



كلية الرشيد الجامعة

قسم تقنيات المختبرات الطبية

الطفيليات الطبية

**Amoeba**

المرحلة الثانية – النظري

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# Amoeba

Amoebas primitive unicellular microorganisms with a relatively simple life cycle which

can be divided into two stages:

- Trophozoite – actively motile feeding stage.
- Cyst – quiescent, resistant, infective stage.

Motility is accomplished by extension of pseudopodia

Amoebae are classified as intestinal amoebae and free living amoebae. Intestinal amoebae: They inhabit in the large intestine of humans and animals. *Entamoeba histolytica* is the only pathogenic species. Others are nonpathogenic such as *E. dispar*, *E. coli*, *E. hartmanni*, *E. gingivalis*, *Endolimax nana*, and *Iodamoeba butschlii*.

## PATHOGENIC INTESTINAL AMOEBAS

### *Entamoeba histolytica*

*E. histolytica* is the pathogenic species causing amoebic dysentery and a of other diseases, including amoebic liver abscess, where as are considered as parasite inhabitate the large intestine.

## morphology

### *1- trophozoites*

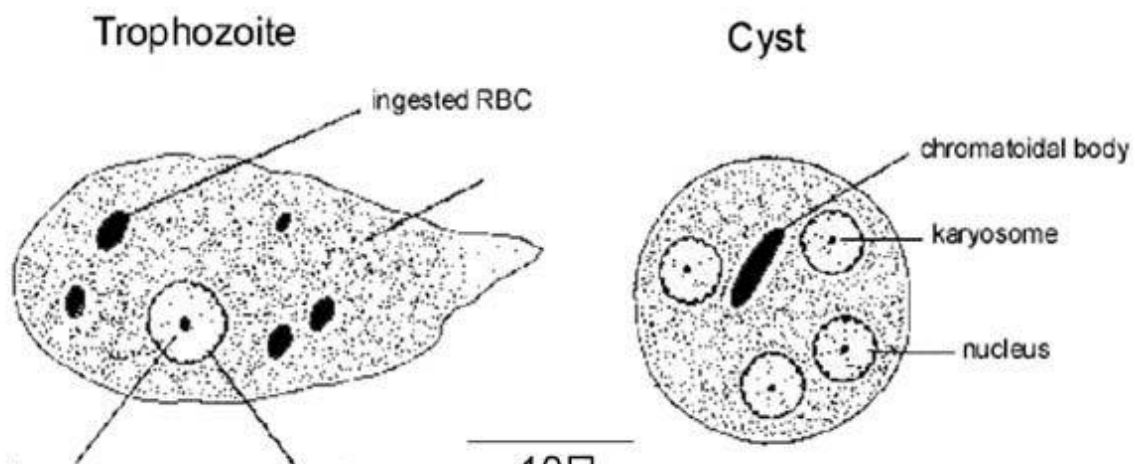
Viable trophozoites vary in size . Motility is rapid, progressive, and unidirectional, through pseudopods. The nucleus is characterized by

evenly arranged chromatin on the nuclear membrane centrally located karyosome. The cytoplasm is usually described as finely

granular with few ingested bacteria or debris in vacuoles. RBCs may be visible in the cytoplasm, and this feature is diagnostic for *E.histolytica*

### *2- cyst*

Cysts range in size from 10-20 $\mu$ m. The immature cyst has inclusions namely; chromatoidal bars. the chromatoidals may also be absent in the mature and have four nucleus in mature cyst .



### ***Habitat:-***

Trophozoite:- Large intestine, liver abscesses and other extra-intestinal organs .

Cyst:- found in the stools of chronic dysenteric patients and carriers.

### ***Life Cycle:***

Host: E. histolytic completes its life cycle in single host, i.e. man.

Intestinal infections occur through the ingestion of a mature quadrinucleate infective cyst, contaminated food or drink and also by hand to mouth contact.

It is then passed unaltered through the stomach, as the cyst wall is resistant to gastric Trophozoites being actively motile invade the tissues and ultimately lodge in the submucous layer of the large bowel. Here they grow and multiply by binary fission.

