Lab 3

Parasitology

protozoa

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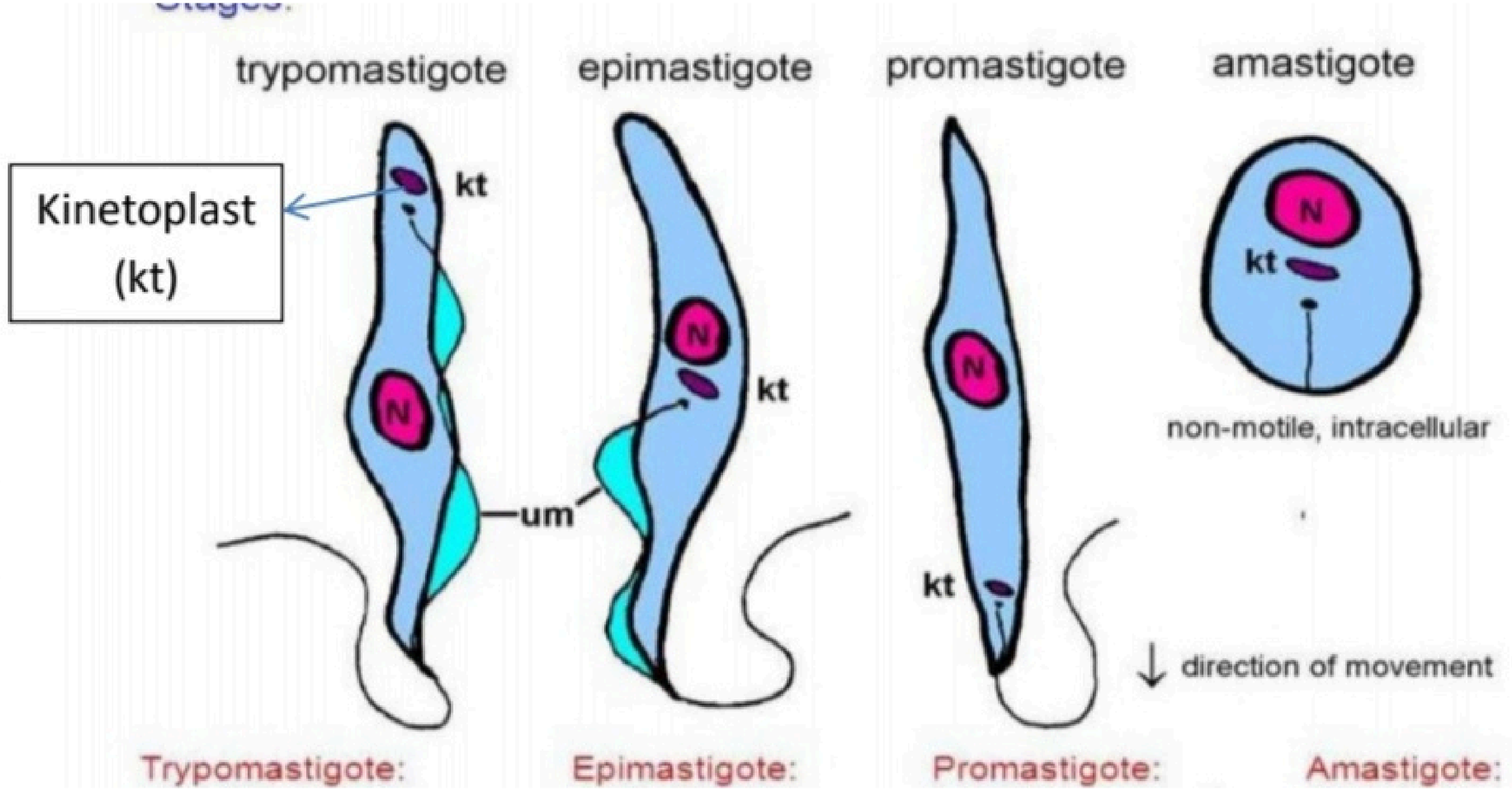
Hemoflagellates

Include several stages throught their life cycle: Amastigote, promastigote , epimastigote , Trypomastigote



Leishmania

Scientific name	Disease	Commune name
Leishmania donovani	Visceral leishmaniasis	Dum dum fever , Kala-azar
Leishmania tropica	Old world cutaneous leishmaniasis	Baghdad boils , Oriental sore, Delhi boils, dry or urban cutaneous leishmaniasis
Leishmania braziliensis	New world cutaneous and mucocutaneous leishmaniasis	Espundia ,pian bois, forest yaws, chiclero ulcer

1. Leishmania donovani

General Properties :

Habitat : Reticulendothelial cells of the spleen, liver, bone marrow, and visceral lymph node

Disease : Visceral leishmaniasis (Dum dum fever , Kala-azar) .

Definitive host : Man

Intermediate host : Female sand fly

Reservoir host : Rodents , Dogs , Fox ,jakas

Stages : Amastigote (in the endothelial cell of visceral organs)

promastigote (in the midgut of sand fly)

Infective stage : promastigote

Diagnostic stage : Amastigote and promastigote

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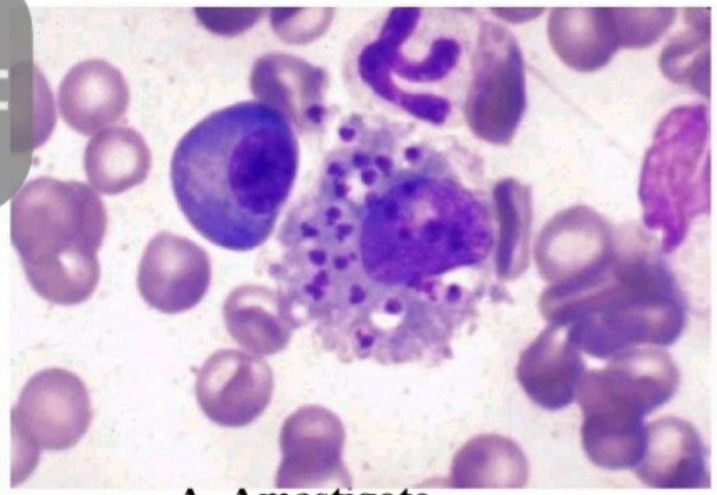
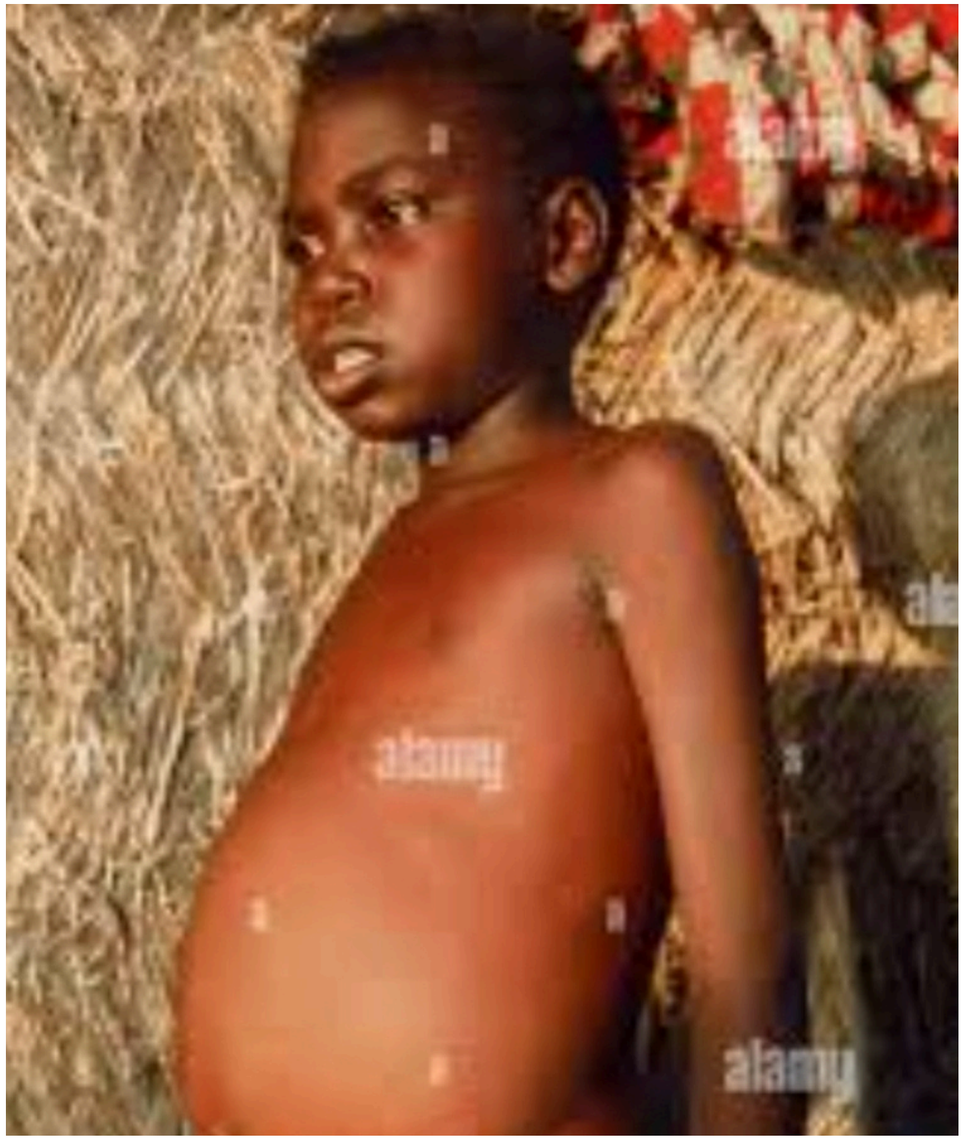


A. Amastigote



Leishmania donovani

Sand fly

Leishmania tropica

General Properties

Habitat: Skin

Disease: Old world cutaneous leishmaniasis (Baghdad boils, Oriental sore , Delhi boils, dry or urban cutaneous leishmaniasis)

Definitive host: Man

Intermediate host: Female sand fly

Reservoir host: Rodents, Dogs, hyrax.

Stages Amastigote (in the endothelial cell of skin)

Promastigote (in the midgut of sand fly)

Infective stage: promastigote

Diagnostic stage : Amastigote

Leishmania tropica (Baghdad boils)

Leishmania braziliensis:

General Propertile:

Habitat: Skin and mucoe .
Disease : New world cutaneous and mucocutaneous leishmaniasis (Espundia, pian bois, forest yaws, chiclero ulcer)

Definitive host: Man
Intermediate host: Female sand fly .
Reservoir host: Rodents and Dogs .
Stages: Amastigote (in the endothelial cell of skin, mucous membrane of nose and oral cavity) , promastigote (in the midgut of sand fly)
Infective stage: promastigote .
Diagnostic stage : Amastigote .

