

Department of microbiology
Parasitology section

Entamoeba histolytica

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Third stage

Entamoeba histolytica:

There is a large number of species of amoebae which parasitise the human intestinal tract. Of these *Entamoeba histolytica* is the only species found to be associated with intestinal disease. Although many people harbour this organism world wide, only about 10% develop clinically invasive disease thus the parasite has been shown to present of two very differing clinical presentations. The commensal or non-invasive luminal form where the parasite causes no signs or symptoms of disease.

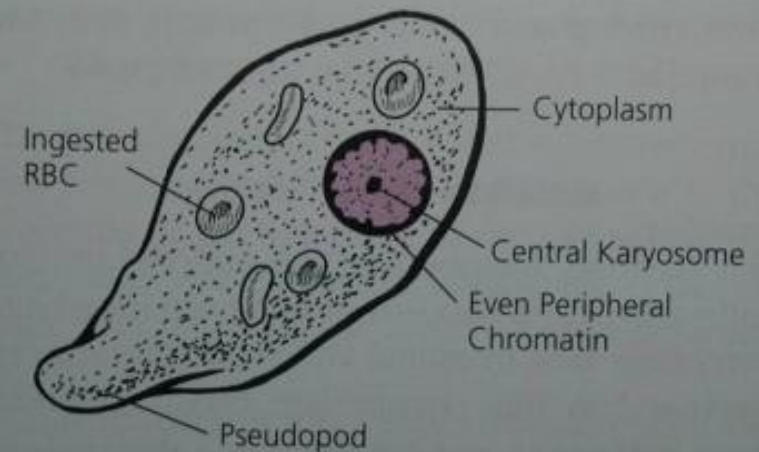
The pathogenic or invasive form where the parasite invades the intestinal mucosa and produces dysentery or amoebomas and may give rise to extraintestinal lesions through bloodborn spread, mainly in the liver.

Sargeaunt and Williams (1978) conclusively proved that invasive and non-invasive strains of *E. histolytica* could be differentiated by isoenzyme electrophoresis and now the application of molecular biology has finally confirmed the presence of two distinct species with the same morphological features. The pathogenic or invasive species has retained the name *E. histolytica* and the non-pathogenic, non-invasive species has been named *E. dispar*.

Morphology

Trophozoite:

- 1- Clear ectoplasm
- 2- Large finger like pseudopodia
- 3- The endoplasm is granular and may contain RBCs.
- 4- It has one nucleolus, contain small central karyosome and fine chromatin granules arranged regularly beneath nuclear membrane.



Size Range: 8 – 65 μm
Average Size: 12 – 25 μm

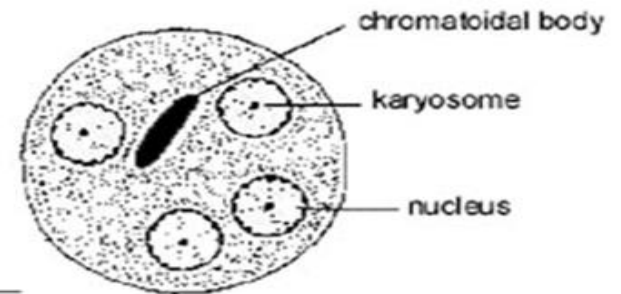
Morphology

Cyst:

- 1- Small, spherical in shape .
- 2_ containing 4 nuclei
- 3- is usually found in feces .
- 4_ Each nucleous contain similar nuclear.



Cyst



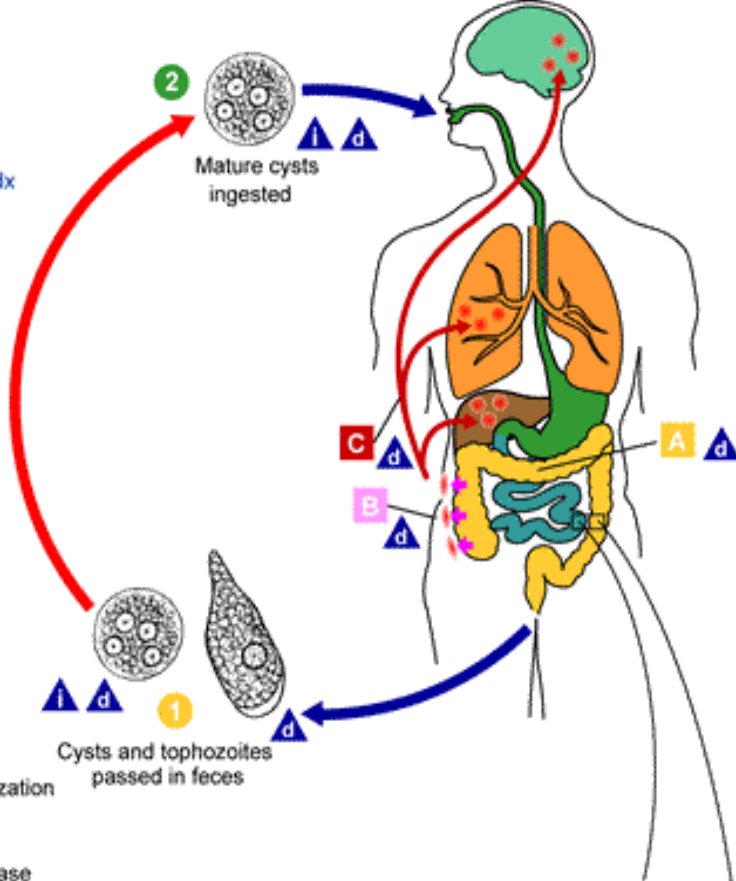
Life cycle :

