. N.E., 2-BR, carpet

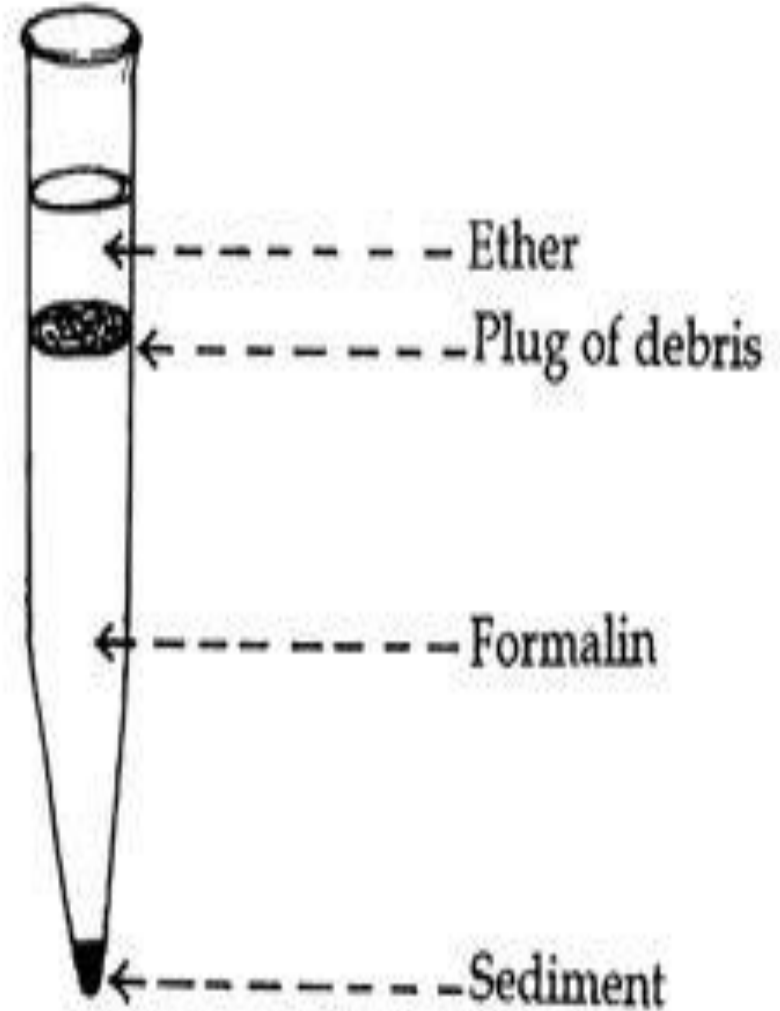
Concentration method

- Sedimentation technique
 - Formal-ether technique
- Flootation technique
 - Saturated sodium chloride method
 - Zinc sulfate method

Formal – ether technique

- Mix 1 gm of stool – 10 ml of 10 % formal-saline – left for 10 min
- Strained through wire gauze or gauze piece in centrifuge tube
- Add 3 ml of ether to filtrate
- Centrifuge at 2000 rpm for 2 min
- Allow to settle, debris is removed with wire
- Decant supernatant fluid with debris
- Make cover slip preparation from deposit
- Count the number of eggs

