**Parasitic heliminths**

**Introduction**

* A parasite is an organism that lives on or in a host & gets its food from its host
* Host: is an organism that harbors a parasite, typically providing

 nutrition and shelter

* Definitive host/primary host : is a host in which the parasite reaches maturity and, if possible, reproduces sexually
* Intermediate host/a secondary host: is a host that harbors the parasite only for a short transition period, during some developmental stage is completed can harbour a pathogen with no ill.
* Reservoir host: A single reservoir host may be reinfected several times effects.
* Paratenic host: is similar to an intermediate host it is not needed for the parasite's development cycle to progress in which serves as "dumps" for non-mature stages of a parasite they can accumulate in high numbers •
* Dead-end host or incidental host

on to the definitive host an intermediate host that does not allow transmission preventing the parasite from completing its development

As infected Humans are dead-end hosts for Echinococcus canine t apeworms. the immature Echinococcus - humans are not usually eaten by dogs, foxes etc., and although it causes serious disease - is unable to infect the primary host matureHelminth

* Helminths :are morphologically similar organisms, worm-like parasites multicellular eukaryotic invertebrates with tube-like or flattened bodies bilaterally symmetrical

 Consisting of members of the following

* (Nematoda; roundworms)
* Platyhelminthes (flatworms):

1-Cestoda (tapeworms)

2-Trematoda (flukes):

|  |  |  |
| --- | --- | --- |
| **Roundworms (Nematodes)** | **Tapeworms (Cestodes)** | **Flukes (Trematodes)** |
|  adults are cylindrical, leaf like unsegmented |  adults are elongated,tape like segmented |  adult flukes are leaf-shaped, unsegmented |
|  bisexual | Hermaphroditic |  Hermaphroditic except for blood flukes: bisexual |
| Head without hooks and suckers | Head with hooks and suckers | Head without hooks but with oral and ventral suckers |
| Digestive canal complete with anus | Digestive canal absent | Digestive canal incomplete without anus |
| Body cavity present | Body cavity absent | Body cavity absent |
|  they inhabit intestinal & extraintestinal sites |  inhabit the intestinal lumen, larval forms inhabit extraintestinal tissues | Inhabit liver ,lung bloob |
| Life cycle egg-larvae(L1,L4)-adult | Life cycle includes egg - metacestode - adult | the life-cycle includes egg - miracidium -sporocyst-redia -cercaria - (metacercaria)-adult |

* **Simple life cycle:** the egg hatch into larvae which eventually grow into adults such as in free living roundworms**.**
* **Complex lifecycle:** the life cycle is often much more complicated egg fertilization-embryo in egg-larvae-4molts- adult such as in parasitic roundworms.

Redia:A larvae of certain trematodes that is produced within the sporocyst and that can give rise toadditional rediae or to cercariae

Cercariae: the final free living stage of a tematode parasite has a tail

Metacercaria: the encysted tailless form

* Autoinfection: is the development of small infective larvae in the gut of the host. These autoinfective larvae penetrate the wall of the lower ileum or colon or the skin of the perianal region, enter the circulation again, travel to the lungs, and then to the small intestine, thus repeating the cycle. Autoinfection makes strongyloidiasis due to *S. stercoralis* an infection with several unusual features
* **Reinfection :**A second infection that follows recovery from a previous infection by the same causative agent such as *Enterobious vermicularis*.

**TRANSMISSION of parasitic helminthes:**

**1-Faecal-oral transmission:**eggs or larvae passed in the

faeces of one host & ingested with food/water by another

eggs Trichuris ingestion of leads directly to gut infections

in humans.the ingestion of Ascaris eggs &Strogyloides larvae leads to a pulmonary migration phase before gut infection in humans

**2-Transdermal transmission**

infective larvae in the soil (geo- helminths) actively penetrating

the skin and migrating through the tissues to the gut In the gut adults develop and produce eggs that are released in host faeces larval hookworms penetrating the skin, undergoing pulmonary migration and infecting the gut egg where they feed on blood

**3-Vector-borne transmission**

larval stages taken up by blood-sucking arthropods or undergoing amplification in aquatic mollusks microfilariae Onchocerca ingested by black fly and injected into new human hosts eggs release Schistosoma miracidia to infect snails where they multiply and form cercariae which are released to infect new hosts

**4-Predator- prey**

preyencysted larvae within animals (vertebrate or invertebrate) being eaten by predators where adult worms develop and produce eggs

cysticerci in beef and Taenia pork being eaten by humans

hydatid cysts in Echinococcus offal being eaten by dogs