

Parasitic Infection of the Renal System Practical session

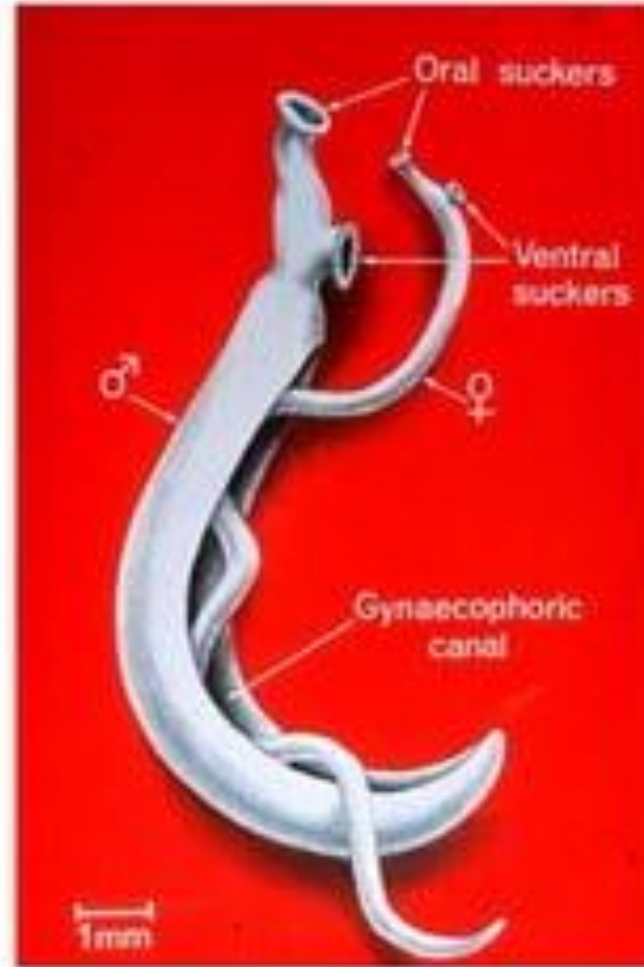
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1. Schistosoma haematobium

- Causative trematode :	<i>Schistosoma haematobium</i> (Blood fluke)
- Geog. Dist.	Africa, South America, Middle East, Turkey, Southern Europe and India.
- Definitive host: - Habitat:	Man. Adults → Portal veins. Oviposition → Vesical submucosal venules.
- Intermediate host:	<i>Bulinus truncatus</i> (freshwater snail)
- Mode of infection:	Cercariae penetrate the skin or buccal mucous membrane during contact with infected water or with drinking.

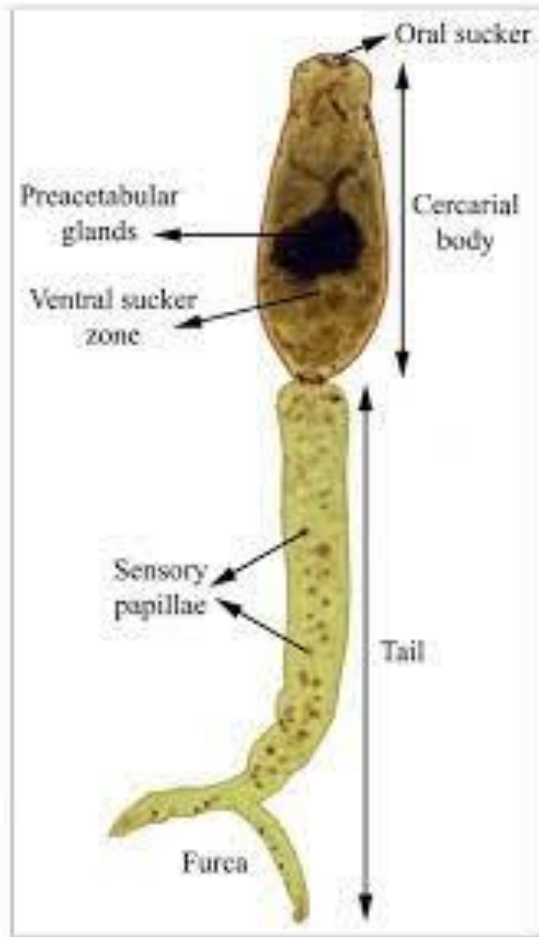
Schistosoma haematobium adult worm



Morphology

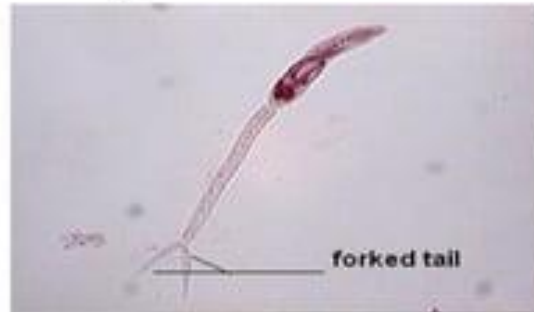
- Adult worms are 10 to 20 mm long
- Schistosomes have separate sexes
- the male has a canal in which the slender female worm resides

Schistosoma spp (cercaria stage)



Infective Stage

- *Schistosoma cercaria* (forked tail).
- Found in fresh water.
- Penetrate the skin of human upon contact with water containing it.



Schistosoma haematobium

EGG

Ovoid non-operculated



Gravid worm has
20-30 eggs in
uterus at a time &
realises **300**
Eggs/day

With a brownish yellow
transparent shell
carrying terminal
spine at one pole



2. *Enterobius vermicularis* **(Pin worm, Seat worm, Family worm)**

Habitat:	Large intestine mainly caecum, colon, rectum and appendix
Final host	Human specially children
Infective stage	embryonated eggs containing fully developed larvae.
Mode of infection:	<ul style="list-style-type: none"> ➤ Ingestion of eggs through contaminated food and drink or hand to mouth via handling contaminated articles as clothes, bed linens, toilet seats, doorknobs. ➤ Autoinfection (external): eggs are carried under fingernails to the mouth. ➤ Internal autoinfection (Retro-infection): eggs hatch on the perianal region and larvae migrates back through the anus to the rectum and caecum. ➤ Air-borne infection: inhalation of infective eggs
Diagnostic stage:	Fully embryonated eggs containing fully developed larvae.

Enterobius vermicularis

Morphology (the worm)

Shape: round

Color: white

Size:

Females: 8 to 13 mm long

males: 2 to 5mm long

posterior end:

Tapered in females

curved in males

anterior part(cervical alae):

found in both male and female worms



female



male

Eggs of *E. vermicularis*

E. vermicularis are oviparous worms

Shape: D shaped

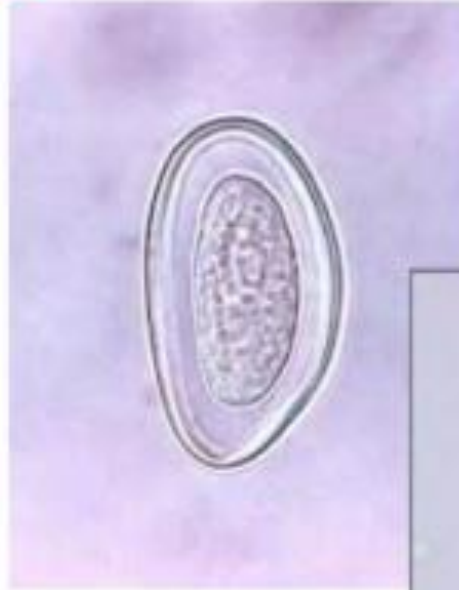
Size: 50- 60 x 20-30 μm

Color: colorless

Shell: thin

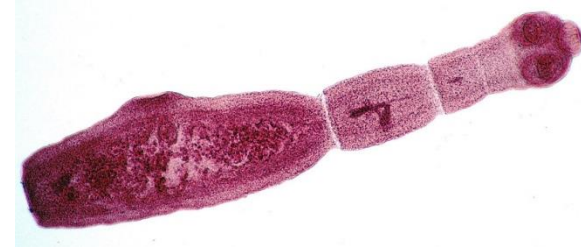
Contents:

- Single cell (immature egg) or
- Larva (mature egg)



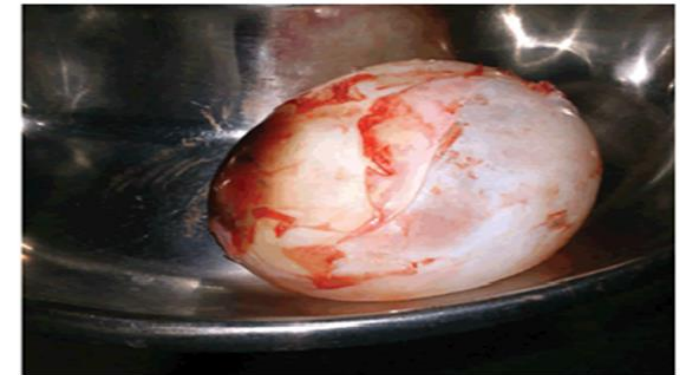
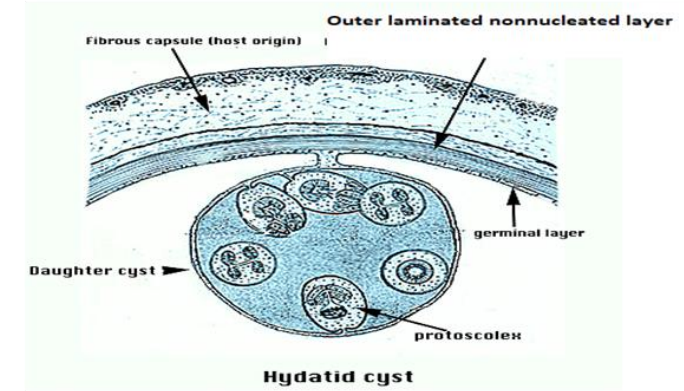
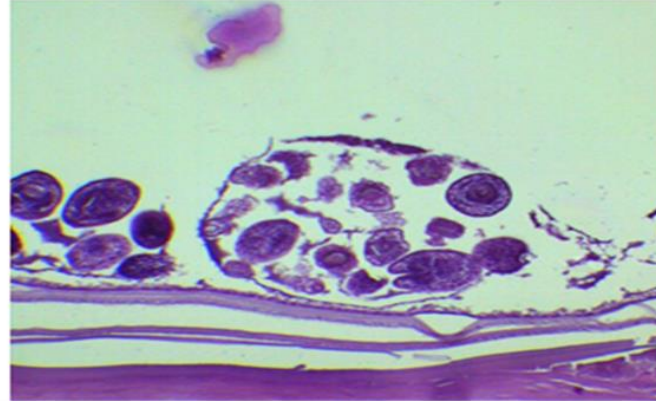


3. Hydatid cyst



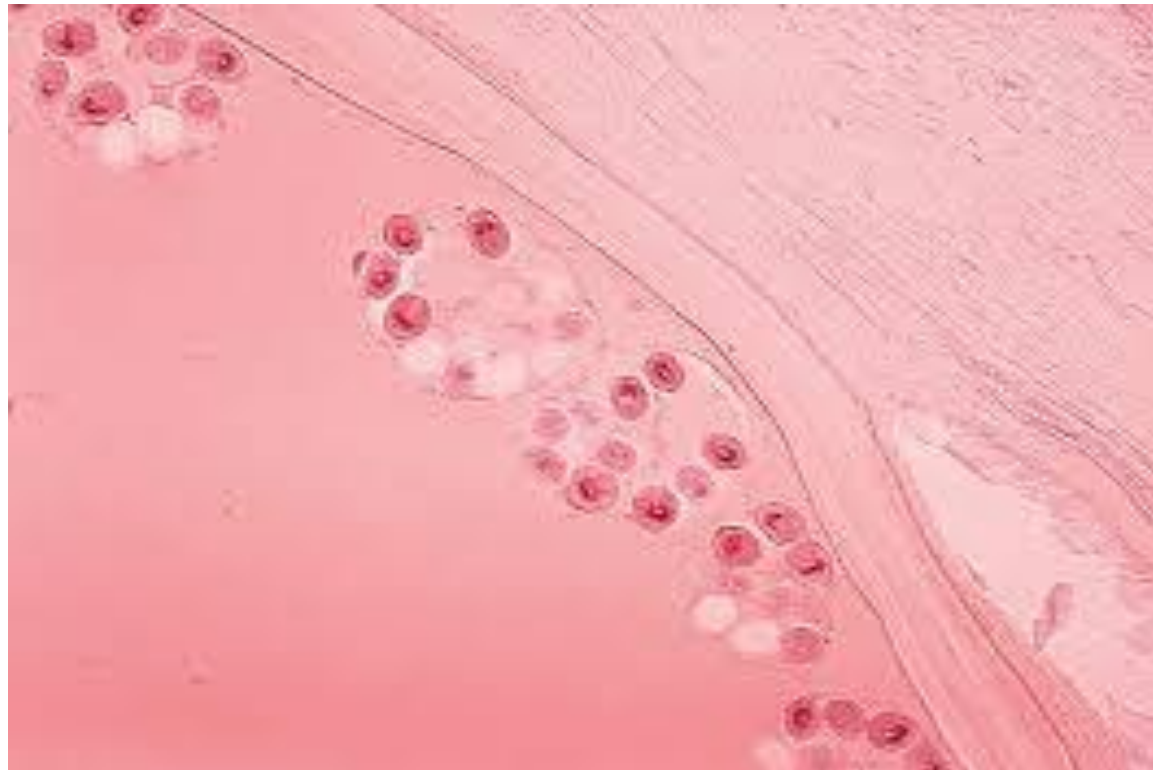
Causative parasite:	<i>Echinococcus granulosus</i> (cystic or unilocular hydatid cyst) <i>E. multilocularis</i> (alveolar or multilocular hydatid cyst).
Geog. Dist.	<i>E. granulosus</i> : Cosmopolitan specially sheep-herding areas <i>E. multilocularis</i> : Europe, Asia, North America, Russia.
Definitive host	<i>E. granulosus</i> : dogs <i>E. multilocularis</i> : foxes, dogs, cats, wolves
Habitat	Small intestine of definitive host
Intermediate host	<i>E. granulosus</i> : Herbivorous animals, man (blind intermediate host) <i>E. multilocularis</i> : Rodents , accidentally man

- Cyst has a well-defined outline.
- Varying in size from 1-10 cm and its diameter may reach 20 cm
- Spherical in shape surrounded by fibrous capsule.
- Opaque-white in color
- Composed of an outer laminated non-nucleated layer and an inner germinal layer.
- Filled with pale yellow fluid called hydatid fluid.



Hydatid Cyst

- Scolices and broad capsules are attached to or detached from the germinal layer.

