Parasitology

Lab 4

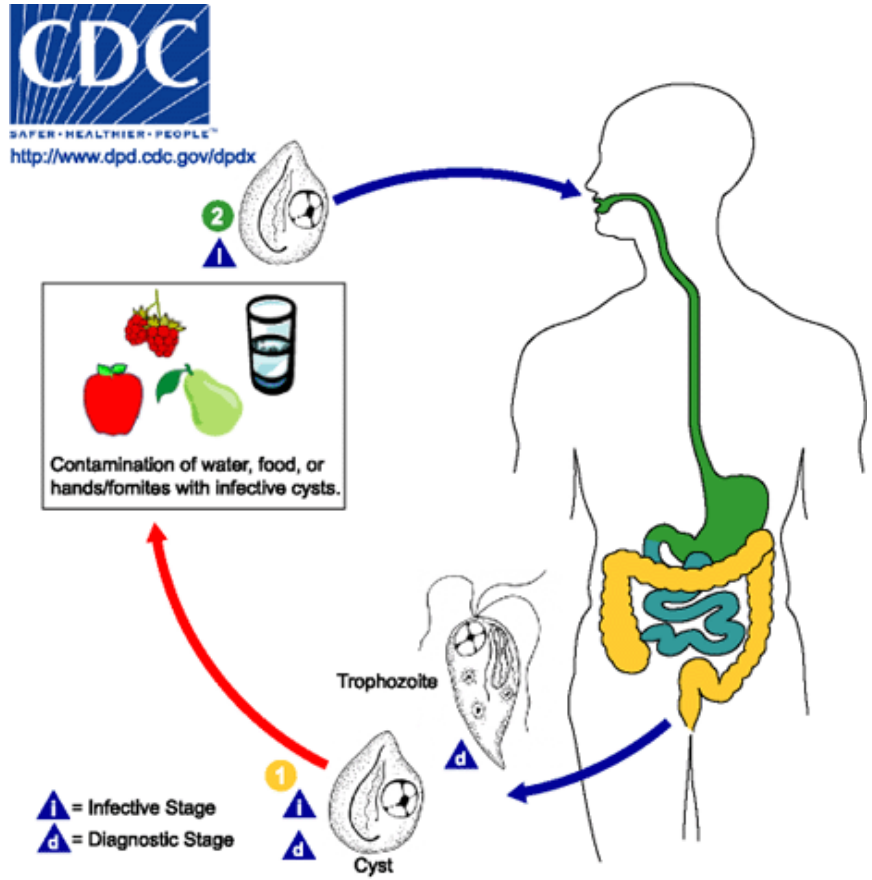
AL-Farahidi University / college of pharmacy / second stage

2022-2023

Non pathogenic intestinal flagellates

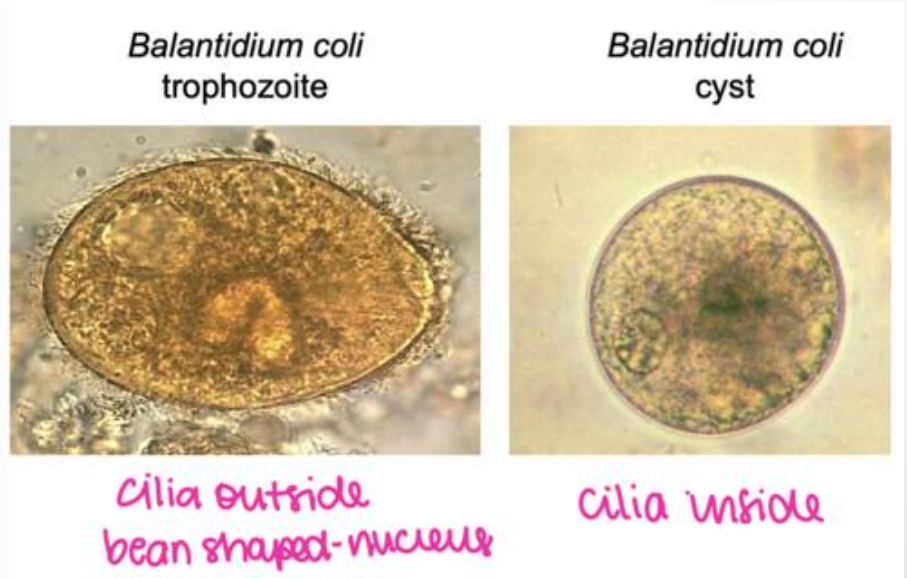
- ***Chilomastix mesnili***: Although it is considered non-pathogenic (commensal), it often occurs with other parasite infections. C. *mesnili* may be confused with other pathogenic species during diagnosis. Inhabit in the human cecum and/or colon. The resistant cyst stage in the life cycle of Chilomastix is responsible for transmission. Both cysts and trophozoites can be found in the feces (diagnostic stages). Infection occurs by the ingestion of cysts in contaminated water or food or by the fecal-oral route (via hands or fomites, i.e., inanimate objects such as towels that transmit infectious organisms to a host). In the large (and possibly small) intestine, excystation releases trophozoites.

