

Balantidium coli

Balantidium coli is a protozoan parasite responsible for the disease Balantidiasis. *B.coli* is the largest protozoan, *B. coli* is a species of [ciliate protozoan](#). This parasite is the only member of this family known to be [pathogenic](#) to humans. Hosts include [pigs](#), [rats](#), [primates](#) (including humans), [horses](#), [cattle](#) and [guinea pigs](#). Infection is transmitted within or between these species by fecal-oral transmission. Pigs are the most significant reservoir hosts. The protozoa are found worldwide, usually with a prevalence of less than 1%. Infection is rare, but is likely to occur in places where humans live closely with swine and where water sanitation is poor or non-existent.

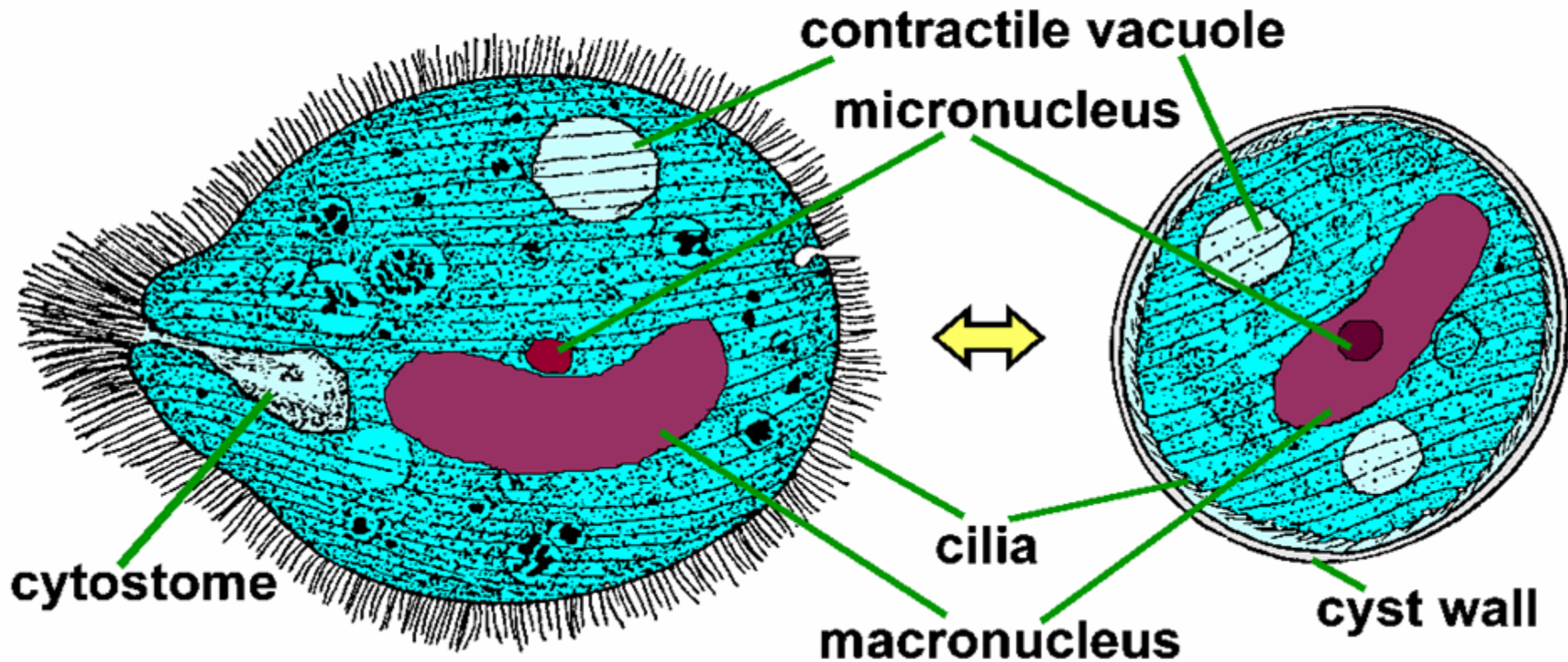
- **Trophozoite**

- B. coli occurs in two stages—the trophozoite and cyst