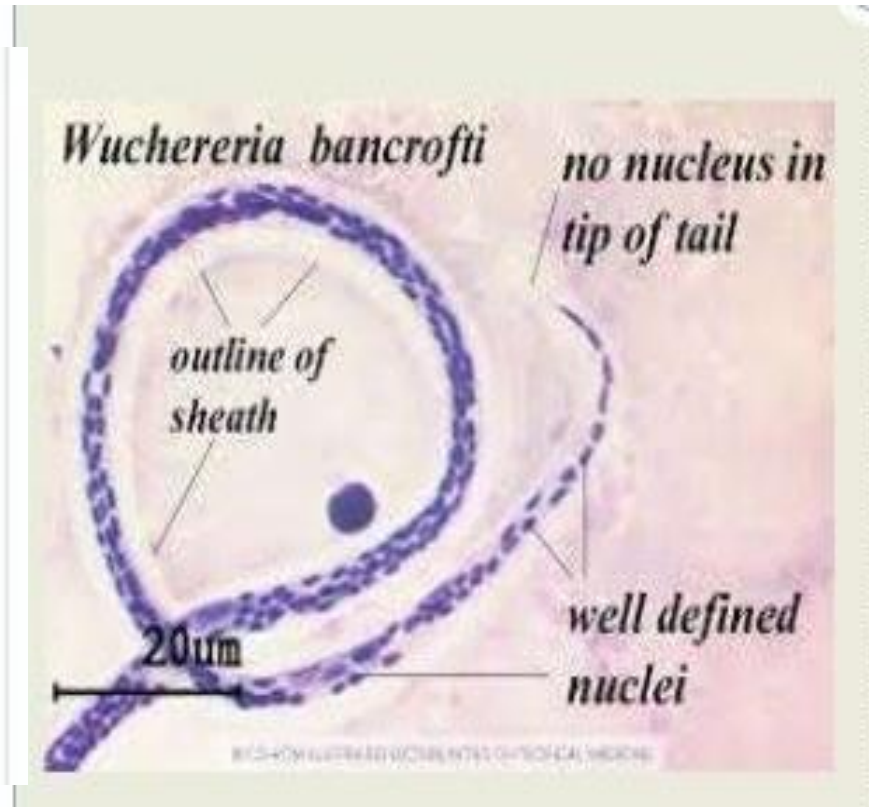


4. Wuchereria bancrofti

Definitive host:	man
habitat:	Adult in lymphatics mainly of the lower limb Microfilaria in peripheral blood (nocturnal) or pooled in the lung
Intermediate host:	Mosquitoes
Mode of infection	Bite of mosquitoes harboring
infective stage:	Third-stage larvae (filariform larva, embryofilaria)

4. *Wuchereria bancrofti* microfilariae

- 244- 296 μm by 7.5- 10 μm
- Nuclei not reaching tail end
- No terminal nuclei
- Nuclei regularly spaced, dispersed
- Bigger, wider than *B. Malayi*
- Graceful sweeping curves
- Short head space (as long as broad)
- Sheath unstained with Giemsa
- Bluntly rounded anteriorly and pointed caudally

