

**Tikrit University**

**College of Nursing**

**Basic Nursing Sciences**



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**Micobiology**

**Protozoa**

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# **GENERAL CHARACTERISTICS OF MEDICALLY IMPORTANT PARASITES**

Medically important protozoa, helminthes, and arthropods, which are identified as causes and propagators of disease have the following general features. These features also differ among parasites in a specific category.

## **PROTOZOA**

Protozoan parasites consist of a single "cell-like unit" which is morphologically and functionally complete and can perform all functions of life. They are made up of a mass of protoplasm differentiated into cytoplasm and nucleoplasm.

**Transmission** In most parasitic protozoa, the developmental stages are often transmitted from one host to another within a cyst. The reproduction process is also related to the formation of the cyst. Asexual reproduction of some ciliates and flagellates is associated with cyst formation, and sexual reproduction of Sporozoa invariably results in a cyst. Pathogenic protozoa can spread from one infected person to another by:

- Faecal – oral transmission of contaminated foods and water.
- Insect bit inoculums or rubbing infected insect faeces on the site of bite.
- Sexual intercourse

**Pathogenesis** Protozoan organisms are virtually always acquired from an exogenous source, and as such, they have evolved numerous ways to enter the body of the human host. Factors that are important for pathogenecity include:

- Attachment to the host tissue followed by replication to establish colonization. 20
- Toxic products released by parasitic protozoa.

- Shifting of antigenic expression to evade the immune response and inactivate host defences.

Kingdom Protista

### **A-Phylum Sarcomastigophora.**

Sarcodines are the amoeboid protozoan. They have the ability to form temporary cytoplasmic extensions called pseudopodia or "false feet". Example *Entamoeba histolytica*

These protists possess one or more flagella as their locomotory organelle. Example *Giardia lamblia*

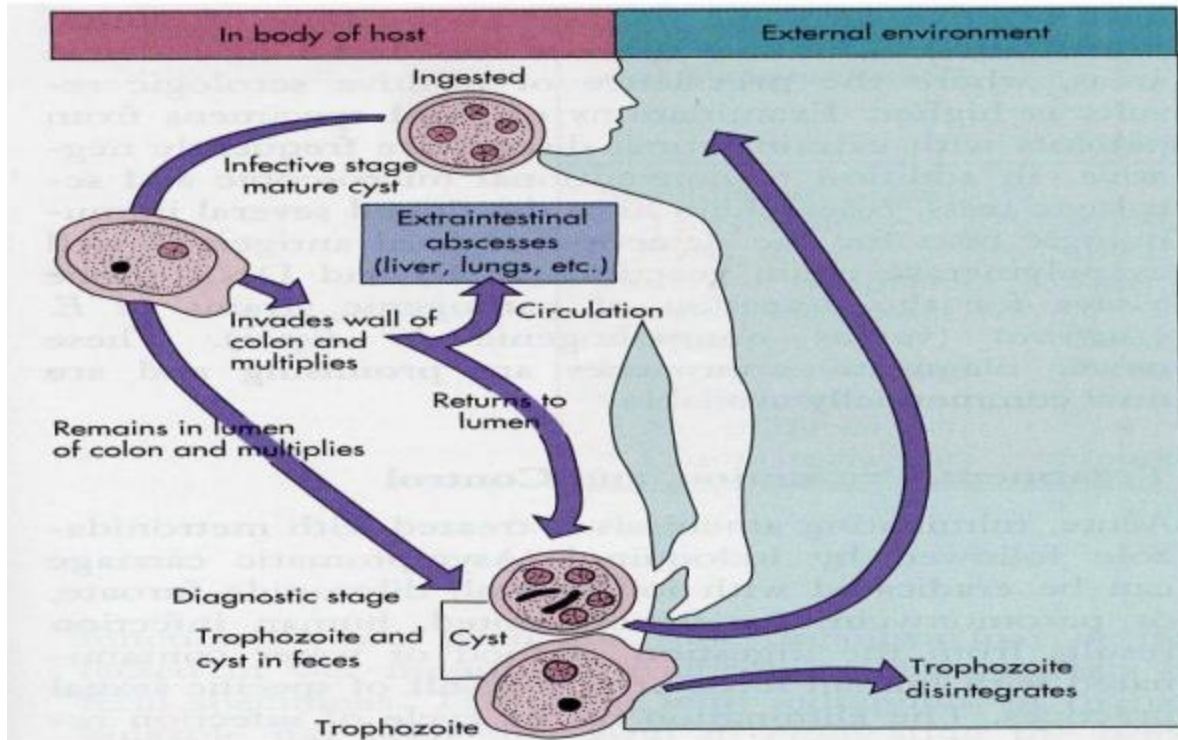
### **B-Phylum: Ciliphora (carrying cilia) Ex. Balantidium coli**

