

**Class : Flagellates**

This group of parasites bear flagella as the organ of locomotion. Flagella are slender, long and thread-like extension of cytoplasm. Its intracellular portion is called as **axostyle** or **axoneme**. Flagella arise from kinetoplast (made up of copies of mitochondrial DNA) which in turn consists of:

- Blepharoplast or basal body or kinetosome from which flagellum arises
- Parabasal body, through which it passes as axostyle

**. Classification**

- Intestinal Flagellates → Giardia
- Blood and tissue → leishmania & Trypanosome
- Vagina and urethra → *Trichomonas vaginalis*

***Giardia lamblia***

**Habitat:** Duodenum and upper part of jejunum.

**Morphology:** It occurs in two forms—(1) trophozoite and (2) cyst

**The trophozoite**

The trophozoite has a falling leaf-like motility, usually measures 10–20  $\mu\text{m}$  in length and 5–15  $\mu\text{m}$  in width .

In front view, it is pear shaped (or tear drop or tennis racket shaped) with rounded anterior end and pointed posterior end

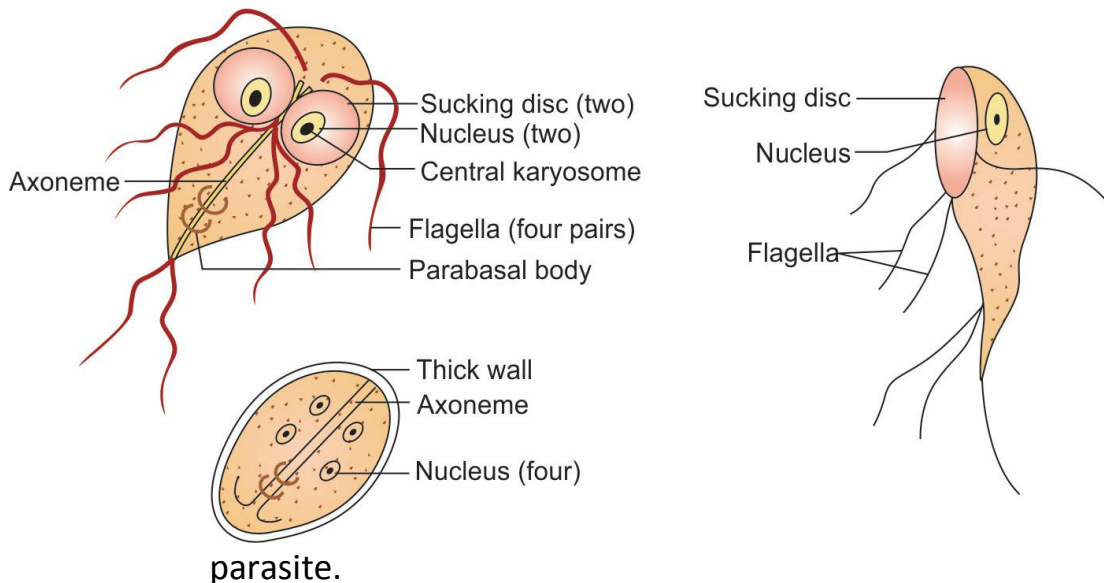
- Laterally, it appears as a curved portion of a spoon (sickle shaped)
- Trophozoite is bilaterally symmetrical; on each side from the midline it bears
  - One pair of nuclei
  - Pair of median bodies
- Four pairs of basal bodies or blepharoplasts (from which the axoneme arises)
- Four pairs of flagella—two lateral, one ventral and one caudal pair of flagella
- Pair of parabasal bodies (connected to basal bodies through which the axoneme passes)
- Pair of axoneme or axostyle (the intracellular portion of the flagella

with ventral side, which serves as the parasite's method of attachment to the mucosa of the host has a large sucking disk on the anterior.

**Cyst**

*Giardia* cyst is oval shaped, measures 11–14  $\mu\text{m}$  in length and 7–10  $\mu\text{m}$  in width. It contains four nuclei and remnants of axonemes, basal bodies and parabasal bodies

- It is the infective form as well as the diagnostic form of the



**Host:** *Giardia* completes its life cycle in one host.

**Infective form:** Mature cyst.

**Mode of transmission:** Man acquires infection by ingestion of food and water contaminated with mature cysts or rarely by sexual route (mainly in homosexuals).