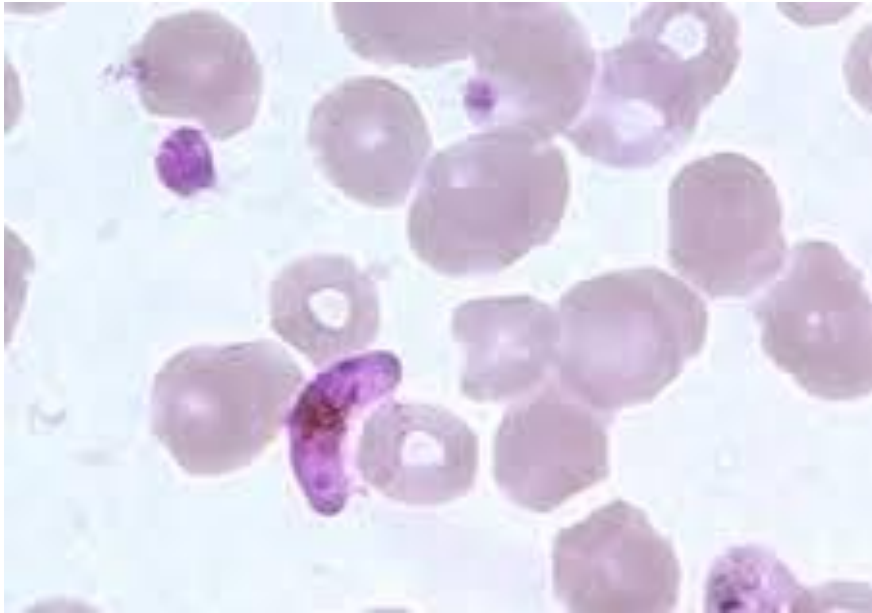


***Wuchereria bancrofti* microfilariae**

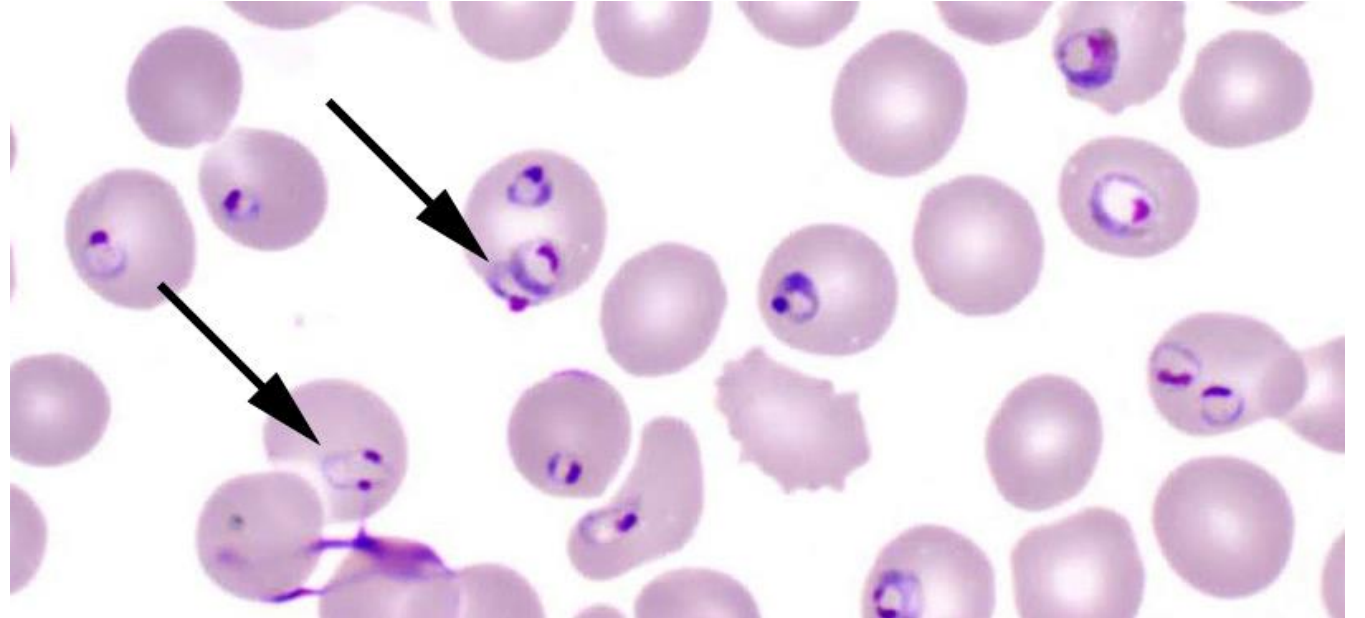


5. Malaria

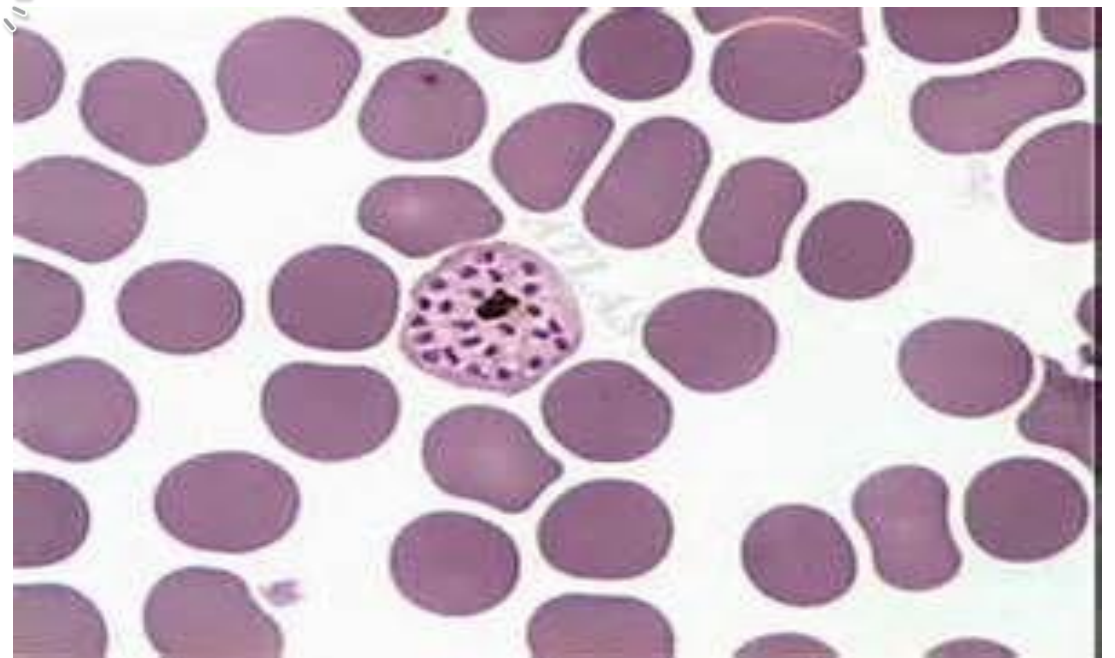
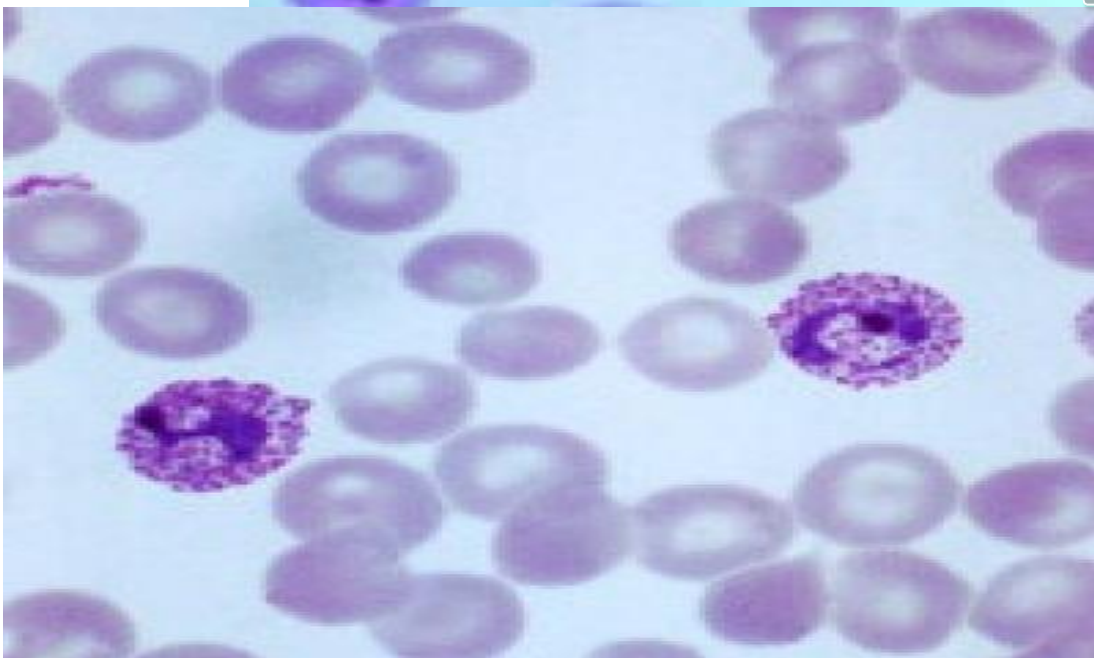
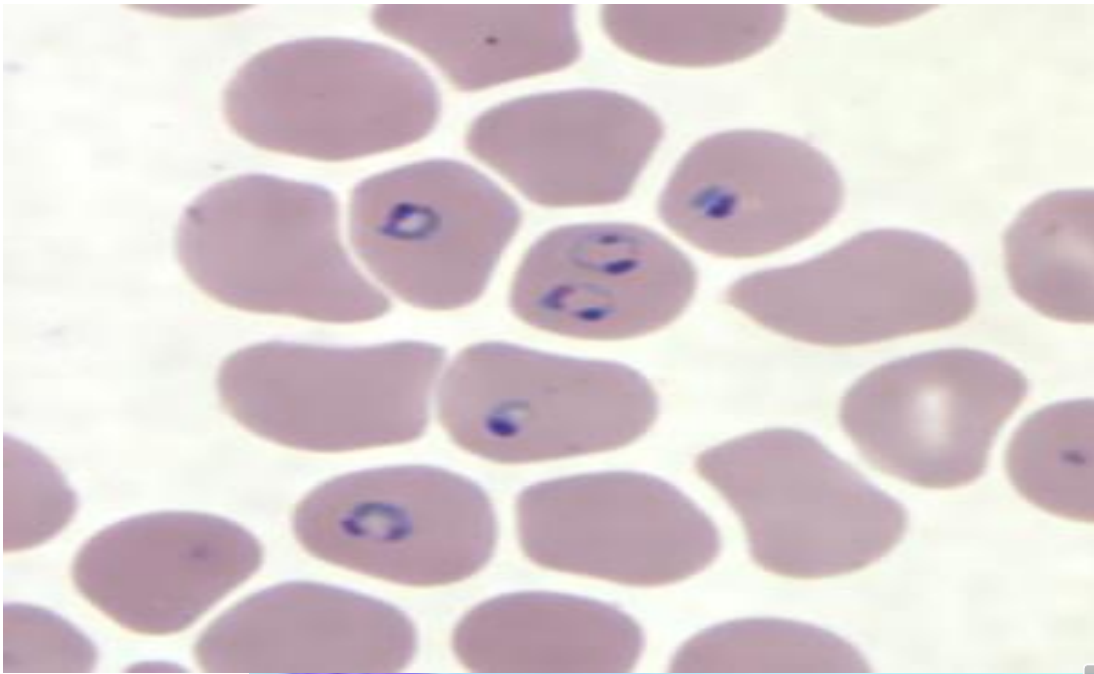
Causative protozoa :	<i>Plasmodium vivax</i> , <i>Plasmodium ovale</i> , <i>Plasmodium malariae</i> , <i>Plasmodium falciparum</i>
Geog. Dist.	Tropics and subtropics.
Definitive host:	Man
Habitat:	Liver cells and R.B.Cs
Infective stage:	➤ Sporozoites
Diagnostic stage:	➤ blood stages.
Mode of infection:	1. Through the bite of female Anopheles mosquitoes . 2. blood transfusion 3. Congenital transmission.



