

Introduction to parasitology



Definition

- Parasites are organisms that infect other living beings.
- They live in or on the body of another living being (HOST) and obtain nourishment from it.
- **Medical parasitology deals with parasites which causes human infections and diseases they produce**



- **Micro parasite:** small, unicellular Eg., viruses, bacteria and protozoa
- **Macro parasite:** large, multicellular Eg., helminths

Host parasite relation

commensalism



Parasite

symbiosis



Host

parasitism





Classes of parasite

- Ectoparasite

- Endoparasite



ECTOPARASITE



- **Ecto parasite:** living on the surface of the skin.
- It will not penetrate into the tissues.
- The infection caused by these are called as infestation.

eg., head louse, body louse etc.,



ENDOPARASITE



- **Endoparasite:** living within the body of the host (infection)
- Usually these are responsible to cause human infections.

eg., protozoa & helminths



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- This can be further subdivided into

Obligate parasite : cannot exist without host eg., *Toxoplasma gondii*

Facultative parasite: capable of living either as parasite and as free living state eg., pathogenic free living amoeba



- **Accidental parasite**: attack an unusual host
eg., Hydatid disease of man

- **Aberrant parasite**: cannot live or develop further. One that can't be transmitted from human to human. eg., *Toxocara canis*



HOST

- Defined as an organism which harbours the parasite and provides the nourishment.

- Larger, when compared to parasite.



HOST - Types

- Definitive host
- Intermediate host
- paratenic host
- Reservoir host





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- **I. Definitive host:** harbors adult parasite or where parasite replicates sexually
 - **II. Intermediate host:** harbors larval form or parasite replicates asexually
 - **III. Paratenic host:** larval stage survives but does not develop further
 - **IV. Reservoir host:** source of infection to

SOURCES OF INFECTION



- Contaminated soil and water
(Embryonated eggs of parasite)
- Fresh water fishes
(Infecting larvae/
Intermediate host)
- Crab and cray fishes
- Raw or undercooked

Mode of Infection



- Blood –sucking insects (Tick , Reduviid bugs, Mosquito etc.,)
- Housefly
- Dog
- Cat
- Cow
- Pig
- Human
- Autoinfection (Finger to mouth – pinworm)