Leishmania braziliensis

Laboratory Diegnosis:

1_**Montenegro skin** test.

2_ **Giemsa _ stained** slides of blood,bone marrow, lymph node aspirtates, for demonstrating the diagnostic Amastigote forms.

3_ **culturing** in NNN(Novy_ MacNicolle) medium or inoculation hamster

.

4_**Biopsy** form the infected ulcer for identifying the amestigote .

5_ **serologic tests** ,such as IFA testing.

Properties	*T. brucei gambiense*	*T.brucei rhodesiense*	*T. cruzi*
Habitat	**Blood**	**Blood**	**Tissue**
Disease	**West African sleeping sickness, Gambian trypanosomiasis.**	**East African sleeping sickness, Rhodesian trypanosomiasis**	**Chagas' disease, Americantrypanosomiasis**
Definitive host	**Humans**	**Humans**	**Humans**
Vectors	**Tsetse flies (Glossina palpalis and Glossina tachinoides)**	**Tsetse flies (Glossina morsitans and Glossina pallidipes)**	**reduviid bug**
Reservoir host	**Humans**	**domestic animals (especially cattle) and wild animals**	**domestic cats, dogs**
Stages	**Procylic Trypomastigote Epimastigote Metacylic Trypomastigote Trypomastigote**	**Procylic Trypomastigote Epimastigote Metacylic Trypomastigote Trypomastigote**	**Procylic Trypomastigote Epimastigote MetacylicTrypomastigote amastigote Trypomastigote**
Infective stage	**Metacylic Trypomastigote**	**Metacylic Trypomastigote**	**MetacylicTrypomastigote**
Diagnostic stage	**Trypomastigote**	**Trypomastigote**	**Trypomastigote and amastigote**

Laboratory Diegnosis

1. Giemsa-stained slides of blood and lymph node aspirations from infected patients revealthe typical trypomastigote morphologic forms .

2. CSF- microscopic examination of the sediment for trypomastigotes.

3. Thick and thin blood fime.

4. serological tests for lgM and protein detectin lgM.

Thank you
for you listening

protozoa

Lab 1

Introduction

The phylum protozoa is classified into four subdivisions according to the methods Of locomation

1.The amoebae (sarcodina)move by means of pseudopodia.
2.The flagellates(Mastigophora)typically move by long,whip like flagellar.
3.The ciliates)Ciliata(are propelled by rows of cilia that beat witha synchronized wave-like motion.
4.The sporozoans(Sporozoa)lack specialized organelles of motility.

Feature

1. Unicellular animals
2. Living either individually or cluster colony
3. Reproduction by two ways sexual and Asexul or one
4. Some of which is free of living on the land or in water or salt.

E.histolytica

- Amebiasis is an infection of the large intestine, and some times the liver and other organs,caused by the single- celled parasite(protozoan)Entamoeba histolytica,or amoeba

- There are two forms of Entamoeba histolytica :

  1. Active parasite (trophozoite)
  2. Dormant parasite (cyst)

Diagnostic tests

- Stool tests
- Blood tests sometimes to detect antibodies Check out
- asample of the intestinal tissue sometimes

- Scientific classification of E. histolytica:

  1_ Kingdom:- protista

  2_ Phylum:- Amoebozoa

  3_Class-:lobosa

  4_ Order:- Amoebida

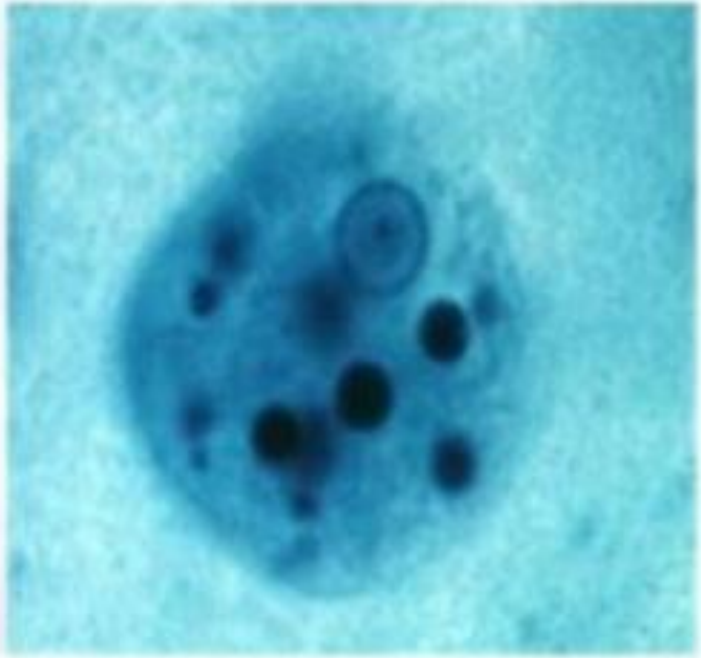
  5_ Family:- Endamoebidae

  6_ Genus:- Entamoeba

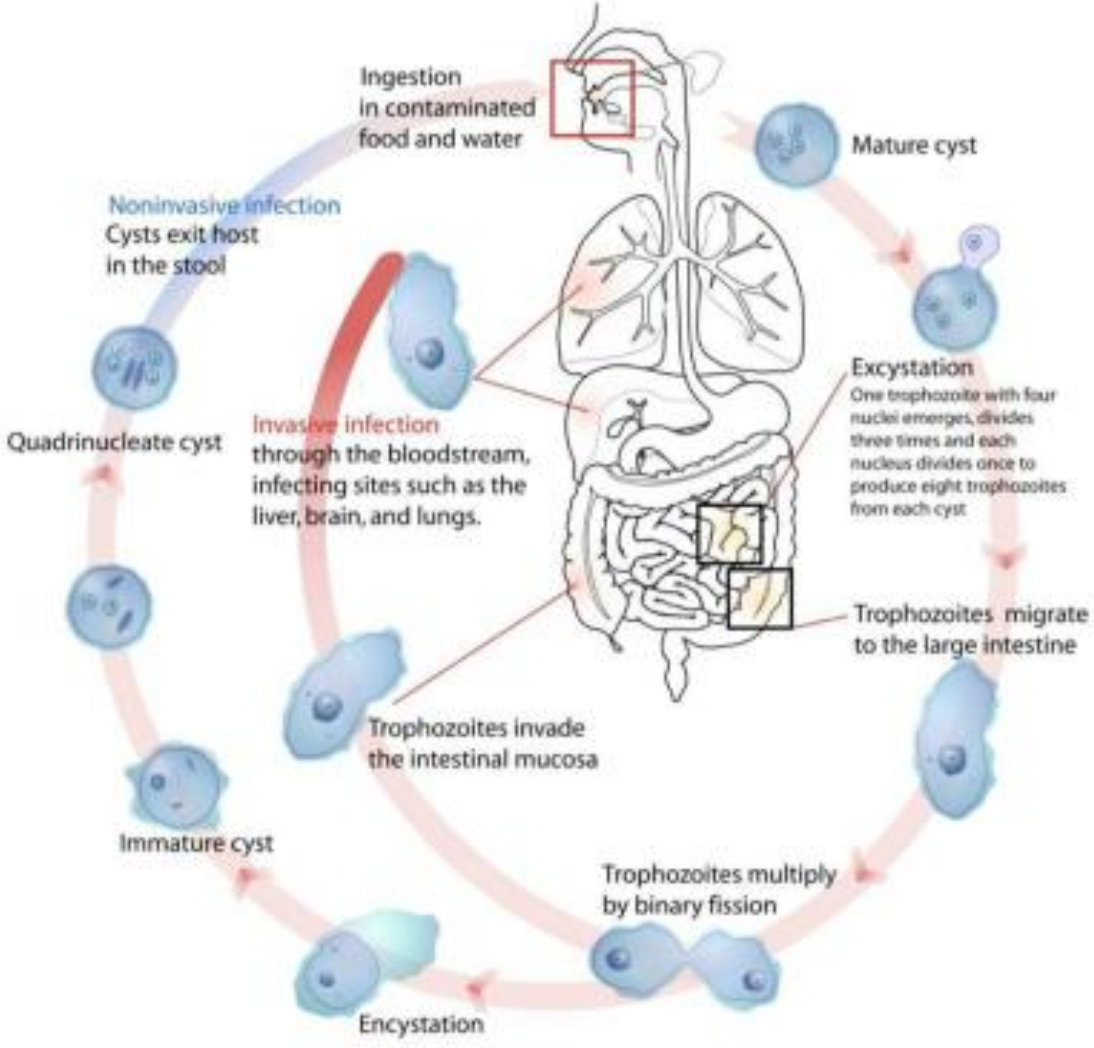
  7_ Species:- histolytica

Entamoeba histolytica

trophozoite



cyst



Life-cycle of *Entamoeba histolytica*

Entamoeba Coli

- Entamoeba coli is a non-pathogenic amoeba with world wided is tribution. Its life cycle is similar to that of E.histolytic abut it doesnot have an invasive stage and donot ingestred blood cells.