Formal ether sedimentation technique

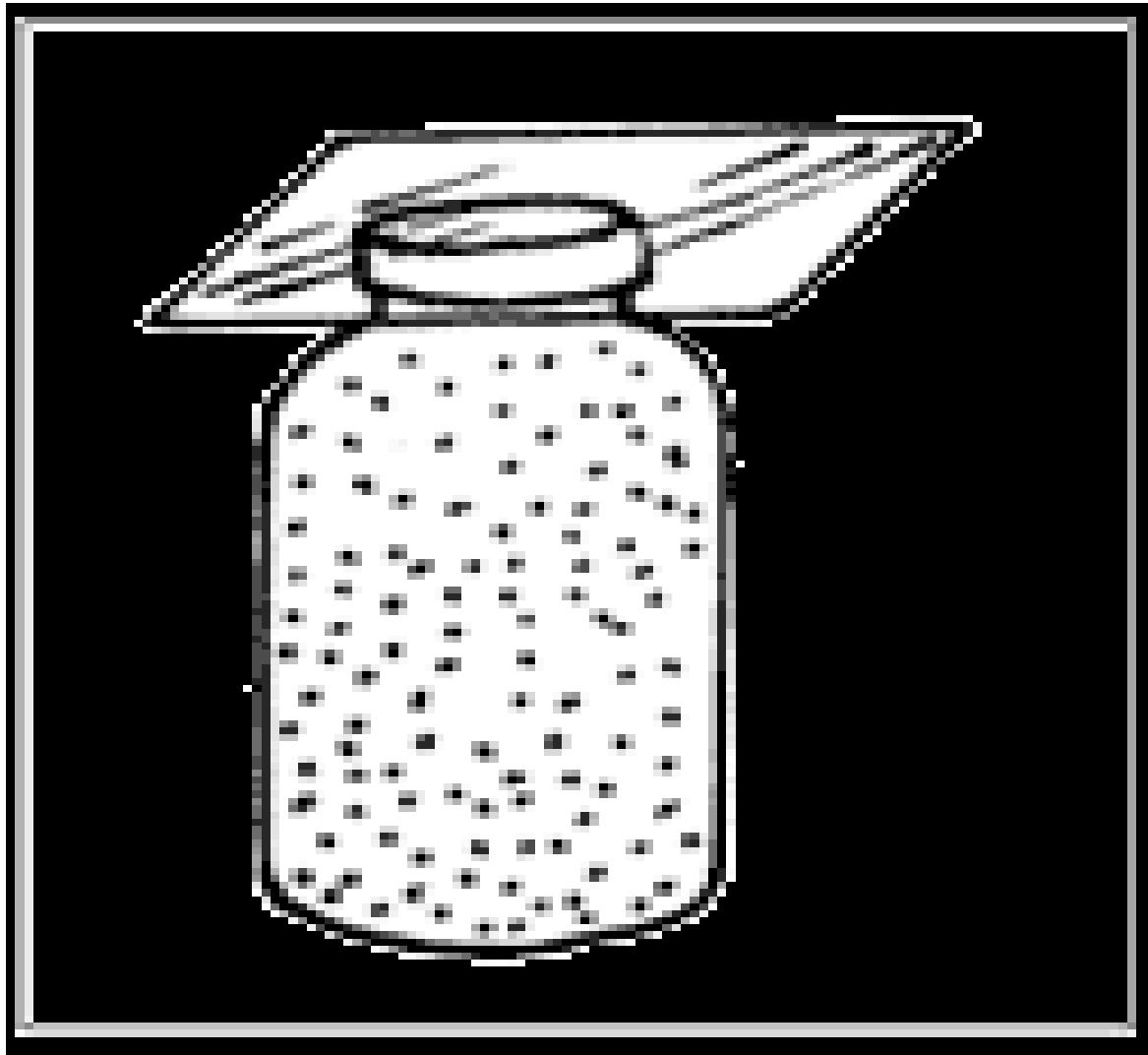


Flotation technique

- Using a solution having greater density than eggs and cysts so that remain float when suspended and kept in medium for some time
 - Saturated salt solution
 - Zinc sulphate (Zenker's)
 - Sucrose solution (Sheather's)