Plasmodium falciparum
gametocyte stage

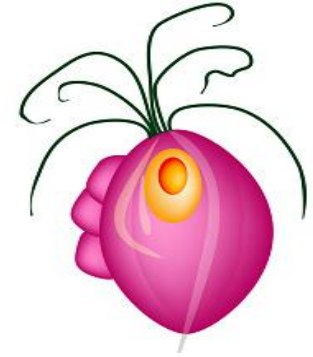


Plasmodium falciparum
ring stage



6. *Trichomonas vaginalis*

Trichomoniasis



Causative protozoa :	<i>Trichomonas vaginalis</i> (Urogenital flagellates)
Geog. Dist.	Cosmopolitan.
Definitive host:	Man
Habitat:	<ul style="list-style-type: none">➤ Vagina and urethra of female➤ Prostate, seminal vesicles and urethra of male
Infective stage:	<ul style="list-style-type: none">➤ Trophozoites.
Diagnostic stage:	<ul style="list-style-type: none">➤ Trophozoites.
Mode of infection:	<ul style="list-style-type: none">➤ Sexually Transmitted Infection (STI).➤ Contaminated toilet articles and toilet seats.

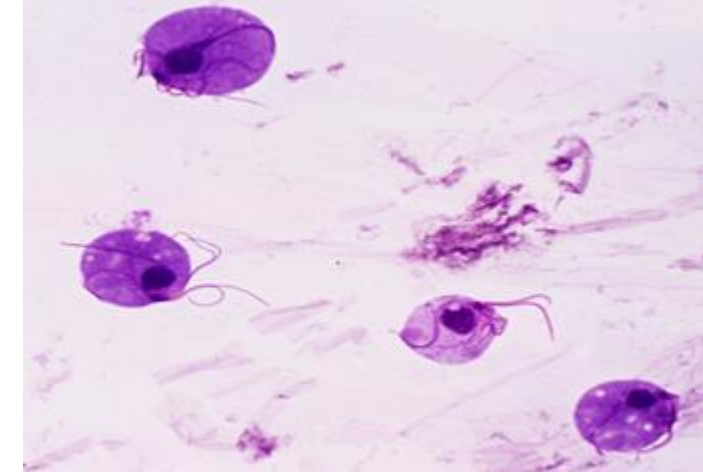
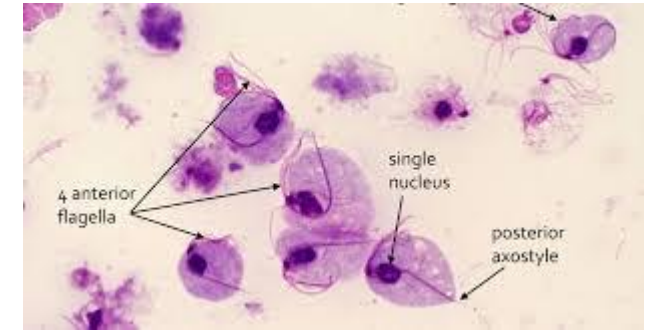
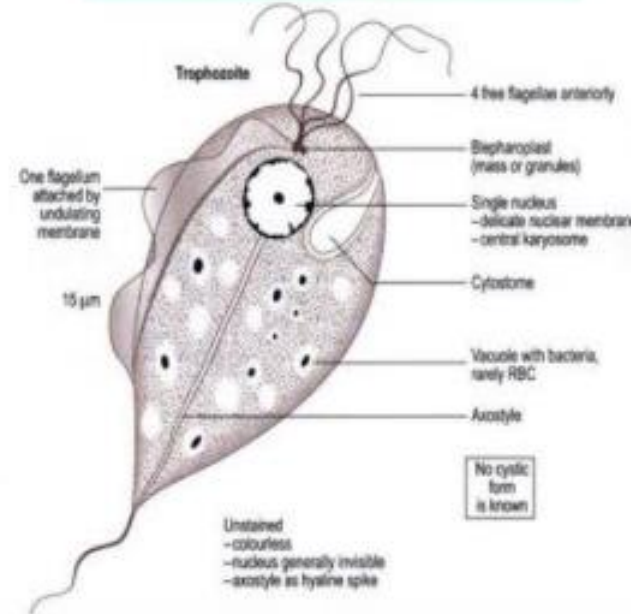
Morphology

Trophozoite

□ *T. vaginalis* exists only as a **trophozoite stage**, which:

- is pear-shaped, ~15x8 µm in size.
- has 5 flagella (4 anterior free & 1 marginal) & an undulating membrane.
- has a very small antero-lateral cytostome & a nucleus.
- has an axostyle extending from anterior to posterior ends & protrude outside.

Trophozoite is the IS & DS



3. Entamoeba histolytica

Definitive host/:

➤ Man, dog / large intestine

habitat

➤ Large intestine

Infective stage:

➤ Quadrinucleated cyst

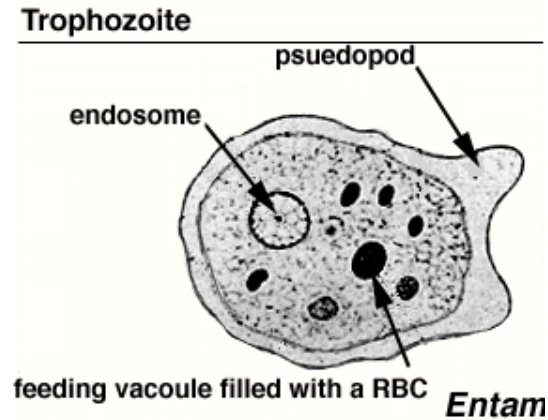
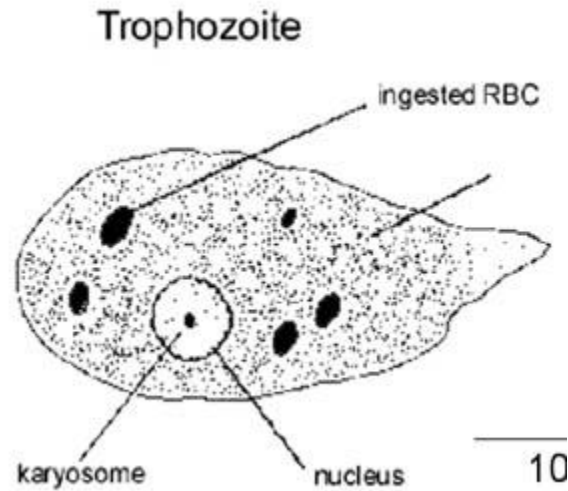
Diagnostic stage:

➤ Quadrinucleated cyst and trophozoite.

