



Phylum: Protozoa:

Class: Flagellates.

Parasitic protozoa, which possess whip-like flagella as their Organs of locomotion are called as flagellates

Depending on their habitat, they can be considered under:

- 1- **Lumen-dwelling flagellates:** Flagellates found in the alimentary tract and urogenital tract
- 2- **Hemoflagellates:** Flagellates found in blood and tissues

***- Giardia Lamblia**

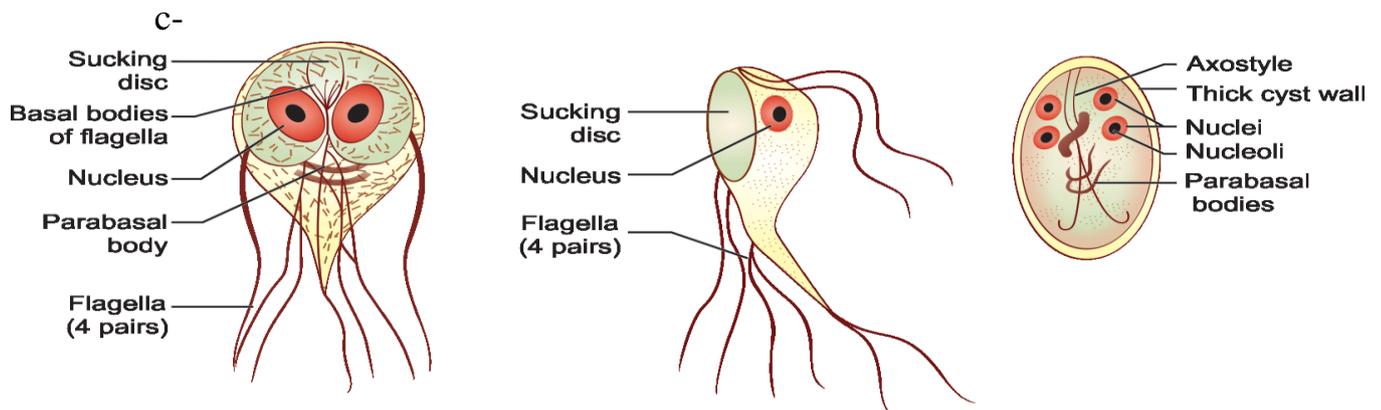
1- Habitat: *G. lamblia* lives in the duodenum and upper jejunum and is the only protozoan parasite found in the lumen of the human small intestine

2- Morphology: It exists in two forms:

- a- **Trophozoite (or vegetative form):** is in the shape of a tennis racket and is rounded anteriorly pointed posteriorly. The trophozoite is motile, with a slow oscillation about its long axis, often resembling **falling leaf**.

It is bilaterally symmetrical and possesses 1 pair of nuclei, 4 pairs of flagella, Blepharoplast, from which the flagella arise (4 pairs), 1 pair of axostyles, running along the midline

- b- **Cyst (or cystic form).** It is the infective form of the parasite its internal structure includes two pairs of nuclei grouped at one end. A young cyst contains one pair of nuclei.





3- Life Cycle: Giardia passes its life cycle in **one host**.

4- Infective form: Mature cyst. **Infective dose** is 10–100 cysts.

5- Mode of transmission:

a- By ingestion of cysts in contaminated water and food.

b- Direct person-to-person transmission.

6- Pathogenicity:

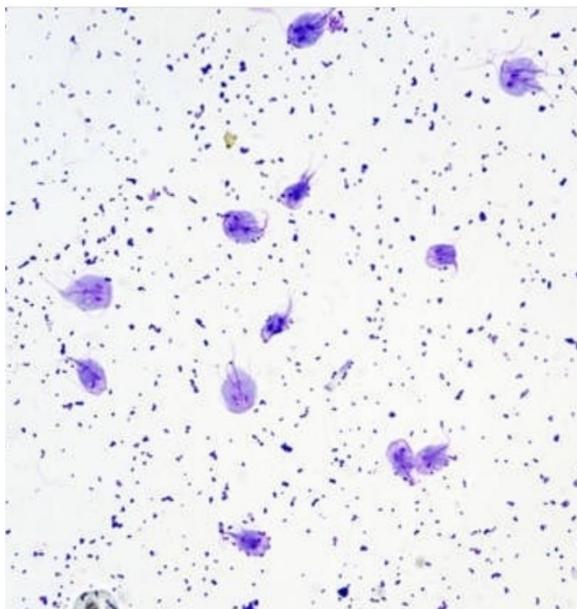
G. lamblia is typically seen within the crypts of duodenal and jejunal mucosa. **It does not invade the tissue**, but remains tightly adhered to intestinal epithelium by means of the sucking disc.