- There are two forms of Entamoeba coli

1.Active parasite(trophozoite)

2. Dormant parasite (cyst)

- Scientific classification of Entamoeba coli

Kingdom:Eukaryota

Phylum:Amoebozoa

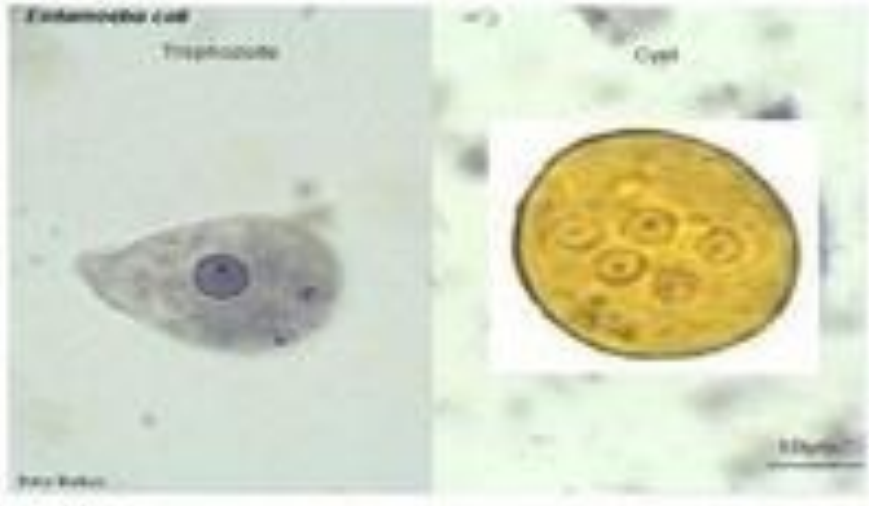
Family:Entamoebidae

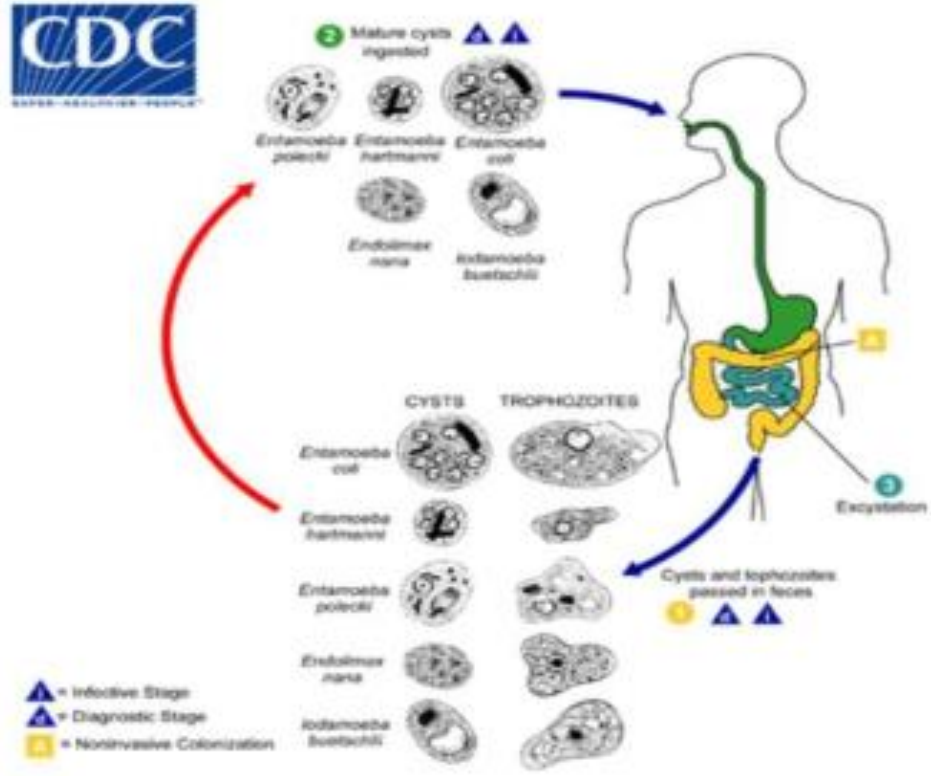
Genus:Entamoeba

Species:E. coli

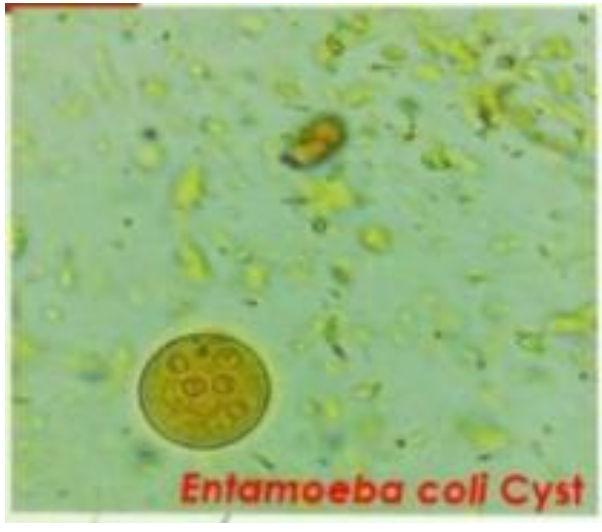
Daignostic test

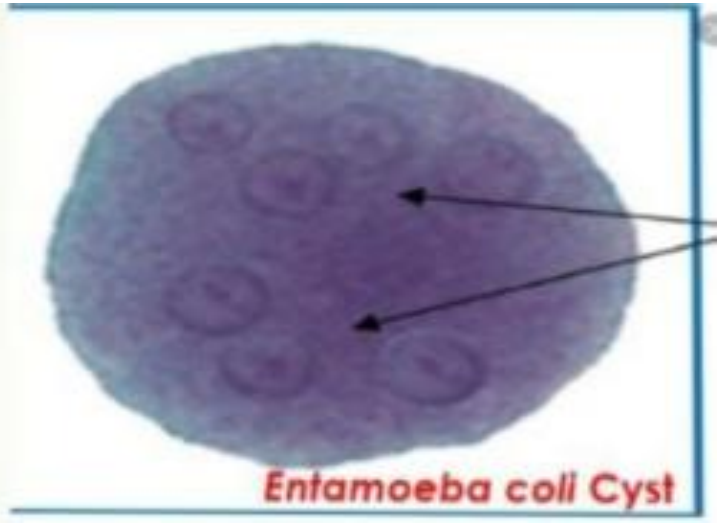
Stool examination is the method of choice for the recovery of E. coli trophozoites and cysts



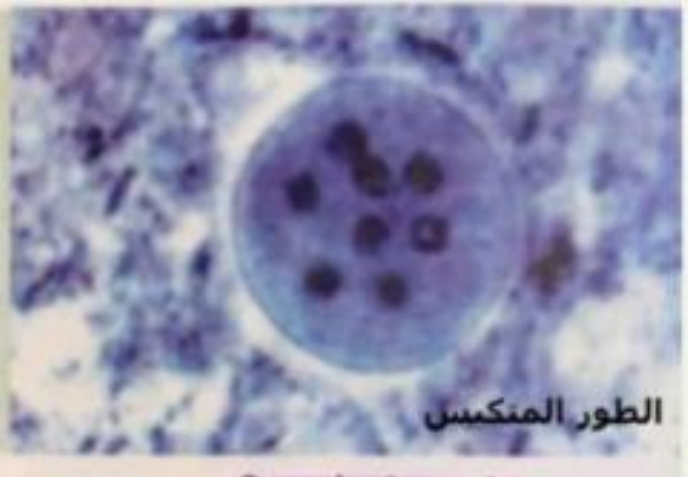


Common lifecycle of various non-pathogenic parasites, including *E. coli*


Entamoeba coli Cyst


Entamoeba coli Cyst

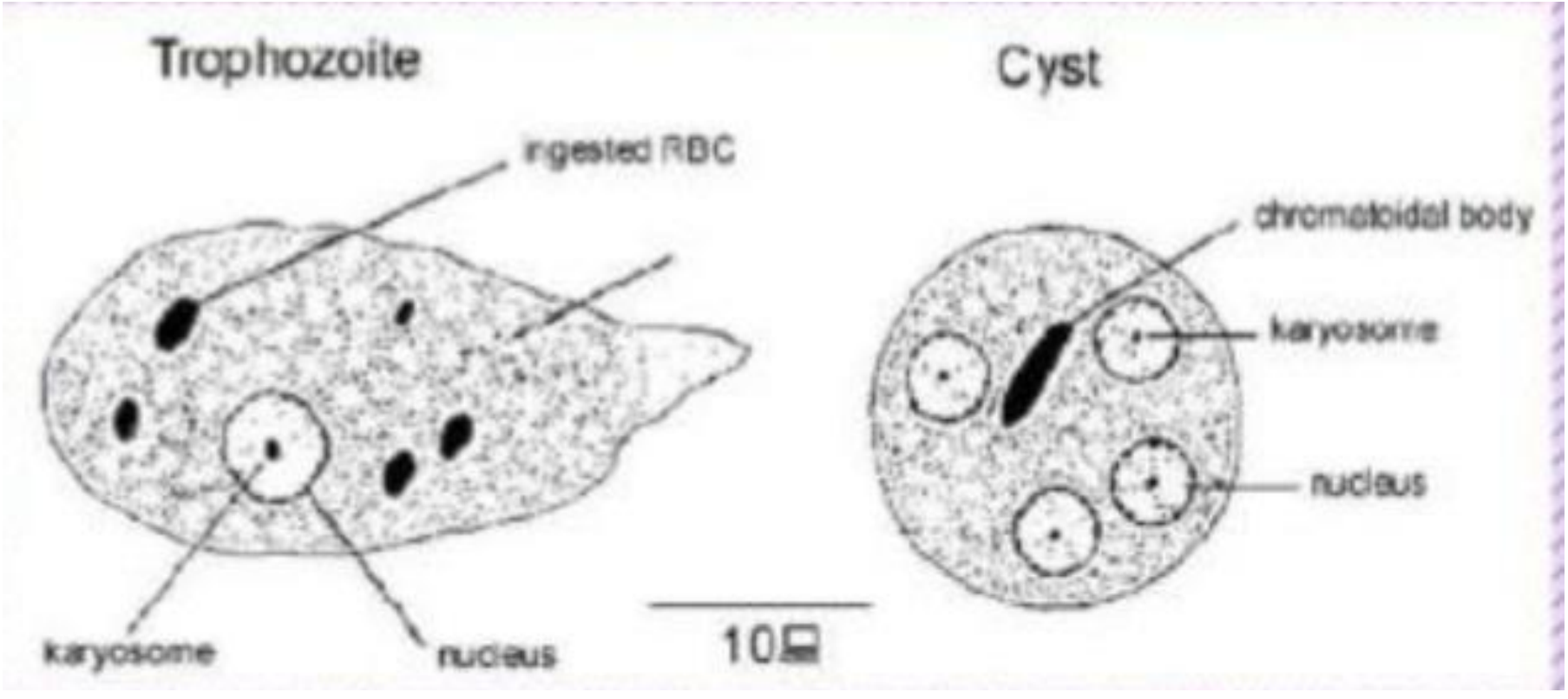

الطور النشط
Trophozoite


الطور المنكيس
8-nucleate cyst

Entamoeba cyst

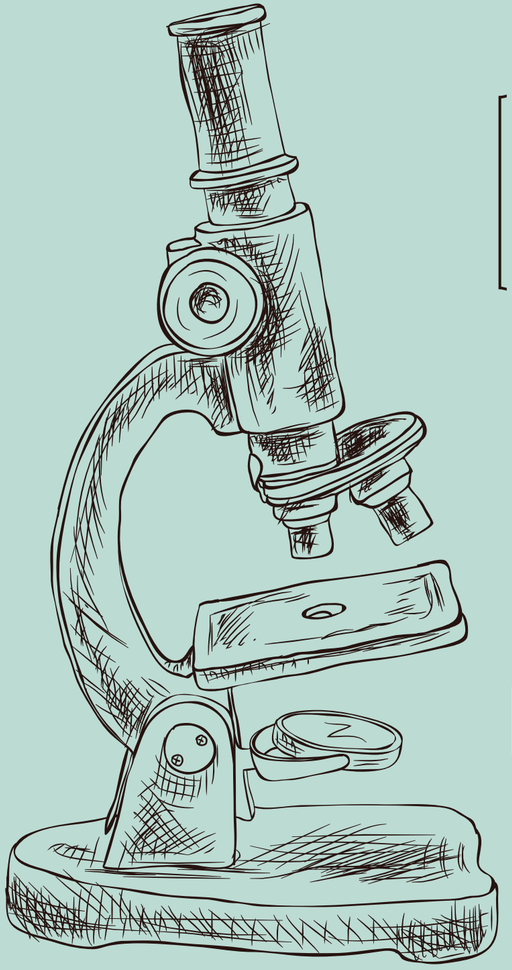
Entamoeba coli

Entamoeba histolytica


Trophozoite
Cyst
ingested RBC
chromatoidal body
karyosome
nucleus
karyosome
nucleus
10

