Phylum: Protozoa:

. Coccidia

The coccidia is unicellular protozoa and belongs to the Phylum Apicomplexa.

- They live intracellularly, at least during a part of their life cycle, and at some stage in their life cycle, they possess a structure called the **apical complex**, using which they attach to and penetrate host cells; hence included in Phylum Apicomplexa.
- All coccidian have a **sexual sporogonic phase** and an **asexual schizogonic phase**.
- Many of them also show an alteration of hosts; a definitive host and an intermediate host.
- Many parasites considered in this chapter have acquired great prominence due to their frequent association with HIV infection.

Toxoplasma Gondii

T. gondii occurs in 3 forms:

1- ***Trophozoites (Tachyzoites)***: crescent-shaped, with one end pointed and the other end rounded. And have an **apical complex** at the pointed end and are seen intracellularly in various tissues during the early acute phase of infection.

2- ***Tissue cysts***: They are found during the chronic stage of the infection and can be found in the brain (most common site), skeletal muscles, and various other organs.

3- ***Oocyst***: Oocysts develop only in definitive hosts – in the intestine of cats and other felines but not in humans.

*The trophozoite and tissue cyst represent stages in asexual multiplication (**schizogony**), while the oocyst is formed by sexual reproduction (**gametogony or sporogony**).

* All 3 forms occur in domestic cats and other felines, which are the definitive hosts and support both schizogony and gametogony.

* Only the asexual forms, trophozoites, and tissue cysts are present in other animals, including humans and birds, which are the intermediate hosts.

*** All the 3 forms are infectious to man**.

Lab 9

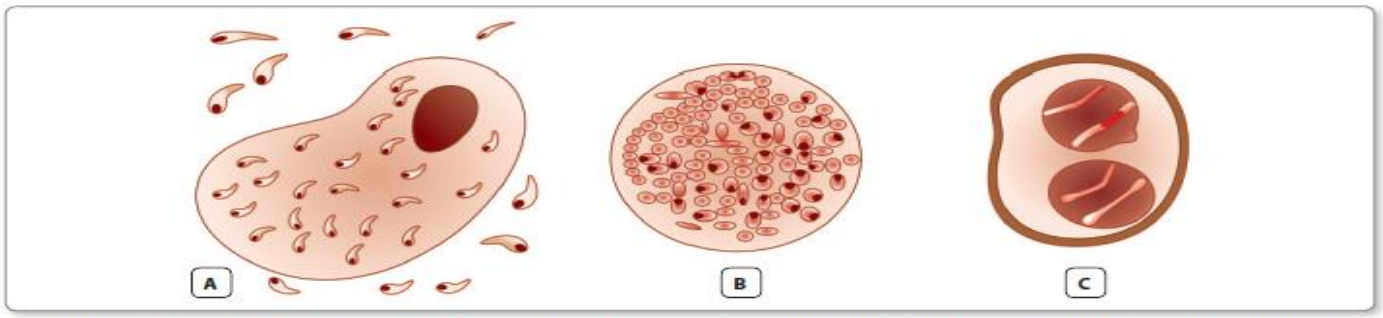
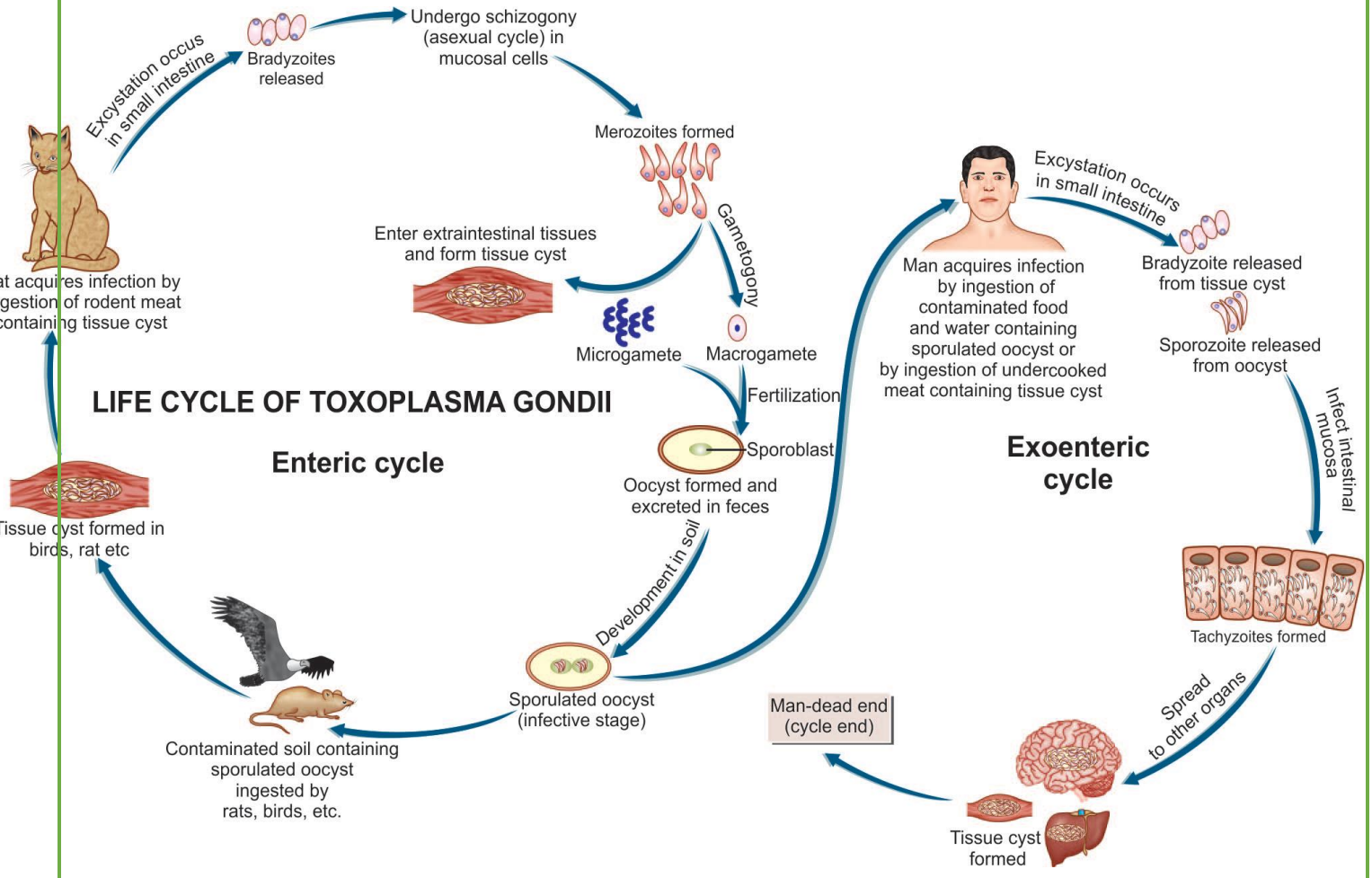