Life cycle of Chilomastix mesnili



Balantidium coli

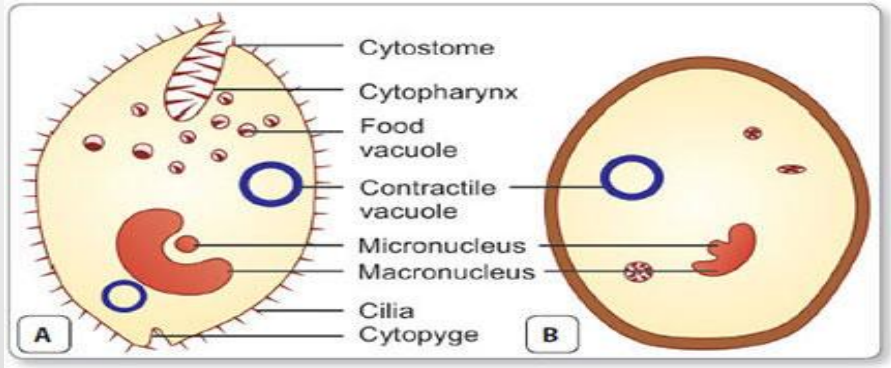
- ***Balantidium coli*** is the only ciliated protozoan known to infect humans. Balantidiasis is a zoonotic disease and is acquired by humans via the feco-oral route from the normal host, the pig (or rodents), where it is asymptomatic. Contaminated water is the most common mechanism of transmission. *Balantidium coli* has two developmental stages, a trophozoite stage and a cyst stage.
- Habitat: *B. coli* inhabits the large
- intestine of man, monkeys and pigs.
- It is generally believed that pigs
- act as the main reservoir for human
- infections.

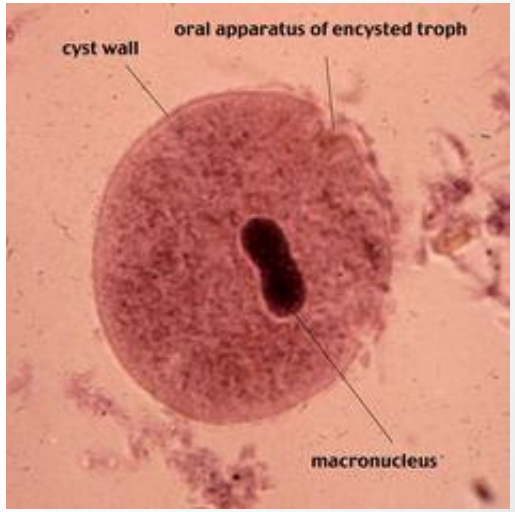


Balantidium coli

- In trophozoites, the two nuclei are visible. The macronucleus is long and the spherical micronucleus is next to it, often hidden by the macronucleus (The parasite is characterized by the presence of a large kidney-shaped 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.