Often they are asymptomatic, but in some cases, *Giardia* may lead to mucus diarrhea, **fat malabsorption** (steatorrhea), dull epigastric pain, and flatulence. The stool contains excess mucus and fat but no blood.

7- Laboratory Diagnosis: (Stool Examination)

On macroscopic examination fecal specimens containing *G. lamblia* may have an offensive odor, are pale colored and fatty, and float in water.

On microscopic examination, cysts and trophozoites can be found in diarrheal stools by saline and iodine wet preparations



*Trichomonas

Trichomonas differs from other flagellates, as they exist only in trophozoite stage. Cystic stage is not seen.

Genus *Trichomonas* has three species, which occur in humans

1- *T. vaginalis*

2- *T. hominis*

3- *T. tenax*

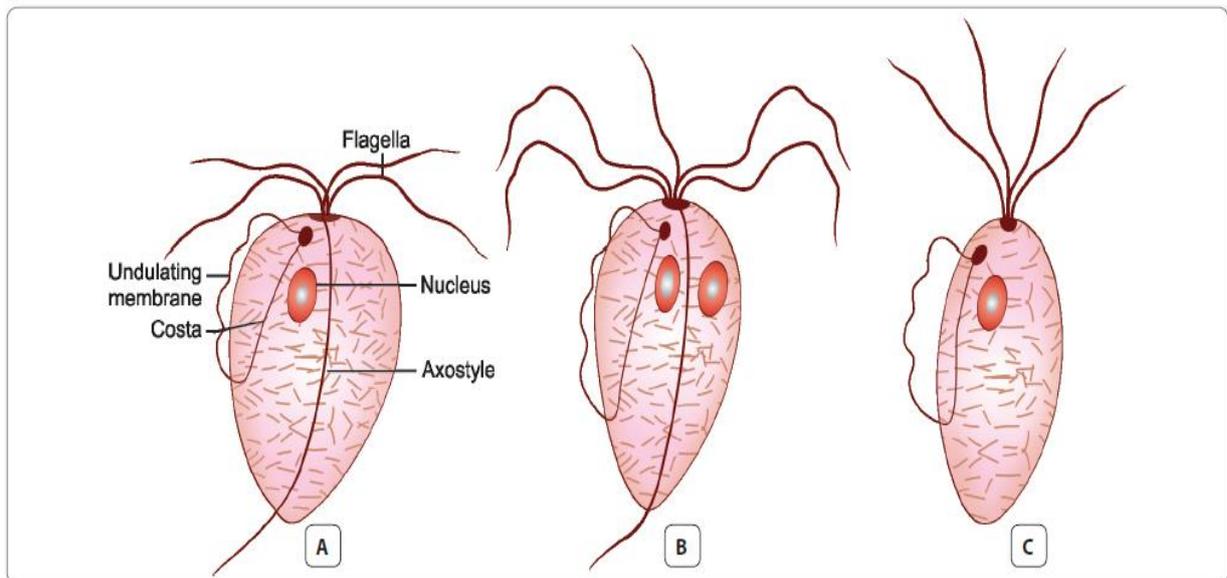


Fig. 4.4: *Trichomonas* species. A. *T. vaginalis*; B. *T. hominis*; C. *T. tenax*

Trichomonas Vaginalis (T. vaginalis)

Morphology

It is **pear-shaped** or **ovoid** with a short undulating membrane reaching up to the middle of the body it has four anterior flagella and fifth running along the outer margin of the undulating membrane, which is supported at its base by a flexible rod, **costa**. A prominent **axostyle** runs throughout the length of the body and projects posteriorly like a tail. It is motile with a rapid **jerky or twitching** type movement.



Lecturer 5

Life Cycle: Life cycle of *T. vaginalis* is completed in a single host either male or female.