Fig. 7.1: *Toxoplasma gondii.* **A.** Smear from peritoneal fluid of infected mouse, showing crescentic tachyzoites—extracellular trophozoites and intracellular form within macrophage; **B.** Thick-walled tissue cyst containing rounded forms- bradyzoites; **C.** Oocyst containing 2 sporocysts with sporozoites inside

Life Cycle

T. gondii completes its life cycle in 2 hosts. **Definitive host:** Cats and other felines, in which both sexual and asexual cycle takes place. **Intermediate hosts:** Man and other mammals, in which only the asexual cycle takes place.

***T. gondii* has 2 types of life cycles * Enteric cycle and * Exoentric cycle.**



Laboratory Diagnosis

The diagnosis of acute toxoplasmosis is made mainly by demonstration of trophozoites and cysts in tissue and body fluids and by serology

1- ***Microscopy:*** Smear made from the above specimens is stained by Giemsa, PAS, or Gomori methenamine silver (GMS) stain Tachyzoites appear as crescent-shaped structures with blue cytoplasm and dark nucleus.

2- **Serodiagnosis:**

Various serological methods have been developed to detect these antibodies and are as follows:

- **Indirect hemagglutination (IHA)**
- **Indirect immunofluorescence (IIF)**
- **Enzyme-linked immunosorbent assay (ELISA)**
- **Latex agglutination test**
- **Sabin-Feldman dye test.**

Sabin-Feldman dye test

This was the first serological test for Toxoplasma antibody to be described by Sabin and Feldman (1948).

Principal: The test is based on specific inhibition by antibody, of the staining of trophozoites by alkaline methylene blue dye.

Technique: Equal volumes of diluted patient's serum are incubated with live trophozoites and normal human serum (accessory factor) for an hour at 37oC. Later, a drop of alkaline methylene blue dye is added to each tube and examined under a microscope. If less than 50% of the tachyzoites first take up the stain and the cytoplasm remains colorless, the test is considered to be positive. The presence of 90–100% tachyzoites, deeply swollen and stained with blue color, shows the test to be negative. It denotes the absence of Toxoplasma antibodies. The highest dilution of the serum, which inhibits staining up to 50% is the titer.

Limitation: The test is reported to give a false positive reaction in Sarcocystis, *Trichomonas vaginalis*, and *Trypanosoma Lewisii* infections.