



# ***Balantidium coli and Cryptosporidium parvum***

**College of Health Sciences  
Department of Medical Laboratory  
Analysis  
Medical Parasitology  
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# *Balantidium coli*

**Distribution:** It is distributed worldwide.

**Habitat:** *Balantidium coli* resides in the **large intestine** of humans, pigs and non-human primates.

## **Morphology**

- It is the **largest** intestinal protozoa of human.
- *Balantidium coli* exists in 2 stages— trophozoite and cyst.
- The **cyst** is the **infective stage** of *Balantidium coli*. It is **spherical** in shape. It is surrounded by a **thick double-layered wall**. The cytoplasm is granular with presence of **macronucleus**, **micronucleus** and vacuoles.

# *Balantidium coli* trophozoite

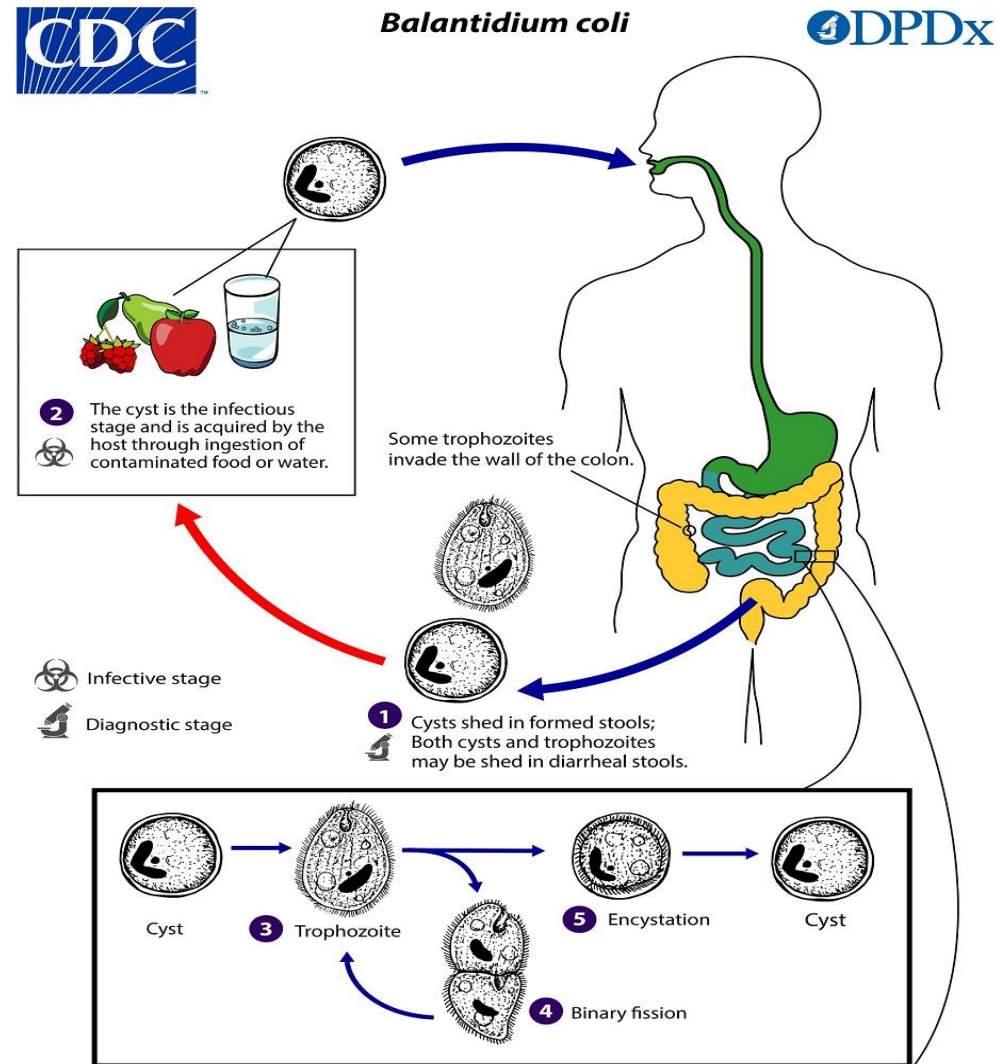
- The trophozoite is the **invasive stage**. It is large and **ovoid**.
- There is presence of **short cilia** over the **entire surface** of the body.
- Its anterior end is narrow and posterior end is broad.
- At the anterior end, there is a groove (**peristome**) advancing to the mouth (**cytostome**) and a short funnel-shaped gullet (cytopharynx).
- Posteriorly, there is a small anal pore (**cytopyge**).
- The trophozoite has **2 nuclei** (a large kidney-shaped **macronucleus** and a small **micronucleus**).
- The cytoplasm has **contractile vacuoles** and **food vacuoles**.

