



Tapeworms of dogs

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TAPEWORMS OF DOG

- ***Dipylidium caninum***
- ***Taenia hydatigena***
- ***Taenia multiceps***
- ***Echinococcus granulosus***
- ***Mesocestoides lineatus***
- ***Diphyllobothrium latum***



DIPYLIDIUM CANINUM

Common name

- Double pored dog tapeworm. It also occurs in man and cat.

Location

- Small intestine

Intermediate Host

- Dog flea: (*Ctenocephalides canis*), Dog lice: *Trichodectes canis* and *Heterodoxus spiniger*)

Intermediate/Larval stage

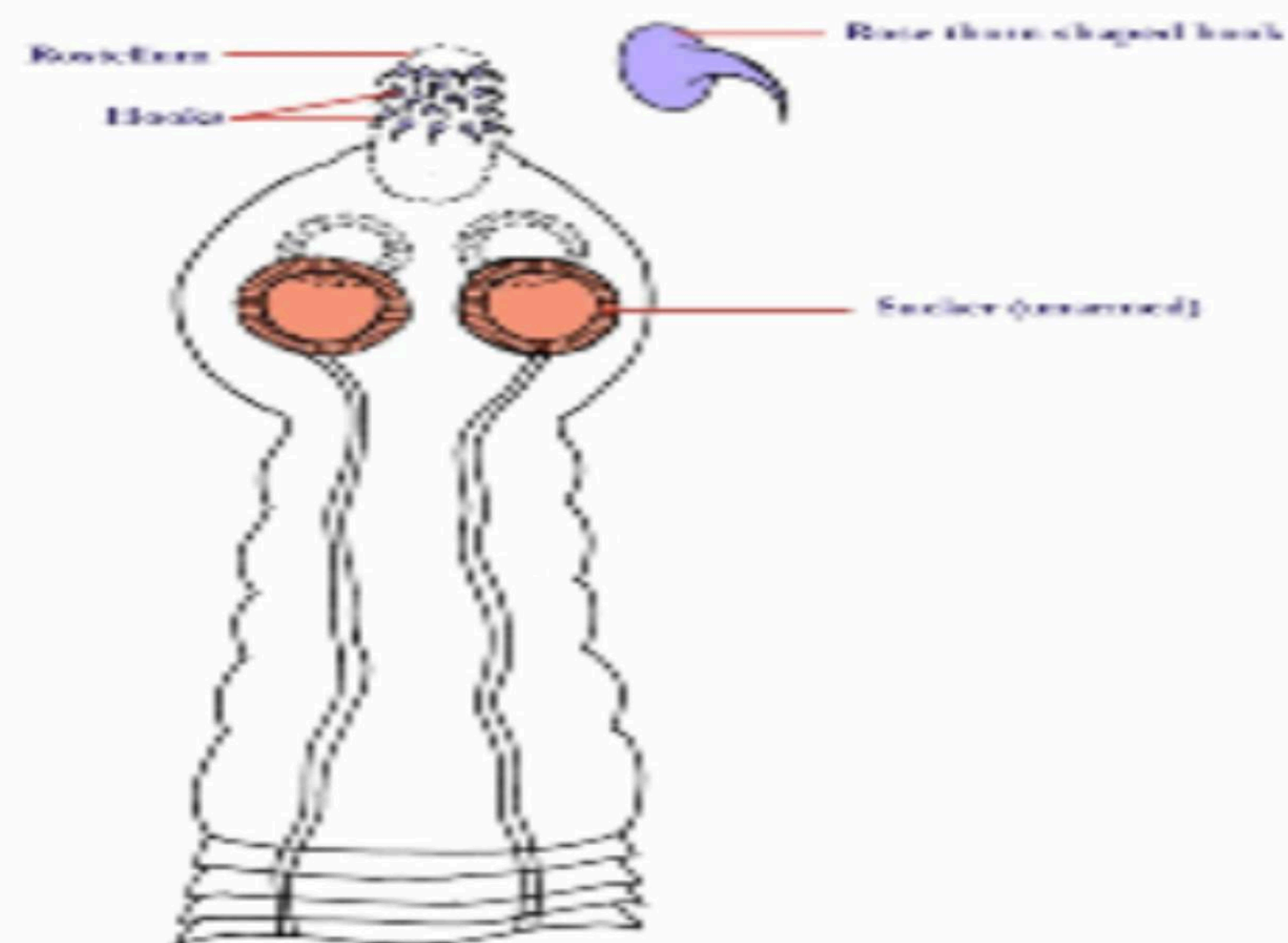
- Cysticercoid

Morphology

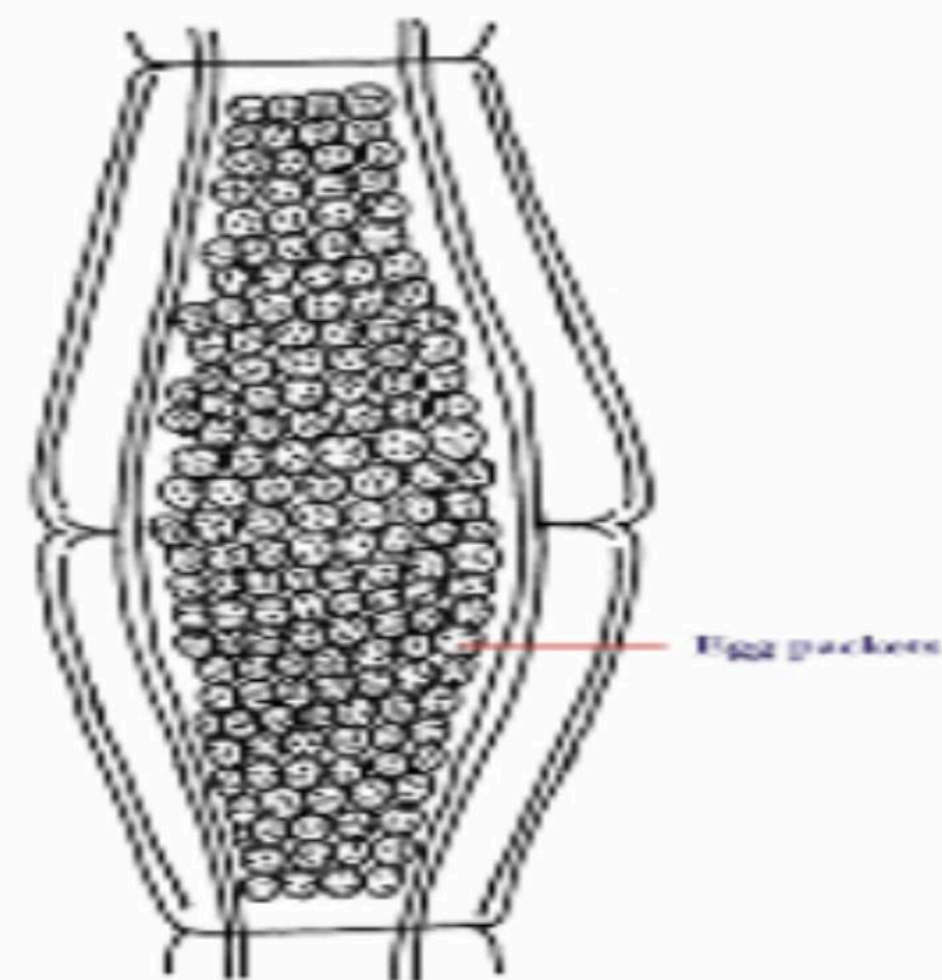
- Retractable rostellum armed with three or four rows of rose thorn shaped hooks.
- Each segment contains two sets of genital organ.
- Vitelline glands and ovary form a mass on either side resembling a bunch of *grapes*.
- In the gravid segment uterus are replaced by egg capsule or egg packets.
- Egg packets contain 30 eggs per packet. Gravid segments are elongate and oval in shape resembling cucumber seed shape.



