

The parasite protozoa

Phylum: Sarcomastigophora

Sarcodina

Amoebae الاميبات

Non_ pathogenic Amoeba of humans:

1. *Entamoeba hartmanii*, contain trophozoite and cyst
2. *Entamoeba coli*, cyst and trophozoite
3. *Endolimax nana*, cyst and trophozoite
4. *Iodamoeba butschlii*, cyst and trophozoite

With large vacuole contains glycogen.

5. *Dientamoeba fragilis*, trophozoite only

Contains two nuclei.

6. *Entamoeba gingivalis*, trophozoite only

Pathogenic Amoeba:

Entamoeba histolytica

General characters of Amoeba

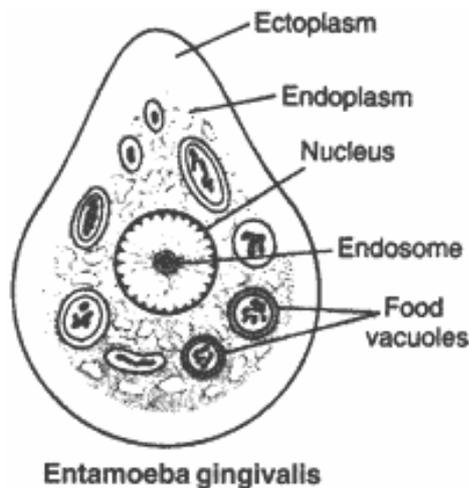
- All the members move by pseudopodium.
- Having Trophozoite stage.
- Multiplication by binary division.
- Some of them parasitic, other free living.
- Commonly parasitizing the large intestine of man, except *Entamoeba gingivalis*, which parasitized the oral cavity.

1. Entamoeba gingivalis

1. It is found in the mouth inside the gingiva, is found in 95% of people with gum disease and rarely in people with healthy gums
2. Cyst formation is not present; therefore transmission is direct from one person to another by kissing, or by sharing eating utensils
3. Only the trophozoites are formed and the size is usually 20 micrometers to 150 micrometers in diameter.

There are numerous food vacuoles.

Laboratory diagnosis : Examining mouth scrapings particularly from the gingival area may best make an accurate diagnosis of *E. gingivalis* trophozoites.



2. Endolimax nana

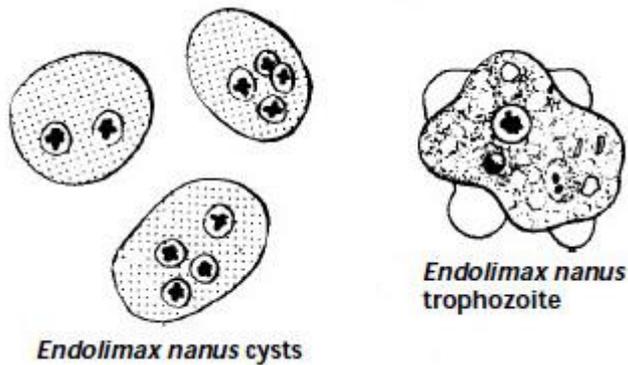
1. It is a small non-pathogenic amoeba with world wide distribution. Its life cycle is similar to that of *E. histolytica* but is non invasive.
2. Cysts of *E. nana* are 6 - 9 μ in diameter. They can be spherical or ovoid in shape and contain 4 pin-point nuclei which are highlighted by the addition of iodine. Chromatoid bodies are not found and glycogen is diffuse.
3. Trophozoites of *E. nana* measures from 6-12 μ . Motility is sluggish

with blunt hyalin pseudopodia. In a permanently stained preparation, the nucleus exhibits a large karyosome with no peripheral chromatin on the nuclear membrane.