Saturated sodium chloride technique

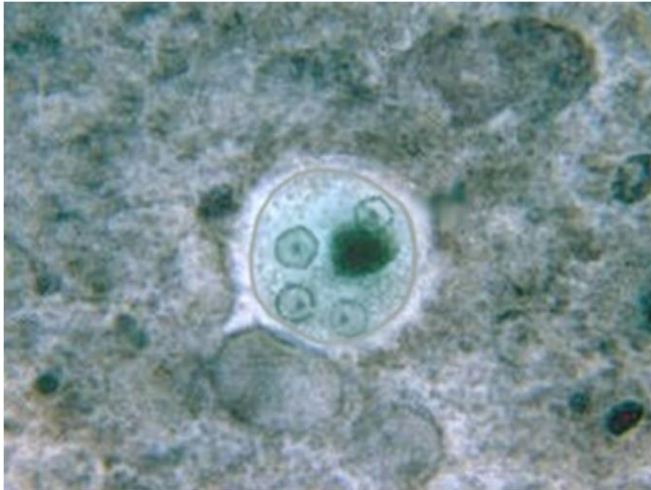
- 1/4th of a 25 ml test tube is filled with saturated salt solution
- Add 1 gm of stool
- Mix and add more salt solution
- Tube is kept in vertical position – any debris collected on top is removed
- Tube is filled up to top (rim of tube)
- Cover slip is placed over it so that it is in contact with fluid
- Preparation is allowed to stand for 30-40 min
- It is lifted carefully by a straight pull upwards and placed on a slide face downwards
- Examine & count number of eggs



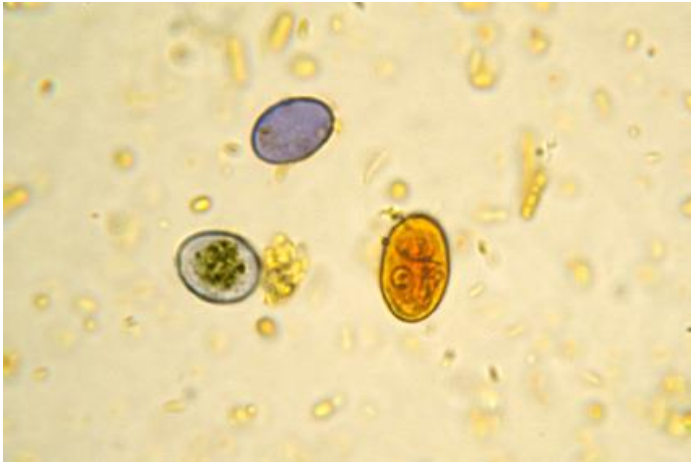
Protozoa found in stool

- Trophozoites & cysts
 - E.histolytica
 - G.lamblia
 - B.coli
- Oocysts
 - Isospora
 - Cryptosporidia

