TAENIA SOLIUM (Pork tapeworm)

Phylum Platyhelminthes

Class Cestode

- Taenia solium is commonly known as the 'Pork tape worm of Man'
- It is an endoparasite living in the small intestine of man.
- The body is dorsoventrally compressed and ribbon like hence the name tapeworm. Body is divisible into 3 parts - Scolex, Neck and Strobila
- Scolex is anterior pear shaped structure. The protrusible and retractile part of scolex is called rostellum.
- The scolex contain 4 suckers and hooks for attachment hence it is also known as 'Armed tapeworm'.
- The number of hooks surrounding the rostellum are 22 to 32 arranged in two rows. Hooks are made up of chitin.
- New segments are budded off from the neck of Taenia, by strobilation So neck is known as the 'Zone of segmentation' or 'Zone of proliferation'.
- The segmented part behind the neck is called strobila. The segments are about 800-900 depending on the degree of developemnt of the reproductive organs, the segments are 3 types.
- The rectangular proglottids behind the neck are - Immature proglottids.
- Segments equal in length and breadth are - Mature proglottids.
- Each mature proglottid has a genital papilla at the middle of the lateral margin. The common genital pore is situated at the tip of the genital papillum.
- Posterior segments which are longer than broad are - Gravid proglottids.
- Detachment of Gravid proglottids from strobila is known as apolysis.
- Apolysis provides a chance for gravid proglottids to the enter the intermediate host and also in managing the length of a worm.
- Segmentation in tapeworm is described as - Pseudometamerism.
- In tape worms new proglottids arc formed from the neck region. In the strobila old segments are located at the posterior end while the new segments are at the anterior end.
- The proglottids are attached with one another due to the arrangement of longitudinal cxcretory canals and nerve cards passing through them.
- The outer covering of body wall is known as tegument.
- Non cellular thin part present below the tegument is basement membrane.
- The microvilli present on tegument increase the area of absorption.
- Below the tegument circular and longitudinal muscles are present.
- In mesenchyme longitudianl. circular, dorsoventral muscle fibres are present.
- The space around organs is filled with mesenchyme. It helps in internal transport of substances and acts as a hydrostatic- skeleton.
- In mature proglottid male and female reproductive organs arc well developed. Large number of testes scattered in the mesenchyme, ovary is bilobed. Vagina, Oviduct, Vitallinc duct and uterus opens into Ootype.

- In Taenia alimentary canal and digestive glands are absent. The digested food is absorbed through general body surface.
- Taenia solium is a pathogenic parasite. Man is the primary host and pig acts as the secondary or intermediate host
- The infective stage of Taenia to man is Cysticercus or Bladderworm and to pig is onchosphere embryo. The mode of infection is contamination.
- Taenia is a hermaphrodite animal. The fertilisation takes place in the ootype.
- The vitelline or yolk gland secretes vitelline or yolk cell. It joins with zygote. The zygote and yolk cell together constitute the 'capsule'.
- The movement of capsules into uterus is facilitated by sticky substance secreted by Mchli's glands.
- The embryonic development in Taenia starts when the capsules are in the intestine of man itself.
- The zygote cell undergo an unequal division and forms a megamere and cmhryonic cell.
- The embryonic cell undergo repeated unequal cleavages and produce number of mesomeres and micromeres. The micromeres develope into a ball like mass of cells called 'Morula'.
- The mesomeres surround the morula and form an inner embryonic membrane or embryophore and the megamere forms the outer embryonic membrane.

LIFE CYCLE IN PIG

- The embryonic membranes of onchosphere are dissolved by the enzymes and the larvae bore intestinal wall with the help of penentration glands later, Hexacanth enters the hepatic portal vein through which it goes to the liver. From the liver it goes to the heart through post caval vein from the heart it finally reaches the voluntary muscles of pig.
- Generally the larvae settles in the muscles of tongue, arms, elbow, neck, fore and hind limbs.
- In voluntary muscles larvae absorbs nutritive substances and grow in size. Centrally appeared cavity is Filled with blood plasma of the host. Outer cuticle, inner germinal layer surrounds the embryo.
- The wall of embryo on oneside gets thickened and invaginated into a cavity in the form of a knob. The knob develops rostellum, hooks and suckers. It is known as 'Proscolex'
- The embryo is known as Cysticercus or Bladder worm. It is cellispsoid milky whilish bladder covered by fibrous capsule.
- It is also described as **'Cysticercus cellulosae'** as its wall is formed by cellulose.
- The pork having Bladder worms is known as 'Measly pork'.

LIFE CYCLE IN MAN

- In the stomach of man, the bladder is dissolved by the enzymes. The proscolex evaginates and give rise scolex.
- It attaches to the intestinal wall and new proglottids arc formed in the neck region it develops into adult tape worm with in 2-3 months.

Pathogenicity:

- The disease caused by adult tapeworm is called **'taeniasis'.** Pain in stomach, anaemia, vomitings, indigestion and eosinophilia are the symptoms.
- The disease caused by bladderworms is cysticercosis.
- Cysticercus may occur when human being consumes contaminated food and water containing onchospheres. Due to reverse peristalsis gravid proglottids reach the stomach.
- This process is called autoinfection. Onchospheres reach voluntary muscles and transform into cysticercus larva. These larvae form cysts in heart, brain muscles.

Necrosis of brain takes place, epilepsy can occur - these disorders are called as cysticercosis.