Mode of infection:

➤ ingestion of the quadrinucleated cysts in contaminated food, water, or hands

Entamoeba histolytica



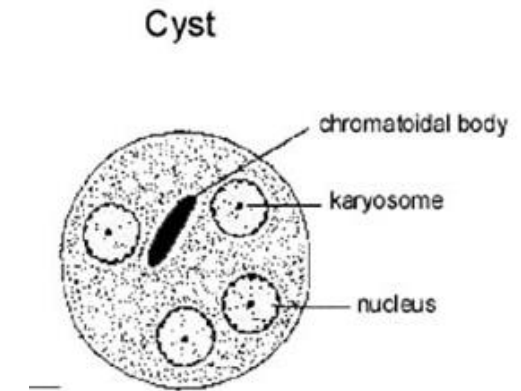
shape; amoeboid with single pseudopodium

Size: ranging from 18-40 μm ; average being 20-30 μm

Cytoplasm: cytoplasm is divided into two portion; a clear transparent ectoplasm and a granular endoplasm. Ingested RBCs, tissue granules and food materials are also found in endoplasm

Nucleus: It is single, spherical shape and size ranging from 4-6 μ Nucleus contains central karyosome and fine peripheral chromatin.

- It is the infective form of parasite.
- **Shape:** It is round or round or oval in shape
- **Size:** 12-15 μm in diameter
- It is surrounded a cyst wall
- **Nucleus:** A mature cyst is quadri-nucleated.
- **Cytoplasm:** Cytoplasm shows chromatid bars and glycogen masses but no RBCs or food particles.



8. Leishmania donovani

PATHOLOGY:

Amastigotes multiply in macrophage, destroyed the macrophage

eventually rupturing the cell

- **Free amastigotes then invade the circulatory system.**

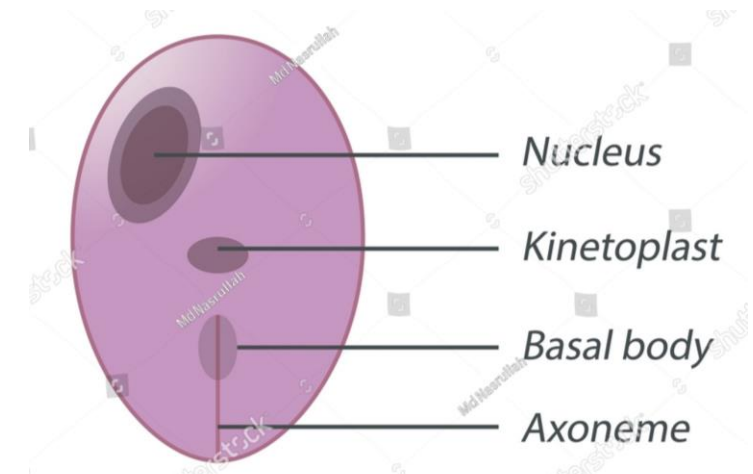
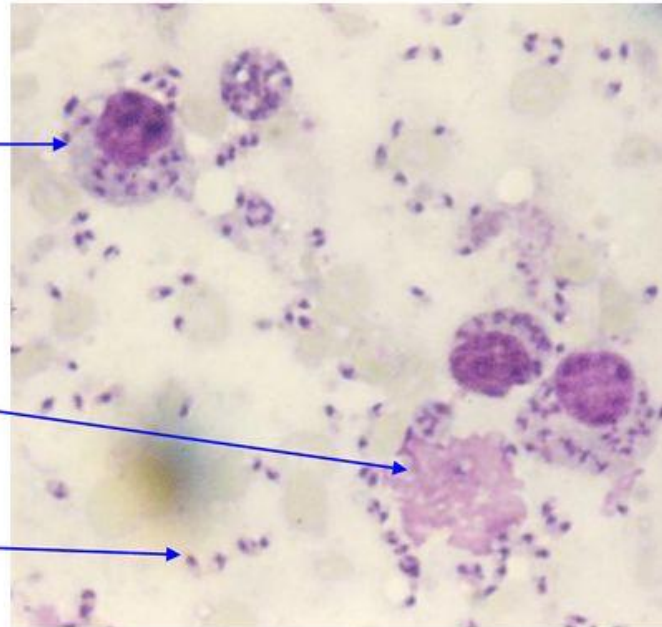
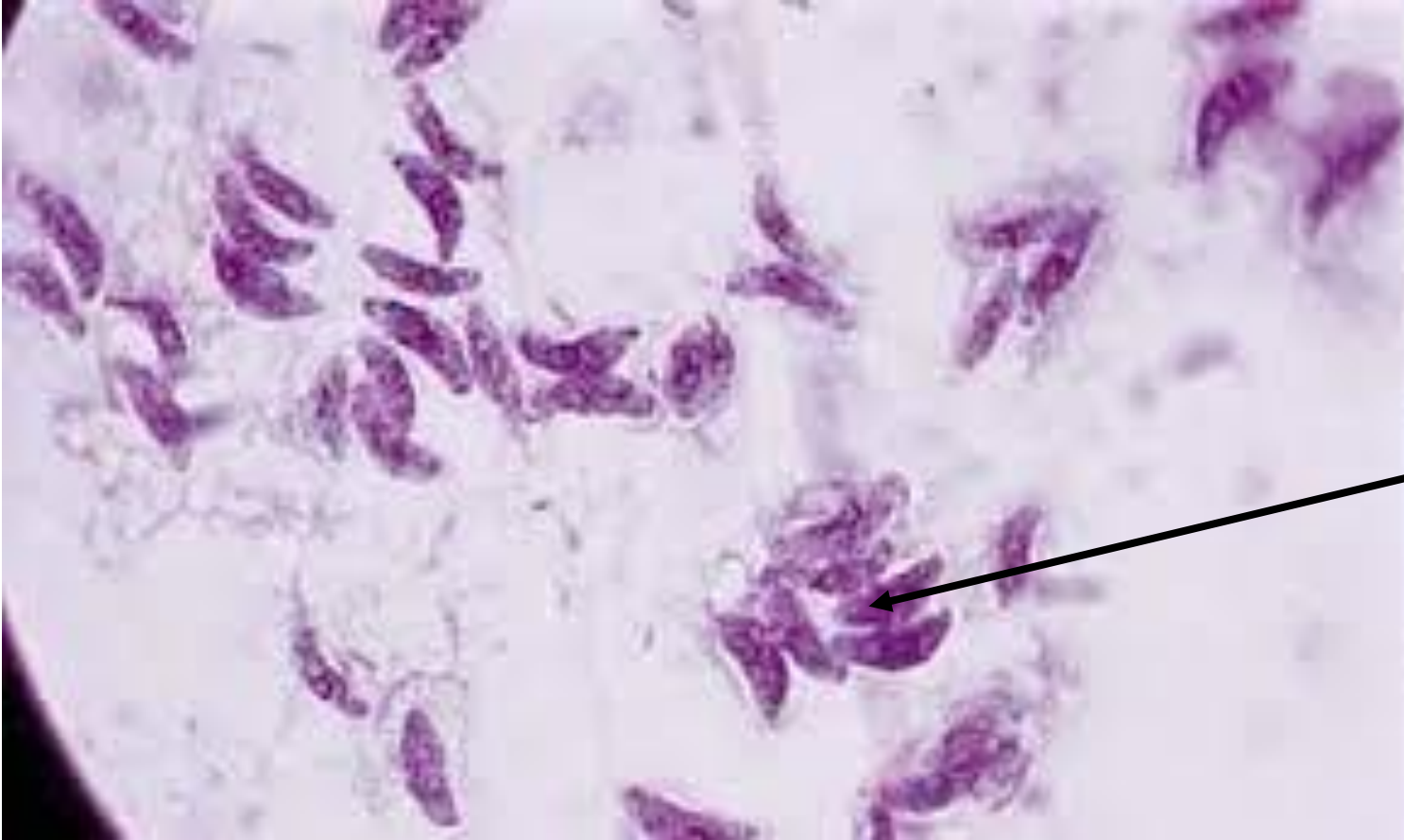