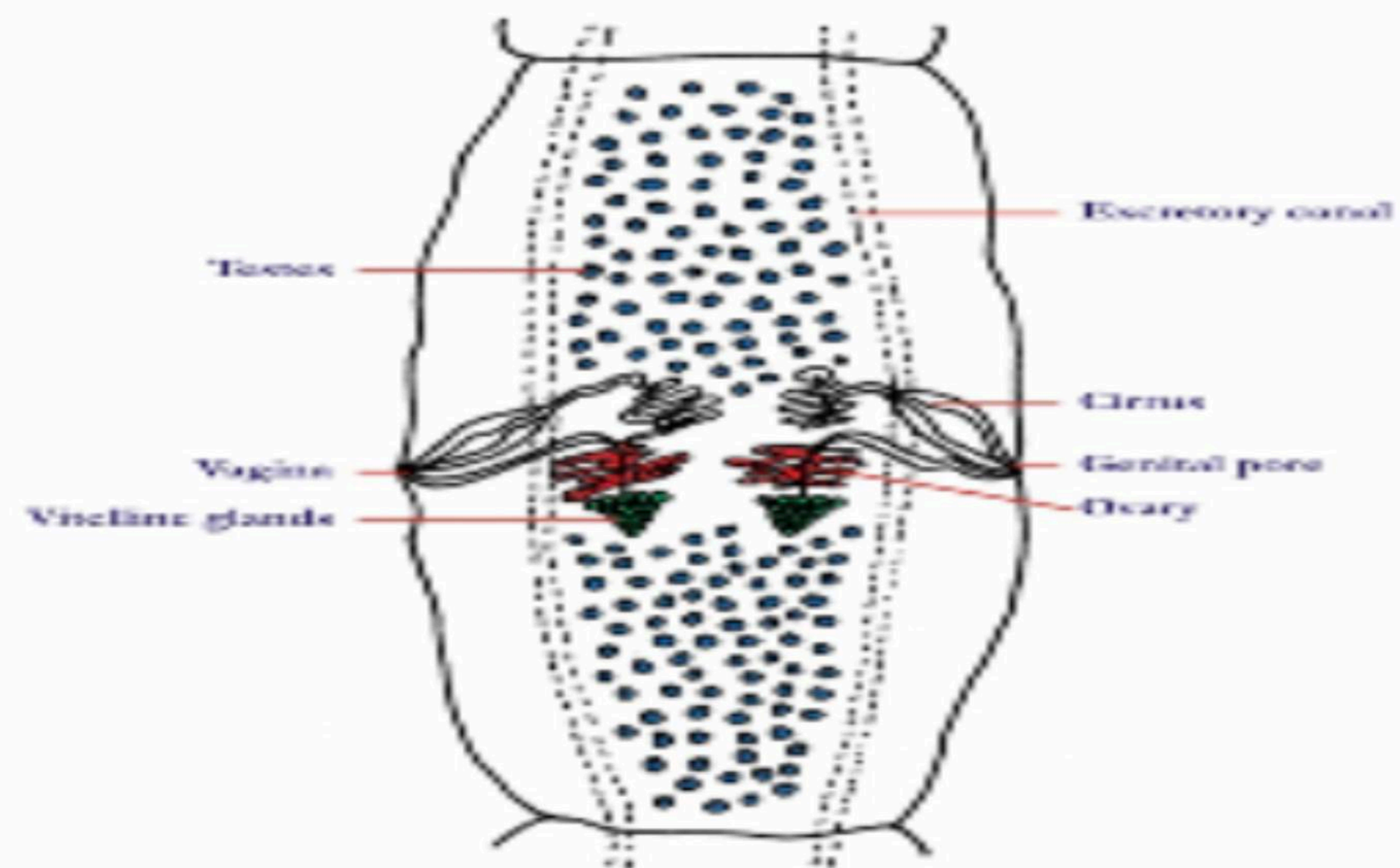
Dipylidium caninum (Scolex)