- Trophozoite Cyst

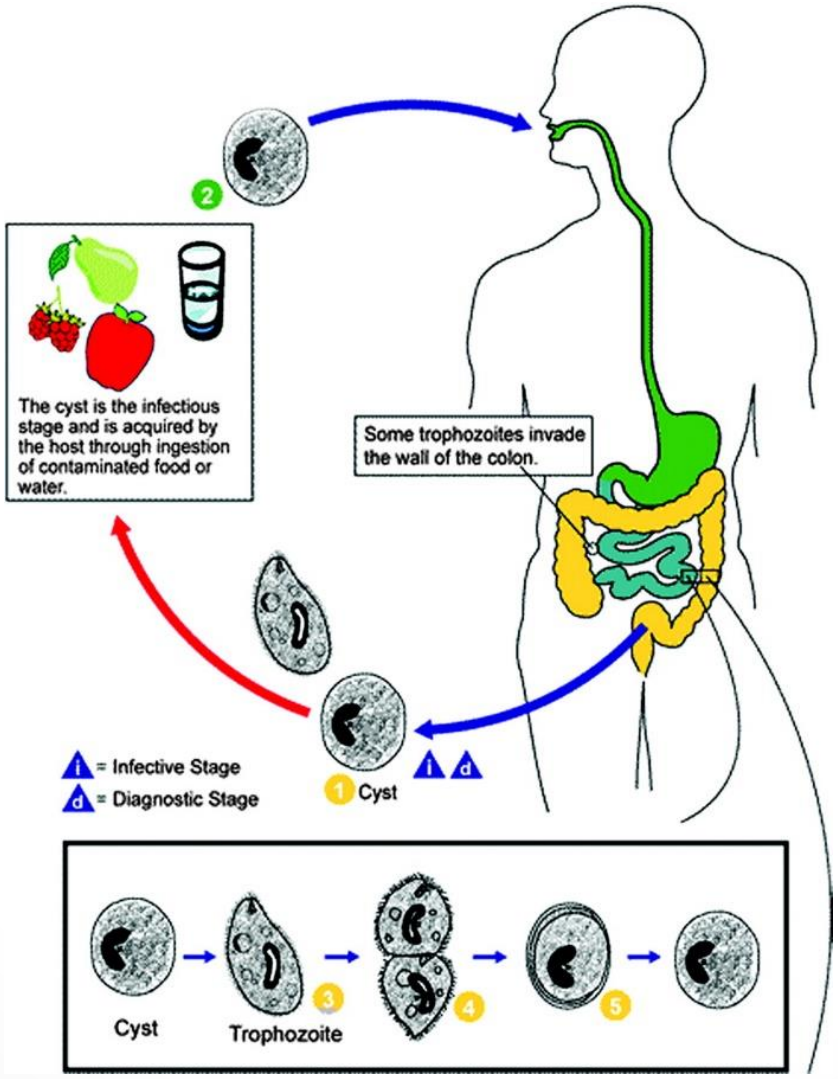




Life cycle of *Balantidium coli*

- Infection occurs when a host ingests a cyst (the infective stage), which usually happens during the consumption of contaminated water or food. Once the cyst is ingested, it passes through the host's digestive system reaches the small intestine, trophozoites are produced through (Excytation). The trophozoites then colonize the large intestine, where they live in the lumen and feed on the intestinal flora.
- Some trophozoites invade the wall of the colon using proteolytic enzymes and multiply, and some of them return to the lumen. In the lumen trophozoites may undergo (Encystation) in the distal large intestine, but may also occur outside of the host in feces. Now in its mature cyst form, cysts are released into the environment where they can go on to infect a new host.