LAB 2

protozoa



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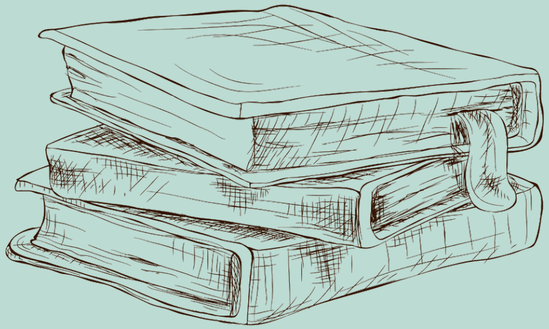


Balantidium coli

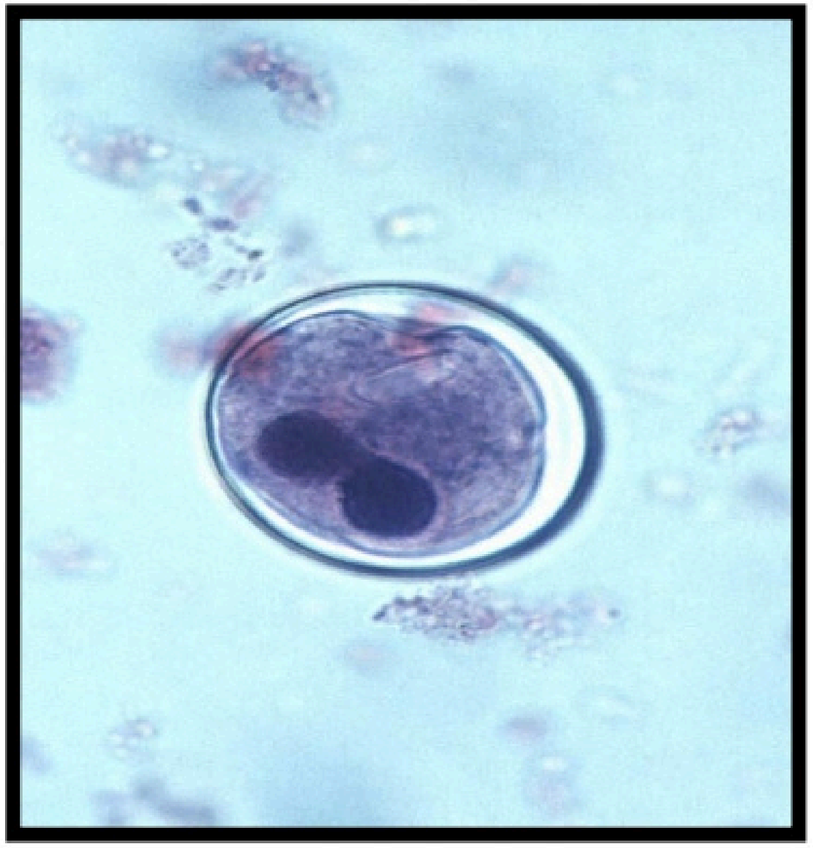
This Parasite is the only member of protozoan ciliate known to be pathogenic to humans. that frequently infects pigs but on occasion (rarely) infects humans

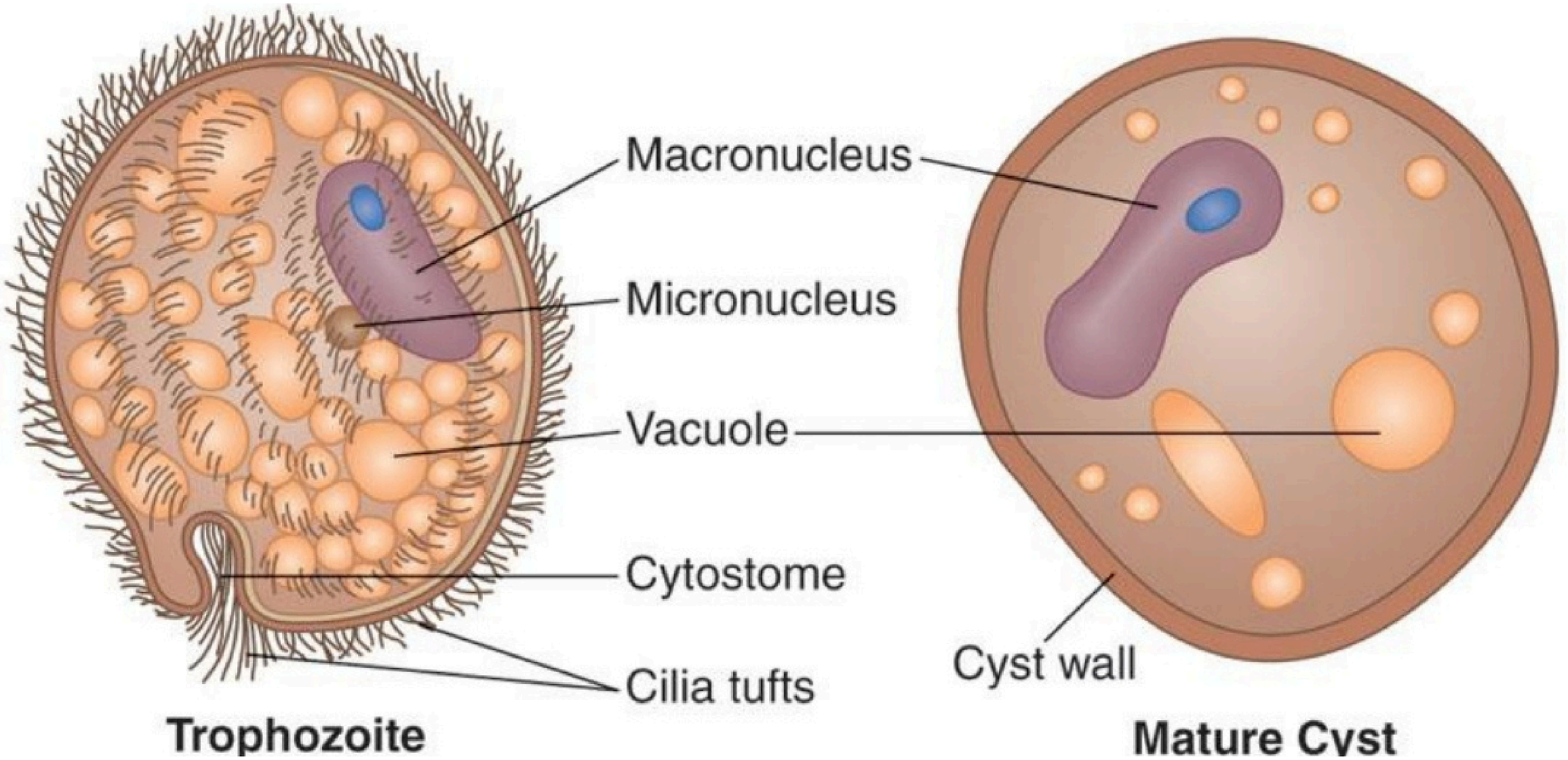
- Found in intestine.
- Infected route: fecal –oral
- Have trophozoite & cyst

- Balantidium coli Disease: Balantidiosis
- Causative Agent: Balantidium coli
- Cysts are the parasite stage responsible for transmission.
- The host acquires the cyst through ingestion of contaminated food or water (NOT in undercooked meat).
- Common in pigs .

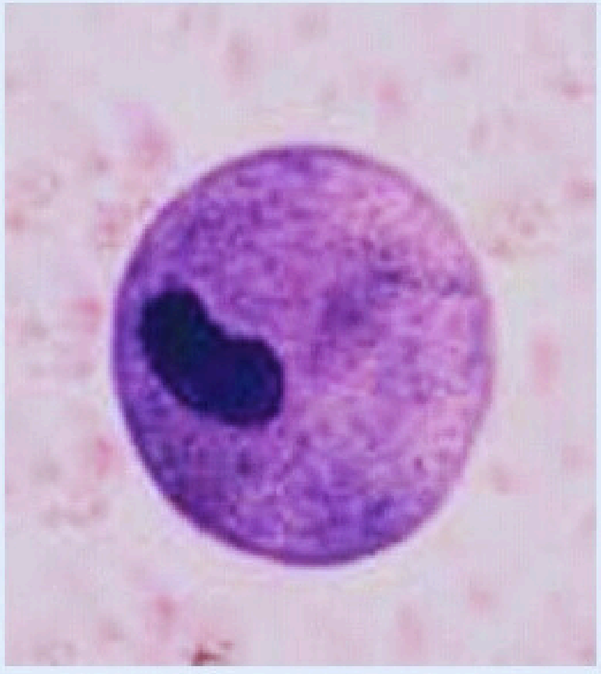
Balantidium coli

cyst




Macronucleus
Micronucleus
Vacuole
Cytostome
Cilia tufts
Cyst wall
Trophozoite
Mature Cyst