Habitat

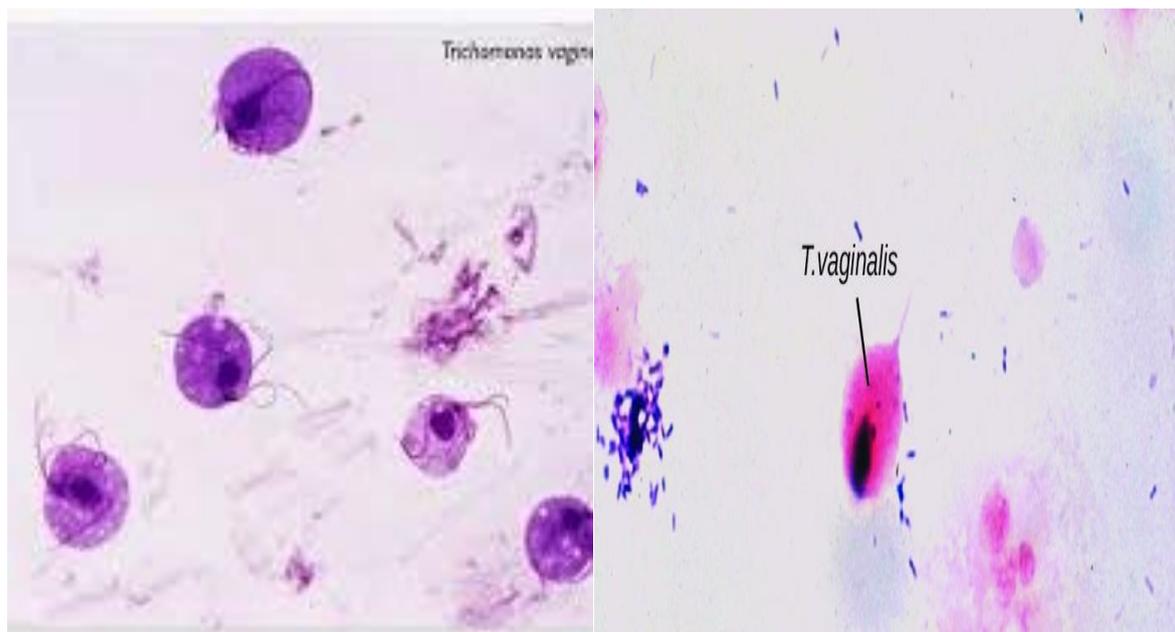
In females, it lives in vagina and cervix and may be found in Bartholin's glands, urethra, and urinary bladder. In males, it occurs mainly in the anterior urethra, but may also be found in the prostate and preputial sac.

Mode of transmission:

The trophozoite cannot survive outside and so infection has to be transmitted directly from person to person. Sexual transmission is the usual mode of infection. Babies may be infected during birth.

Pathogenesis

T. vaginalis particularly infects squamous epithelium and not columnar epithelium. It secretes cystine proteases, lactic acid, and acetic acid, which disrupt the glycogen levels and lower the pH of the vaginal fluid. Parasite causes petechial hemorrhage (**strawberry mucosa**), metaplastic changes, and desquamation of the vaginal epithelium. Intracellular edema and so-called **chicken-like epithelium**, is the most characteristic feature of trichomoniasis.



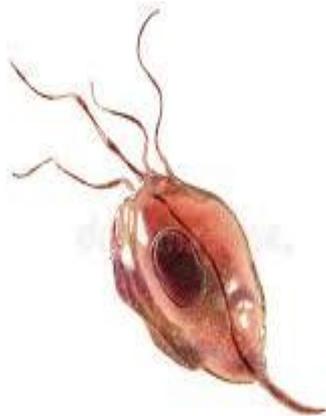


Trichomonas Tenax

T. tenax, also known as *T. buccalis*, is a harmless commensal, which lives in mouth in the periodontal pockets, carious tooth cavities, and less often in tonsillar crypts. It is **smaller** (5–10 μm) than *T. vaginalis*. It is transmitted by kissing, through salivary droplets, and fomites.

Trichomonas Hominis

T. hominis measures 8–12 μm , **pyriform-shaped**, and carries **5 anterior flagella** and an undulating membrane that extends the full length of the body. It is a **very harmless commensal** of the caecum. Microscopic examination of stool will reveal motile trophozoite of *T. hominis*. Transmission occurs in trophic form by fecaloral route.



T. tenax



T. hominis