

TUCOM

Year 3

Practice Parasitology

Lab. 7



## ***Isospora belli***

### **Learning objectives:-**

At the end of this lab the students should be able to:-

1. Describe the morphology forms of thick-walled oocyst of *Isospora belli*.
2. Briefly describe the life cycle of *Isospora belli*.
3. Identify the laboratory diagnosis of *Isospora belli*.

Phylum: Apicomplex

Class: coccidia

### **Introduction:**

Cystoisosporiasis or isosporiasis is an intestinal disease caused by the microscopic parasite *Cystoisospora belli*. This is the same parasite that used to be called *Isospora belli* (isos=equal+sporos,seed). The parasite can be spread by ingesting food or water that was contaminated with feces (stool) from an infected person. *Isospora* can be found worldwide. It is most common in tropical and subtropical areas.

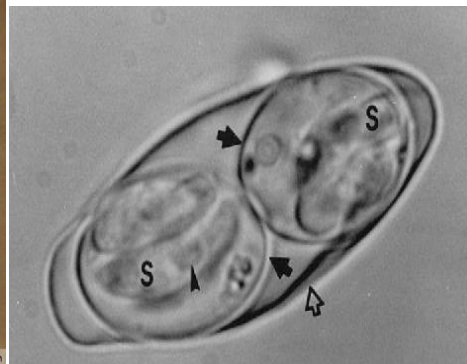
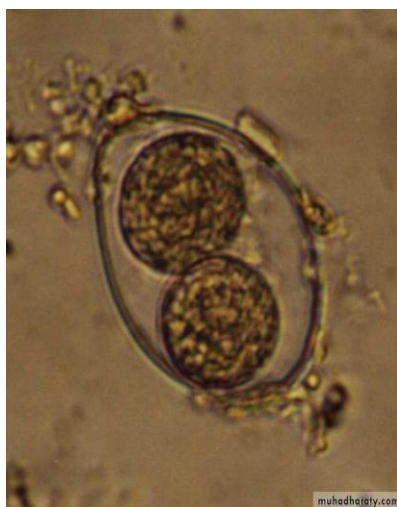
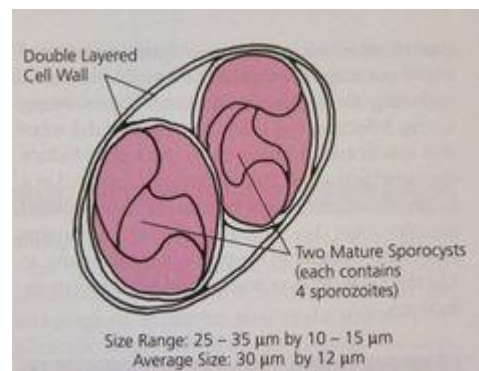
People become infected by swallowing mature oocyst, for example, by ingesting contaminated food or water. Infected people shed the immature form of the oocyst in their feces. The immature oocyst usually needs about 1 or 2 days in the environment (outside of people) to mature enough to infect someone else. In some settings, the oocyst might mature in less than a day.

*Isospora* usually is spread indirectly, such as through contaminated food or water. This is because the parasite needs time to mature. However, oral-anal contact with an infected person might pose a risk for transmission. It causes mucous diarrhea. People with weak immune systems, such as people with AIDS, may be at higher risk for severe or prolonged illness.

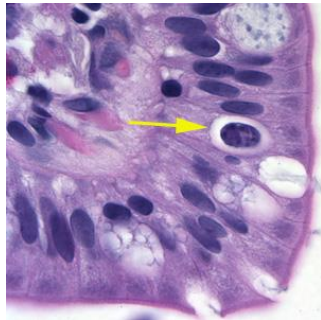
**Habitat:** lower part of the ileum in small intestine (intracellular development)

**Morphology:** A fully mature (sporulated) oocyst of genus *Isospora* is a spindle-shaped body that has two sporocysts that contain four sporozoites each. The