Life cycle of *Balantidium coli*

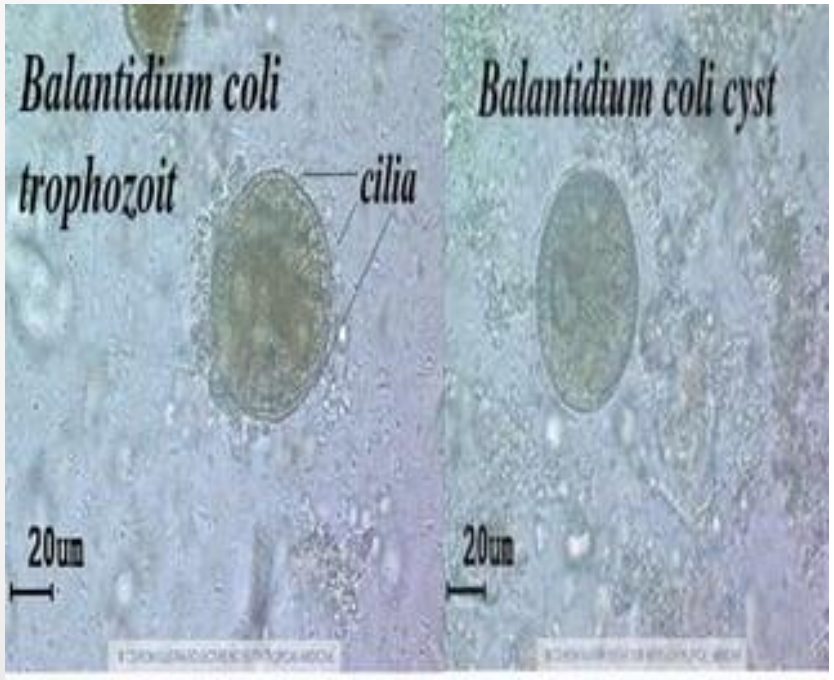


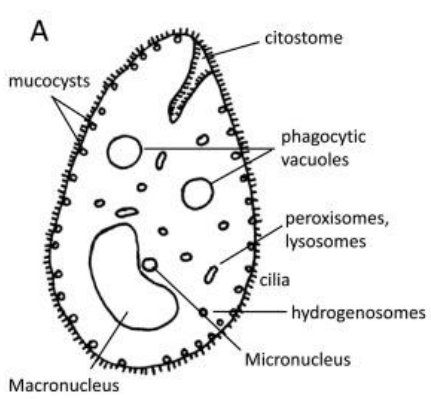
Pathogenicity of *Balantidium coli*

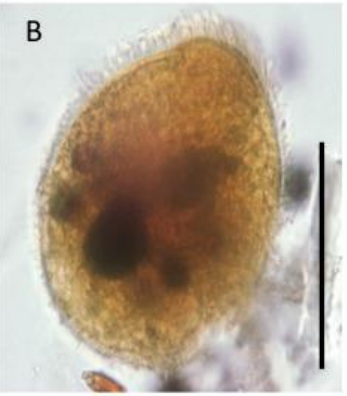
- Most infections with *B. coli* apparently harmless. However, the trophozoites invade the mucosa and submucosa of large intestine and produce ulcers. If left untreated, Balantidiasis can become chronic. Persistent diarrhea can lead to high fluid loss and dehydration. Chronic recurrent diarrhea, alternating with constipation, is the most common clinical manifestation. Abdominal bleeding can lead to death. Extraintestinal involvement such as liver, peritonea and lung may occur.

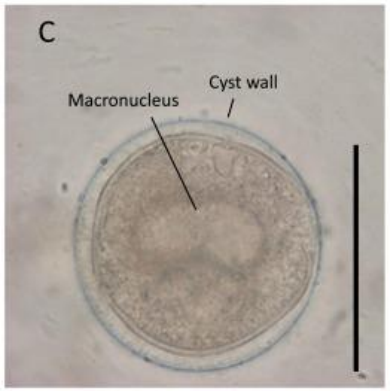
Diagnosis of *Balantidium coli*

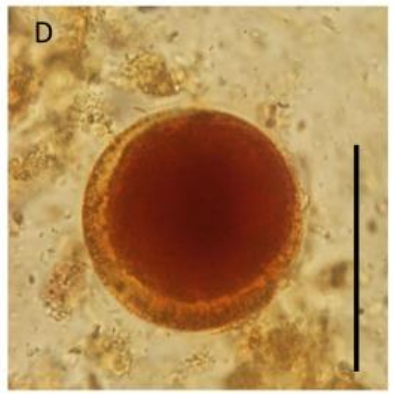
- Balantidiasis is diagnosed by microscopic examination of a patient's feces. A stool sample is collected and a wet mount is prepared. Trophozoites can also be detected in tissue. In order to collect a tissue specimen from the large intestine, a sigmoidoscopy procedure is used.