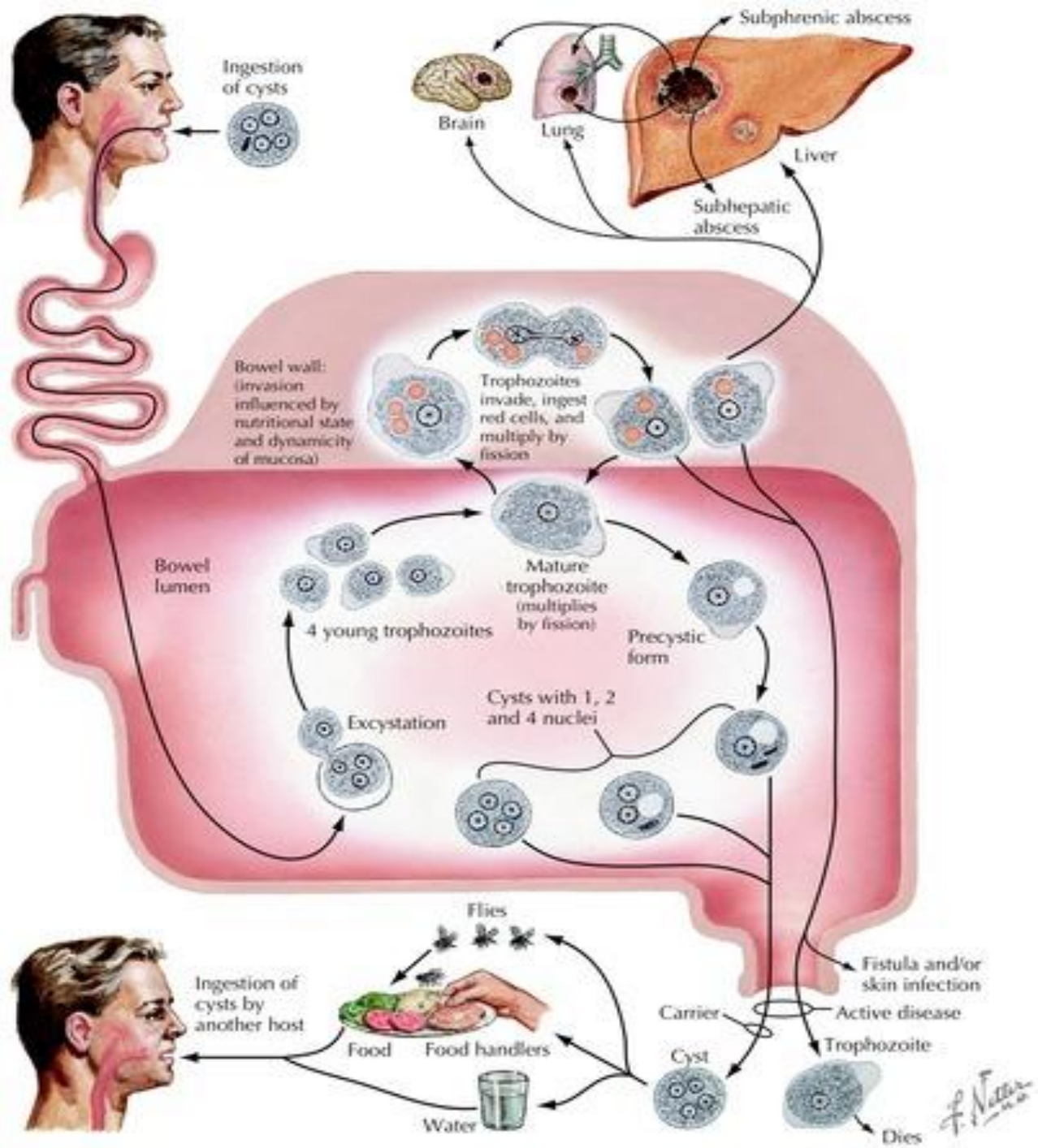
Trophozoites are responsible for producing lesions in amoebiasis.

Gradually the effect of the parasite on the host is toned down together with concomitant increase in host tolerance, making it difficult for the parasite to continue its life cycle in the trophozoite phase.

A certain number of trophozoites come from tissues into lumen of bowel transformed into pre-cyst forms.

Pre-cysts secrete a cyst wall and become a uninucleate cyst.

Eventually, mature quadrinucleate cysts form. These are the infective forms. Both mature and immature cysts may be passed in faeces. Immature cysts can mature in external environments and become infective.