- The trophozoite lives in the large intestine, feeding on cell debris, bacteria, starch grains and other particles. The trophozoite is a large ovoid cell, about 60 to 70 μm in length and 40 to 50 μm in breadth. Very large cells, up to 200 μm are sometimes seen. The anterior end is narrow and the posterior broad. At the anterior end is a groove (peristome), leading to the mouth (cytostome). Posteriorly there is a small anal pore (cytopyge). The cell is covered all over with short delicate cilia. The cell has two nuclei—a large kidney-shaped macronucleus and lying in its concavity a small micronucleus. The cytoplasm has one or two contractile vacuoles and several food vacuoles.

Balantidium coli

trophozoite

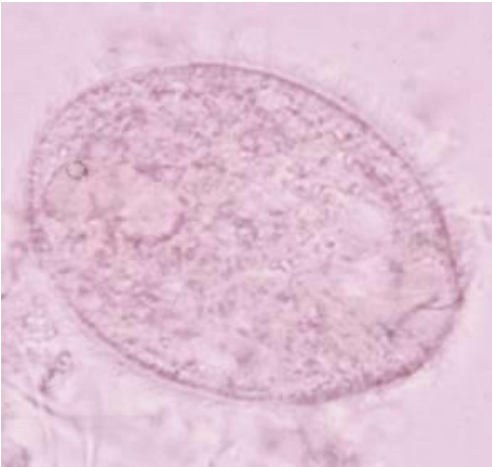
cyst



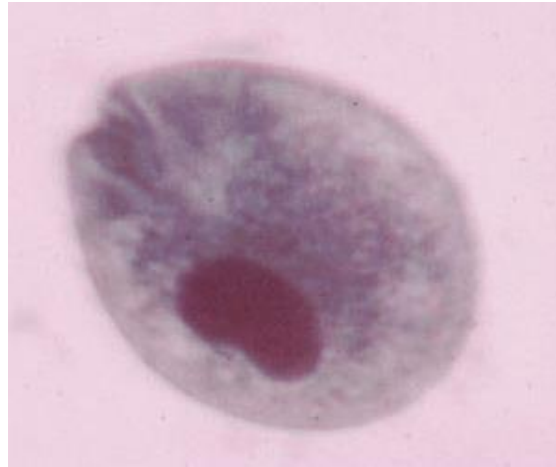
~70 x 45 μm
(up to 200 μm)