Treatment of *Balantidium coli*

- ***Balantidium coli*** **infection can be treated effectively with antibiotics. Tetracyclines, Metronidazole, Iodoquinol.**

Genital flagellates

- ***Trichomonas vaginalis***
- Morphology: It measures 7–23 µm in length and 5–15 µm in width, the trophozoites show jerky movement. High-power examination may reveal the beating flagella and undulating membrane characteristic of the species. It has five flagella—four of which are in the anterior and the other flagellum is incorporated within the undulating membrane. The flagella and the undulating membrane contribute to its motility.

Trichomonas vaginalis

- Habitat: The normal habitat of the parasite is the vagina and urethra of women, and the urethra, seminal vesicles and prostate of man. It may also be found in the Bartholin's glands and in urinary bladder in females. It is transmitted principally through vaginal intercourse.
- *T. vaginalis* exists as a trophozoite lacks a cystic stage and lacks mitochondria, instead uses the Hydrogenosome which plays an important part in metabolism. **The trophozoite consider diagnostic and infective stage** at the same time, it is dividing by longitudinal binary fission with mitotic division of the nucleus.
- *T. vaginalis* has an incubation period of from four days after exposure to one month.

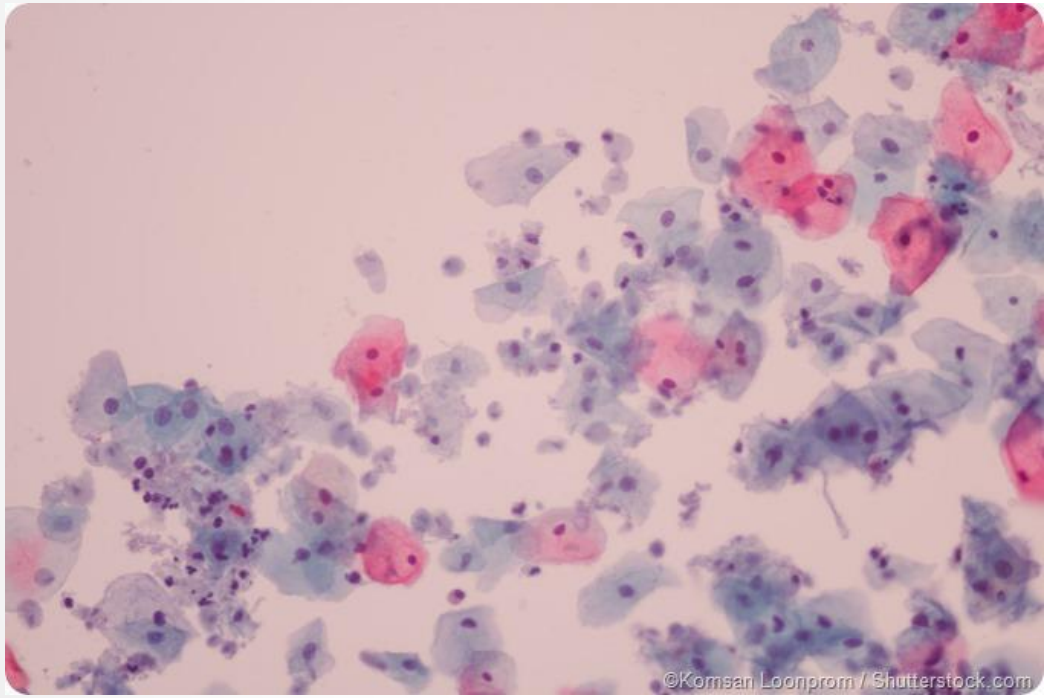
Pathogenicity of *Trichomonas vaginalis*