Balantidium coli

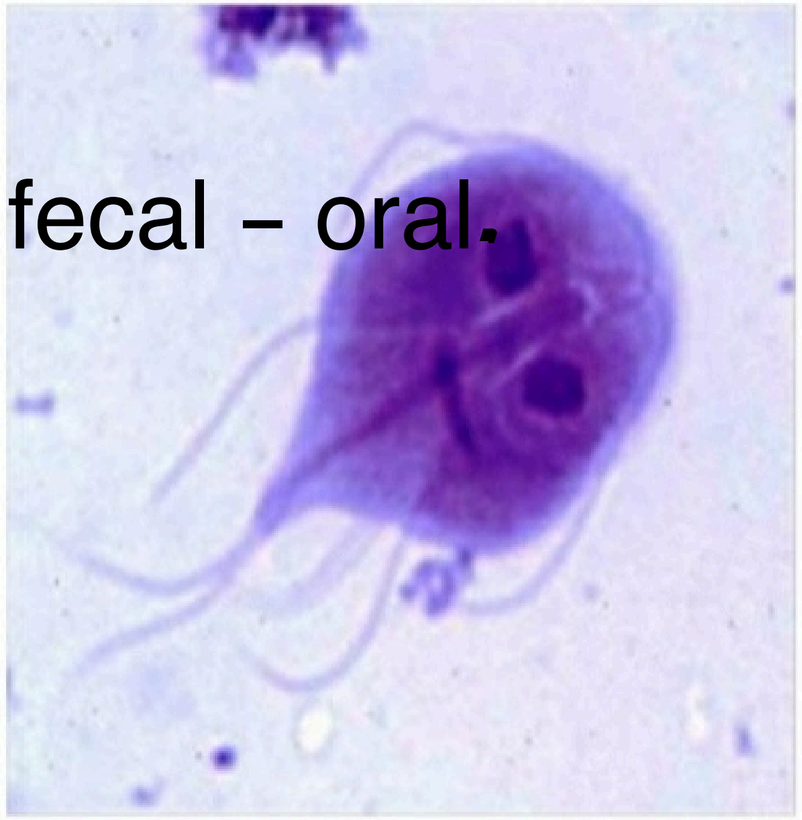


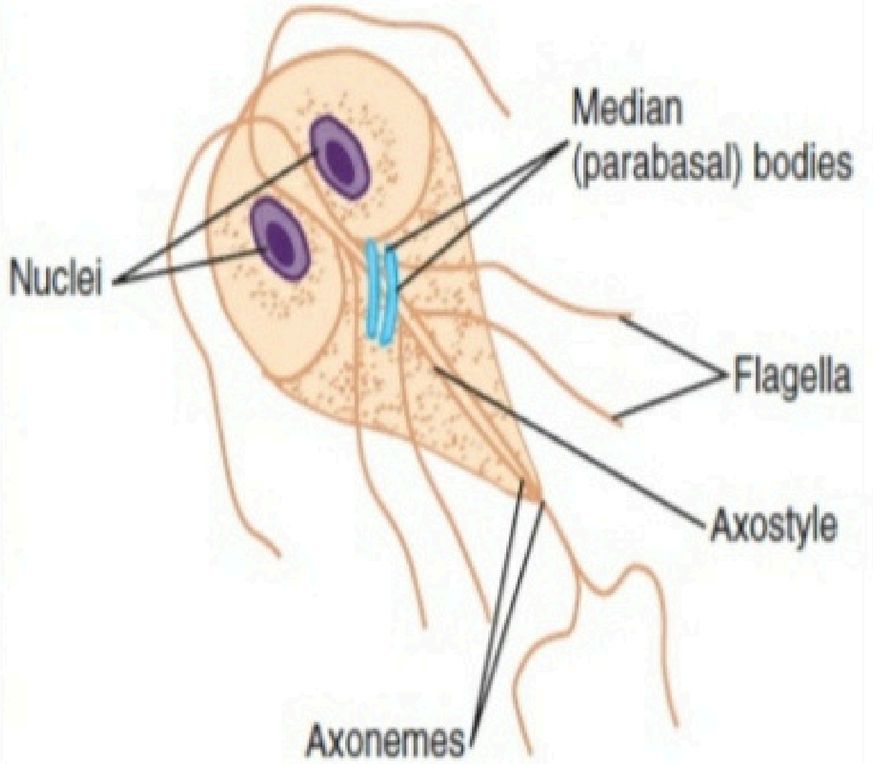
Intestinal flagellates

Have (trophozoites & cyst) stages through their life cycle

- **Giardia lamblia:**

1. In intestine
2. Infective route: fecal – oral.

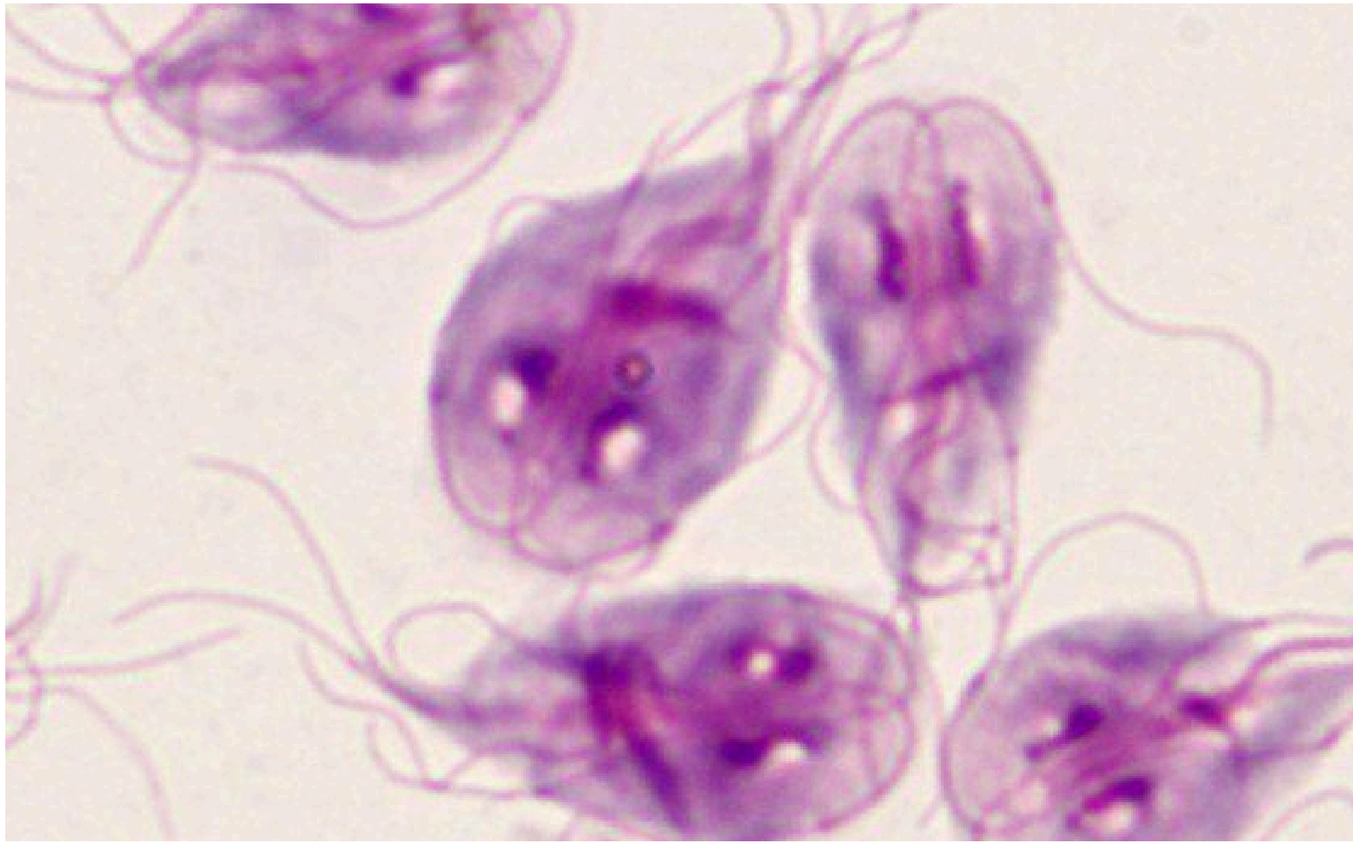




Giardia lamblia

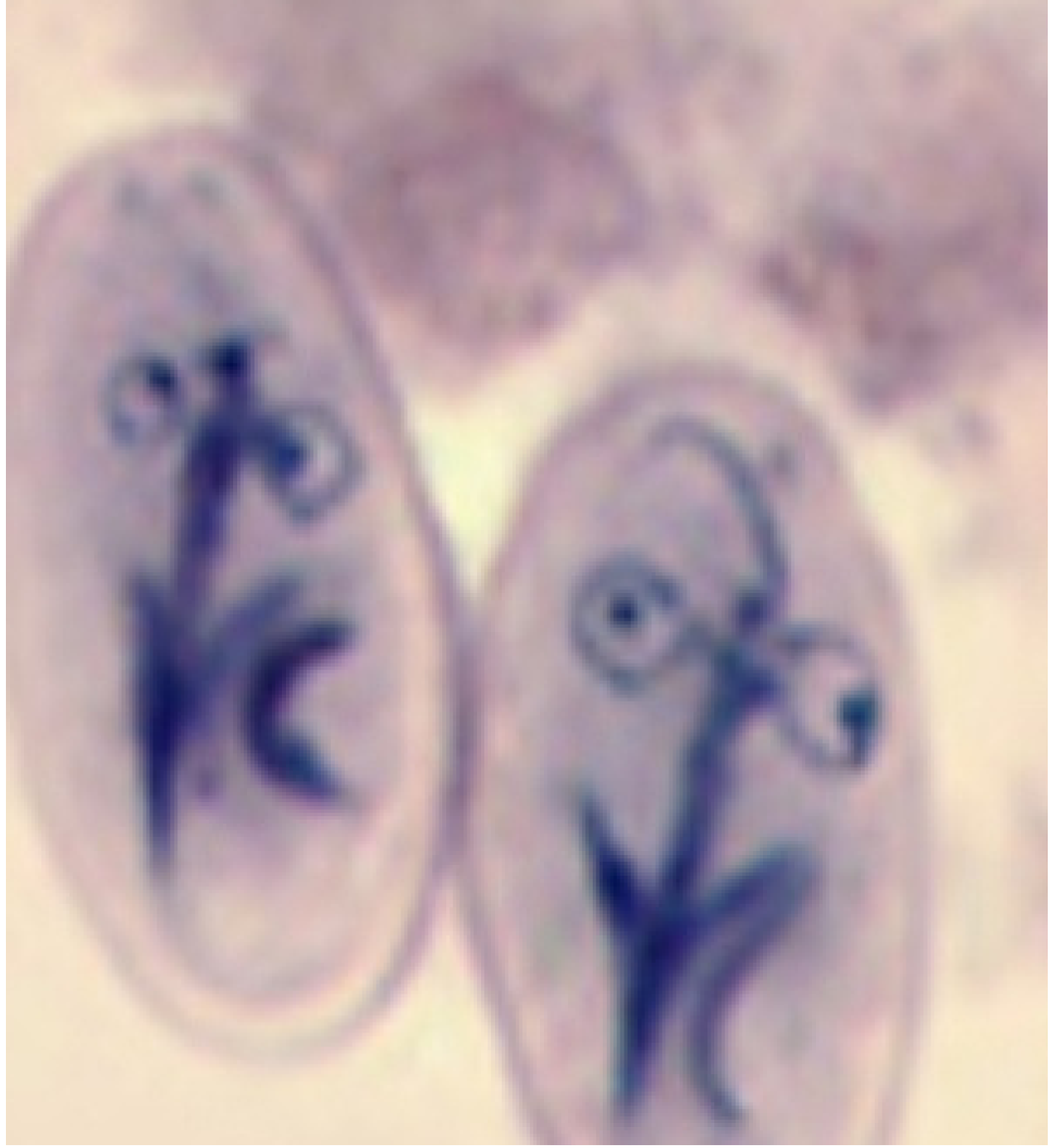
Trophozoite

- Teardrop shape, spoon
- Two nuclei, pale stain
- Curved median bodies
- Linear axonemes
- Pathogenic
- Water, food borne
- Typical motility, but caught up in mucus



Giardia lamblia cyst

- Oval to round
- Four nuclei
- Curved median bodies
- Linear axonemes
- Pathogenic
- Water, food borne



Diagnosis:

1. by finding troph. Or cyst or both in diarrhea stool
2. using ELISA test
3. string test

Trichomonas vaginalis

.Trichomonas vaginalis Trophozoite only

Urogenital tract

Diagnosis:

