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## ***Cystoisospora belli (Isospora belli)***

- ◆ ***Cystoisospora belli* (formerly known as *Isospora belli*) is a gastrointestinal protozoan.**
- ◆ **In patients with AIDS and other immunodeficiency, it is an opportunistic pathogen that can cause watery diarrhea and weight loss.**
- ◆ **It is found worldwide, especially in tropical, subtropical regions, Middle East, and areas with poor sanitation.**
- ◆ **The coccidian parasite, *Cystoisospora belli*, infects the epithelial cells of the small intestine, and is the least common of the three intestinal coccidia that infect humans (the other two are *Cyclospora* and *Cryptosporidium* species).**

### ***Classification of Isospora belli***

**Domain: Eukaryota**

**Phylum : Apicomplexa ( Protozoa)**

**Class : Coccidia**

**Order : Eucoccidiorida**

**Family : Eimeriidae**

**Genus : *Cystoisospora (Isospora)***

**Species : *Cystoisospora belli***

### Habitat

- The upper small intestine of humans.

### Transmission

- ♦ transmitted fecally in contaminated food and drink with oocyst.
- ♦ It's also possible that oral-anal sex may spread the infection.

### Morphology of *Isospora belli*

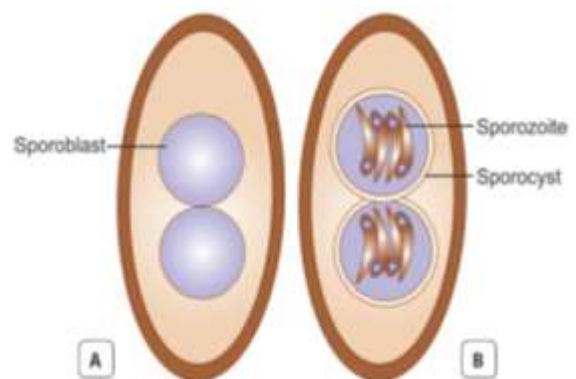
Oocysts of *I. belli* are elongated ovoid and measure  $25\ \mu\text{m} \times 15\ \mu\text{m}$ .

- Each oocyte is surrounded by a thin smooth 2 layered cyst wall.
- Immature oocyst seen in the feces of patients contain two sporoblasts.
- The oocysts mature outside the body.
- On maturation, the sporoblast converts into sporocysts.
- Each sporocyst contains 4 crescent-shaped sporozoites.
- The sporulated oocyst containing 8 sporozoites is the infective stage of the parasite.

#### Oocysts of *Isospora belli*.

A. Immature cyst.

B. Mature cyst.



**Laboratory Diagnosis of *Isospora belli***

**1. Microscopic examination of stool**

**Indirect evidence**

- **High fecal fat content.**
- **Presence of fatty acid crystals in the stool.**
- **Presence of Charcot Leyden**
- **crystals in the stool.**

**Direct evidence**

**It may be difficult to demonstrate the transparent oocyst in saline preparation of stool.**

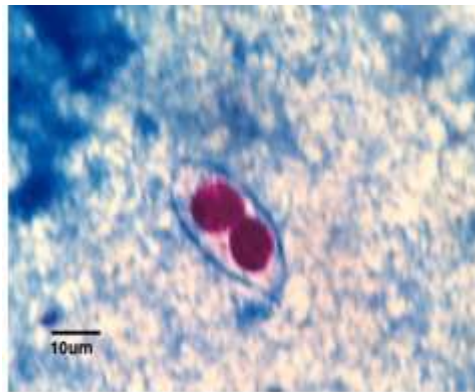
- **Stool concentration techniques may be required when direct wet mount of stool is negative.**
- **The staining technique used is Modified Ziehl-Neelsen stain or Kinyoun acid fast staining of stool smear. In these methods, pink colored acid-fast large oocyst (>25  $\mu\text{m}$ ) can be demonstrated. The stool smear can also be stained by auramine rhodamine and Giemsa stains.**

**2. Duodenal Aspirates**

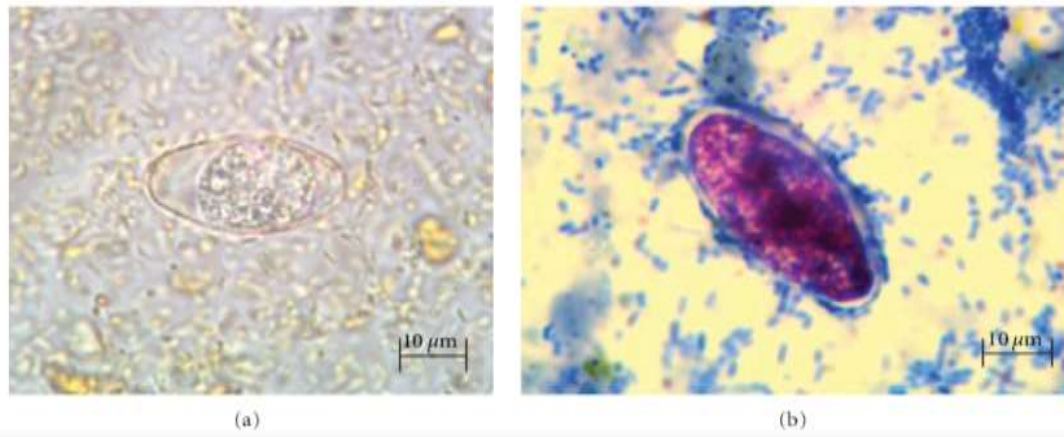
**After repeatedly negative stool examinations, duodenal aspirate examination or enterotest can be performed to demonstrate oocyst.**

### 3. Intestinal Biopsy

Upper gastrointestinal endoscopy may provide biopsy specimens for demonstration of oocysts.



*Isospora belli* oocysts on stool smear stained using Ziehl-Neelsen method



(a) *Isospora belli*, saline mount. (b) *Isospora belli*. Modified acid-fast stain.