~55 μm

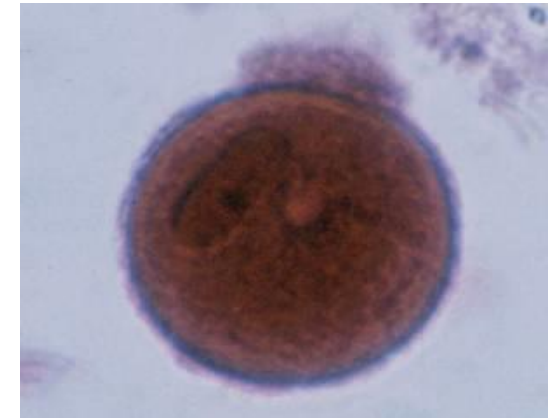
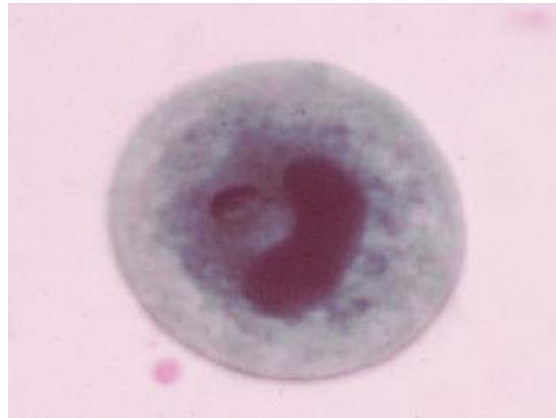
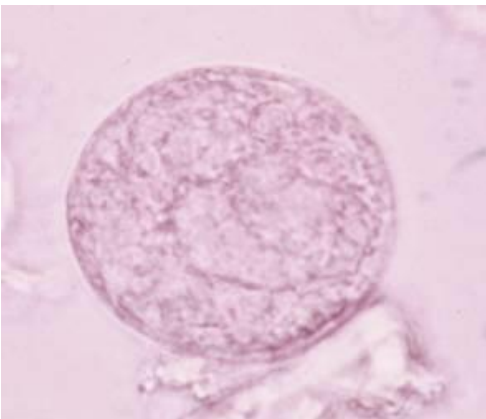
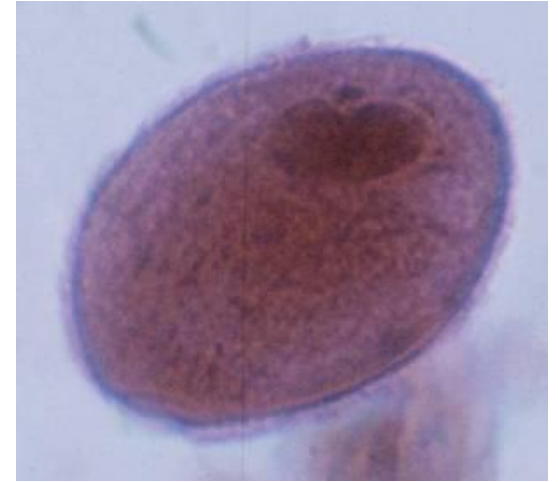
unstained



