

Protozoa

Ameboids

The most common amebas seen in the intestinal tract are *Entamoeba histolytica/dispar*, *Entamoeba coli*, *Entamoeba hartmanni*, *Endolimax nana* and *Iodamoeba bütschlii*. All but *Entamoeba histolytica* are thought to be non-pathogenic. The cysts can be identified in an ethyl acetate concentrate by the addition of iodine to reveal the characteristic inclusions and also by measuring the cyst using an eyepiece graticule. The trophozoites can be seen in a fresh saline preparation of the stool although accurate identification is on a permanently stained fecal smear.

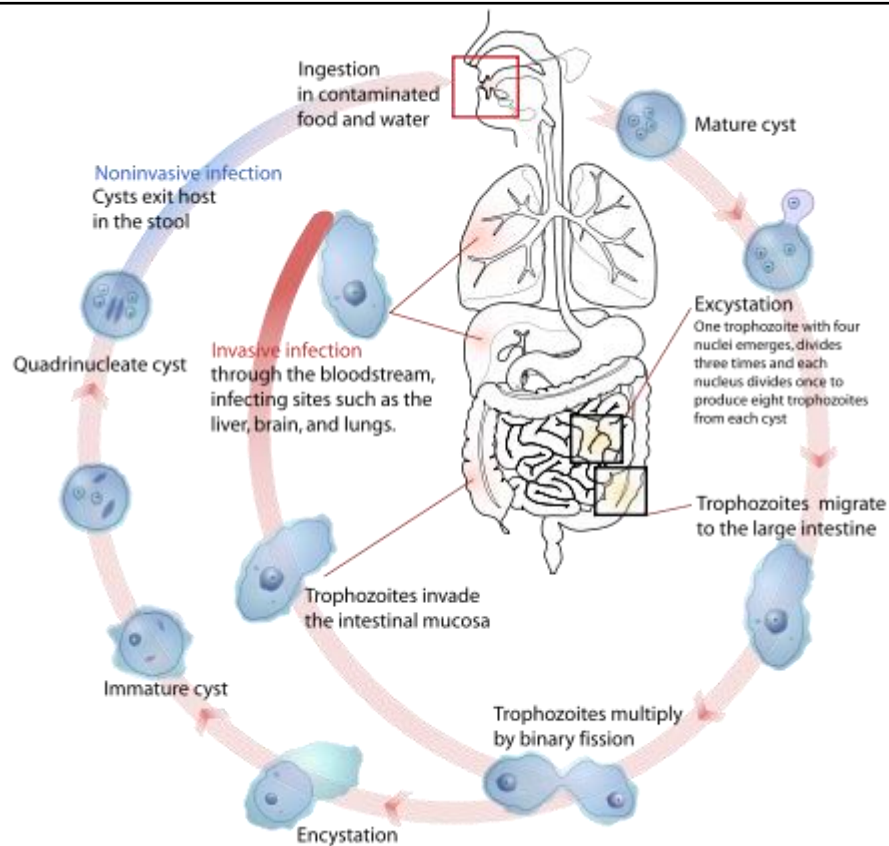
Entamoeba histolytica

Introduction

There are a large number of species of ameba which parasitize the human intestinal tract. Of these, *Entamoeba histolytica / dispar* is the only species found to be associated with intestinal disease. Although many people harbor this organism world wide, only about 10% develop clinically invasive disease,

thus the parasite has been shown to present as two very differing clinical presentations.

1. The commensal or non-invasive luminal form where the parasite causes no signs or symptoms of disease.
2. The pathogenic or invasive form where the parasite invades the intestinal mucosa and produces dysentery or amebiasis and may give rise to extra-intestinal lesions via the blood, mainly to the liver.