### **C-Phylum: Apicomplexa Class: Sporozoasida like Plasmodium (Malaria).**

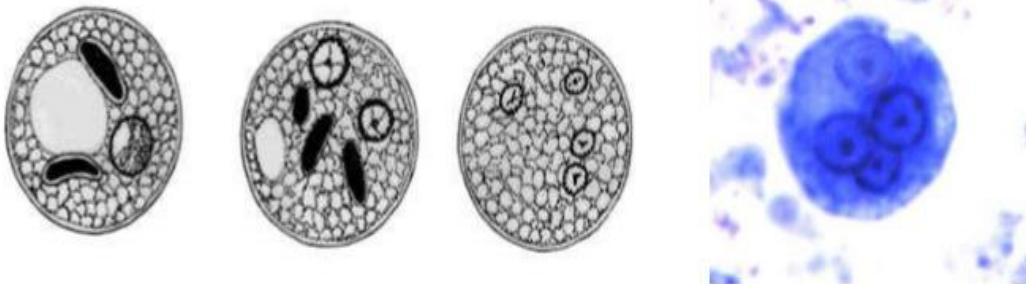
*Entamoeba histolytica* Morphological features

(a) Trophozoites Viable trophozoites vary in size from about 10-60 $\mu$ m in diameter. Motility is rapid, progressive, and unidirectional, through pseudopods. The nucleus is characterized by evenly arranged chromatin on the nuclear membrane and the presence of a small, compact, centrally located karyosome. The cytoplasm is usually described as finely granular with few ingested bacteria or debris in vacuoles. In the case of dysentery, however, RBCs may be visible in the cytoplasm, and this feature is diagnostic for *E.histolytica*.

(b) Cyst range in size from 10-20 $\mu$ m. The immature cyst has inclusions namely; glycogen mass and chromatoidal bars. As the cyst matures, the glycogen completely disappears; the chromatoidals may also be absent in the mature cyst.



Disease: AMEBIASIS (Amebic dysentery, amebic hepatitis). It Has two stages (cyst and trophozoite)



Infective stage: Is mature quadrinucleated cyst.

Pathogenic stage: Only Trophozoite which seen in diarrheic acute dysentery stool.

Mode of infection: Contamination of food and water

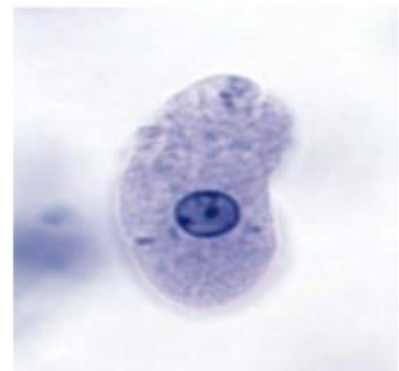
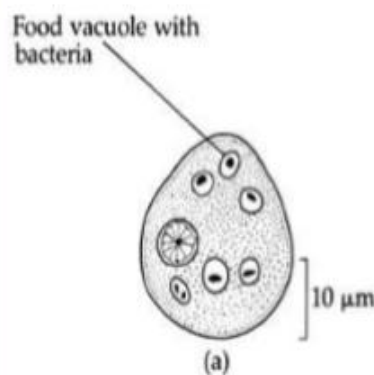
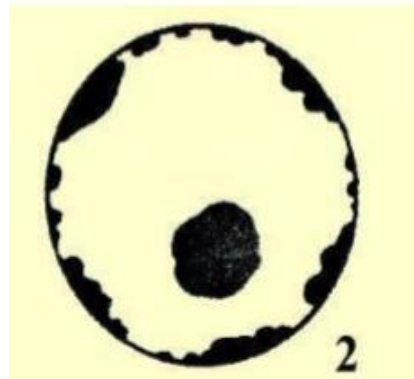
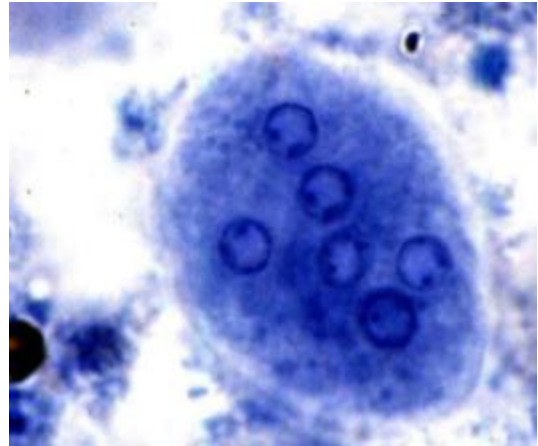
Habitat: Trophozoite in 1- large intestine 2- extra-intestinal infection. cyst only in large intestine

## **Entamoeba coli**

The most common amoebic commensal in large intestine of human.

Trophozoite stage

Larger than *E. histolytica*



Cyst stage

-Nucleus 8-16

- Each nuclei has eccentric karyosome and chromatin granules irregular in shape and distribution. No RBCs vacuoles.

Non pathogenic

Habitat: large intestine

## **Ciliates *Balantidium coli***

Has two stages: trophozoite and cyst The trophozoite and cyst have two nuclei large and small one.

The body of protozoa covered with cilia (motion organelles) Habitat: Large intestine. The infective stage is cyst while the diagnostic stage is cyst and troph. Fecal-oral transmission. Man is accidental host. Pigs is the natural host.

Trophozoite stage: It has 2 nuclei (one macronucleus and other micronucleus).

Cysts: \*Are smaller than trophozoites, 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. \**B. coli* also has ability to penetrate the mucosa resulting in ulceration and cause Extra-intestinal disease but rarely.

