

Introduction to Parasitology



Parasitology

- Parasite- living organism which receives nourishment and shelter from another organism where it lives
- Host-organism which harbors the parasite

Relationship between two diff. species

■ Predation

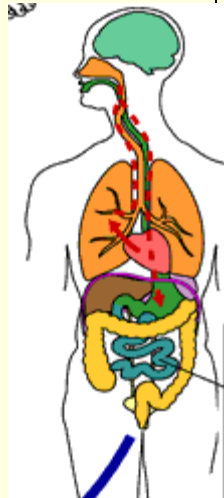
Larger
consumes
smaller



■ Mutualism

(Close living arrangement between two species)

1. Symbiosis (Both benefited)
2. Commensalisms (smaller one benefited, no harm to larger one – called as host)
3. Parasitism (smaller one benefited, harmful to host.)



Parasites

- Living organism – live in or on a **host** which provide protection and nourishment.

Bacteria
Fungi



- Terms usually applied to protozoan and helminthes.



Parasites classified as :

- Ecto parasite
- Endo parasites
- Obligatory
- Facultative
- Accidental
- Temporary
- Permanent

Classes of Hosts

- **Definitive host:**

- harbors adult form / where parasites multiply sexually.

- **Intermediate host:**

- harbors larval form / where parasites multiply asexually.

- **Paratenic host:**

- where parasites can remain viable without further development.

- **Reservoir host:**

- Host responsible for continuous existence of parasites in an endemic area.

Terminology

- Zoonosis:
 - Infections of animals which can be transferred to humans
- Anthroponosis – infection of humans only
- Zooanthroponosis
- Vectors: Biological / mechanical

Common terminologies in your textbook...

- Vertebrate animal
- Mammalian host
- Canine animal
- Herbivorous
- Carnivorous
- Omnivorous

