

**TRICHOMONAS**

It includes a group of flagellated protozoa, it infects humans and animals. Flagellates of the digestive tract and genital organs: **A-**inhabiting the mouth, intestine, and genital tract are typically lumen parasites ex. *Giardia lamblia* in the duodenum and *Trichomonas vaginalis* in the vagina or *Trichomonas hominis* in intestine. **B-** flagellates of the blood and tissues ex. *Leshmania spp.* & *Trypanosoma spp.*

Trichomonas include three species infect human :

**1-T. tenax:** living around, in cavities of carious teeth, its harmless commensal of the human mouth. Transmitted by kissing or salivary droplet

**2-T. hominis:** Inhibits caecum of man, it does not invade the intestinal mucosa (not pathogenic). occasionally been found in the diarrheic stool. Transmitted by oral- fecal mode.

**3- T. vaginalis**

**Trichomonas Characteristic**

These flagellate exist only in trophozoide stage. they have four flagella and one lateral flagellum which is attached to the surface of the parasite to form undulating membrane, its supported by a rod-like structure called costa. The axostyle runs down the middle of the body and ends in the pointed tail-like extremity. A round nucleus is located in the anterior portion .

**Trichomonas vaginalis**

Trichomoniasis is the most common curable sexually transmitted disease (STD) in young caused by flagellated anaerobic protozoa *Trichomonas vaginalis* , sexually active women. An estimated 7.4 million new cases occur each year in women and men. In females the organism inhabits the vagina and urethra . In males it is found in the urethra, prostate or, seminal vesicles.

**Morphological** it resemble to T.tenax but larger ,its mmeasures 7-23µm in length and 5-15 µm in width. Trophozoite pear shaped as seen on a wet-mount, it is slightly larger than a white blood cell with undulating memberane extend to the middle part of the body . Five flagella arise near the cytostome; four of these immediately extend outside the cell together, while the fifth flagellum wraps backwards along the surface of the organism. In addition, a conspicuous barb-like axostyle projects opposite the four-flagella bundle. The axostyle may be used for attachment to surfaces and may also cause the tissue damage seen in trichomoniasis infections.

## **Transmission Rout**

- Almost always sexually transmitted ( life cycle figure)
- *T. vaginalis* may persist for months to years in epithelial crypts and periglandular areas
- Transmission between female sex partners has been documented
- Transmission during dealings with contaminated matters (clothes, cotton).

## **Pathogenesis &Symptoms**

1-T. vaginalis obligate parasite ,it cannot live without close association with vagina or prostatic tissues.the normal PH of vagina is 4-4.5 and it is maintain by the lactic acide producing lactobacillus.when T.vaginalis live in vagina ,it can disrupt lactic acide causing PH raise to above 5. Also the pathogenic bacteria will devlope faster causing inflammation or vaginitis.

2- T. vaginalis responsible for vaginitis with many sign & symptoms include:

- Greenish-yellow, frothy vaginal discharge with a foul odor
- Painful urination
- Vaginal itching and irritation
- Discomfort during intercourse
- Lower abdominal pain (rare)
- Patchy vaginal erythema and (strawberry cervix)

Symptoms usually appear within five to 28 days of exposure in women

3- In men , usually mild or asymptomatic infection may develop itching and discomfort inside penile urethra.High concentration of zinc in prostate fluid may have lytic effect on the parasite.

4-Mechanism of pathogenesis seem to be mediated by cell to cell adhesion, hemolysis, produce proteineses , pore-forming proteins .

## **5-Complications**

Some of the complications of *T. vaginalis* in women include: preterm delivery, low birth weight, and increased mortality as well as predisposing to HIV infection, AIDS, and cervical cancer.

## **Diagnosis**

1-Wet amount examination by microscope : sediment of rine&vaginal secretions or in male it may be found in urine or prostatic secesion.

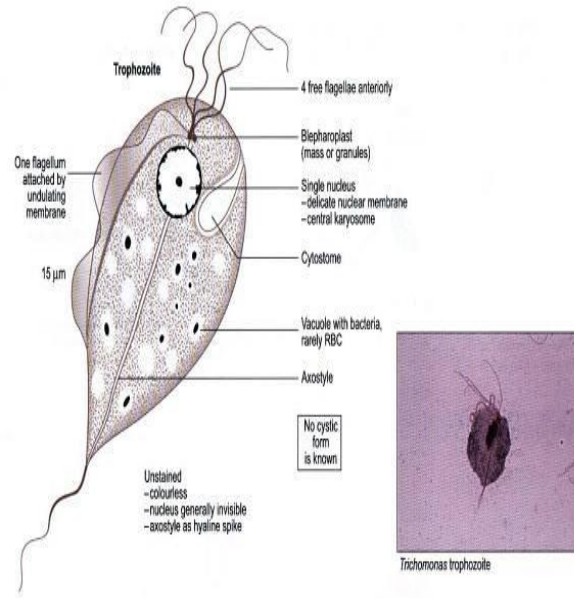
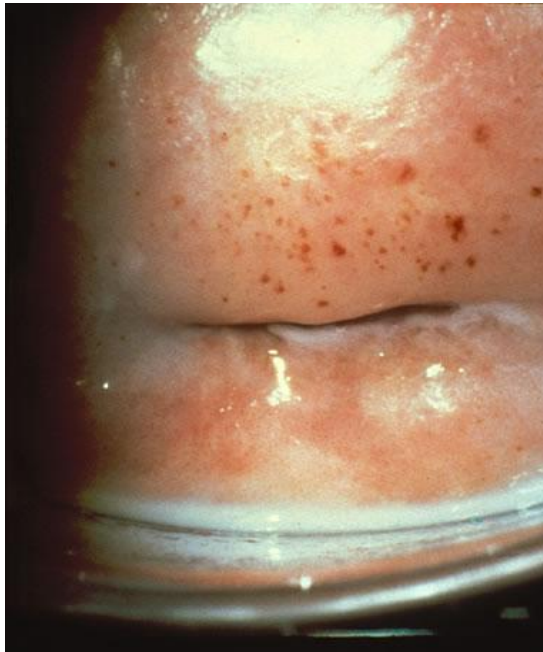
2-Fixed smear stained with papanicolaou, Giemsa, Leshmania stains