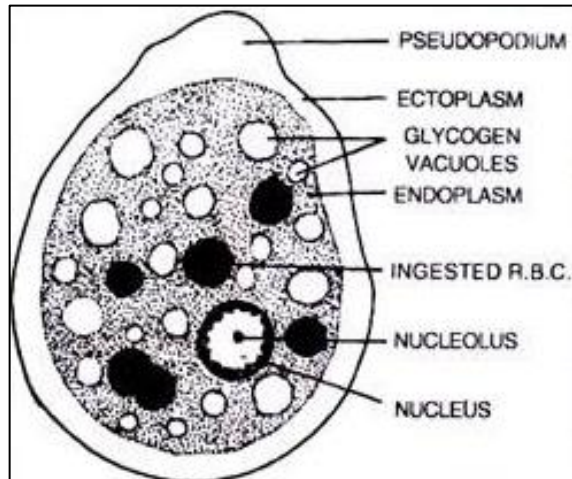
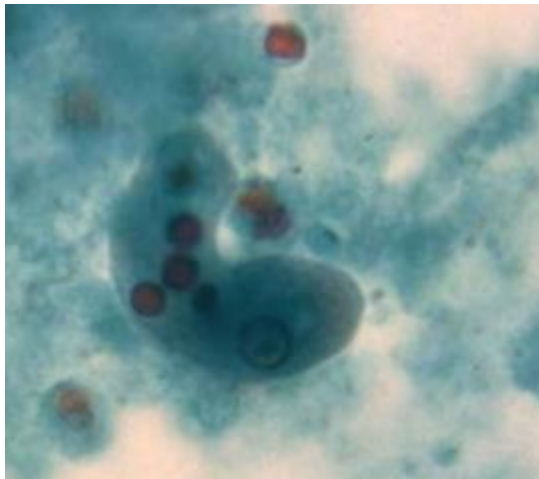


Life cycle

Morphology of Trophozoites

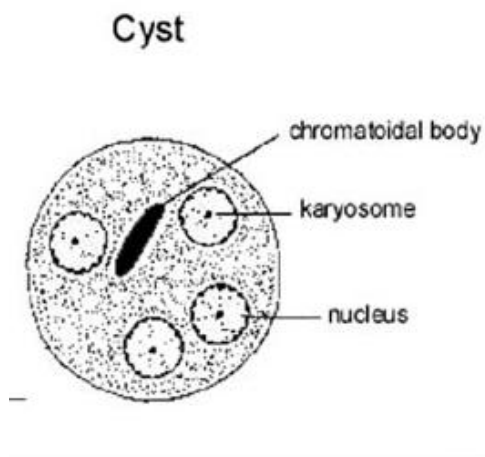
The trophozoites of *E. histolytica* / *dispar* recovered from dysenteric stools exhibit ingested red blood cells and clear pseudopodia. Those of *E. dispar* will have no ingested red blood cells.

- 1- They can be up to 60µm in diameter and
- 2- motility is rapid and unidirectional.
- 3- The presence of one nucleus with a small centrally placed karyosome is clearly visible. With Iron hematoxylin, nuclear chromatin and the karyosome will be stained immensely black. The remainder will be varying shades of grey/black.



Morphology of Cysts

- 1- Cysts of *E. histolytica* / *dispar* are 10-15µm in diameter and
- 2- contain one to four nuclei.
- 3- Chromatoid bodies are usually present in young cysts as elongated bars with bluntly rounded ends.
- 4- Glycogen is usually diffuse, but in young cysts it is often present as a concentrated mass, staining reddish brown with iodine.



Intestinal Disease

Patients with intestinal disease may exhibit a number of symptoms including

- 1- Profuse diarrhea with blood and mucus.
- 2- Fever and dehydration.
- 3- Amebic ulcers may develop in the large colon and can also be found in the rectal area. The ulcers are usually "flask shaped" with a small opening on the mucosal surface and a larger area below the surface.

Microscopy

Where amebic dysentery is suspected, the laboratory should be informed that a "hot stool" is being supplied so that it can be examined within twenty minutes of being passed. On cooling the ameba stop moving which then become very difficult to identify. Direct microscopy should be done by mixing a small amount of the specimen in 0.9% sodium chloride solution. This permits detection of motile trophozoites of *Entamoeba histolytica* / *dispar* and can also provide information on the content of the stool (i.e., the presence of leucocytes and red blood cells.) (On search e.g. primarily for cysts, not for ameba, several stool samples are required to be examined, by direct microscopy and a sensitive concentration technique. Three negative stool samples are required before it can be accepted that there is no amebic infection. Microscopic examination of an amebic abscess aspirate e.g. in the liver or lungs, may reveal hematophagous trophozoites. It must be examined immediately by mixing a drop of warm saline with some aspirated pus on a microscope slide.