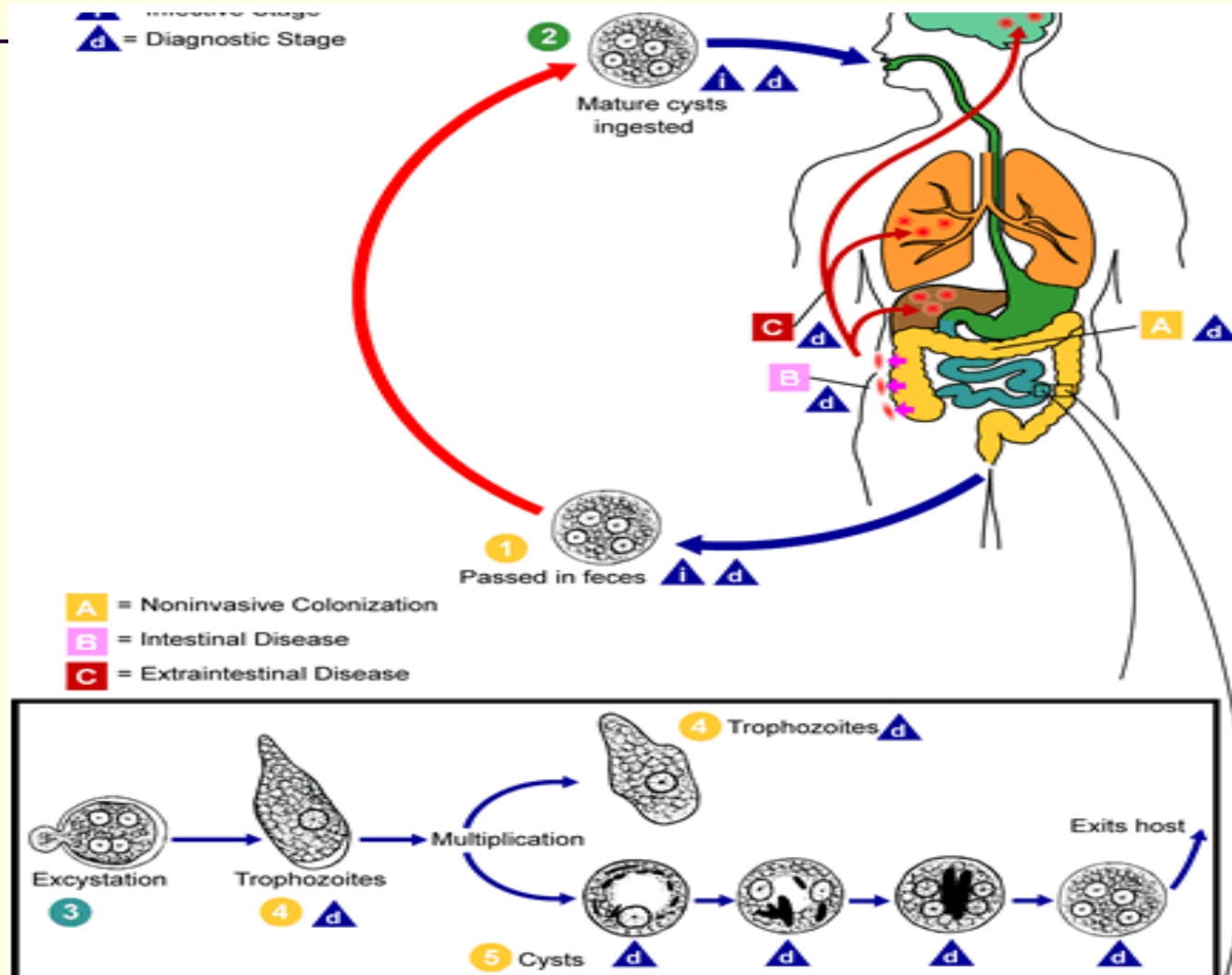
Schemes to be followed

- History
- Geographical distribution
- Habitat
- Morphology
- Life cycle
- Modes of infection
- Pathogenesis
- Laboratory diagnosis

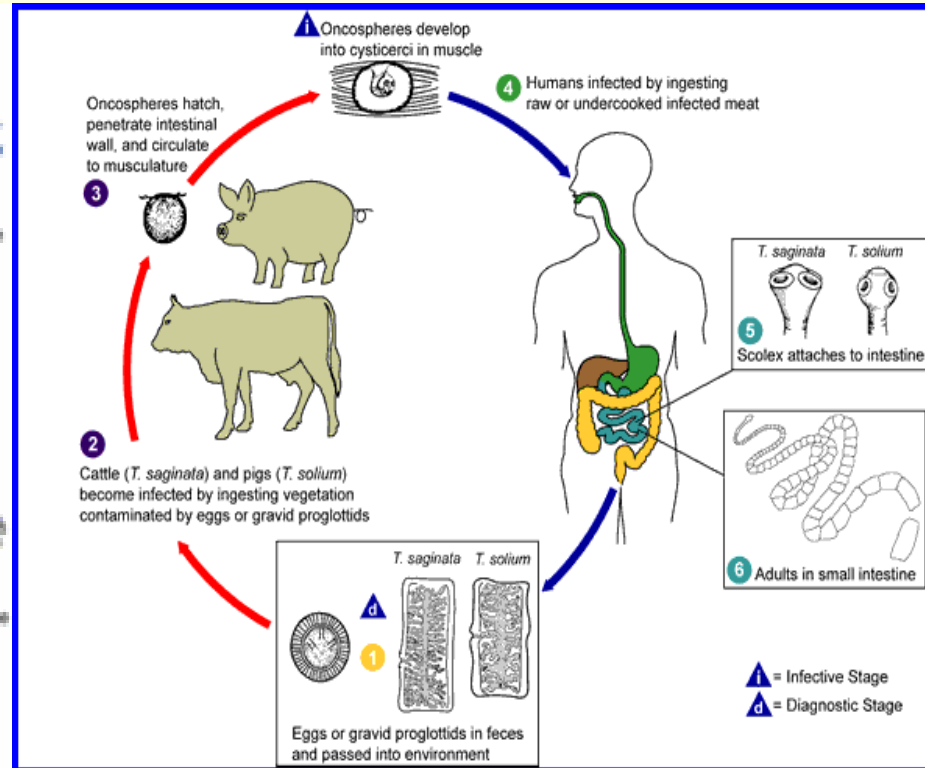
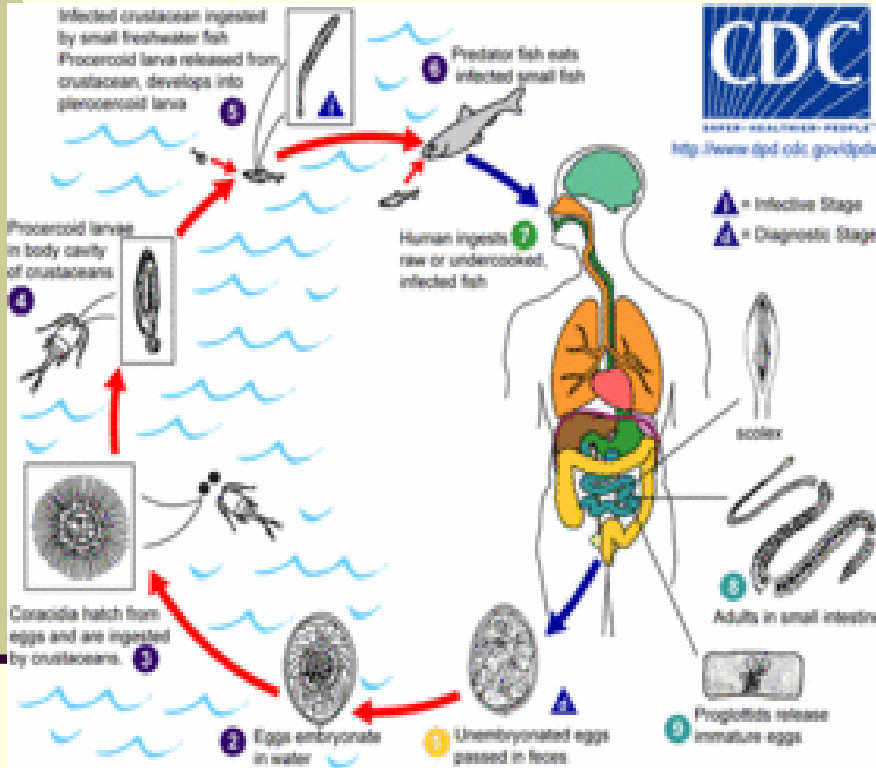
Life cycle of parasites

