Tikrit University

College of Nursing

Basic Nursing Sciences

Second Year - 2023-2024

Microbiology

Trematoda

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Class Trematoda:

• Trematodes are commonly referred to or commonly called as flukes. Flat and broad look like leaf of tree or flatfish (the name flukes comes frome).

• All are hermaphrodite (monoecious) except Schistosoma in which sexes are separated (dioecious).

• According to the sites they inhabit, there are four groups of flukes (blood flukes, intestinal flukes, liver flukes and lung flukes)

• All of them are parasitic and pathogenic flatworms.

• No cavity, not segmented.

Bilaterally flattened except genus Schistosoma is cylindrical .

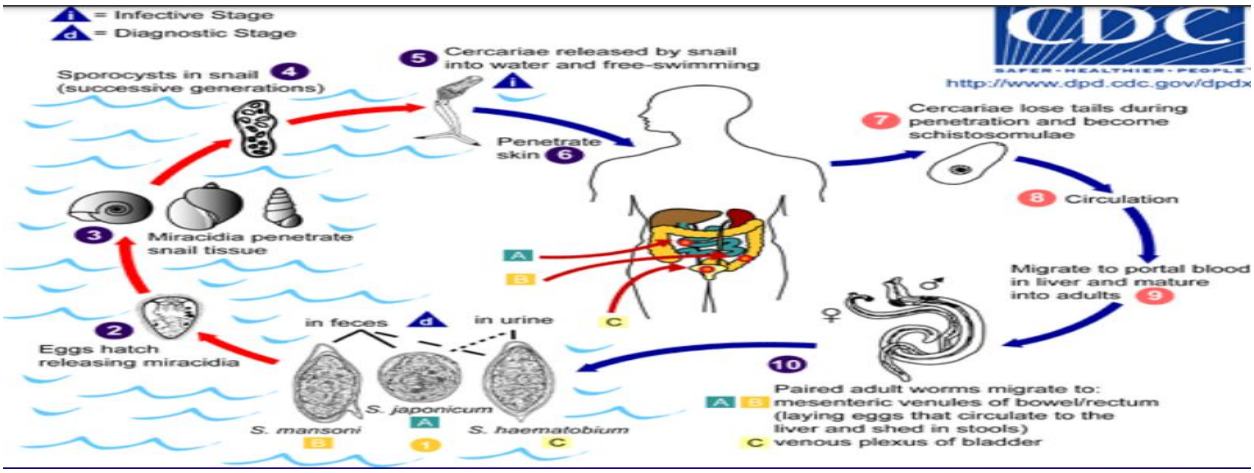
• Body has 2 oral & ventral suckers (except some species have 3 rd genital sucker).

• Oral suckers Situated anteriorly sometimes supported by hooks.

• Ventral sucker on ventral side for attachment and fixation.

• The all interior is occupied by the reproductive system; the organism is capable of producing huge numbers of eggs.

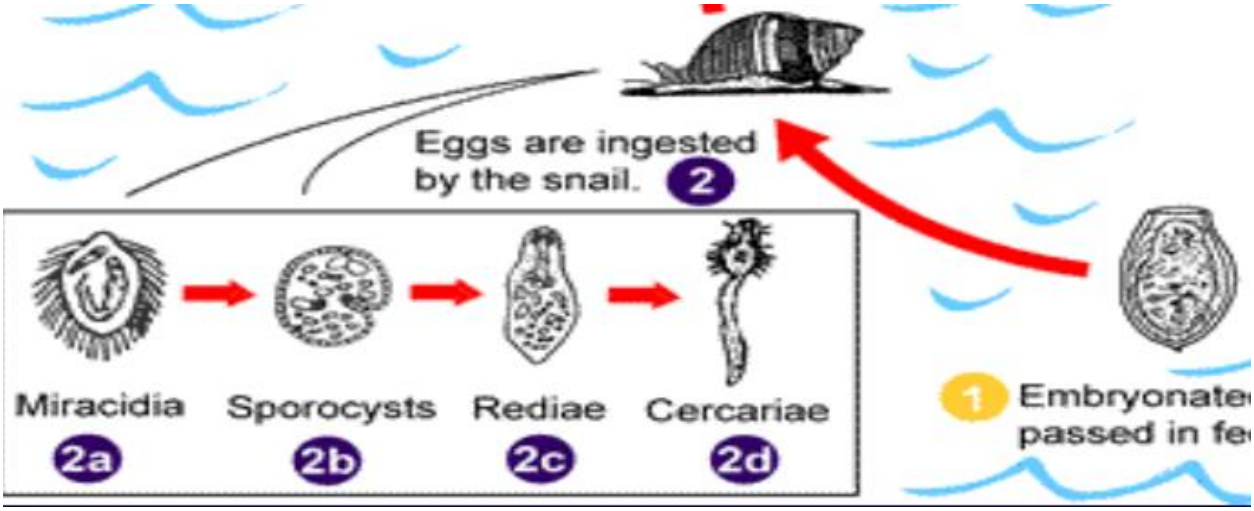
• Life cycle: all have indirect life cycle, so all trematodes are parasites of mollusks (snails) and vertebrates.