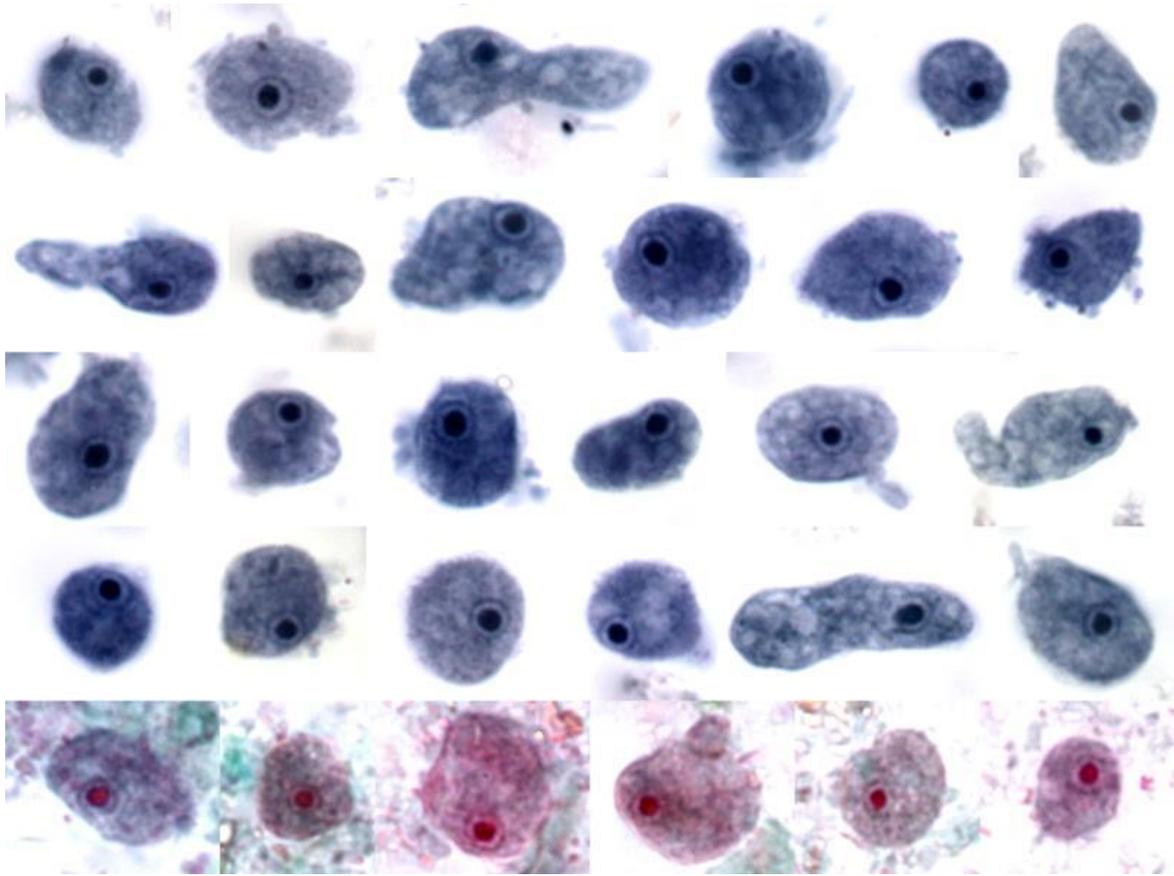
4. Diagnosis by finding the characteristic cysts in an iodine stained,

Morphology of Trophozoite

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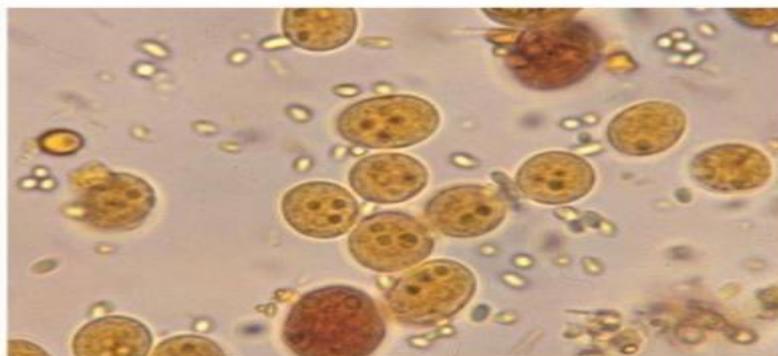
Endolimax nana trophozoite and cyst morphology