Protozoal cyst

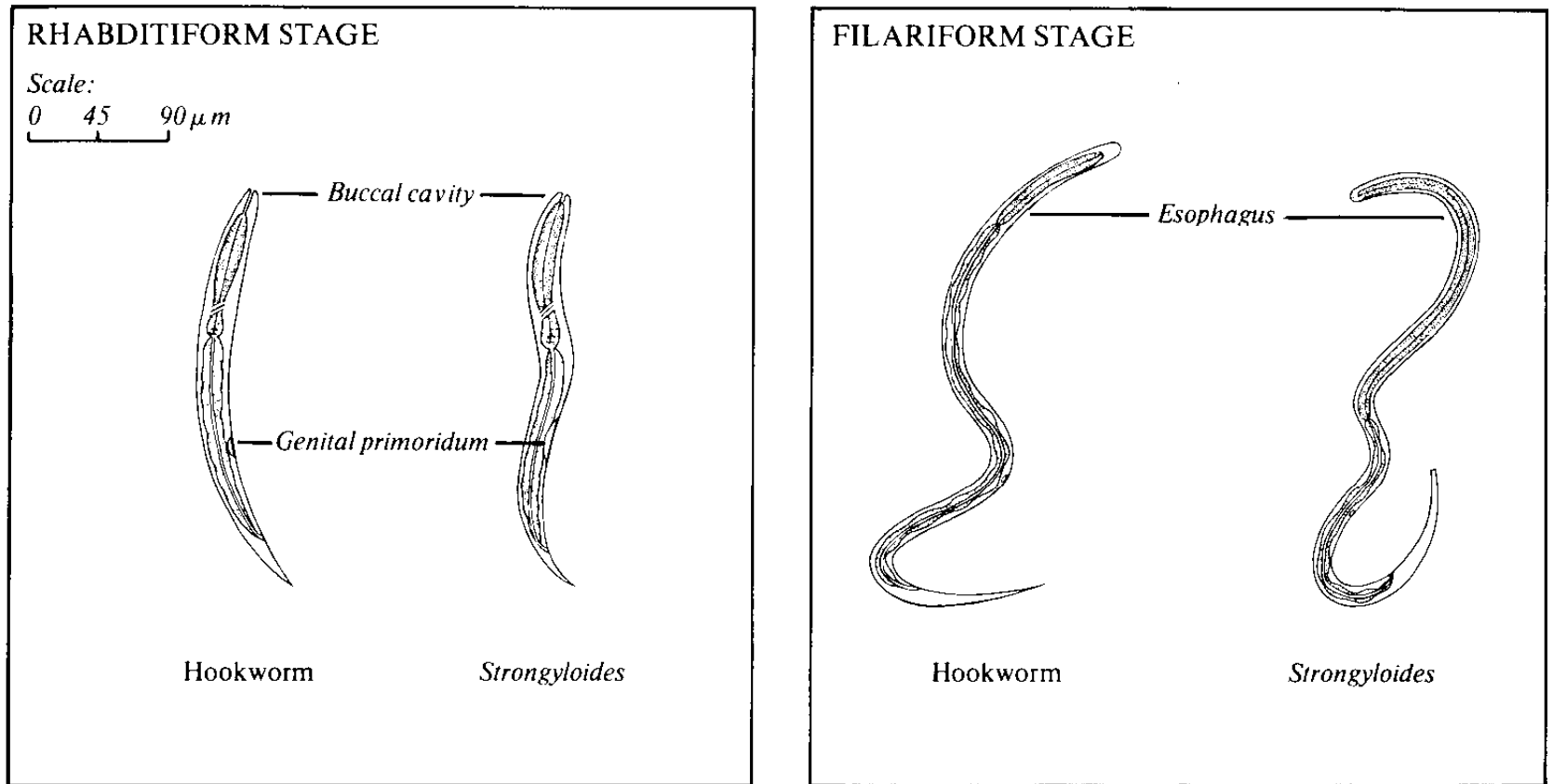


Protozoa



Larvae of helminths

Figure 7
HOOKWORM AND STRONGYLOIDES LARVAE



Cestode eggs

- *D.latum*
- *Taenia*
- *H.nana*

Cestode eggs found in stool



Cestode eggs

Operculated
D.latum

Hexacanth embryo
Taenia
H.nana

Bile stained

Non-bile stained

Taenia

H.nana

Trematode eggs

- *Schistosoma mansoni*
- *Schistosoma japonicum*
- *Fasciola hepatica* / *Fasciolopsis buskii*
- *C.sinensis*

Common features of trematode eggs

- Bile stained
- Does not float in saturated salt solution
- Operculated except schistosoma