- **Developmental cycle of parasites**
- Direct life cycle: only **one** species of **host** is required to complete development
- Indirect life cycle: **Host** of **two or more** species required to complete development.

Direct life cycle



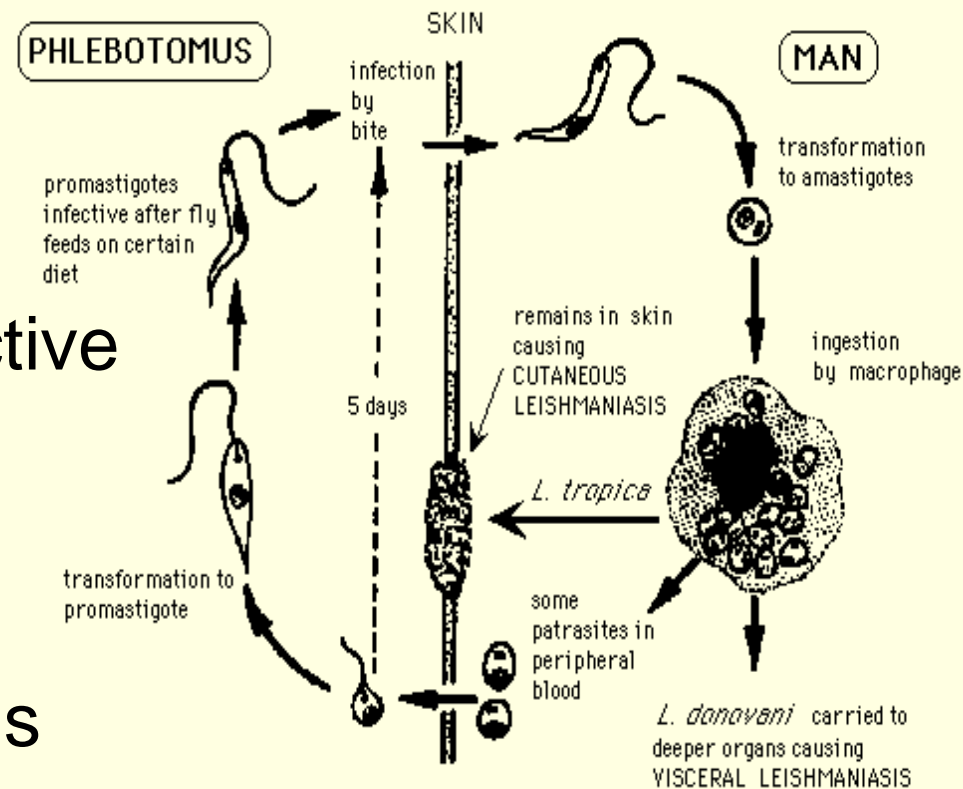
Indirect life cycle



Parasitic infection - lifecycle

- Describes sequential stages in growth, development and multiplication.
- Helps to understand
 - Mode of entry, infective form
 - Incubation period
 - Pathogenesis
 - Laboratory diagnosis
 - Control measures