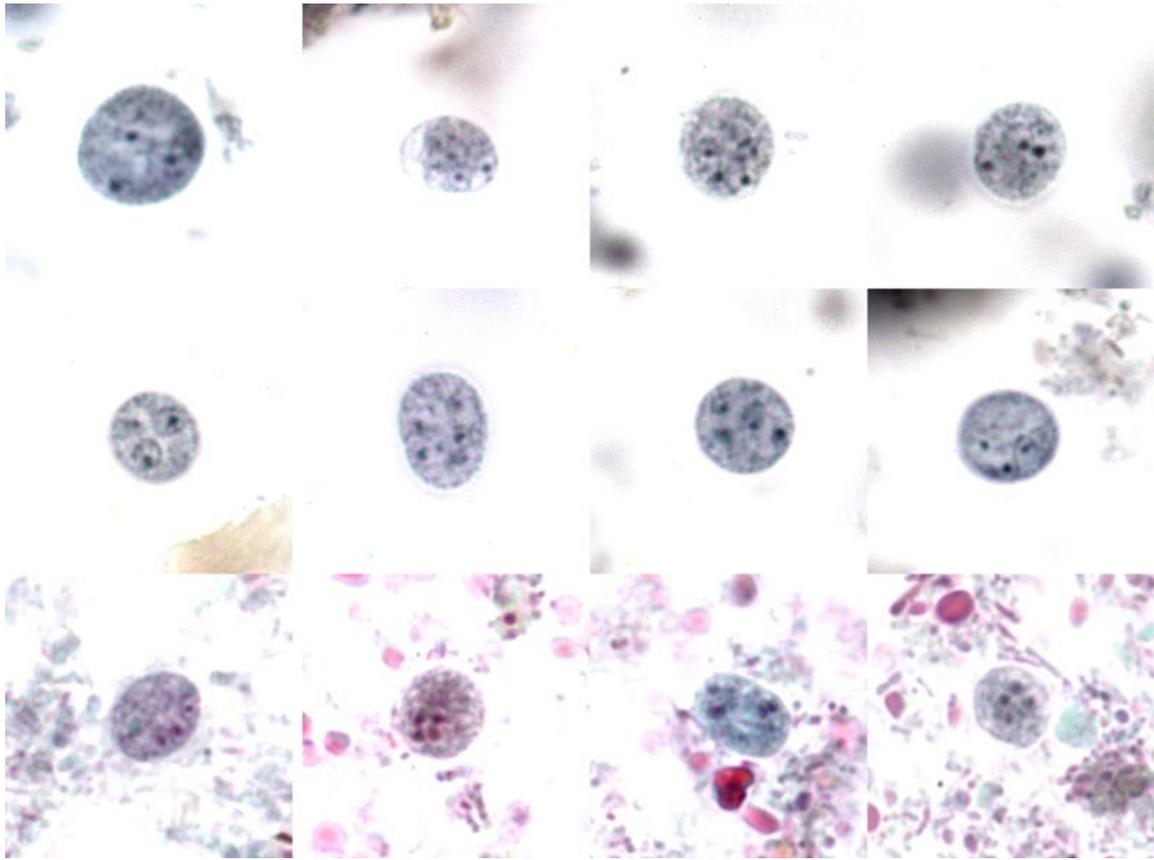
Endolimax Nana trophozoites Pictures

Morphology of Cysts

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



Endolimax Nana Cysts – Iodine stain



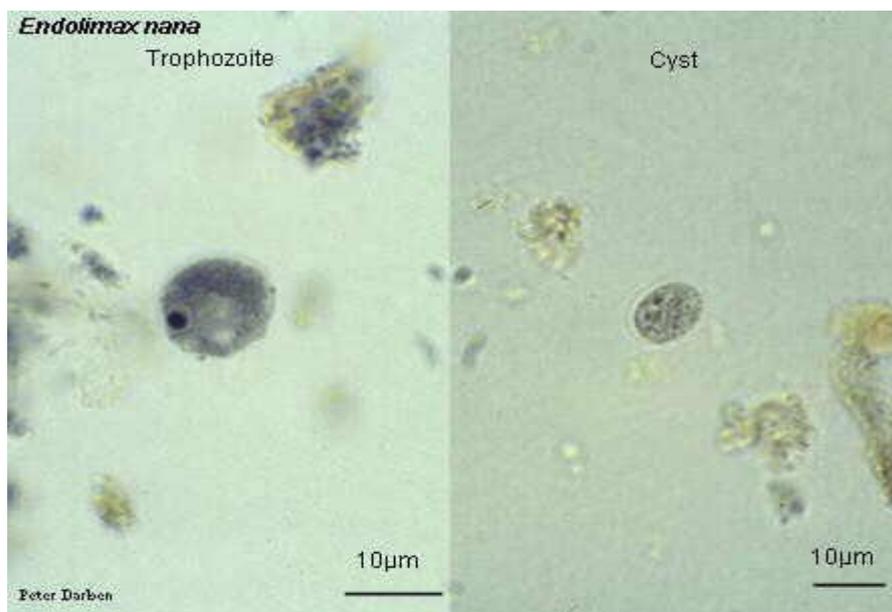
The cysts of *E. nana* – trichrome stain



E. nana trophozoites *E. nana* cysts in wet mount

Laboratory Diagnosis

- Laboratory diagnosis is made by finding the characteristic cysts in an iodine stained, formolether concentration method or by detecting the characteristic trophozoites in a wet preparation or a permanent stained preparation.