***Development in Man***

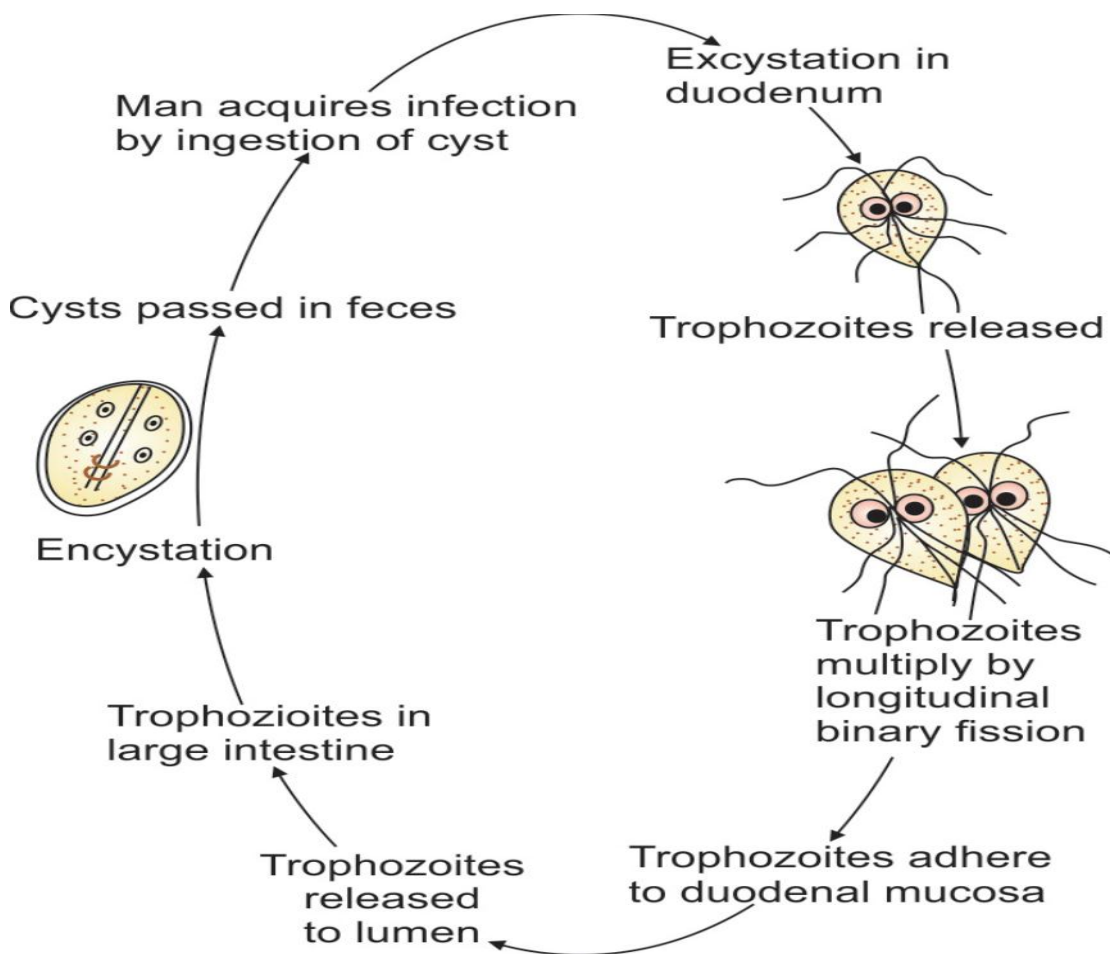
**Excystation:** Two trophozoites are released from each cyst in the duodenum within 30 minutes of entry

**Multiplication:** Trophozoites multiply by longitudinal binary fission in the duodenum.

**Adhesion:** Trophozoites adhere to the duodenal mucosa by the bilobed adhesive ventral disc. This is achieved by the microtubules of median bodies, contractile proteins and lectins present on the surface of adhesive disc that bind to the intestinal receptors (sugar molecules)

-In active stage of the disease, sometimes the trophozoites are excreted in diarrhea stool

**Encystation:** Gradually when the trophozoites pass down to large intestine, encystation begins





## *Trichomonas vaginalis*

It is the most common parasitic cause of sexually transmitted diseases (STDs). Females are commonly affected than males

### Morphology

Trophozoites are the only stage, there is no cystic stage.

#### Trophozoites

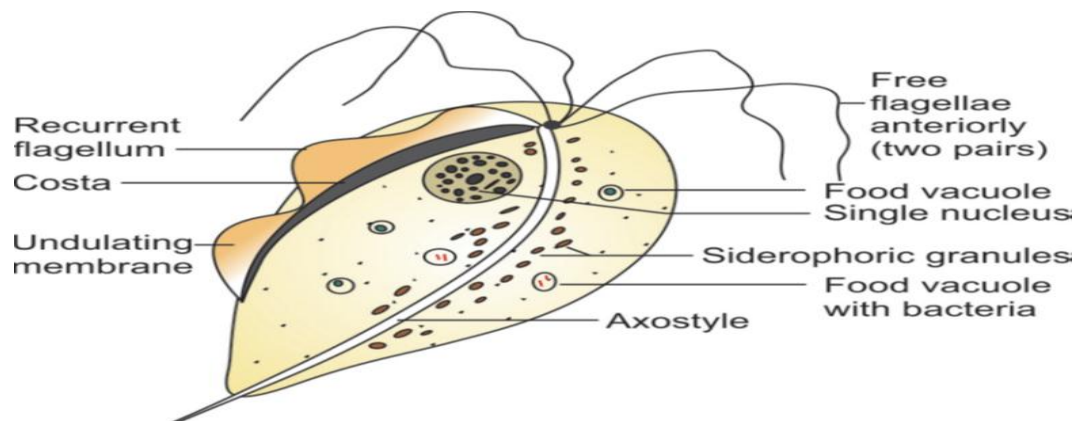
Trophozoite is oval, 7 by 15 Mm size. Single elongated nucleus.