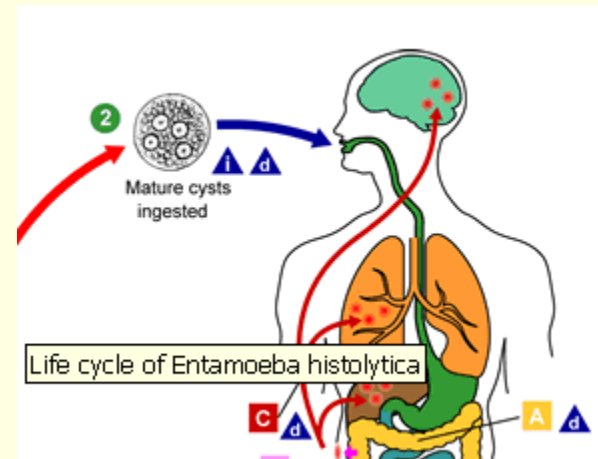
Life cycle of *Leishmania donovani* & *L. tropica*.
(After Smyth, 1994)



Mode of infection

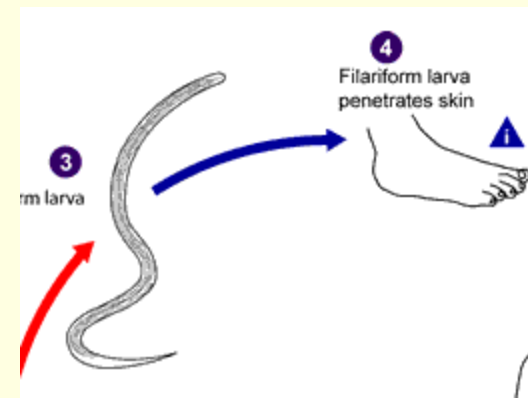
■ Ingestion

- faeco-oral (direct)
- undercooked meat
- infected cyclops
- plants or vegetables