In female: T.vaginalis may be found in urine sediment wet preparations of vaginal secretions.

In males, it may be found in urine sediment, wet preparations of prostatic secretions.

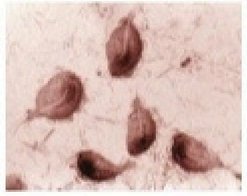
Laboratory diagnosis

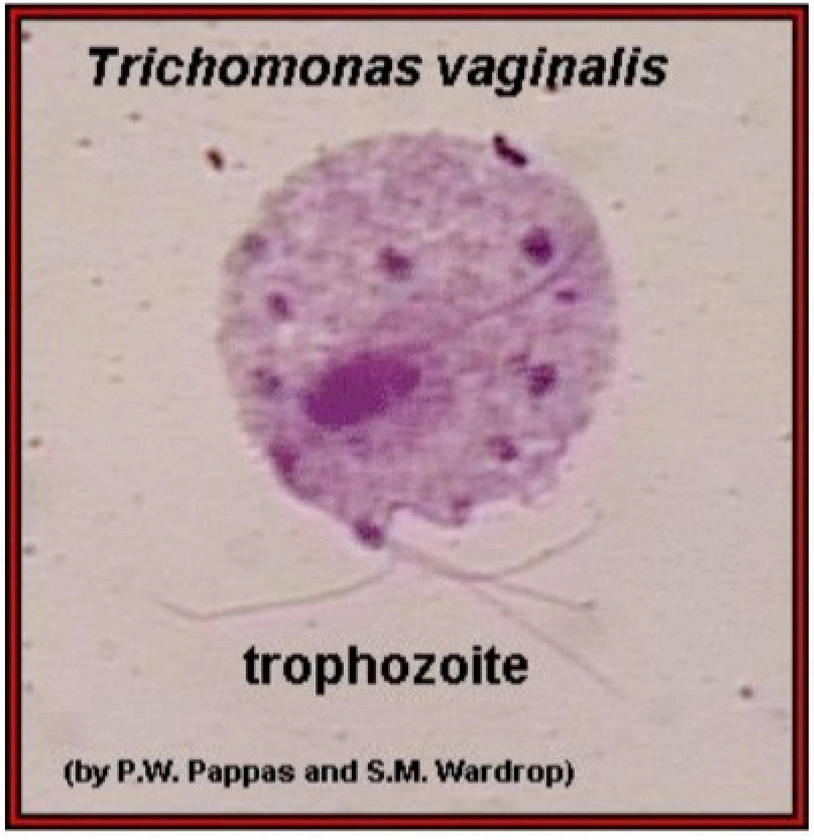
The diagnosis for this organism is commonly based on the examination of (Vaginal and Urethral discharge, Prostatic fluid, urine sediment, Semen) :used

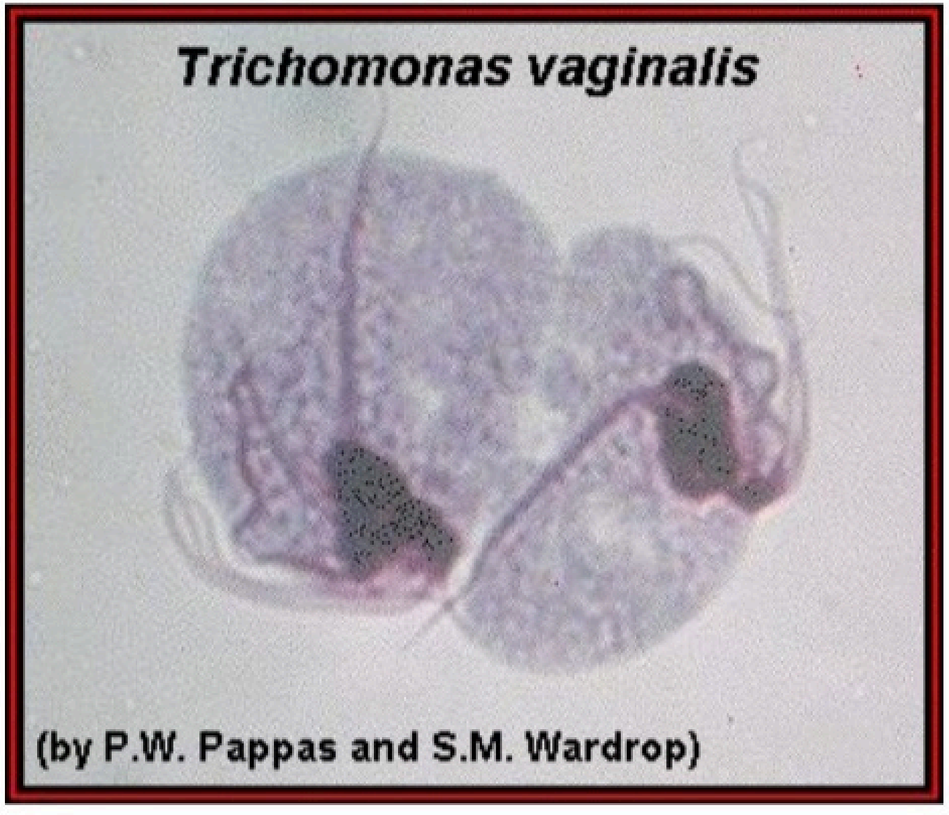
Wet mount (Easy, useful & economie. T. vaginalis of actively–motile organism with jerky motility is diagnostic.)

Acridine orange stain (Rapid & accurate method, Sensitivity– same as wet mount

Trichomonas







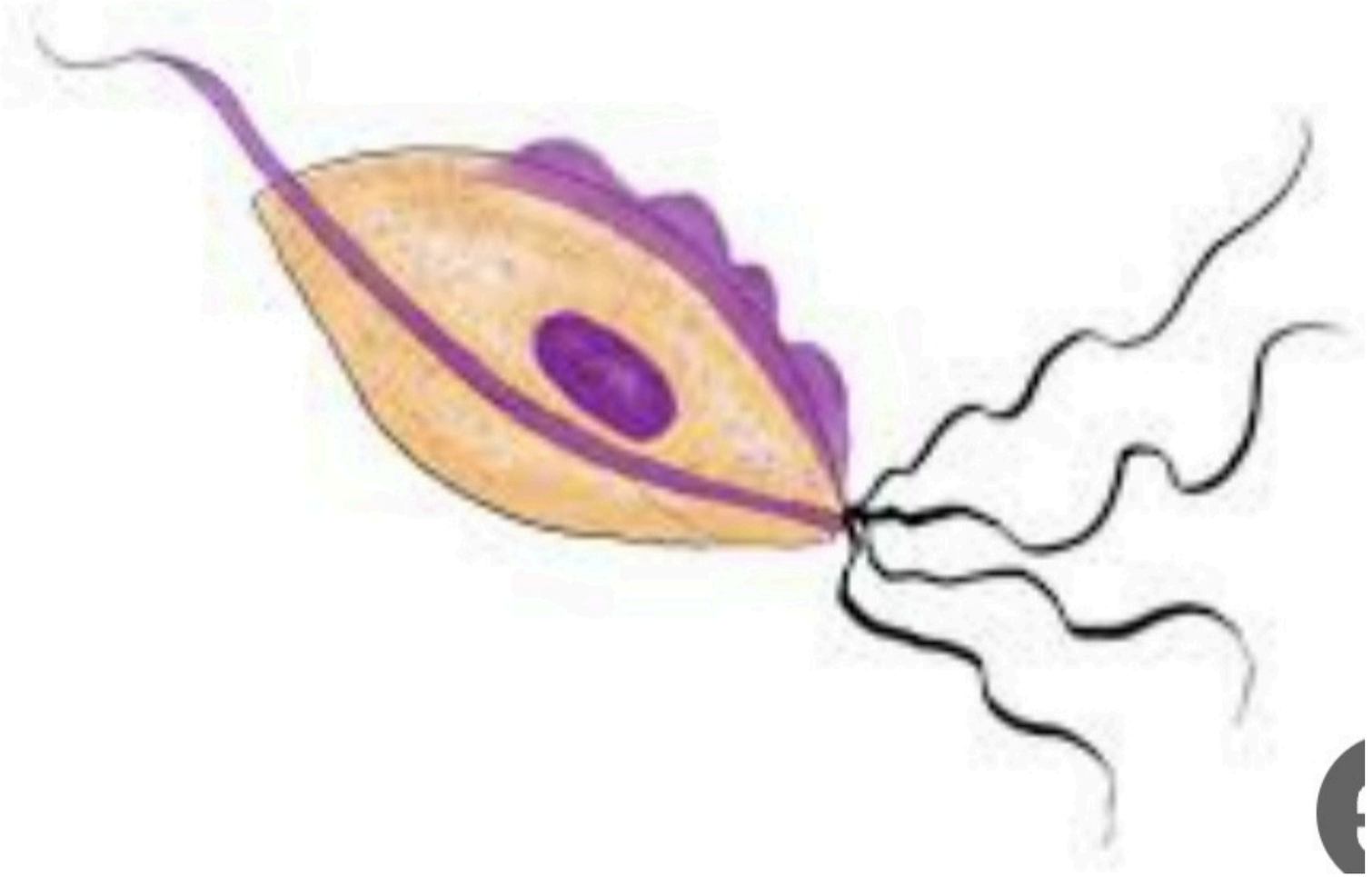
Trichomonas tenax

Habitat is in the mouth; sockets of teeth; gums. Associated with periodontal disease, mucous in mouth. This is an opportunist if conditions are right it is easier for it to infect.