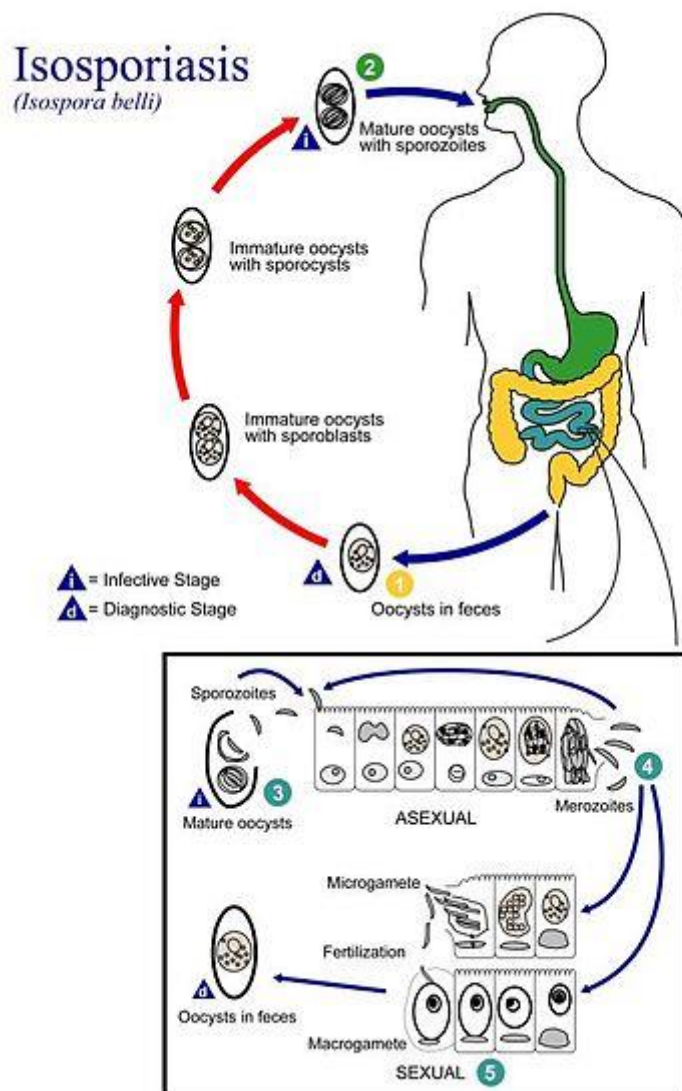
oocysts of *Isospora belli* are long and oval shaped. They measure between 20 and 33 micrometers in length and between 10 and 19 micrometers wide.



Mature oocyst with four sporozoites in each of two sporocysts



Oocyst of *C. belli* in the epithelial cells



## Life cycle

At time of excretion, the immature oocyst contains usually one sporoblast (more rarely two) ①.

In further maturation after excretion, the sporoblast divides in two (the oocyst now contains two sporoblasts); the sporoblasts secrete a cyst wall, thus becoming sporocysts; and the sporocysts divide twice to produce four sporozoites each ②.

Infection occurs by ingestion of sporocysts-containing oocysts: the sporocysts excyst in the small intestine and release their sporozoites, which invade the epithelial cells and initiate schizogony ③.

Upon rupture of the schizonts, the merozoites are released, invade new epithelial cells, and continue the cycle of asexual multiplication ④.

Trophozoites develop into schizonts which contain multiple merozoites. After a minimum of one week, the sexual stage begins with the development of male and female gametocytes ⑤.

Fertilization results in the development of oocysts that are excreted in the stool ①.

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## Diagnosis

*Isospora* is too small to be seen without a microscope. The immature oocyst is diagnosed by examining stool (fecal) specimens under a microscope. More than one specimen may need to be examined to find the mature oocyst which sporulates after 48hr

### **Treatment**

The infection is treated with prescription antibiotics. The usual treatment is with trimethoprim160mg-sulfamethoxazole800mg twice daily for 2-3 weeks.

### **Prevention and control**

Avoiding food or water supply that might be contaminated with stool may help prevent infection. As always, good handwashing and personal-hygiene practices should be followed. Wash your hands with soap and warm water after using the toilet, changing diapers, and before handling food. Teach children the importance of washing hands to prevent infection.

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