PROTOZOA

The protozoa are contained within the kingdom Protista along with the unicellular organism. The classes of protozoa are categorized by a variety of factors: cell structure, motility structure, even hosts. They do not photosynthesize, rather being chemoheterotrophic like animals.

This means that they use chemicals for energy production and they get their carbon from the same compounds, e.g. sugar.

Many of the protozoa form a resistant, dormant structure called a cyst. Parasitic protozoa are identified by the active feeding stage, called a trophozoite, in addition to the cyst stage, both of which may be found in the feces.

For our purposes, there are only 4 groups of protozoa that will be covered here: these groups are separated by motility and cell structure.

- Amebas (representative: Ameba proteus)
- Flagellates (representative: Trypanosoma, Giardia lamblia)
- Ciliates (representative: Paramecium)
- Apicomplexa (representative: Plasmodium)

Many protozoa are found in the gut of warm-blood animals and cold-blooded animals, as well as in insects such as termites and cockroaches. In addition, there are quite a few protozoans that live in blood.

Amebas move by cytoplasmic streaming, having no motility structure. You will likely see some freshwater amebas in the pond water.

The flagellates have flagella or an undulating membrane for motility.

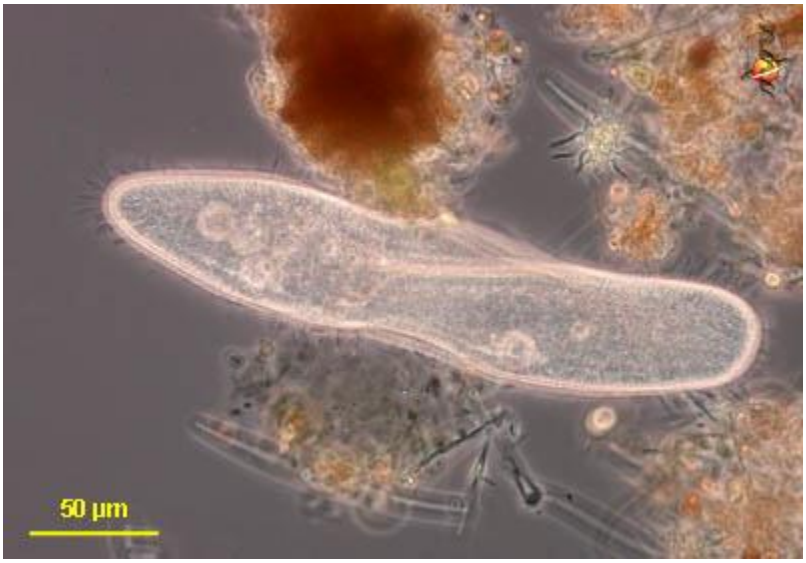
The ciliates have cilia.

The Apicomplexa have a unique arrangement of microtubules, called the apical complex (used in the takeover of the host cell), in the cell.

