

# Parasitology - protozoal infections

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Recall : phylum Protozoa is classified according to organ of locomotion & habitat

- I. Rhizopoda ( amoebae) - move by pseudopodia
- II. Ciliates - by cilia
- III. Zoomastigophora - flagella
- IV. Sporozoa (plasmodia & coccidia) - gliding

Protozoa	Class & locomotion	Disease	Cyst / trophozoite
Entamoeba histolytica Invade intestinal mucosa Fecal oral route	Rhizopoda - pseudopodia	Amoebiasis ( dysentery )	C : quadrinucleate , infective stage  T : active , ingest RBCs
Entamoeba gingivalis	Rhizopoda- pseudopodia	<u>Associated with</u> peridontal disease	T: found in oral cavity
Naegleria fowleri Free living	Rhizopoda- pseudopodia	Primary Amoebic Menunigoenephalitis	Not mentioned
Acanthamoeba spp. Free living	Rhizopoda- pseudopodia	Granulomatous Amoebic Encephalitis (GAE) , Keratitis	Not mentioned
Giardia lamblia  Causes stearrhea & malabsorption , transmitted via contaminated water	Zoomastigophora - Flagella	Giardiasis  the only common pathogenic protozoan found in the duodenum and jejunum	C : Ellipsoid , resistant 2 nuclei if immature , 4 if mature T: heart shaped , 4 pairs of flagella , 2 nuclei with prominent central karyosome , 2 axostyles

Protozoa	Class & locomotion	Disease	Cyst / trophozoite
<p>Cryptosporidium</p> <p>Intestinal sporozoa</p> <p>Inhabits brush border of mucosal epithelial cells of GIT</p>	Sporozoa -Gliding	<p>Cryptosporidiosis</p> <p>Causes diarrhea , severe in immunocompromised</p>	<p>C : oocyte ( indicates sexual transmission), acid-fast , infectious</p> <p>T: intercellular, brush-border associated</p>
<p>Balantidium coli</p> <p>Largest protozoan parasite , causes intestinal erosions</p>	Ciliata - cilia	Balantidiasis ( Dysentery)	<p>C : round , infectious, resistant</p> <p>T: Large , ciliated , actively motile</p>
<p>Trichomonas vaginalis - sexually transmitted</p>	Zoomastigophora-flagella	Trichomoniasis	<p>C : None</p> <p>T: pear shaped (pyriform) , wobbling motion , 5 flagella ( 4 anterior &amp; 1 running along membrane)</p>
<p>Trypanosoma brucei</p> <p>Tsetse fly</p>	Zoomastigophora-flagella	<p>African Trypanosomiasis</p> <p>Sleeping sickness</p>	Slender , extracellular trypomastigote
<p>Trypanosoma cruzi</p> <p>Reduviid bugs or "kissing" bug</p>	Zoomastigophora-flagella	<p>American Trypanosomiasis</p> <p>Chagas' disease , intracellular cardiac infection</p>	<p>Intercellular amastigote</p> <p>Extracellular trypomastigote</p>
<p>Leishmania - sand flies - obligate intracellular</p>	Zoomastigophora-flagella	<p>Leishmaniasis - manifests as cutaneous , subcutaneous or visceral</p>	Intracellular amastigote

# parasitic Helminths

Recall : helminthology deals with parasitic worms

- I. Phylum Platyhelminthes ( flat worms ) , class : Trematoda & cestoidea ديدان مسطحة
- II. Phylum Nemanthelminthes ( round worm ) , class : Nematoda ديدان أسطوانية

Helminth	Class	Disease	Infective / diagnostic stage
Ascaris lumbricoides  Intestinal , soil-transmitted , diagnosed in stool or sputum	Nematode	Ascariasis  Mechanical obstruction, pneumonitis ( löffler's syndrome)	I : embryonated egg (contain larvae)  D : fertilized/unfertilized egg
Enterobius vermicularis  Perianal itching, Especially at night ; immediately infectious	Nematode	Pinworm infection	I: embryonated egg  D: Eggs at perianal region ( diagnosis using scotch tape )
Trichuris trichiura  Bipolar plugged eggs , soil-transmitted	Nematode	Whipworm infection  Causes colitis , rectal prolapse in severe cases	I: embryonated egg  D: Eggs in stool
Necator americanus	Nematode	Hookworm infection  Chronic anemia & diarrhea	I: Filariform larva ( penetrates skin)  D: Eggs in stool
Ancylostoma duodenale	Nematode	Hookworm infection  Bloody stools , Anemia , Ground itch	I:Filariform larva ( penetrates skin)  D: Eggs in stool
Strongyloides stercoralis  Penetrate the skin / can be ingested as well	Nematode	Strongyloidiasis Internal auto-infection , disseminated infection in immunocompromised	I: Filariform larva  D: larvae in stool

Helminth	Class	Disease	Infective / diagnostic stage
Trichinella spiralis acquired through undercooked pork Intracellular, encyst in skeletal & cardiac muscle	Nematode	Trichinosis	I : larva in infected pork (No Eggs)  D: encysted larvae in muscle biopsy
Wucheria bancrofti	Nematode	Lymphatic filariasis ( blockage of lymphatic circulation) , Elephantiasis	I : Microfilaria larvae  D: Microfilariae in blood
Loa Loa Transmitted by fly - genus chrysop	Nematode	Eye unilatera worm disease	I : Microfilaria larvae  D: Microfilariae in blood
Onchocerca volvulus  Black flies	Nematode	Eye unilatera worm disease  River blindness	I : Microfilaria larvae  D: Microfilariae in blood
<b>Fasciolidae</b> <i>Liver flukes</i> 1. Clonorchis sensis 2. Fasciola hepatica <i>Lung flukes</i> 3. Paragominus westermani	Trematodes	1. Chinese / oriental liver fluke 2. Sheep liver fluke 3. Paragonimiasis	Not mentioned
Schistosoma haematbium Eggs with terminal spine	Trematode	Schistosomiasis ( urinary ) it causes granulomatous reaction which leads to fibrosis that causes metaplasia → urinary cancer	I : cercariae penetrate skin  D: Eggs in stool
Schistosoma mansoni  Round eggs with lateral spine	Trematode	Schistosomiasis ( Intestinal ) Inferior mesenteric vein of large intestine	I : cercariae penetrate skin  D: Eggs in stool

Helminth	Class	Disease	Infective / diagnostic stage
Schistosoma japonicum  Eggs with rudimentary spine	Trematode	Schistosomiasis ( Intestinal ) Inferior & superior mesenteric vein of small intestine	I : cercariae penetrate skin  D: Eggs in stool
Taeniae saginata	Cestode	Beef tape worm infection  Mild intestinal symptoms	I : cysticercus in beef  D: proglottids or eggs in stool
Taeniae solium	Cestode	Pork tapeworm infection  May lead to epilepsy  Note below*	I : cysticercus in pork  D: proglottids or eggs in stool
Diphyllobothrium latum	Cestode	Fish tapeworm infection	I : pleroceroïd larva in fish  D: proglottids or eggs in stool
Echinococcus granulosus	Cestode	Hydatid cyst Disease	I : Eggs ingested [ Protoscolices ]  D : Hydatid cyst in imaging or surgery

Note\* ( Taeniae solium ) : -Usually patient eats contaminated beef that has encysted larvae, but if the patient eats the egg directly, the larva will do encystation inside their brain causing neurocysticercosis(that happens with taenia solium especially).