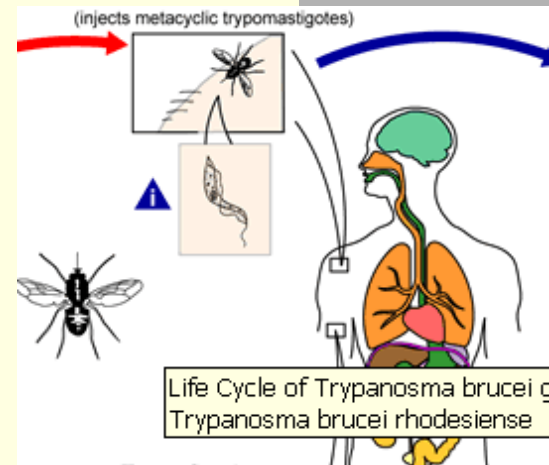
■ Inoculation

Penetration of skin – by larvae

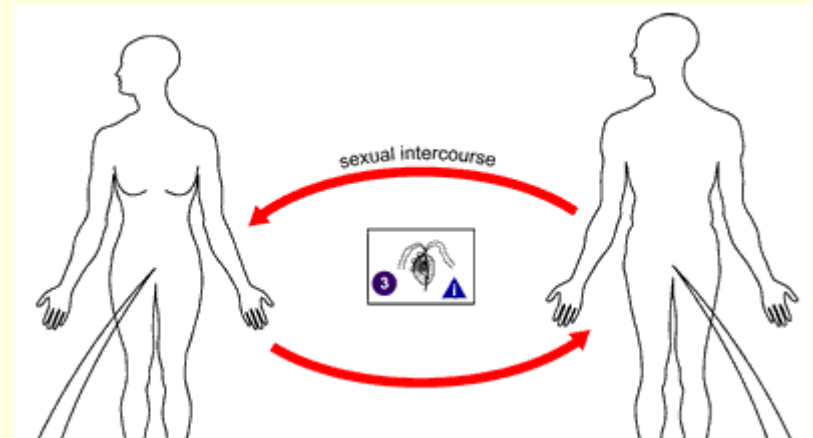


Transmission of infection

Biological vectors
Bite of mosquito



Direct
transmission –
sexual, close
contact



Parasitic infection - pathogenesis

- Intestinal
- Extra intestinal

Nomenclature

- Each parasite possesses two names – one generic and one specific
- First begins with initial capital letter and second with initial small letter after which comes designator's name, followed by a punctuation mark and finally year of discovery
 - *Ascaris lumbricoides* Linnaeus, 1758

- Phylum
 - Subphylum
- Class
 - Superclass
 - Subclass
- Order
 - Suborder
- Family
 - Superfamily
 - Subfamily
- Genus
- Species

Medical parasitology:

Deals with parasites which infect man and the diseases produced by them.

1. Phylum : Protozoa
2. Phylum : Helminthes
 1. Platyhelminthes
 2. Namehelminthes
3. Phylum : Arthropoda



Parasitology of our interest...

■ Protozoology

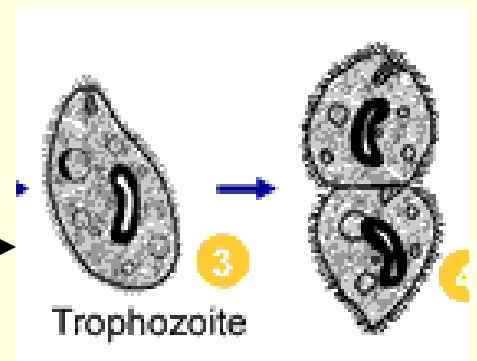
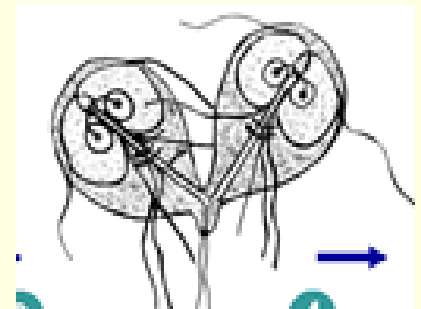
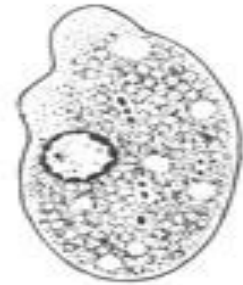
- Unicellular
- Single cell performs all function
- Occurs in two forms
- Trophozoite is active multiplying form
- Cyst is dormant form-nondividing, non multiplying

■ Helminthology

- Multicellular
- Specific cell performs a specific function
- Produces eggs which develop into intermediate host-larval form and then converted to adult form

Protozoa – Kingdom Protista

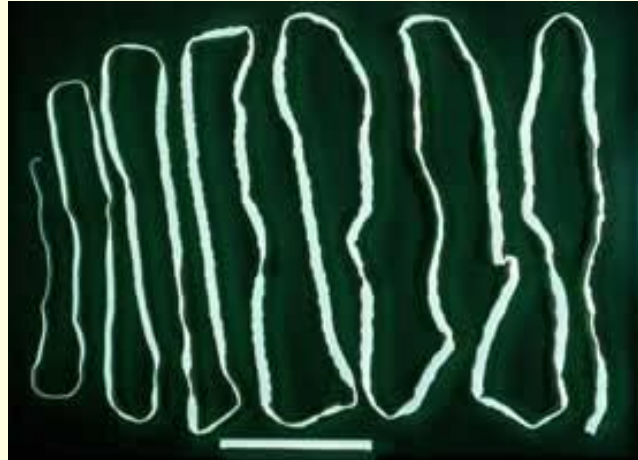
- Unicellular
- Multiply by binary fission :
 - Pseudopodia (Sarcodina – amoebae)
 - Flagella (Mastigophora)
 - Cilia (Ciliophora – Balantidium coli)



Protozoa – Kingdom Protista

- Group 2: Coccidia – sporozoea – multiply by sexual and asexual mode
 - Blood – malaria
 - Tissue – toxoplasma
 - Intestinal - cryptosporidium

Helminthes –



Cestodes



Nematode



Trematode

thank you