Endolimax nana trophozoite and cyst

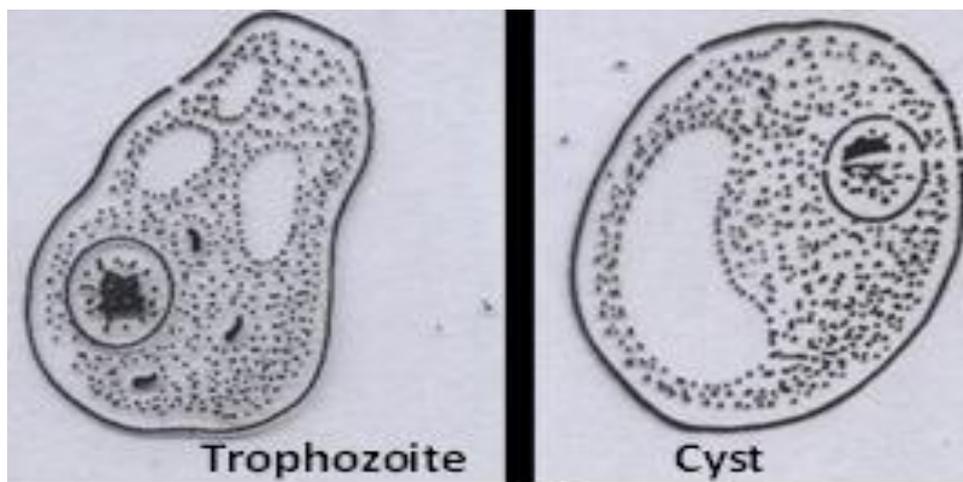
3. *Iodamoeba butschlii*

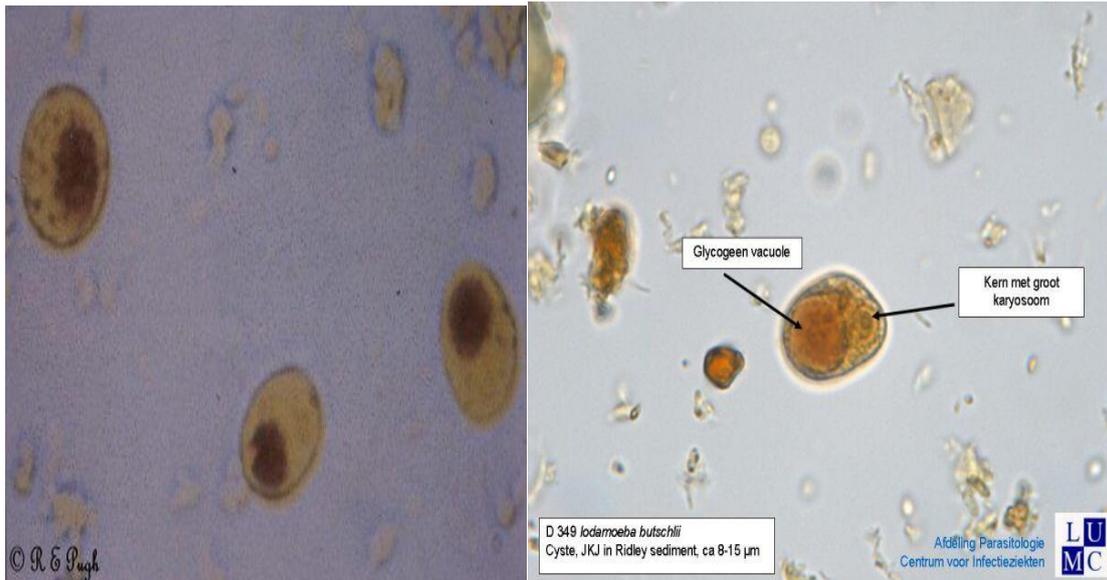
1. is a nonpathogenic parasitic ameba, commonly found in the large intestines of people, pigs and other mammals.
2. The **trophozoites** are 9–14 micrometres in diameter This form has a pseudopodia for locomotion. The pseudopodia is short and blunt. It moves in a slow manner. The trophozoite has a single nucleus, prominent for nuclear endosome and many cytoplasmic vacuoles. The ectoplasm and the granular endoplasm are often hard to distinguish. The nucleus is fairly large Food vacuoles are commonly filled with bacteria and yeast. Trophozoites are often identified by a stool smear, found in loose stools.
3. The **cysts** are 8–10 micrometres in diameter, with a thick wall and a