## ***Pathogenesis***

asymptomatic or exhibit amoebic dysentery or extra-intestinal amoebiasis in the liver, brain, spleen, lung, etc. Amoebic dysentery occurs when *E histolytica* trophozoites invade the wall of the large intestine and multiply in the submucosa. Trophozoites invade the colonic mucosa producing characteristic ulcerative lesions and profuse bloody diarrhea (amoebic dysentery)

## ***Laboratory Diagnosis***

1. Stool microscopy detects cysts and trophozoites
2. Stool culture
3. Stool antigen detection (copro-antigen) CIEP, ELISA, ICT
4. Serology

## **Non pathogenic amoeba**

### **1- *Entamoeba coli***

the life cycle stages include; trophozoite, precyst, cyst, metacyst, and metacystic trophozoite. Typically the movements of trophozoites are sluggish, with broad short pseudopodia and little locomotion, remarkably variable in size. *Entamoeba coli* is transmitted in its viable cystic stage through faecal contamination. *E.coli* as a lumen parasite is non-pathogenic and produces no symptoms. The mature cyst (with more than four nuclei) is the distinctive stage to differentiate.



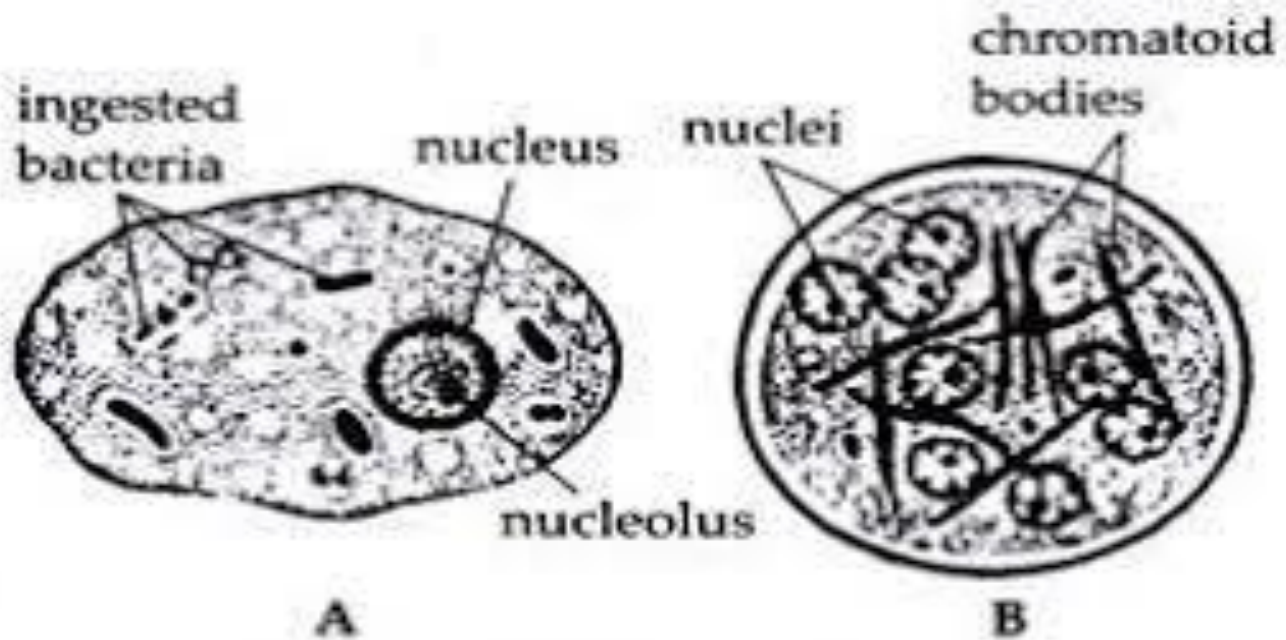


Fig. 1.7 : *Entamoeba coli*. A. Mature trophozoite, B. Octonucleate cyst.

## 2- *Entamoeba gingivalis*

only the trophozoite stage presents, has numerous blunt pseudopodia and one small nucleus living primarily on exudate from the margins of the gums, and thrives best on unhealthy gums. However the presence of *E.gingivalis* suggests a need for better oral hygiene. The infection can be prevented by proper care of the teeth and gums

