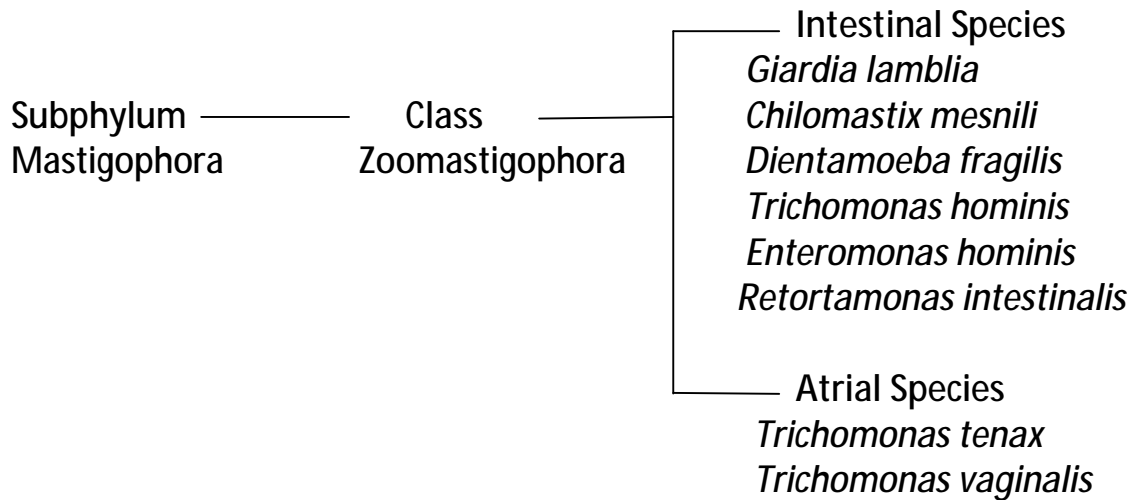


Flagellates



Movement of the flagellates is accomplished by the presence of flagella in their trophozoite form , this characteristic that distinguishes flagellates from the other groups of protozoa .

In flagellates life cycles that consist of both the trophozoite and the cyst stages.

Classification of *Giardia lamblia*

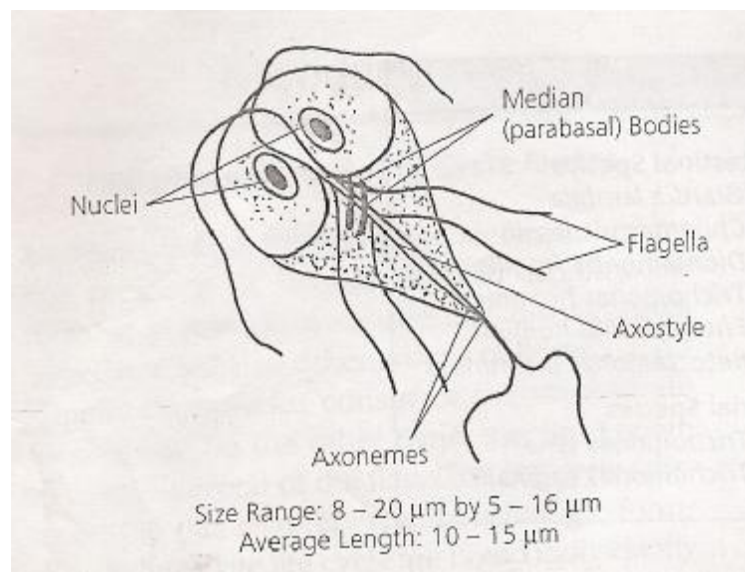
Phylum : Sarcomastia
Subphylum : Mastigophora
Class : Zoomastigophora
Order : Diplomonadida
Family : Hexamitidae
Genus : *Giardia lamblia*

Genus : *Giardia lamblia*

Was for many years considered as nonpathogenic . This organism is now considered to be the only known pathogenic intestinal flagellate . It is causing disease called (Giardiasis) , the natural habitate to this parasite is duodenum of human intestine .