# Balantidium coli Life Cycle

1. Cyst is passed out in the stool of infected human.
2. Humans acquire infection by **ingesting** cyst through contaminated food or water.
3. In the **intestine**, the cyst undergoes excystation to release trophozoite.
4. The trophozoites divide by **binary fission**.
5. It encysts as it passes down the colon and is excreted in faeces.

Infection is acquired from pigs and other animal reservoirs or from human carriers. Pig is its reservoir host.

Balantidiasis is a **zoonosis**.



## Pathogenesis and Clinical Features of balantidiasis

- Clinical disease results when the **trophozoites burrow into the intestinal mucosa** and initiate inflammatory reaction.
- This leads to **mucosal ulcers**, resembling lesions in amoebiasis.
- **Unlike *Entamoeba histolytica*, *Balantidium coli* infection does not involve** extraintestinal sites.
- Most infections are asymptomatic. Symptomatic disease **resembles intestinal amoebiasis** causing
  1. **Diarrhoea or dysentery with abdominal colic.**
  2. **Nausea and vomiting.**

# Balantidiasis

- **Diagnosis**

*Microscopic examination* detection of trophozoites and cysts in stool.

- **Treatment**

Tetracycline, doxycycline and Metronidazole.

- **Prevention and Control**

1. Boil drinking water and eat cooked food.
2. Personal hygiene.
3. Proper sanitation.
4. Treat infected animals.
5. Treat positive cases.

# *Cryptosporidium parvum*

- **Distribution**

It has a worldwide distribution. *Cryptosporidium parvum* (infects various species of mammals) can cause human infections.

*Cryptosporidium* causes **intractable diarrhoea** in AIDS patients and immunocompromised persons.

- **Habitat**

*Cryptosporidium parvum* inhabits the **small intestine**. It **may also be found** in **stomach, large intestine** and **lungs**.