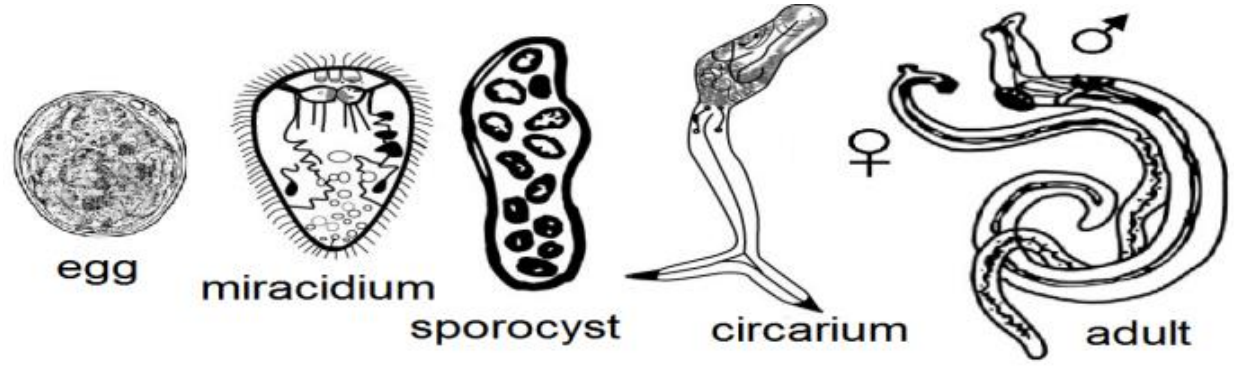


Life cycle

All have indirect needs so all trematodes are parasites of mollusks snails as (I.H) and vertebrates as final host, Show sexual stages or adult stages in the (definitive host) and asexual or larval stages in the (I.H.). Require one or more intermediate host like snail or some fish.

The habitat either in blood called blood flukes or in intestine called intestinal flukes or in the liver called hepatic or liver flukes. Egg from adult worm out side human body →→ miracidium (ciliated free swimming) →→ redia inside the snail sporocyst → many cercaria (free swimming with tailed) or or encysted on vegetable forming metacercaria





Genus Schistosoma

* Schistosoma, commonly known as blood-flukes and bilharzia causing schistosomiasis.

* Adult parasitize and lives in blood vessels.

* They are dioecious (sexes are separated)

* All Schistosoma has indirect life cycle.

* It needs I.H(Snail), larval immature stages.

* It needs human as final host→ adult stage.

* Male has ventral groove called a gynecophoric canal that extented posterior to the ventral sucker that holds female during copulation.

Genus: Schistosoma species

Common name. Blood flukes, Bilharzias worm

• Schistosoma, (phylum Platyhelminthes)

• Three pathogenic Spps. to human:

1-S. haematobium: causes schistosomal hematuria, vesicle

schistosomiasis, and urinary bilharziasis. habitat: venous plexuses around the urinary bladder. Intermediate host: snail bulinus .

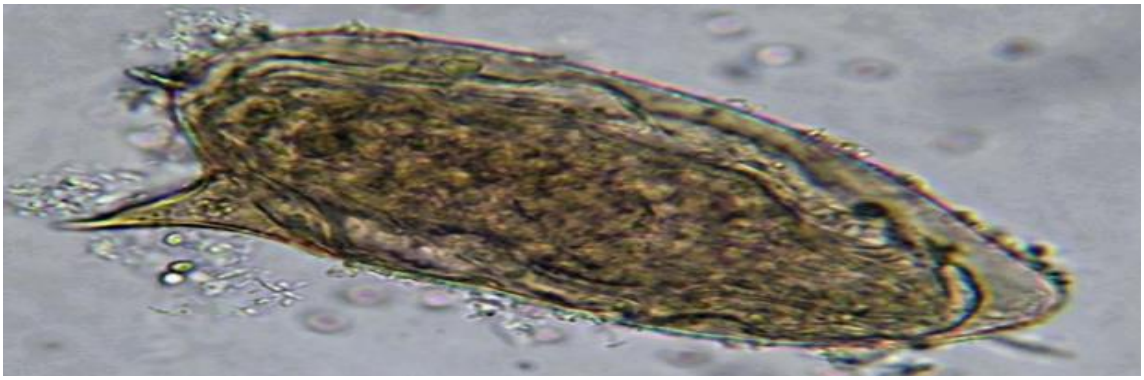
Ova: oval elongated in shape with terminal or polar spine

mansoni: causes intestinal bilharziasis, schistosomiasis mansoni.

habitat: inferior mesenteric venules of the intestine.

intermediate host: snail biomphalaria.