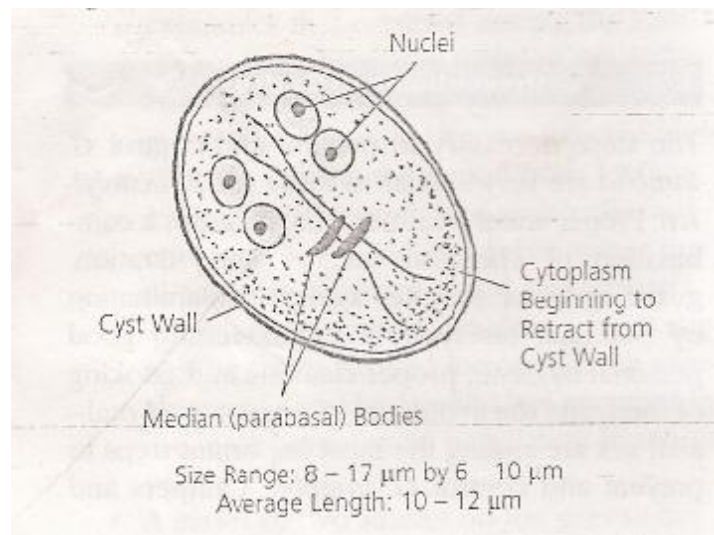
1 – Trophozoite stage :

This form is described as pear or teardrop in shape (in front view) , whereas in (lateral view) it is spoon shaped . The broad anterior end of the organism tapers off at the posterior end .It 's motility resemble a falling leaf.The appearance is bilaterally symmetrical .Containing two ovoid to spherical nuclei , each with a large karyosome usually centrally located . Peripheral chromatin is absent .This stage is supported by an axostyle made up of two axonemes, two slightly curved rod-like structures known as median bodies (parabasal bodies) . Typical trophozoite containing four pairs of flagella (one pair at the anterior end, one pair at the posterior end and two pairs are located laterally which are extended from the axoneme in the center of the body) . Also this stage has sucking disc covering one half to three quarters of the ventral surface , the sucking disc serves as nourishment point of entry by attaching to the intestinal villi of an infected human .



2- Cyst stage :

It's ovoid in shape and have two median bodies . Immature cysts have 2 nuclei , mature cysts have 4 nuclei and 4 median bodies , central karyosomes are present but no peripheral chromatin. Mature cysts contain twice as many anterior flagellar structures .



Laboratory Diagnosis

1. Stool examination : The stool sample is the specimen of choice for the recovery of *Giardia lamblia* trophozoites and cysts.
2. Stool antigen detection : available tests use either an immunofluorescent antibody (IFA) assay or enzyme-linked immunosorbent assay (ELISA) against cyst or trophozoite antigens, these examinations are limited to the detection of *Giardia lamblia* .
3. Stool culture : not useful for diagnosing Giardiasis because the organism cannot be grown from patient samples .
4. Serum antibody detection :
5. String test (entero-test) :

Life Cycle

The infective *Giardia lamblia* cysts enter the stomach , the cyst excyst in the duodenum resulting trophozoites become established and multiply approximately every 8 hours via longitudinal binary fission. The trophozoites feed by attaching their sucking discs to the mucosa of the duodenum .

Trophozoites may also infect the common bile duct and the gallbladder . Encystation occurs as the trophozoites migrate into the bowel . The cysts enter the outside environment via the feces and may remain viable for as long as 3 months in water . Trophozoites entering into the outside environment quickly disintegrate .

Notes :

- ✓ Trichrome stain is useful for finding the cysts and trophozoites
- ✓ Trophozoites disintegrate rapidly outside of the body but may be found in fresh , watery stools .
- ✓ Cysts are found in soft and (semi) formed stools .

The life cycle of *Giardia lamblia*