Fig: Amastigote of *L. donovani*

9. Toxoplasma gondii

Definitive host:	The domestic cat (predator)
Intermediate host:	All vertebrate hosts including humans serve as prey hosts.
Developmental stages:	Oocyst, Schizonts, Gamonts, Tachyzoites, Bradyzoite cyst.
Mode of infection	<p>a) Ingestion of sporulated oocysts in contaminated vegetables or water or during handling of litter trays or by aids of flies</p> <p>b) Ingestion of tachyzoites or bradyzoites in cysts in undercooked meat or during handling infected raw meat.</p> <p>c) Blood transfusion and organ transplant.</p>

Toxoplasma gondii



Trophozoite: Crescent or banana shaped organisms measured 2-4 μm
Nucleus: central, compact



Identify the parasite (mention the genus, species and the stage)

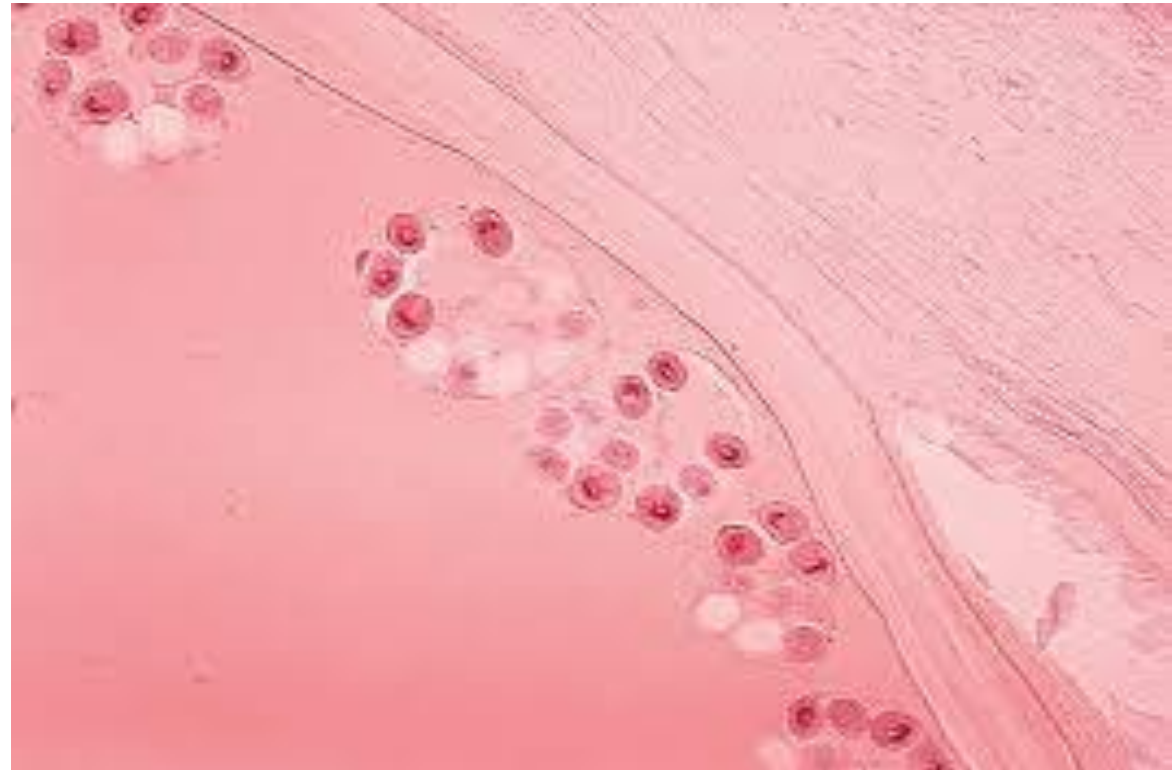
1. Lung affection:

2. Definitive host:

3. Intermediate host:

4. Mode of infection

5. Infective stage:



Identify the parasite (mention the genus, species and the stage)