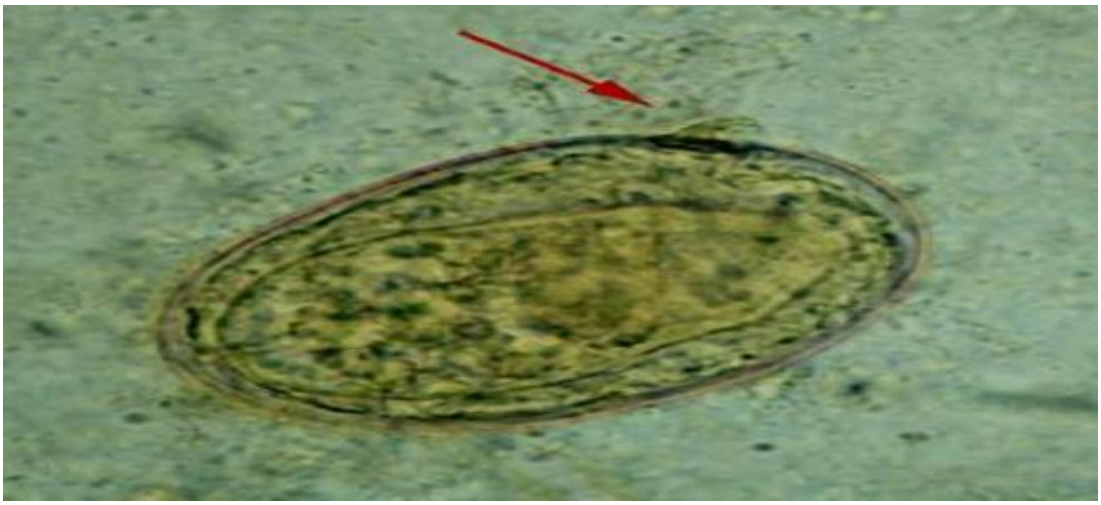
ovum: is oval in shape with lateral spine



-S. japonicum: causes Oriental schistosomiasis or Katayama disease. habitat: superior mesenteric venules of the intestine.

intermediate host: snail oncomelania

ovum: is rounded in shape with rudimentary lateral knob



General characters of genus schistosoma

These are flukes that reside mainly in the blood vessels of various organs.

Disease: schistosomiasis (bilharziasis).

The schistosoma cause intestinal, hepatic, splenic. schistosomiasis.

Schistosoma is dioecious with distinct sexual dimorphism between male and

female. It considered by the (W.H.O.)as the 2 nd most important parasitic disease, next to the malaria with hundreds of millions infected worldwide.

Adult worms parasitize and live in blood vessels.

Egg are passed through urine or feces to fresh water, where larva must pass through an intermediate host (snail) in which different larval stage of the parasite emerge that can infect an new human host directly penetrating the skin.

Schistosoma life cycle in general

Schistosoma have vertebrate - invertebrate life cycle, with human (definitive host). Parasite egg is released into the environment from infected individuals (with urine or stool) hatching on contact with fresh water to release the free swimming miracidia infect freshwater snail by penetrating the snail foot.

After infection miracidium transforms in to sporocyst that produced cercaria with biforked tail which are larvae capable of infecting mammals and human.

Cercariae emerge daily from the snail host dependent temperature and light.

Penetration of the human skin occurs after the cercaria have attached to explored the skin.

The parasite secretes enzymes that break down the skin’s protein to enable penetration of the cercarial head through the skin.

The cercaria penetrates the skin it transforms into a migrating schistosomula stage.

The schistosomula may remain in the skin for two days before locating a postcapillary venule.

From here the schistosomula travels to the lungs where it undergoes further development changes necessary for subsequent migration to the liver.

Adult worm pairs of S. mansonia and S. japonicum relocated to the mesenteric or rectal veins.

Parasites reach maturity in six to eight weeks, at which time they begin to produce eggs.

Worm pairs can live in the body for an average of four and a half years, but may persist up to twenty years.

Schistosoma haematobium

Common name: Urinary blood flukes.

* Disease : Schistosomal hematuria, vesicle schistosomiasis,

and urinary B.

Infective stage : Bi-forked tail cercaria.

Mode of infection : skin penetration.

Intermediate host: Snail called Bulinus spp.

Final or definitive host : Human.

Habitat : Venous or vesicle plexus of urinary bladder.

Egg : Oval in shape with terminal spine.

Diagnostic stage: ova with terminal spine in urine

Diagnosis:

• In laboratory

• Detection of ova in last few drops of

urine(specially in morning, after doing some

exercises)

• Immunodiagnosis like ELISA, IHT, RIA, and

CFT.

• Biopsy from infected organ

• Treatment

• praziquantel is the drug of choice for treatment.

• Praziquantel is effective against all forms of

schistososmiasis and has few side effects. This

drug is given in either two or three doses over the

course of a single day.

Fasciola hepatica (Liver fluke)

• Fasciola hepatica ro ekulf revil nommoc eht sa nwonk osla ,

.ekulf revil peehs

• It is a parasitic flatworm of the class Trematoda, phylum

Platyhelminthes that infects liver of various mammals,

including humans .

• The disease caused by the fluke is called fascioliasis (also known as fasciolosis). Or liver rot

• F. hepatica is distributed worldwide and causes great economic losses in sheep and cattle.

• It is Hermaphrodite (Monoecious).

• Two suckers (Oral, Ventral).

• The adult is leaf-like dorso-ventrally flattened