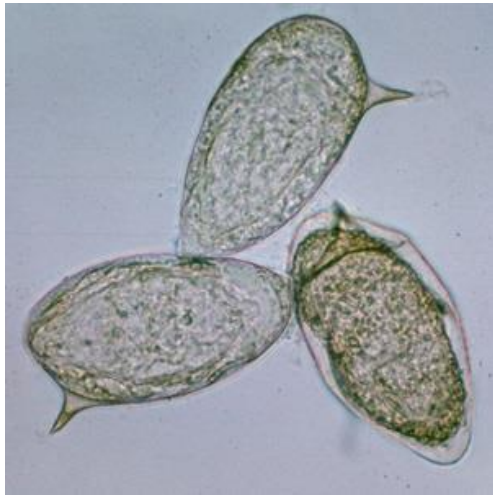
Trematode eggs found in stool



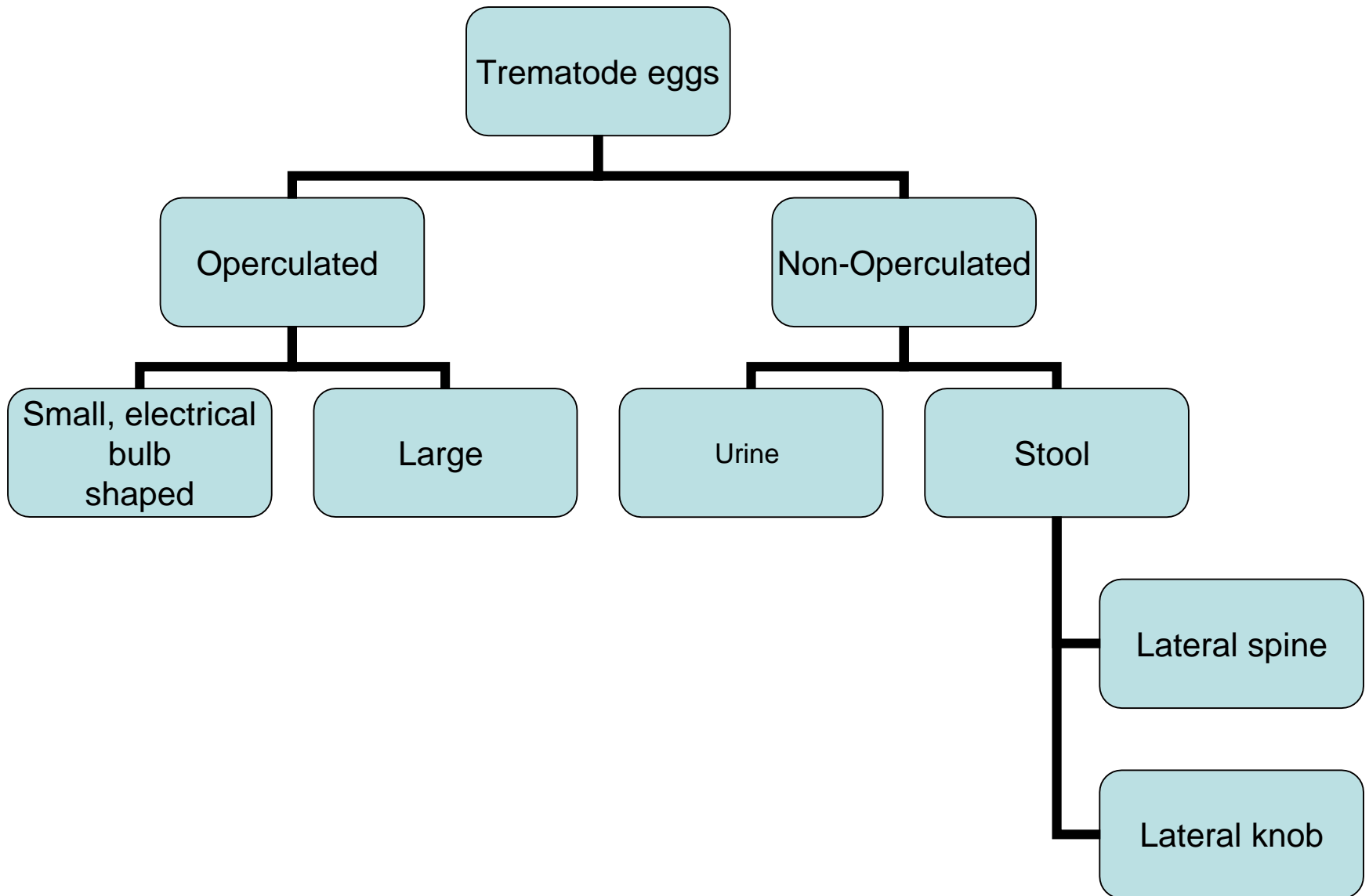
Figura 3. Huevo de *Clonorchis sinensis*, se observa el opérculo en un extremo y la prominencia al otro.