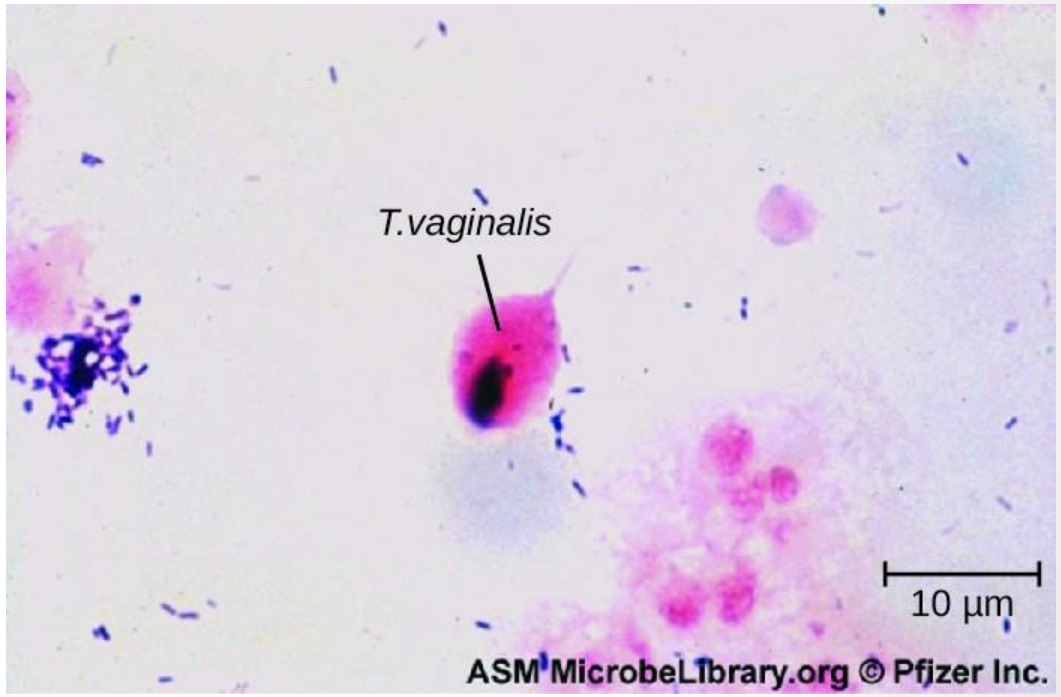
- The parasite lives on the mucosa feeding on bacteria and leucocytes. *T. vaginalis* is an obligate parasite, it cannot live without close association with the vaginal, urethral or prostatic tissues.
- Human trichomoniasis is a widely prevalent sexually transmitted disease of worldwide importance. Approximately 10% of vulvovaginitis is due to infection with *T. vaginalis*. Asymptomatic infections have been observed in 50% of infected female patients. The infected males are usually asymptomatic, acting as carriers of infection.
- The organism is responsible for a mild vaginitis with discharge. Vaginal discharge contains a large number of parasites and leucocytes and is liquid, greenish or yellow. It covers the mucosa down to the urethral orifice, vestibular glands and clitoris. Male patients usually have mild or asymptomatic infections. They may develop itching and discomfort inside penile urethra, especially during urination.

Diagnosis of *Trichomonas vaginalis*

- The diagnosis of *T. vaginalis* cannot be readily made solely on the classic symptoms, because the clinical symptoms may be synonymous with those of other Sexual Transmitted Diseases (STDs). Diagnosis of trichomoniasis could be through:
- 1. Microscopic examination of wet mount considered most traditionally method. It detects the active motility of the trophozite.
- 2. Culture *T. vaginalis* can be isolated from urethral and vaginal exudates on several commercially available media. E.g., Trussell and Johnson's medium, Diamond's media, and Simplified trypticase serum media.
- 3. Antibody and antigen detection through ELIZA technique.
- 4. Molecular methods through Polymerase chain reaction
- (PCR) test.

Diagnosis of *Trichomonas vaginalis*





Treatment of *Trichomonas vaginalis*

- Treatment:
- Metronidazole, 2 g oral single dose or tinidazole, 2 g oral single dose are highly effective against *T. vaginalis* infection. Or Metronidazole orally (500mg, 2times daily for 7 days).
- Vaginal suppositories of Metronidazole daily with oral treatment by Metronidazole provide increased efficacy in resistant infection.