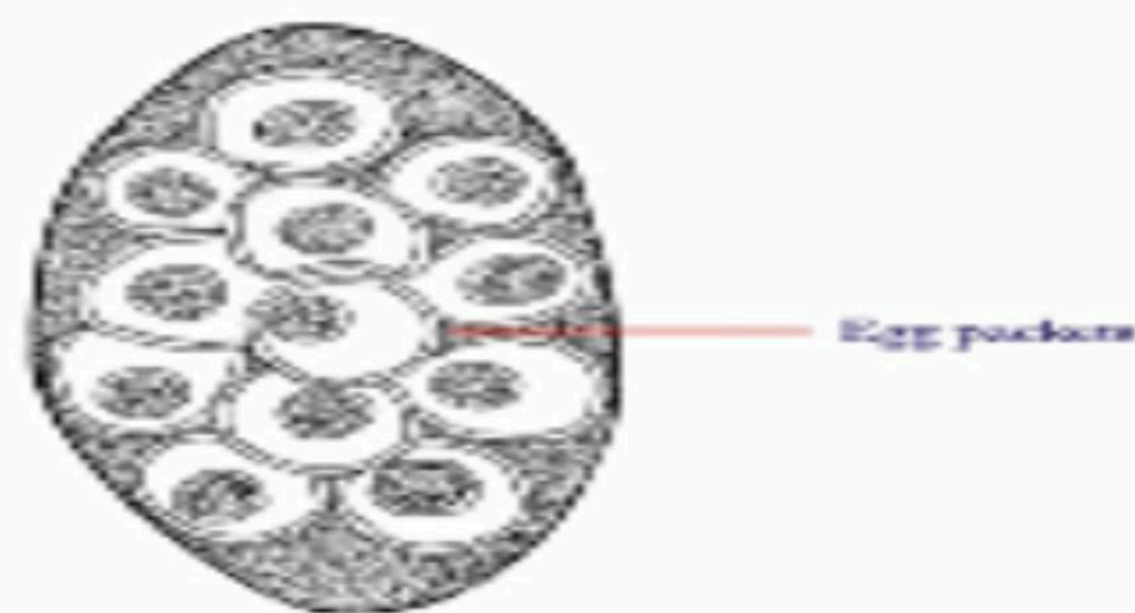
Dipylidium caninum (Gravid segment)

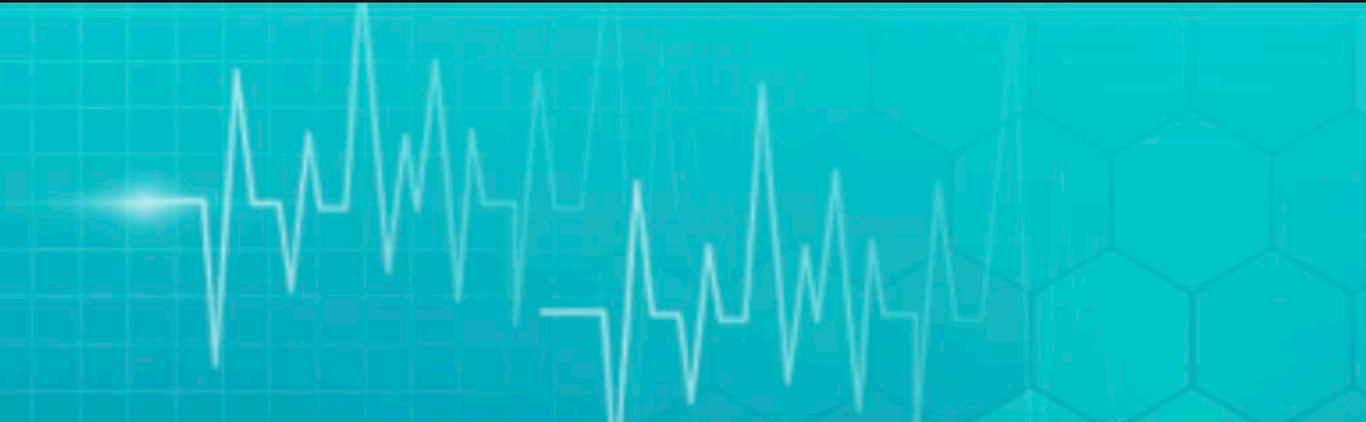


Dipylidium caninum (Mature segment)