Non-operculated eggs



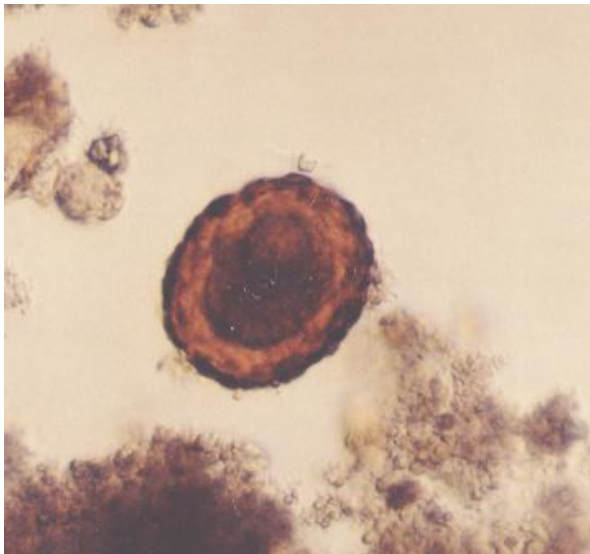
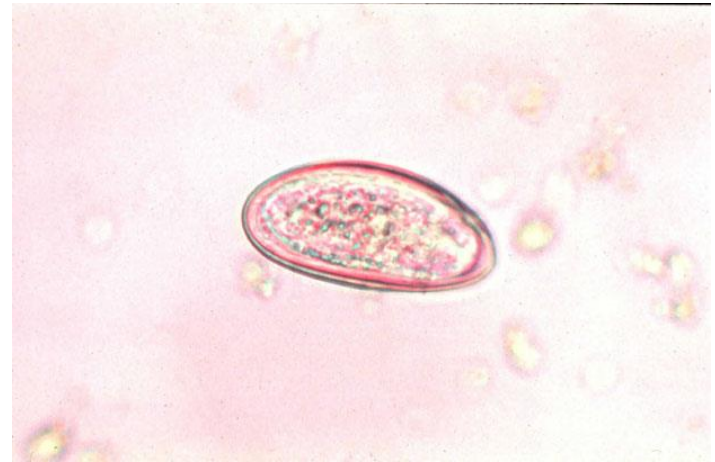
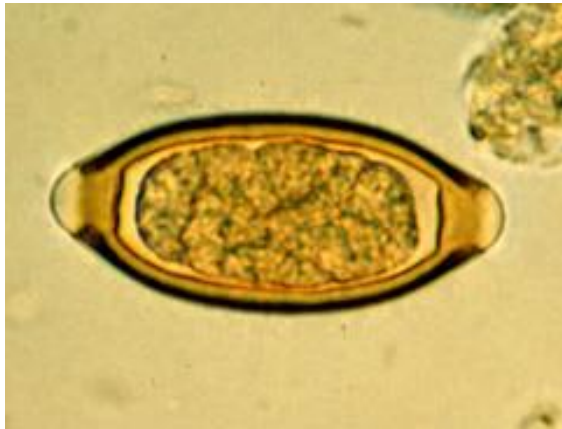
All does not float in saturated salt solution