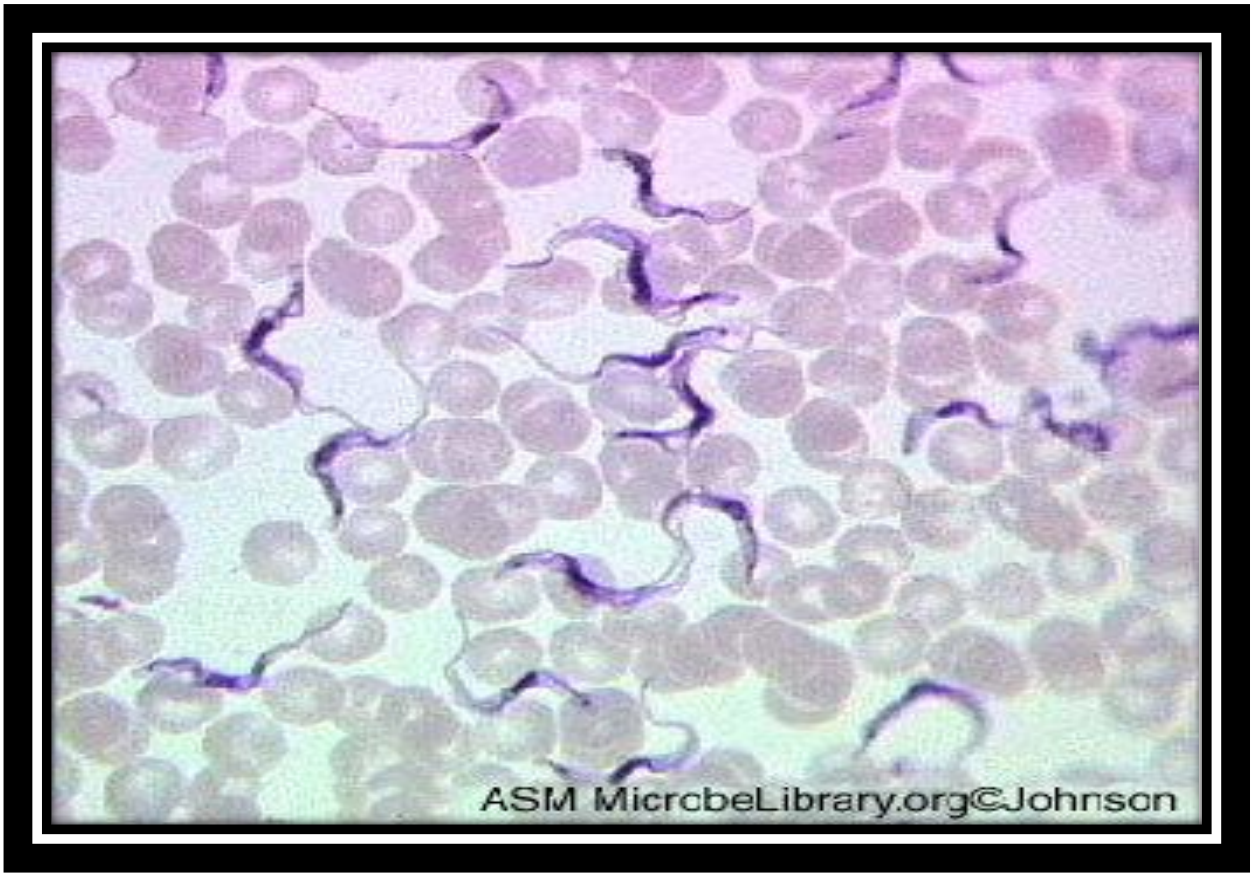
This last class has most of the human and animal pathogens in it.

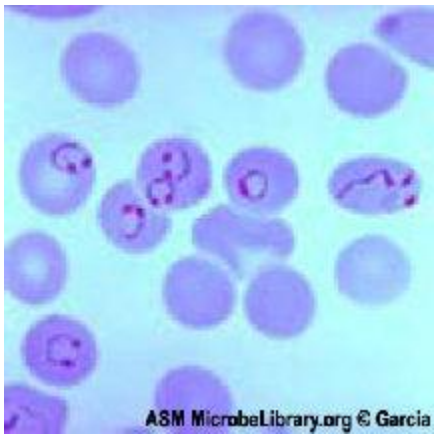
Ameba

Paramecium



Trypanosoma





Plasmodium

MATERIALS NEEDED:

prepared slides: *Trypanosoma and Plasmodium*

fresh specimens: *Ameba* and *Paramecium*

pond water

PROCEDURE:

1. Make wet mounts of the pond water.

□□Go down to the **bottom** of the container

□□Do NOT stir the specimen.

□□Start with the 10X and go to 40X. Oil-immersion will magnify too much for most pond water protozoa.

□□Once you have found your objects on bright field, *change over to dark field and phase contrast* for even better viewing.

2. Look at the READY VIEW containing ***Paramecium*** and ***Ameba***.

3. Look at the prepared blood slides of ***Trypanosoma*** and ***Plasmodium*** on 100X, using brightfield microscopy. ***Trypanosoma*** will be easy to see: it is far larger than the red blood cells. However, ***Plasmodium*** will be difficult since the parasite will be inside of the RBCs.

Microscopical examination:

The direct smear method by using lougal's iodin:

the method was done as follows:-

1-A drop of lougal's iodin solution was placed on a glass slide.

2-Small amount of fecal sample of cattle or stool sample of human (about pin head in size) was put on lougal's iodin drop and mixed thoroughly using wooden stick.

3- Cover slip was applied with forceps or fingers.

4-Examination of slide under (40X) and(100X) powers.

Di ethyl ether sedimentation method:

the technique procedure as follows:-

1- 5 grams of the stool or feces sample were mixed with 10ml of formal saline(10%).

2-Mixture was filtered through a 350_450 several pores.

3- 7 ml of filtrate in to a 15 ml glass centrifuge tube.

4- 3 ml of diethyl ether was added and mixed.

5- Centrifuged at 1500 rpm for 2-5 minutes.

6- The top three layers (ether , insoluble debris , formal saline) were discard.

7- A drop of the sediment which contain (stool or feces solids , cysts and eggs) was placed on a glass slide and covered with cover slip and examined under(40X) and (100X) powers.


20X
Paramecium
ciliate
protozoa
10um
10um