3-Staining with flourescein-labelled monoclonal antibody ,detecte the parasite by fluorescence microscopy.

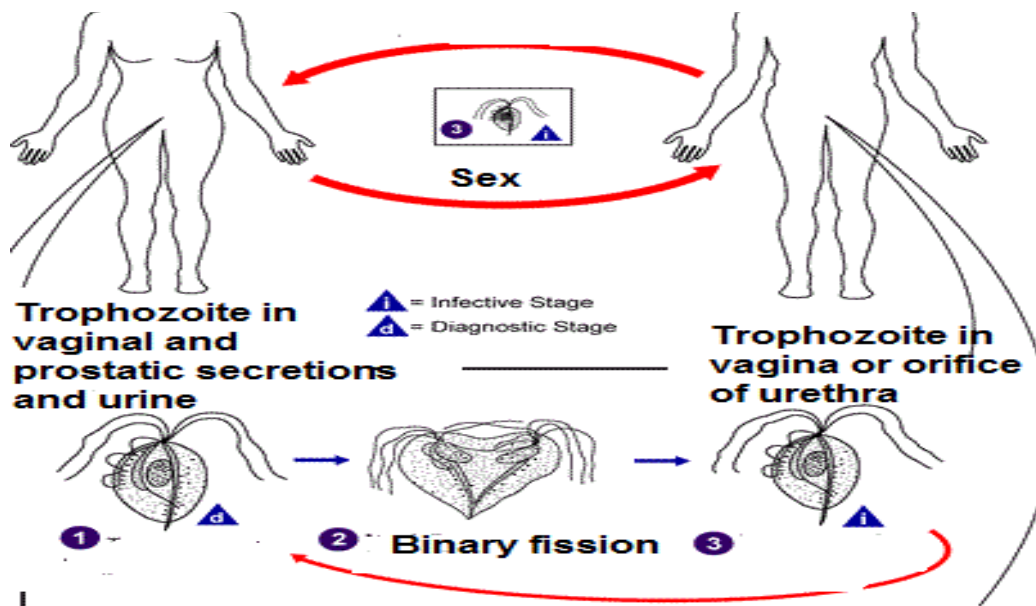
4-Culture by Diamond' s medium: It is grow best at 35-37°C under anaerobic condition &PH(5.5-6).

5- ELISA : Measure antibodies against antigen of *T.vaginalis*

6- Polymer Chain Reaction (PCR): The presence of *T. vaginalis* can also be diagnosed by this method, using specific primers.



Strawberry cervix' due to *T. vaginalis*



### Treatment

Metranidazole is highly effective therapeutic agent .it given orally 250 mg three times daily for seven days .treatment of sexual partner is essential to prevent recurrence of infection.

## Control

1-Avoiding intercourse with infected person 2-use of condoms 3-detection & treatment both men & women

## Ciliates, Phylum Ciliophora

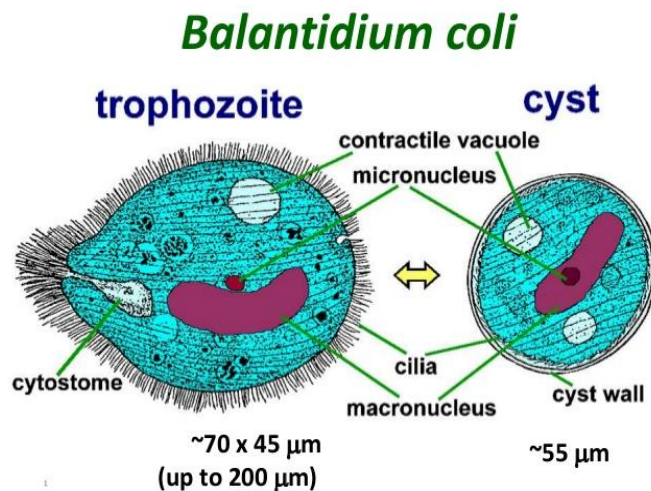
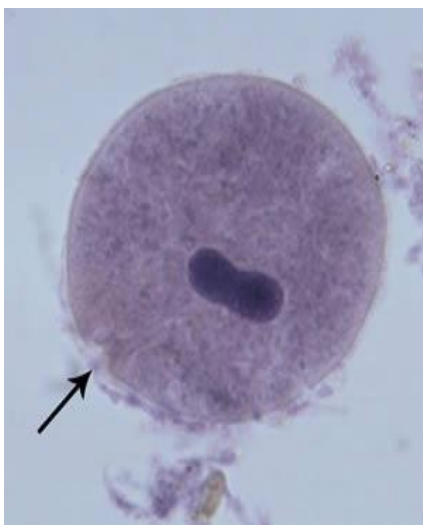
Most ciliates are free-living; however, a few groups are commensals or parasitic. The only ciliate that is a parasite of man is *Balantidium coli*.