1. Lung affection:

2. Definitive host:

4. Mode of infection

5. Infective stage:

A

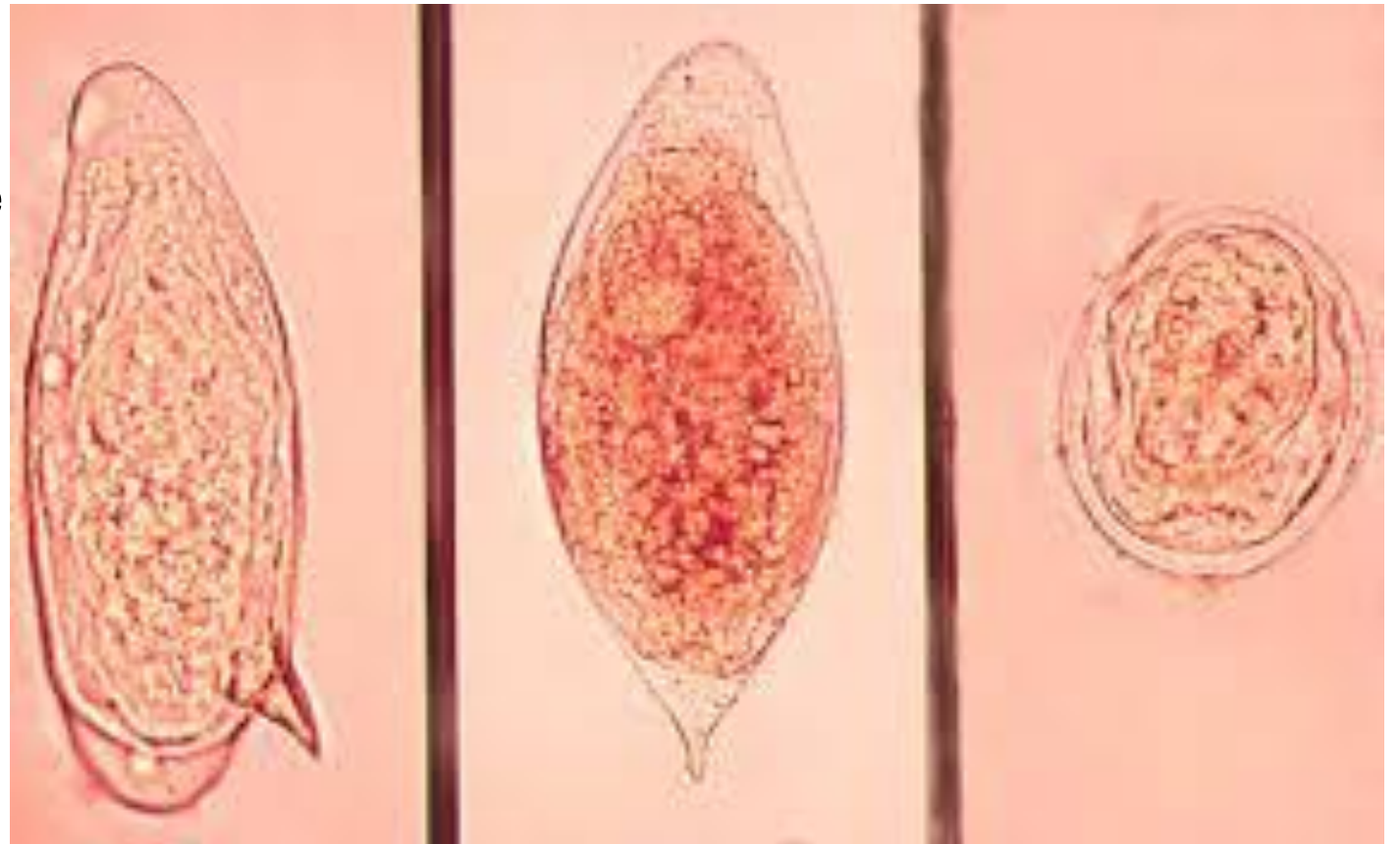


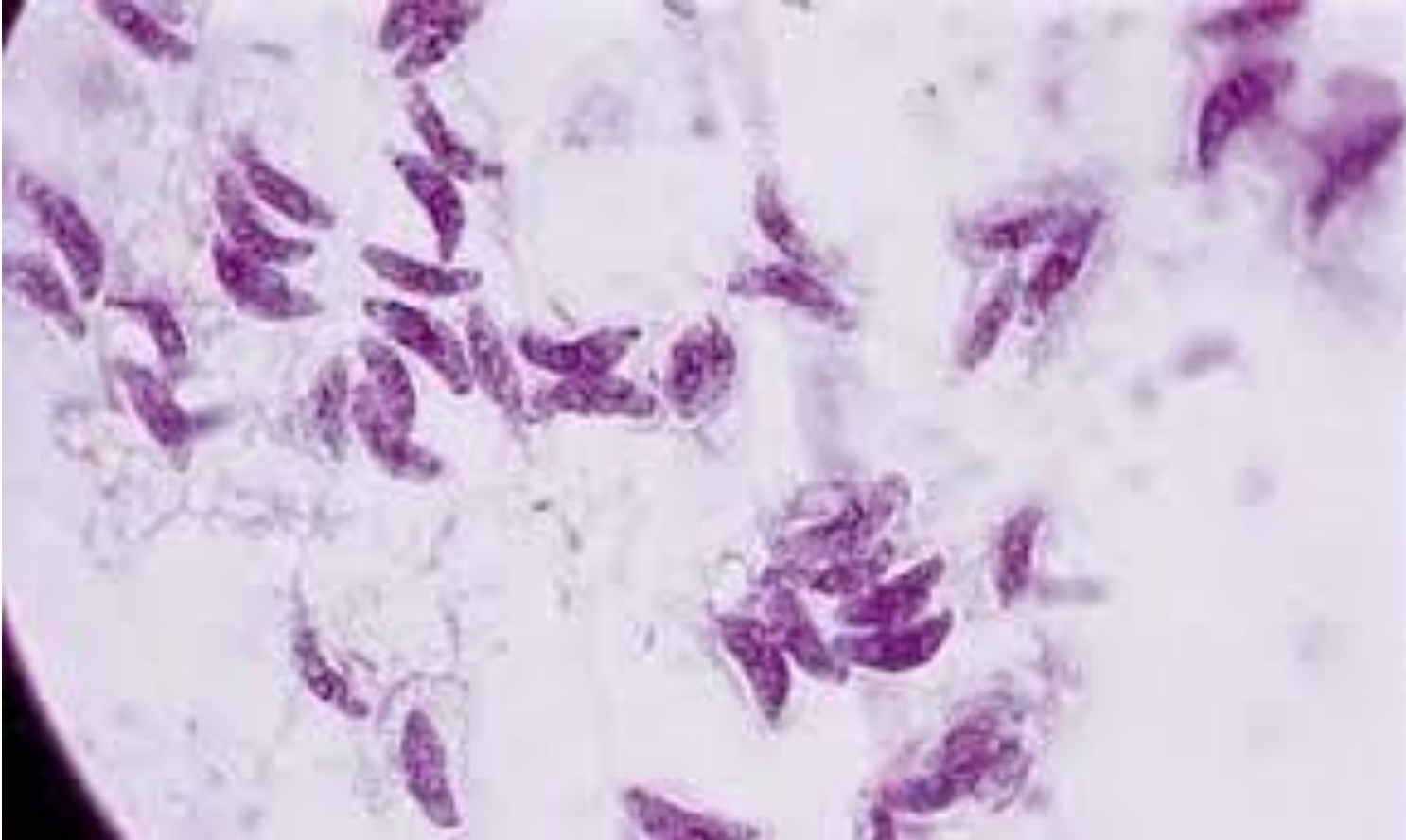
B



Identify the parasite (mention the genus, species and the stage)

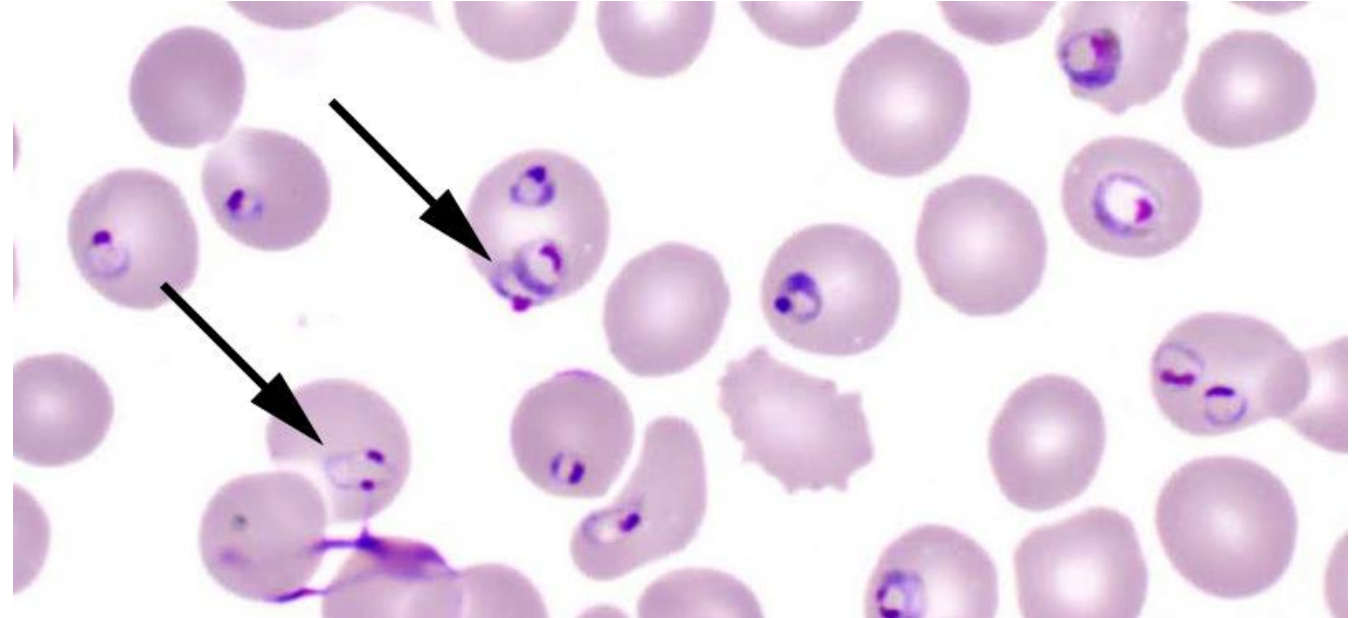
- 1. Lung affection:**
- 2. Definitive host:**
- 3. Intermediate host:**
- 4. Mode of infection**
- 5. Infective stage:**





Identify the parasite

Mention the infective stage and mode of infection



Identify the parasite

Mention the infective stage and mode of infection



Identify the parasite (mention the genus, species and the stage)

Lung affection:

Definitive host:

Intermediate host:

Mode of infection

infective stage:



THANK YOU!