Serology

If visceral or hepatic amebiasis is suspected, serological tests should be done as microscopic methods do not always reveal the characteristic trophozoites. The tests of choice are indirect fluorescent antibody test (IFAT), counter immunoelectrophoresis (CIEP) enzyme linked

immunosorbent assay (ELISA), and Rapid Antigen testing by enzyme immunoassay.

Non-pathogenic ameboids

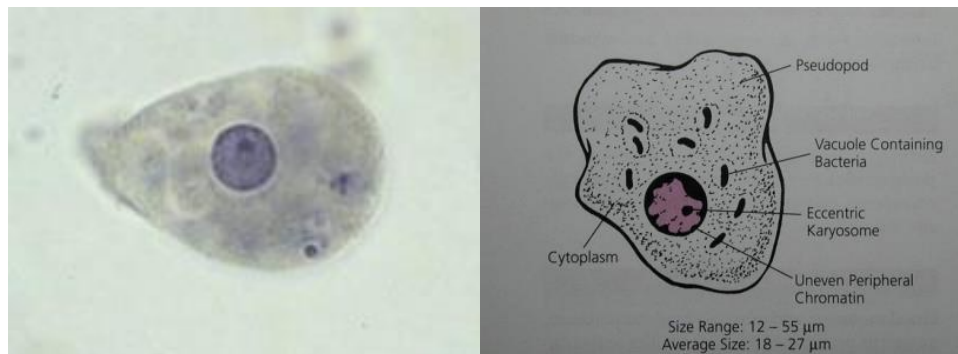
Entamoeba coli

Introduction

Entamoeba coli are a non-pathogenic ameba with world wide distribution. Its life cycle is similar to that of *E. histolytica* but it does not have an invasive stage and does not ingest red blood cells.

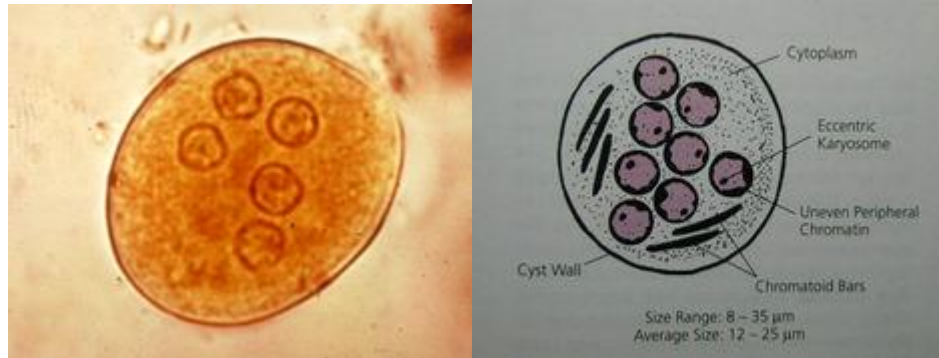
Morphology of Trophozoite

- 1- The trophozoite is larger than that of *E. histolytica* ranging from 15-50µm in diameter.
- 2- It exhibits blunt pseudopodia with sluggish movement.
- 3- A permanently stained preparation shows a nucleus with eccentric karyosome .
- 4- The cytoplasm appears granular containing vacuoles with ingested bacteria and other food particles.



Morphology of Cysts

- 1- Cysts of *E. coli* are 15-30µm in diameter .
- 2- contain one to eight nuclei with irregular peripheral chromatin: karyosomes not central.
- 3- Chromatoid bodies are not frequently seen but when present they are usually splinter-like with pointed ends.