large glycogen vacuole that stains darkly with iodine. Usually harmless, it may cause amebiasis in immunologically compromised individuals.

4. cysts have an oval shaped- single nucleus with a prominent nuclear endosome. This form is also large, single, glycogen-filled vacuole called iodophilous vacuole (glycogen stains with iodine). Cysts are the infective stage of *I. bütschlii*. Unlike trophozoites, cysts are often found in formed stools.

- **We can differentiate between *I. bütschlii* & others by:**
- The trophozoite & cyst have one nucleus & both of them have glycogen vacuoles, so in stain with iodine to give brown mass.
- A large karyosome in nucleus found centrally or somewhat eccentrically.
- Only the trophozoite of this amoeba has one or two distinct glycogen vacuoles.
- The cyst has only one nucleus, it has large glycogen vacuoles which stained with iodine in deep brown color.





4. *Entamoeba coli*

1. is a non-pathogenic species of *Entamoeba* that frequently exists as a commensal parasite in the human gastrointestinal tract
2. **Trophozoite** Size: from 15 to 50 µm; usual range, 20-30µm. **Cyst** Size: 10 to 35 µm; usual range, 15-20 µm
3. The trophozoite slowly forms a pseudopod, then withdraws it and remains immobile maintaining a round shape.
4. In *Entamoeba coli* nucleus contain Karyosome decentralized and nuclear membrane line with chromatin granules Irregular shaped



Mature cyste contain 8 nucleus

Entamoeba histolytica

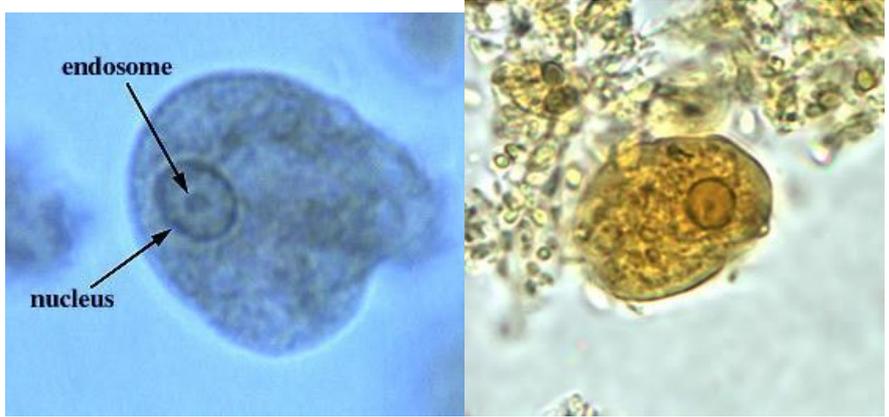
Entamoeba histolytica is an amoeba that feeds on cells in the human colon. It is the cause of amoebic dysentery (bloody diarrhea) as well as colonic ulcerations. The infection is also referred to as **amebiasis**. If the organisms spread throughout the body via the bloodstream they may cause abscesses in the liver or, less frequently, other organs.

It occurs usually in the large intestine and causes internal inflammation as its name suggests (histo = tissue, lytic = destroying).

Transmission of the parasite occurs when a person ingests food/water that has been contaminated with infected feces

Morphology : The organism has two forms. The cyst is round and 10-20 micrometers in diameter, and contains four nuclei when mature. It is resistant to desiccation and stomach acid, and can survive long enough in the environment to be spread to other humans. When the cyst reaches the large intestine, it excysts and the four nuclei present in the cyst become four separate amoebae, each of which undergoes binary fission immediately; thus the ingestion of a single cyst leads to 8 trophozoites. The trophozoite, 10-60 micrometers in diameter, is the active form of the organism and it is in this form that the damage is done to the body.