trichrome



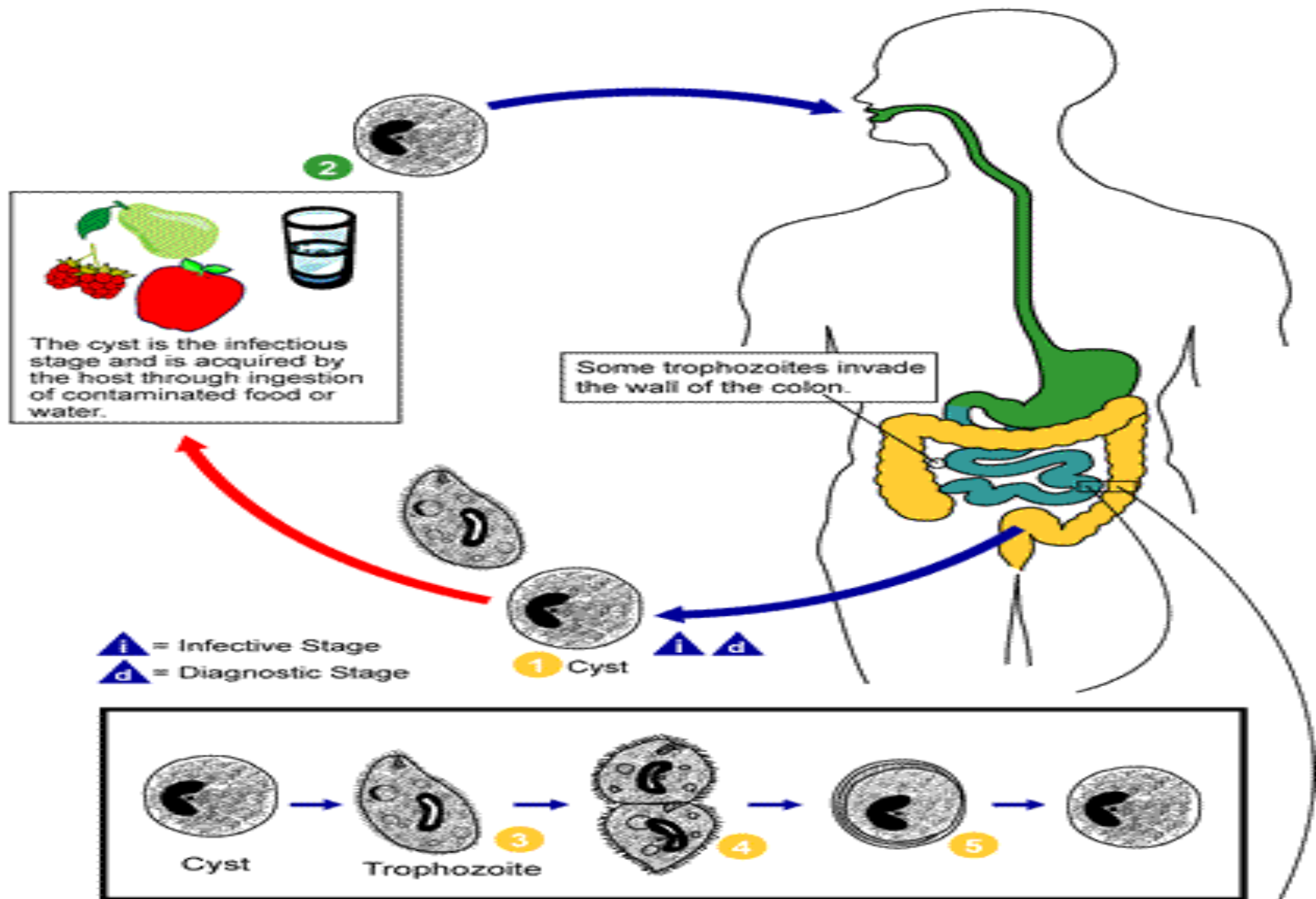
eosin



Life Cycle of *Balantidium coli*

The cyst is the infective stage of *Balantidium coli*. Once the cyst is ingested via feces-contaminated food or water, it passes through the host digestive system. The tough cyst wall allows the cyst to resist the acidic environment of the stomach and the basic environment of the small intestine until it reaches the large intestine. There, excystation takes place. Excystation produces a trophozoite from the cyst stage.

The motile trophozoite feeds on intestinal bacterial flora and intestinal nutrients. Trophozoites multiply by asexual binary fission or sexual conjugation. The trophozoite may become invasive and penetrate the mucosa of the large intestine. Trophozoites are released with the feces, and encyst to form new cysts. Encystation takes place in the rectum of the host as feces are dehydrated or soon after the feces have been excreted.



Life Cycle of *Balantidium coli*

Clinical manifestation

who are infected with *B. coli* remain asymptomatic.

Although *Balantidium coli* usually resides in the lumen of its host, trophozoites can invade the mucosa of the large intestine (cecum and colon) and cause ulcerations. The parasite secretes a substance like Proteolytic enzyme and cytotoxic enzyme, which helps degrade intestinal tissue and facilitates penetration of the mucosa. Other bacteria in the intestine may enter the ulcer leading to secondary infections. Ulcerations of the large intestine can be viewed using sigmoidoscopy. Common symptoms of Balantidiasis include chronic diarrhea, occasional dysentery (diarrhea with passage of blood or mucus), nausea, foul breath, colitis (inflammation of the colon), abdominal pain, weight loss, deep intestinal ulcerations, and possibly perforation of the intestine. After ingestion of an infective *Balantidium coli* cyst, days to weeks may pass before infection occurs.

Epidemiology

Balantidiosis is most often found in tropical regions throughout the world, It is not a common human disease; the infection rate is less than 1%, The parasite is nonpathogenic in pigs and is much more prevalent (20-100%) among these hosts. Pigs are a good source of infection for humans in areas where they share habitation.

Diagnosis

Examination of stool samples, looking for trophozoites and cysts, Trophozoites are readily identified because of their large size and the fact that *B. coli* is the only ciliate that parasitizes humans, The infection may disappear spontaneously or the host may become asymptomatic, with the host remaining as a carrier. Several drugs that are taken orally are known to eliminate the infection.

Treatment of Balantidiasis

Balantidium coli infection can be treated effectively with antibiotics. Three drugs are commonly used and administered orally. They are listed below in order of recommendation.

- (1) Tetracyclines
- (2) Metronidazole
- (3) Iodoquinol