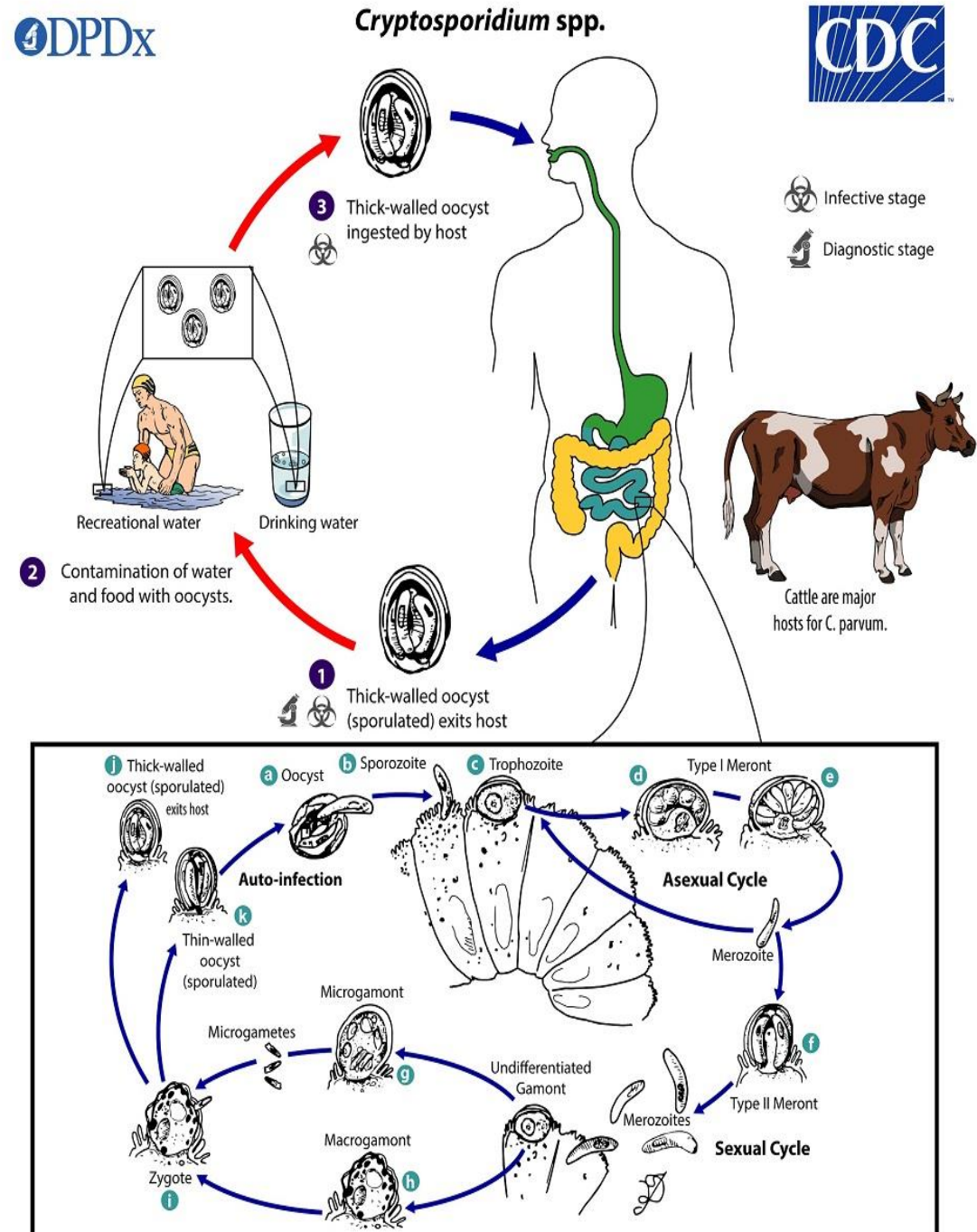
## ***Cryptosporidium parvum* morphology**

- The infective form is the thick-walled **oocyst**.
- The oocyst is small, spherical, or oval.
- Oocysts contain **4 crescent** shaped sporozoites and can remain viable in the environment for prolonged period and **resistant to** most disinfectants and temperature up to 60 °C.
- It can survive **chlorinated water**, but application of **ozone** is effective in killing the oocysts.



# *Cryptosporidium parvum* life cycle

1. Thick-walled **sporulated oocysts** are passed out in faeces of **infected host**.
  2. Humans acquire infection via **ingestion** of contaminated water and food.
  3. The parasite completes its life cycle, **sexual and asexual phases** in a single host.
- Besides humans, the parasite can infect other animals. **Reservoir hosts** include mammals, birds and reptiles.



# Pathogenesis and Clinical Features of cryptosporidiosis

- Clinical manifestations of **cryptosporidiosis** depend on the **immune status** of the host.
- Infection in **immunocompetent** persons may be asymptomatic or cause:
  1. Self-limiting watery diarrhoea.
  2. Nausea.
  3. Abdominal cramping.
  4. Weight loss.

It can also cause traveller's diarrhoea, as well as waterborne outbreaks.

- In **immunocompromised** hosts and **AIDS patients**, diarrhoea can be profuse, **chronic and persistent** causing severe fluid and electrolyte depletion and weight loss.

# Cryptosporidiosis

- **Diagnosis**

1. Microscopic examination.
2. DNA-based test (PCR on stool sample).
3. Antigen-based detection test.

- **Treatment**

There is no effective treatment for cryptosporidiosis. **Nitazoxanide** or **paromomycin** may be effective in AIDS patients.

- **Prevention and Control**

1. Proper faecal disposal.
2. Personal hygiene.
3. Boiling of drinking water.
4. Filtration of drinking water.
5. Wash fruits and vegetables with clean water before eating.
6. Health education.