Diagnosis : *E. histolytica* is diagnosed by the examination of slides prepared from fecal matter. *E. histolytica* is diagnosed by the examination of slides prepared from fecal matter.

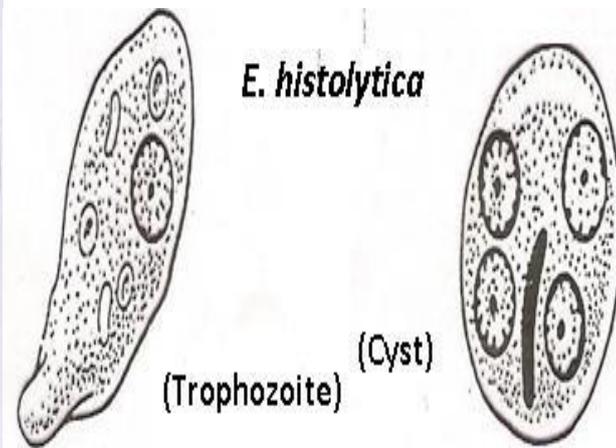
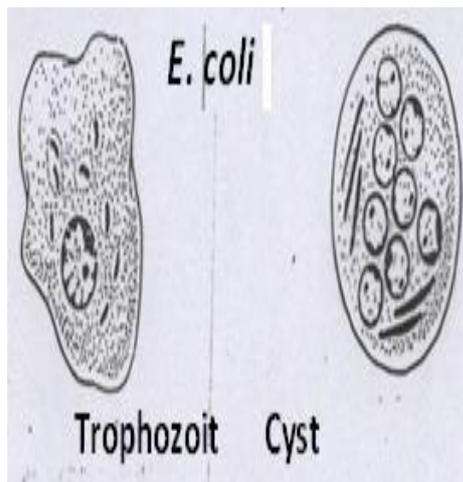
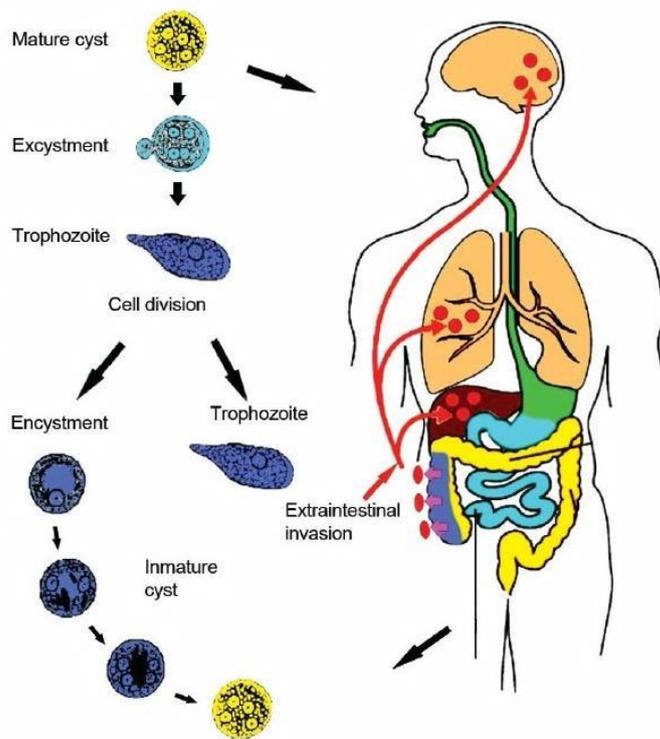


Trophozoite



Mature cyst (4 nucleus)

Immature Cyst (1-2 Nucleus)