Nematode eggs

- *A.lumbricoides*
- *T.trichuria*
- *A.doudenale*
- *E.vermicularis*

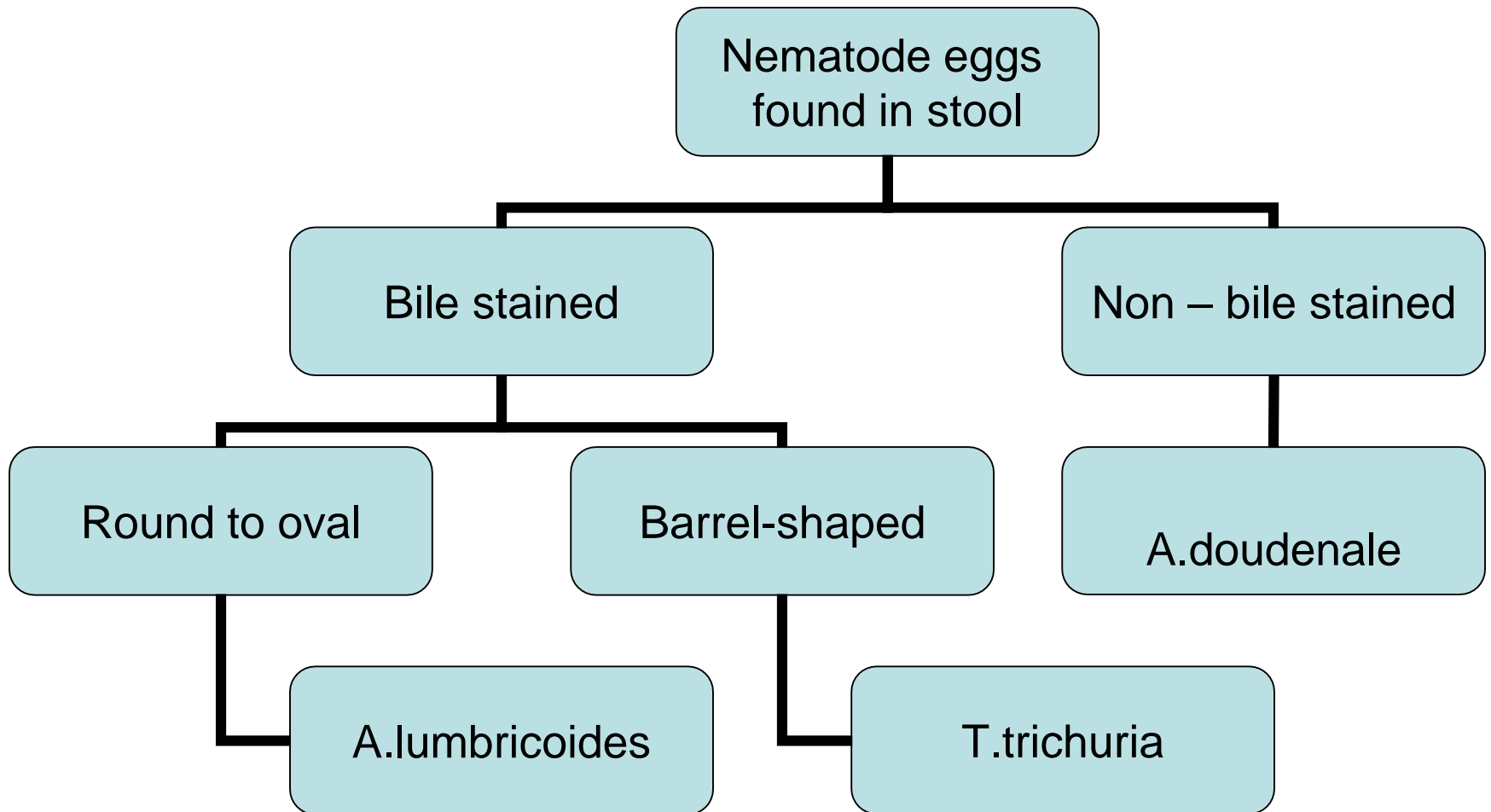
Nematode eggs



Nematode eggs

- All float in saturated salt solution except
 - Unfertilized egg of *A.lumbricoides*
- Bile stained
 - *T.trichuria*
 - *A.lumbricoides*
- Non bile stained
 - *A.doudenale*
 - *E.vermicularis*

All float in saturated salt solution except unfertilized egg of *A.lumbricoides*



Stoll's egg counting technique

- Add 3 gm of faeces + 42 ml of water (1:15 dilution) in a rubber stopper glass tube
- Close tube & mix thoroughly
- 0.15 ml of suspension is placed on a slide, cover slip is applied and all eggs present on slide are counted microscopically
- The numbers are multiplied by 100 – to give number of eggs / gm of faeces
- Multiplication factor :
 - Semi formed – 2
 - Unformed watery – 4
 - unformed soft – 3
 - fluid - 5

Stoll's egg counting technique

- Mainly used for
 - Ascaris
 - Trichuris
 - Hookworm
- To know worm burden or severity of condition
- As per WHO, it is considered as severe if
 - Ascaris - >50 000 eggs/gm
 - Trichuris - >10 000 eggs/gm
 - Hookworm - > 4000 eggs/gm