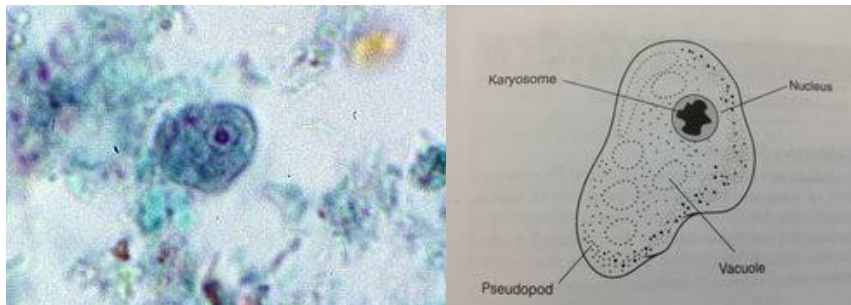
Endolimax nana

Introduction

Endolimax nana is a small non-pathogenic amoeba with world wide distribution. Its life cycle is similar to that of *E. histolytica* but is non-invasive.

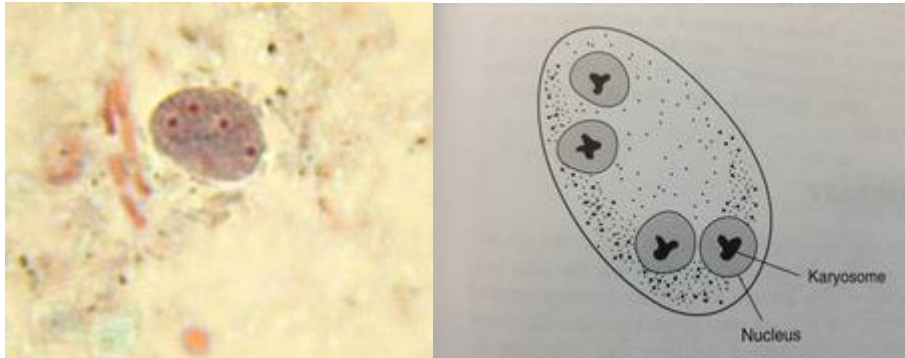
Morphology of Trophozoite

- 1- Trophozoites of *E. nana* measures from 6-12µm.
- 2- Motility is sluggish with blunt hyaline pseudopodia.
- 3- In a permanently stained preparation, the nucleus exhibits a large karyosome with no peripheral chromatin on the nuclear membrane.



Morphology of Cysts

- 1- Cysts of *E. nana* are 6-9µm in diameter.
- 2- They can be spherical or ovoid in shape .
- 3- Contain four pinpoint nuclei, which are highlighted by the addition of iodine.
- 4- Chromatoid bodies are not found and glycogen is diffuse



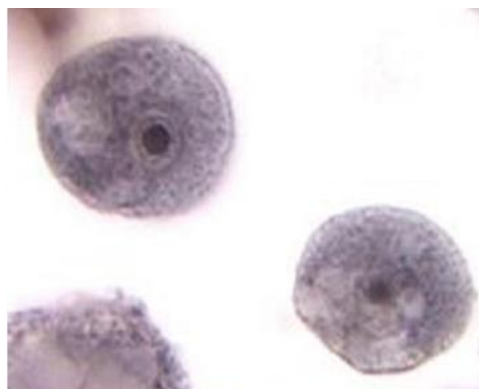
Iodamoeba bütschlii

Introduction

Iodamoeba bütschlii is a non-pathogenic amoeba with world wide distribution although not as common as *E. coli* or *E. nana*. Its life cycle is similar to that of *E. histolytica* but is non-invasive.

Morphology of Trophozoites

- 1- Trophozoites of *I. bütschlii* are 8-20 μ m and are
- 2- Actively motile.
- 3- nucleus with a large karyosome is evident.
- 4- Chromatin bodies form striations around the karyosome.
- 5- The cytoplasm appears granular containing vacuoles with ingested bacteria and debris.



Morphology of cysts

- 1- Cysts of *I. bütschlii* are 9-15 μ m in diameter .
- 2- have one nucleus in mature cysts usually eccentrically placed.
- 3- Chromatoid bodies are not present.
- 4- Glycogen is present as a compact well defined mass staining dark brown with iodine.