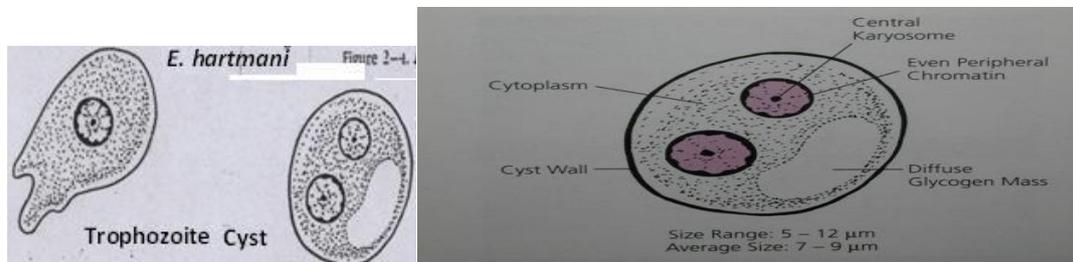


There are 2 things for differentiation between E. histolytica & E. coli

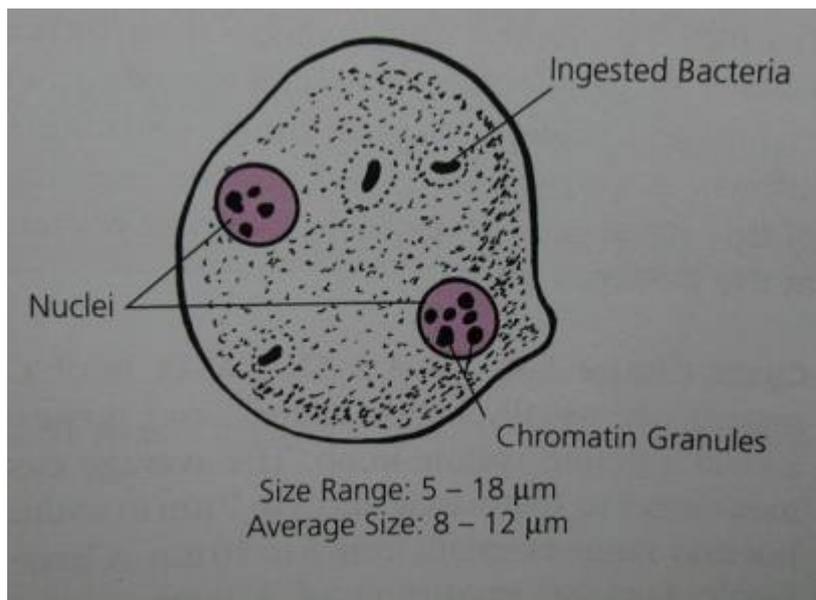
The difference	<i>E. histolytica</i>	<i>E. coli</i>
Karyosome	Central	Eccentric
Chromatin line nuclear membrane	Fine & regular distributed	Course & irregular distributed

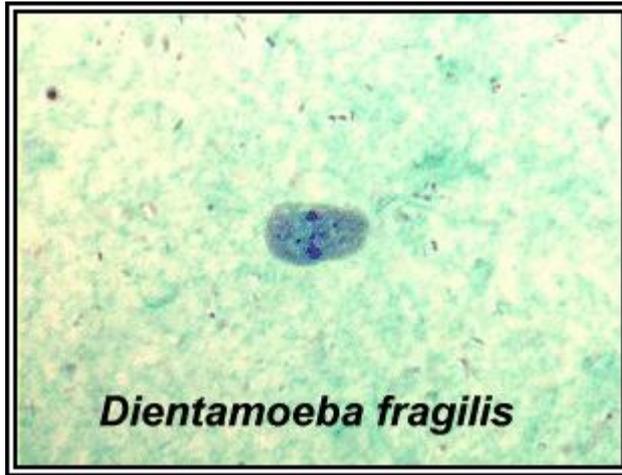
5. Entamoeba hartmanni

sometimes it is mistaken with *E. nana*, fortunately both of them are nonpathogenic.

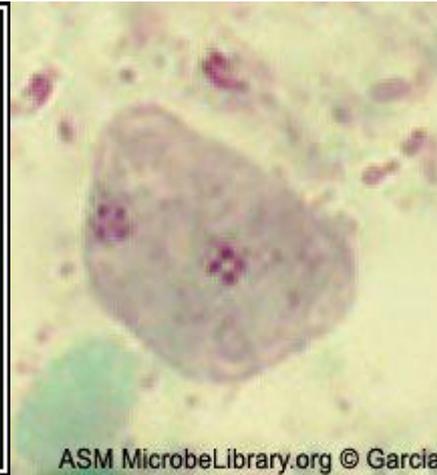


6. Dientamoeba fragilis (**Di** refers to the **two** nuclei in the trophozoites) is a species of single-celled found in the gastrointestinal tract of some humans, pigs and gorillas. It causes gastrointestinal upset in some people, but not in others, Infection with *D. fragilis*, called dientamoebiasis . no cyst stage has been found.





Dientamoeba fragilis



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