Laboratory diagnosis

The specimen of choice for diagnosing Trichomonas tenax trophozoite is mouth scrapings.

Microscopic examination of tonsillar crypts and pyorrheal pockets of patients suffering from T. tenax infections often yields the typical trophozoites.



4Lab
Parasitology
Protozoa

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Sporozoa

- *The Sporozoa are unicellular and spore-forming . All species are obligate endoparasites of animals .*

. *Toxoplasma gondii*

Toxoplasma gondii is an obligate intracellular parasite that occasionally causes serious illness (Toxoplasmosis) .

The major forms of the parasite are :

- *Oocysts (containing sporozoites) , which are shed in the feces of cat .*
- *Tachyzoites , rapidly multiplying organisms found in the tissues of intermediate hosts .*
- *Bradyzoites , slowly multiplying organisms found in the tissues of intermediate hosts .*
- *Cysts : walled structures often found in the muscles , brain and heart containing Bradyzoites.*

Life cycle of Toxoplasma gondii

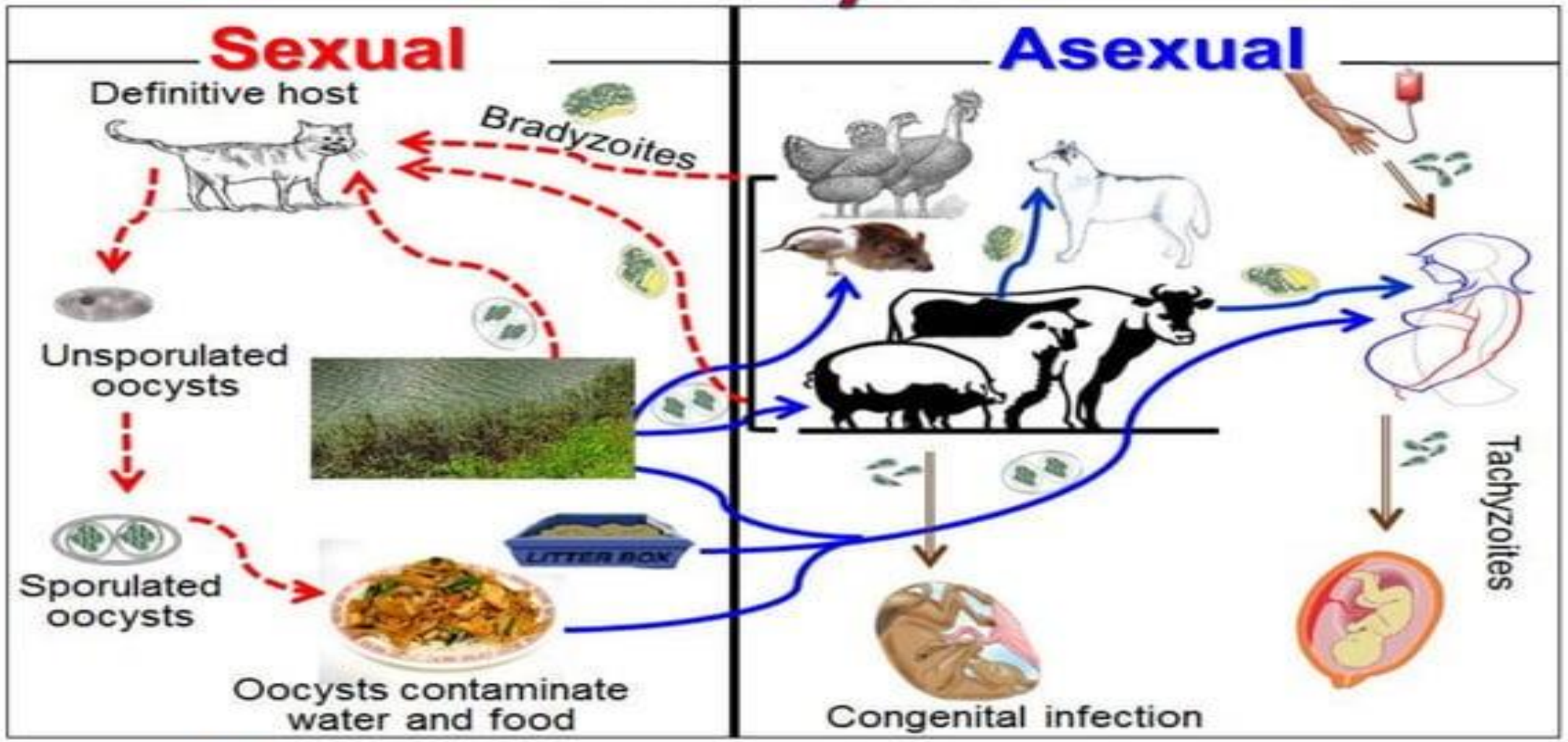
- The life cycle of T.gondii is completed in two phase , the enteric cycle and exoenteric cycle.The enteric cycle is completed in cat .
- It includes both the Asexul (schizogony cycle) and sexual cycle (gametogony). The Exoenteric cycle is completed in human,rat and birds .

- Final host: cat
- Intermediate host : Human,rat and birds

Infected stage: cyst or Oocyst

-
- Diagnostic stage: Tissue cyst.

Life Cycle



T. gondii transmission via tachyzoites

T. gondii transmission via oocysts

T. gondii transmission via bradyzoites (tissue cysts)

Signs and Symptoms

Infection has three stages:

- Acute Toxoplasmosis
- Chronic Toxoplasmosis

Acquired infection form

- Congenital Toxoplasmosis

CONGENITAL TOXOPLASMOSIS

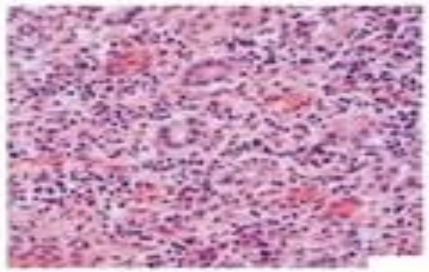
Congenital toxoplasmosis results from an acute primary infection accquired by the mother during pregnancy.

OCULAR TOXOPLASMOSIS

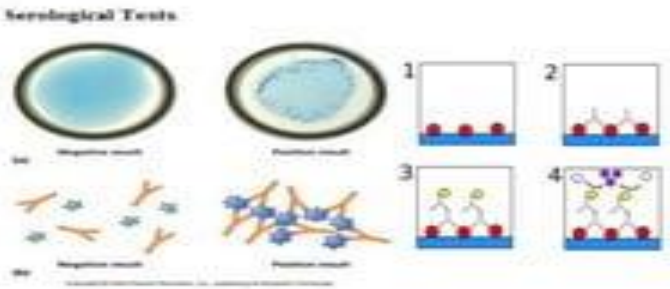
Ocular toxoplasmosis, an important cause of *Chorioretinitis* in the United States, may be the result of congenital or acquired infection.

Diagnosis

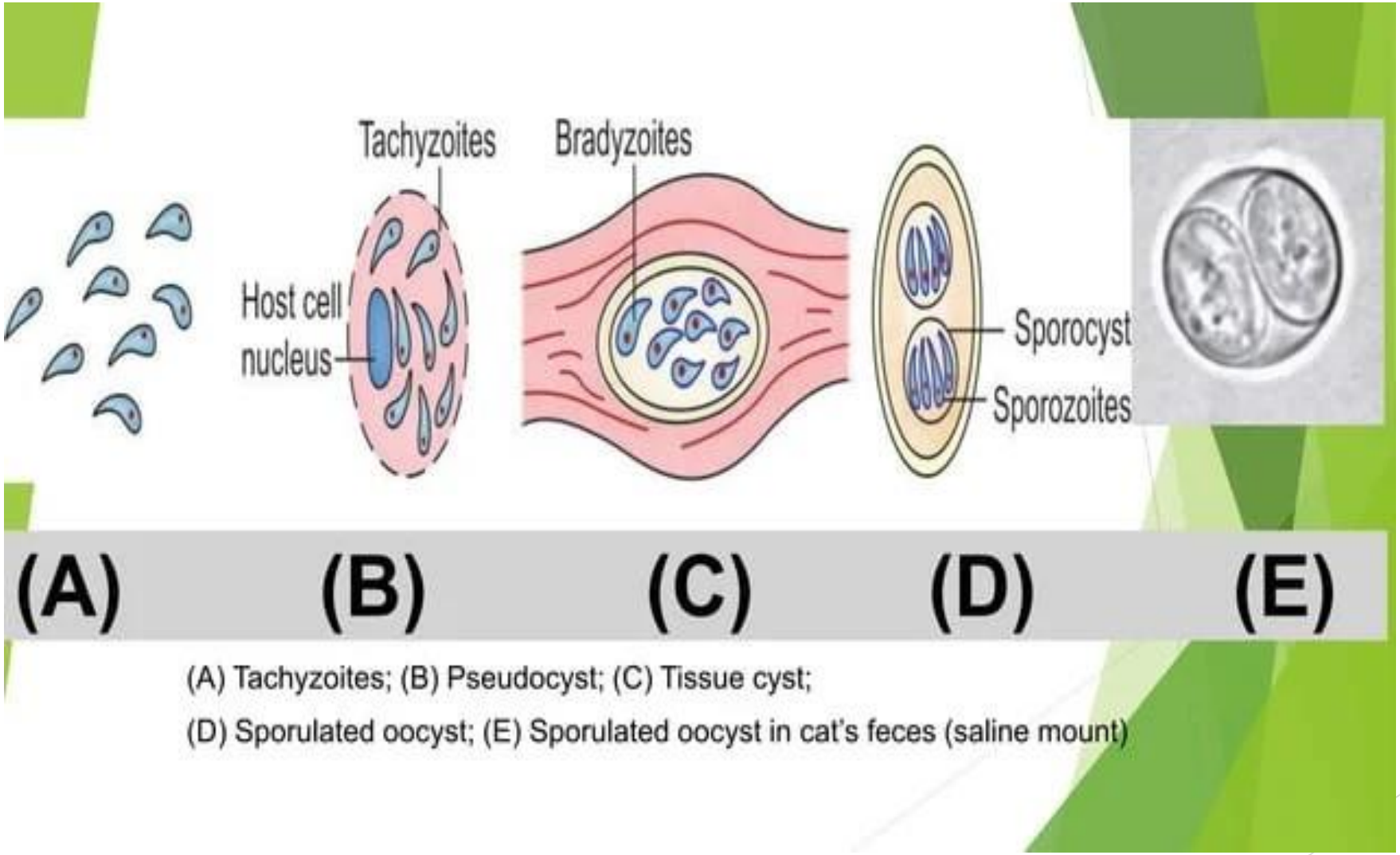
- **Morphologic**
  - **Tachyzoites in circulating**
  - **Histopathologic**



- **Serologic tests**



- **directly by molecular methods (PCR)**



(A) Tachyzoites; (B) Pseudocyst; (C) Tissue cyst;
(D) Sporulated oocyst; (E) Sporulated oocyst in cat's feces (saline mount)

Plasmodium sp .