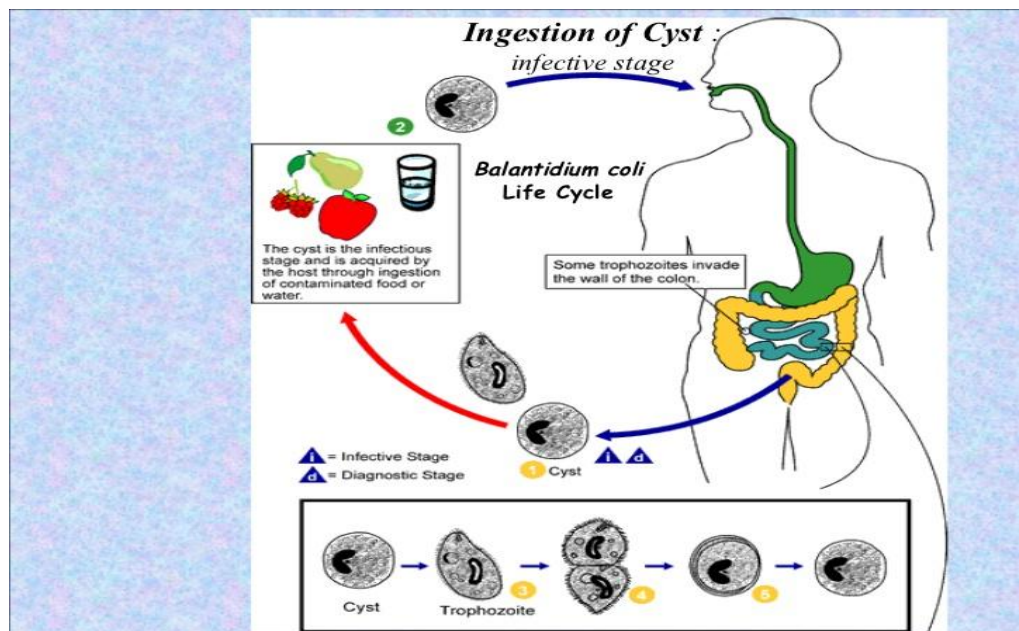
### *Balantidium coli*

is a parasitic species of ciliate protozoan that causes the disease Balantidiasis have two stages trophozoite & cyst . It is the only member of the ciliate phylum known to be pathogenic to humans cause Balantidiosis Ciliary dysentery, are found in the intestinal tract of arthropods and some vertebrates, including mammals .Pathogens of humans, dogs and monkeys ,cyst is the infect stage and transmission (fecal oral) route.

Morphological , In trophozoites, the two nuclei are visible. The macronucleus is long and sausage-shaped, and the spherical micronucleus is next to it, often hidden by the macronucleus. The opening, known as the peristome, at the pointed anterior end leads to the cytostome, or the mouth. Cysts are smaller than trophozoites and are round and have a tough, heavy cyst wall made of one or two layers. Usually only the macronucleus and sometimes cilia and contractile vacuoles are visible in the cyst. Living trophozoites and cysts are yellowish or greenish in color.

Reproduction by Asexual by binary fission or Sexual by conjugation.





## Pathogenesis

*Balantidium coli* produces proteolytic enzymes that break down and digest the intestinal epithelium. Colon ulceration develops which allows for infiltration by lymphocytes and leukocytes. Hemorrhaging and secondary bacterial infections will develop next. Perforation of the large intestine and appendix will occur.

**Sign & Symptoms** include: Mild infections occur with diarrhea, Abdominal pain, Alternating periods of constipation, Ulceration of the gut wall.

## **Pathogenesis & symptoms**

1-mucosal and submucosal destruction

2-rarely invade the muscular coats & seldom been found in extraintestinal tissue

3-Balantidial lesions may develop at any level of large intestine & mostly occur in the cecal & sigmoid-rectal regions.

## Diagnosis

Direct examination (Wet amount) of Cysts in formed stools and active trophs in diarrheic stools.

## Treatment

Tetracyclin HCL(500mg) four time daily for 10 days.

## **Control**

- Eradication of fecal contamination of food and water.
- Cysts killed by boiling
- Resistant to low doses chlorine
- Avoid practices that allow fecal-oral contact
- Improved sanitation in institutions.