Flea

Chagas



Tick

Bug



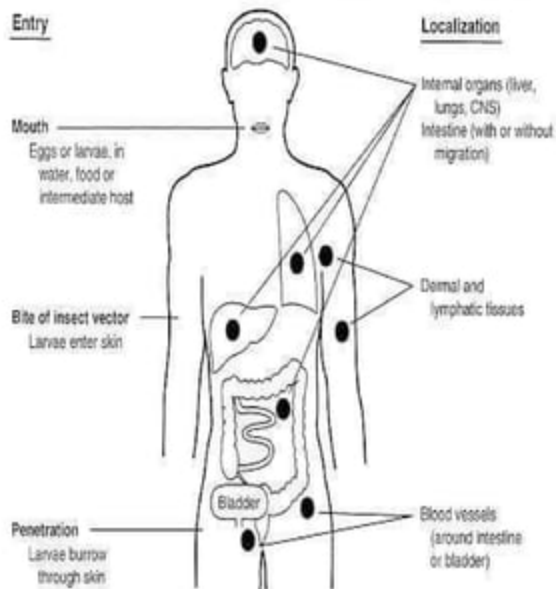
Cat & Dog

Human





PORTAL OF ENTRY INTO THE BODY



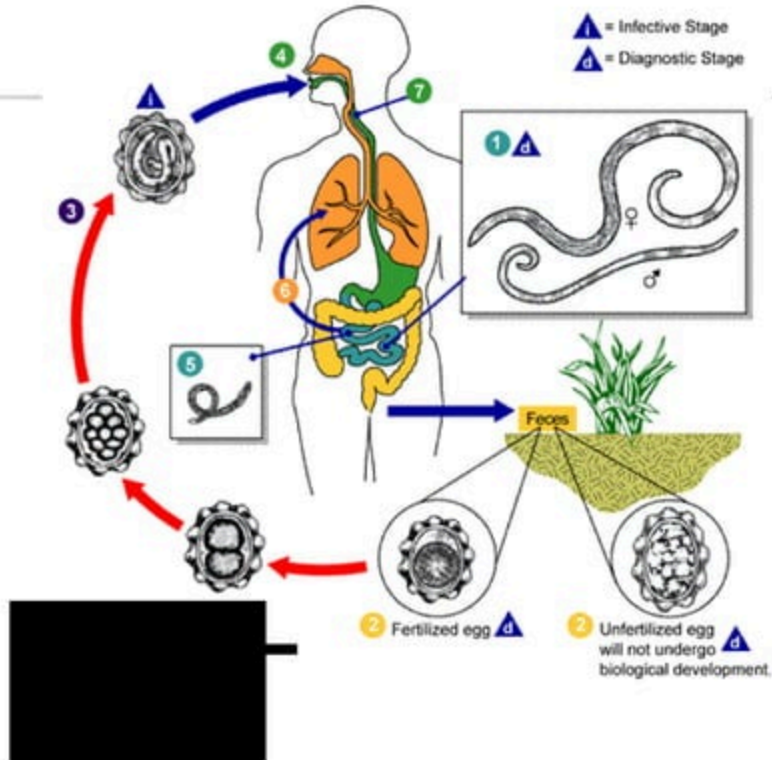
- Mouth
- Skin
- Sexual contact
- Kissing
- Congenital
- Inhalation
- Iatrogenic



Life cycle

- **SIMPLE:** life cycle completed in a single host, eg., *Entamoeba histolytica*
- Some may require two different host to complete their life cycle.
eg., *Leishmania donavani* (man and sandfly)
- **COMPLEX:** parasite requiring two different host, one definitive and one or more intermediate host
eg., *Schistosoma*

Life cycle of human parasites-Ascaris



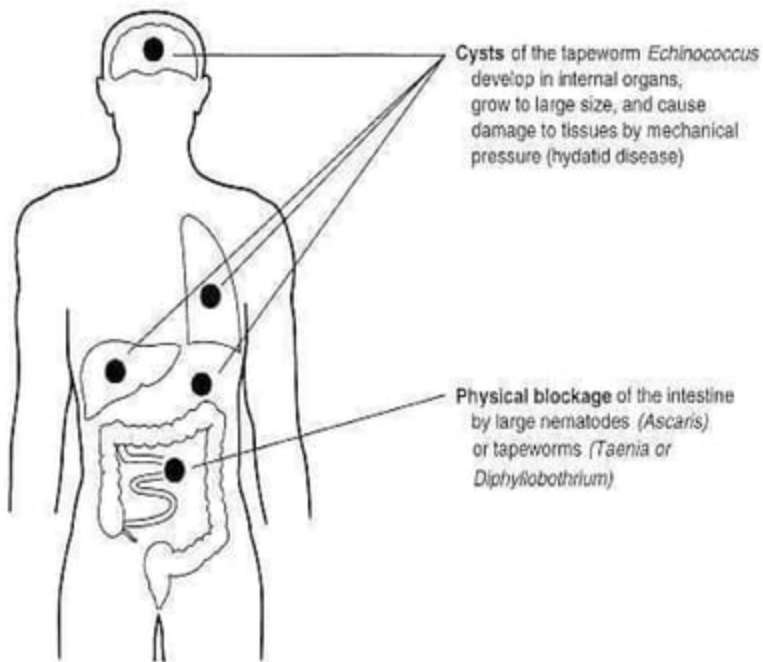


COMPLICATIONS

- Inflammatory reactions in the cells.
- Inflammation of large intestine.
- Inflammation of tissues, vessels.
- Inflammation of respiratory tract.
- Some may also causes allergic manifestations.