-Five flagella arise nearby: Four immediately exit the cell, the 5<sup>th</sup> bends back. Abreviated undulating membrane (giving it jerky movement). Axostyle bisects the trophozoite longitudinally and protrudes through its posterior end

Grow under anaerobic conditions at PH 5.5 – 6.0

-Trophozoite can survive outside human host for 1 -2 hrs on moist surfaces.

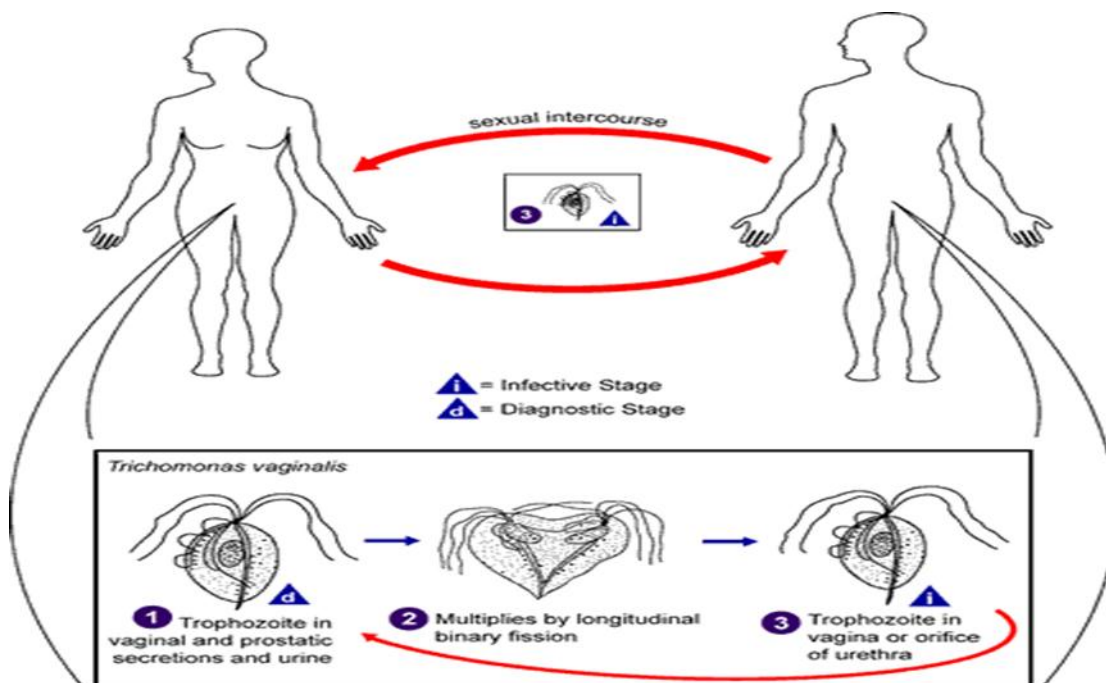
-In urine, semen and water, it is viable for up to 24 hrs



### Life Cycle

Trophozoites are the infective stage as well as the diagnostic stage.

- Asymptomatic females are the reservoir of infection and transmit the disease by sexual route
- Trophozoites divide by longitudinal binary fission giving rise to a number of daughter trophozoites in the urogenital tract which can infect other individuals



### Symptoms in women.

-which can be white, gray, yellow, or green, and -vaginal discharge usually frothy with an unpleasant smell

- vaginal spotting or bleeding-

genital burning or itching

genital redness or swelling

frequent urge to urinate

pain during urination

or sexual intercourse

### **.Symptosis in men**

Urethra and prostate are the usual sites. -Seminal vesicles and epididymis may be involved. -Infections are usually asymptomatic.

-Symptomatic men complain of recurrent dysuria and scant nonpurulent discharge

### **DIAGNOSIS**

Identification is accomplished most easily by examining a wet preparation for the presence of motile organism: -

In women, drop of vaginal discharge is the most appropriate specimen.

-In men, urethral exudate or urine sediment may be used.