- Plasmodium is a genus of parasitic Sporozoa , many of which cause Malaria in their hosts . The parasite always has two hosts in its life cycle :
- A Dipteran insect host (Mosquitoes/ Anopheles) and a vertebrate host . Sexual reproduction always occurs in the insect , making it the definitive host .

There are four species :

.1 Plasmodium vivax

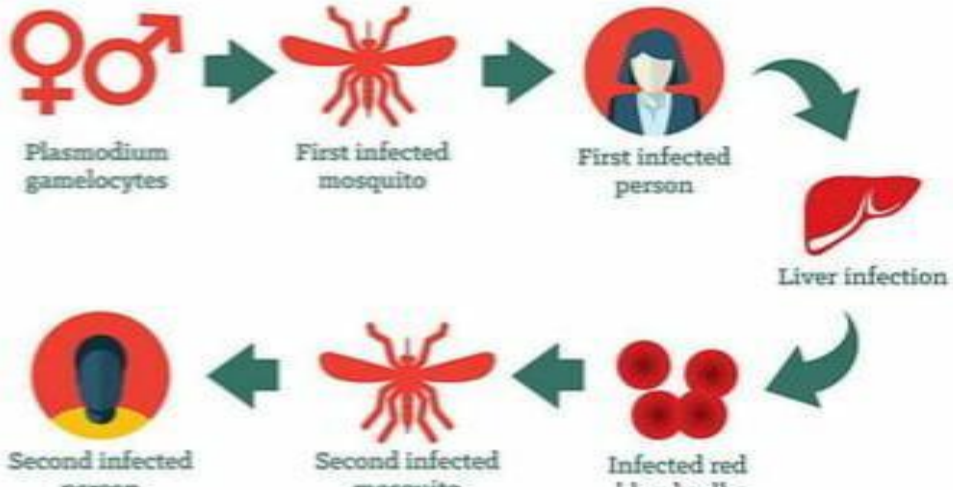
.2 Plasmodium ovale

.3 Plasmodium malariae

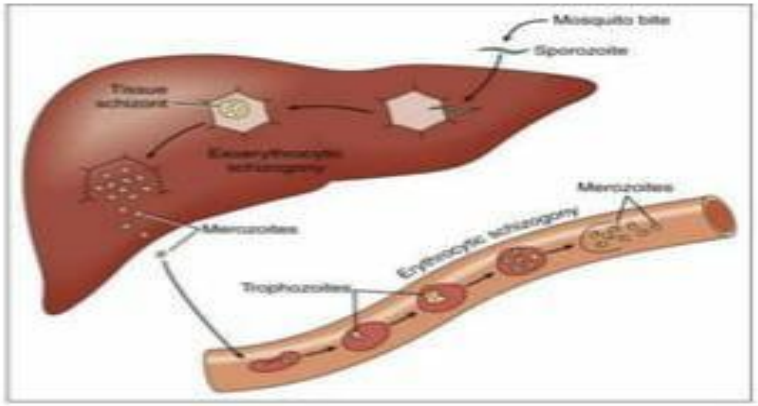
.4 Plasmodium falciparum

Life Cycle:

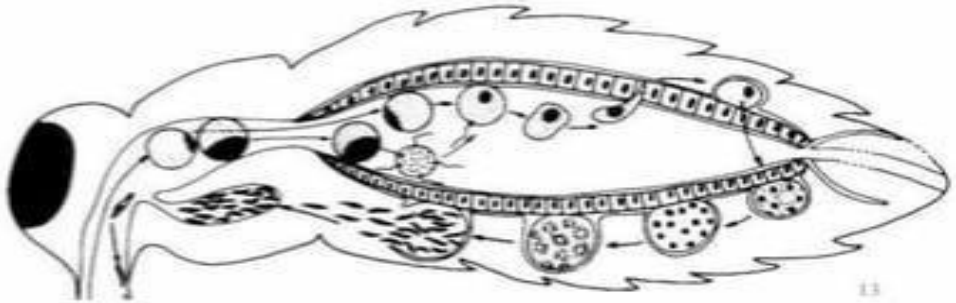
- **Intermediate host** : Human
- **Definitive host** : Mosquito
- **Infective stage** : Sporozoite
- Infective way : mosquito bite skin of human
- Parasitic position : liver and red blood cells
- Transmitted stage : gametocytes



- **Human Cycle: (Intermediate host)**
  - Primary exoerythrocytic / pre-erythrocytic **schizogony**
  - Erythrocytic **schizogony**
  - Gametogony
  - Secondary exoerythrocytic or dormant **schizogony**

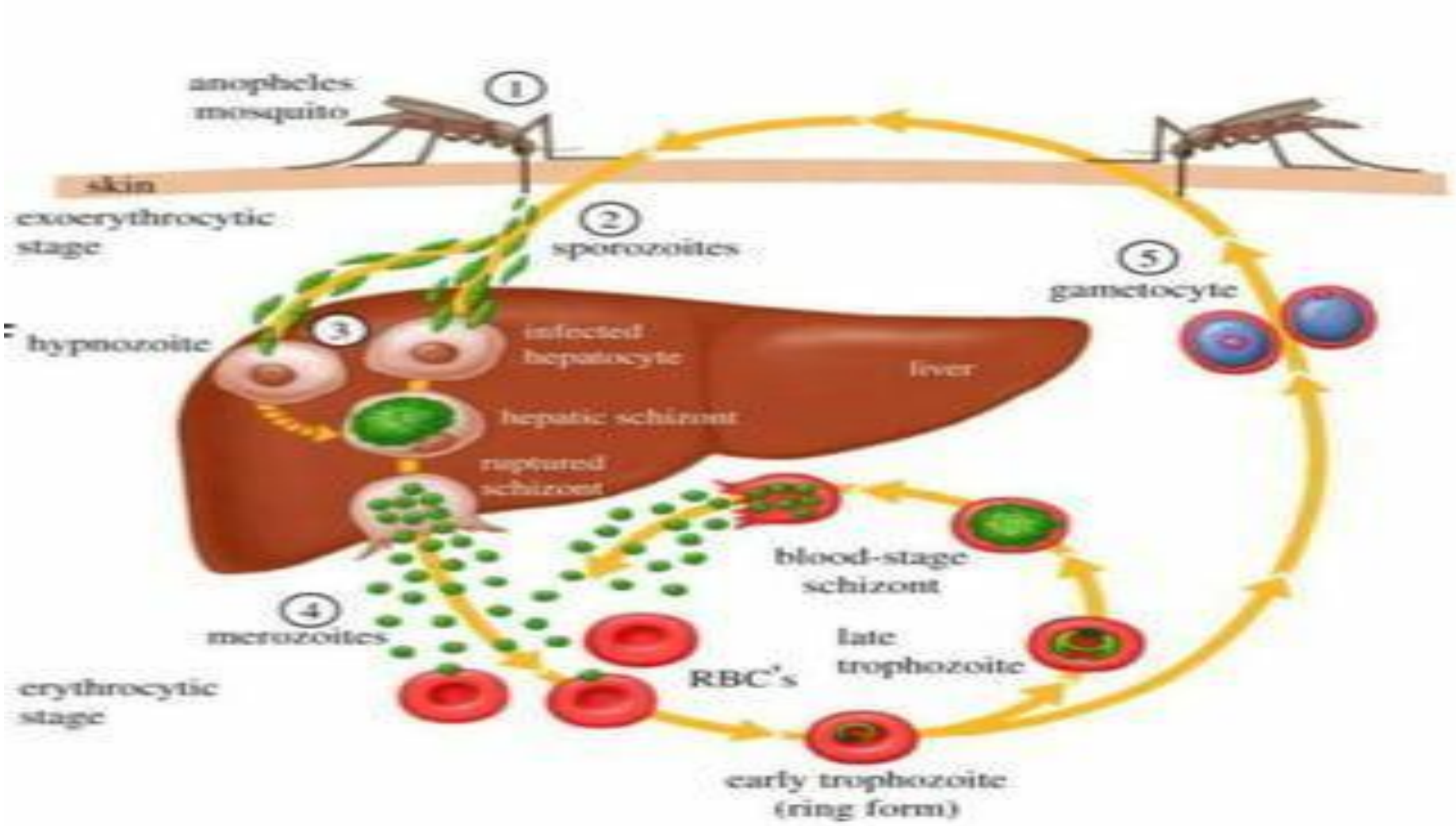


- **Mosquito cycle (Definitive host)**
  - **Sporogony**



Mode of infection	Infective form
• through bite of infected female anopheles mosquito (vector)	• Sporozoites

Life cycle


anopheles mosquito
1
skin
exoerythrocytic stage
2
sporozoites
5
gametocyte
hypnozoite
3
infected hepatocyte
liver
hepatic schizont
ruptured schizont
blood-stage schizont
4
merozoites
late trophozoite
RBC's
erythrocytic stage
early trophozoite (ring form)

Laboratory Diagnosis

Microscopic examination of (thick and thin) films of blood.

PCR

ELISA

Thank You !