The life cycle of *Entamoeba histolytica* completes in a single host, viz. Man. So it is also called a monogenetic parasite. Human beings get infected with this parasite through the consumption of contaminated food and water with quadrinucleate cyst. The gastric juice inside the stomach cannot dissolve the cystic wall due to some kind of resistance on it. As soon as the cyst reaches to the small intestine it will get dissolved through the trypsin enzyme present in the duodenal region. From this cyst, now arises a parasite known as metacyst. This process is known as excystation. Now the nucleus of metacyst divides to form eight nucleated metacysts. Finally eight trophozoites will develop from a single metacyst.

Life cycle

- . These trophozoites start to grow and lodge into the mucosa and submucosa region of large intestine of *Entamoeba histolytica* completes in a single host.

Under the commencement of unfavourable condition, a cystic wall starts to develop in each trophozoite. This stage is called Pre-Cystic stage. The single nucleus of the cyst soon undergoes a division to form two and then into four daughter nuclei. This stage of cyst is quadrinucleate. It does not develop further in the large intestine and reaches to outer environment through the faeces. Finally, if these cysts are consumed by next person s/he will get infected again. In this way life cycle

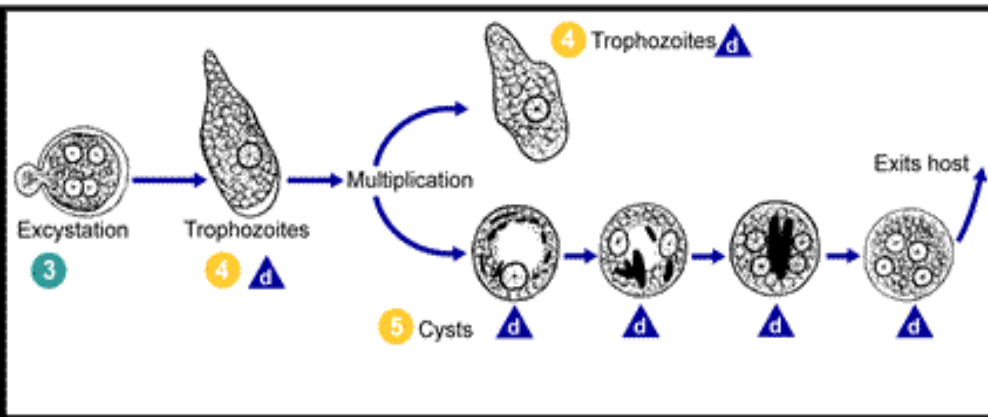


<Infection occurs by ingestion of cysts (generally from fecally contaminated food or water)

<Excystation occurs in the ileum of the small intestine

<Trophozoites multiply by binary fission in the large intestine. Most remain in the lumen of the intestine, however, some may invade the intestinal mucosa, enter the bloodstream and develop in extraintestinal sites. Symptoms

< Cyst formation is triggered by the dehydration of gut contents in asymptomatic carriers.



Clinical features

Amoebiasis is a disease caused by *Entamoeba histolytica* which is spread between humans by its cysts.

It is common throughout tropics *E. histolytica* can give rise to amoebic dysentery or extraintestinal amoebiasis ,e.g.. amoebic liver abscess through invasion by trophozoite

Clinical features

● **intestinal amoebiasis (amoebic dysentery):**

The incubation period of amoebiasis range from 2 weeks to many years , followed by chronic course with abdominal pains and two or more unformed stool a day . Diarrhea alternating with period of constipation is common .the stool has offensive odor there maybe a tenderness along the line of colon ,especially over the cecum (which may stimulate acute appendicitis .acute bowel symptoms with very frequent motion and passage much blood and mucus stimulate bacillary dysentery or ulcerative colitis

Clinical features

◉ Amoebic liver abscess :

This often occur without a history of recent diarrhea.

The trophozoit emerge from the vegetative cyst from the colon and may invade the bowel mucosa .they may enter the portal venous system and be carried to the liver where they multiply rapidly and destroy the parenchyma ,causing amoebic abscess ,,the liquid contents at first have a characteristic pinkish color which may later change to chocolate brown

Clinical features

The early symptoms may be local discomfort only and malaise later a swinging temperature and sweating may develop .An enlarged ,tender liver ,cough and pain in the right shoulder are characteristic ,but symptoms may remain vague and signs minimal.

A large abscess may penetrate the diaphragm and rupture into the lung from where its content may be coughed up ,,,rupture into plural cavity, the peritoneal cavity or pericardial sac is less common but more serious.

Diagnosis:

- Microscopic examination of stool for motile trophozoit containing R.B.Cs
- Sigmoidoscopy may reveal typical flask shape ulcer
- Antibody detection by immunofluorescence in over 95% of patients with hepatic amoebiasis and intestinal amoeboma but is only about 60% of dysenteric amoebiasis

Thank you