COMPLICATIONS





Immunity in parasitic infections

- Immunity refers to the resistance offered by the host towards injury caused by parasite.
- **INNATE:** inherited eg.,
 1. Girls and young women are susceptible to anaemia by hookworm infection.
 2. Gastric acidity cause resistance towards *Giardia* cysts

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- **ACQUIRED:** both AMI and CMI plays role in prevention
 - **CONCOMITANT IMMUNITY:** a host infected with a Schistosome resist reinfection with fresh cercariae at the same time maintains adult Schistosome



Laboratory diagnosis

- Demonstration of parasite
- Immunodiagnosis
- Molecular biological methods

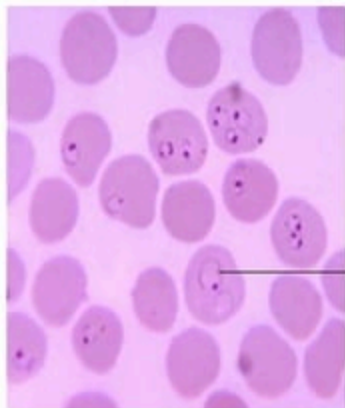


Demonstration of parasites

- Blood
- Stool
- Urine
- Genital specimens
- CSF
- Sputum
- Tissue biopsy and aspiration



Demonstration of parasites in blood

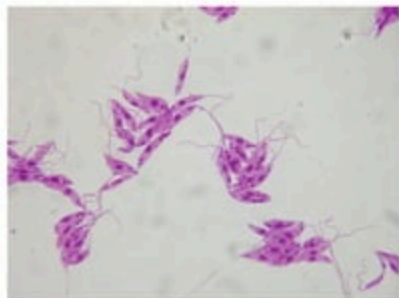


→ Ring forms of
Plasmodium falciparum

Malarial Parasite



Microfilaria

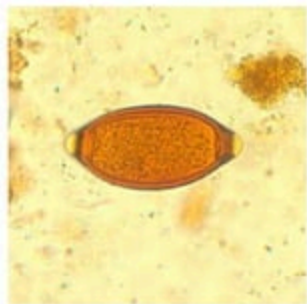


Leishmania

Demonstration of parasites in Stool



Entamoeba histolytica



Trichuris trichuria



Ankylostoma duodenale



Other Methods

- Culture
- Animal inoculation
- Immunodiagnosis
- Skin tests
- Serological tests
- Molecular methods




Classification of parasites

The parasites are divided into three main groups:

- Phylum Protozoa- single-celled organism, multiply in human host. *Eg., Entameoba, Giardia, Plasmodium, Leishmania*
- Phylum Platyhelminthes (flatworms):
Flukes & tapeworms

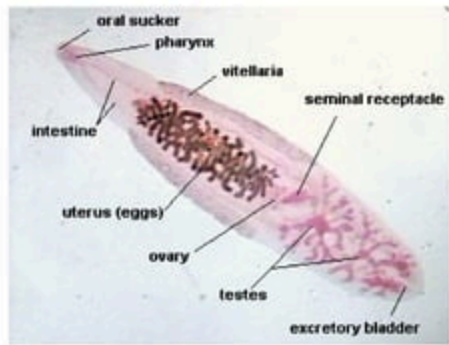
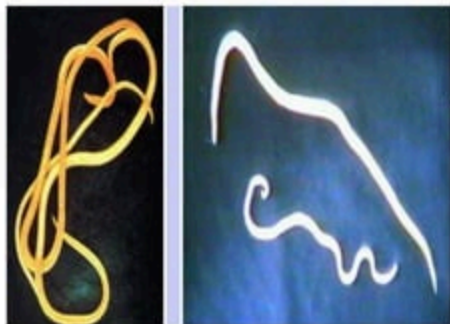
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- Phylum Nematelminthes (round worms):
Ascaries, Filarial worms etc., = multicellular worms,
do not normally multiply in human host,

 - Phylum Arthropoda

Nematode

Ascaris lumbricoides (roundworm)



Trematode

Paragonimus westermani (Flukes)

Cestode

Taenia solium (Tape worm)



Wuchereria bancrofti (Filarial worm)



Tag By Adams

Thank You

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