Dipylidium caninum (Egg)





***DIPYLIDIUM CANINUM* LIFE CYCLE**

- ▶ The gravid segments are passed in the faeces or spontaneously leaving the host and crawling on the body surface of the host or on the floor, during this process eggs are released.
- ▶ **Eggs** are ingested by larval stage of fleas, but cysticercoid development occurs in the adult flea.
- ▶ D/H acquires infection by ingestion of infected adult flea.
- ▶ Man acquires infection by accidental ingestion of flea while playing with dog and cat.
- ▶ Egg ----> Larval flea ----> Adult flea ----> D/H



Life cycle

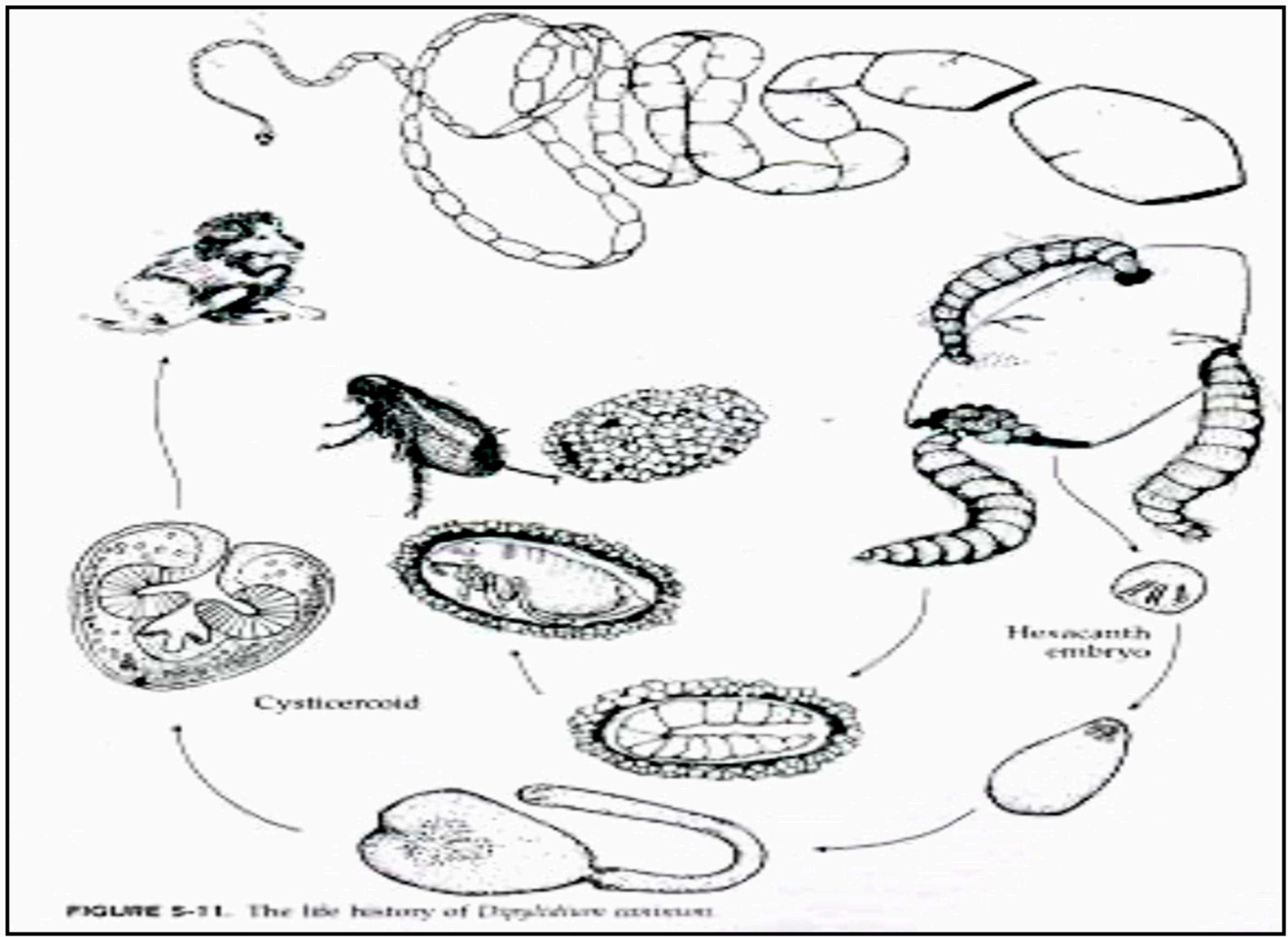


FIGURE 5-11. The life history of *Dyplosiphum ruscicum*.



PATHOGENESIS, DIAGNOSIS AND TREATMENT

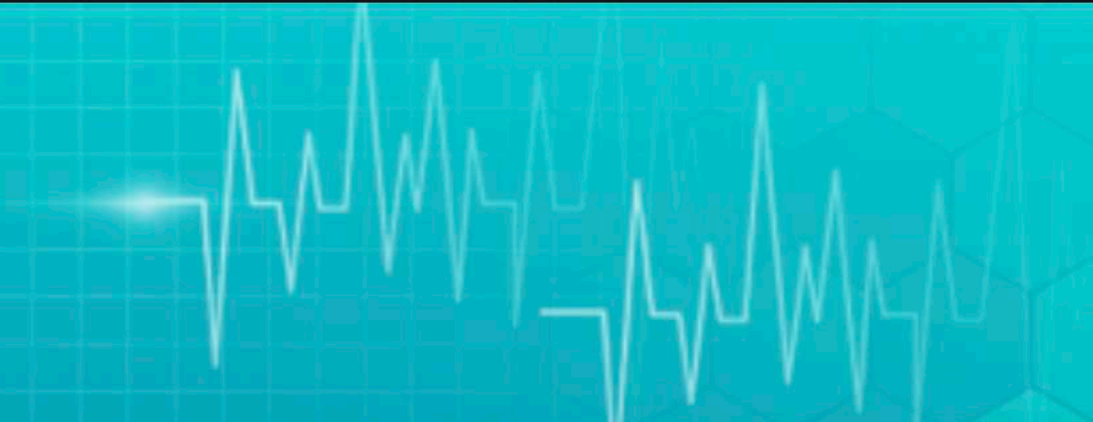
- ▶ It depends upon the age of host. Adult worms are not pathogenic to dog but heavy infection causes abdominal pain, unthriftiness, diarrhoea or constipation and rarely intestinal obstruction may occur.
- ▶ When gravid segment leave the intestines they cause severe irritation around the perianal area and due to constant irritation the dog will drag its anus over the ground. This condition is known as “anal pruritus”.

Diagnosis

- ▶ Demonstration of egg packets in faeces.
- ▶ Macroscopic examination of faeces for gravid segment.

Treatment

- ▶ Arecoline hydrobromide - 1 to 2 mg/Kg b wt.
- ▶ Praziquantel – 5 mg/Kg b wt.
- ▶ Niclosamide – 100 to 150 mg/Kg b wt.



TAENIA HYDATIGENA

Host

- ▶ Dog and wild carnivores

Location

- ▶ Small intestine

I/H

- ▶ Domestic and wild ruminants (sheep, cattle, sometimes pigs also act as I/H)

Larval stage

- ▶ *Cysticercus tenuicollis*

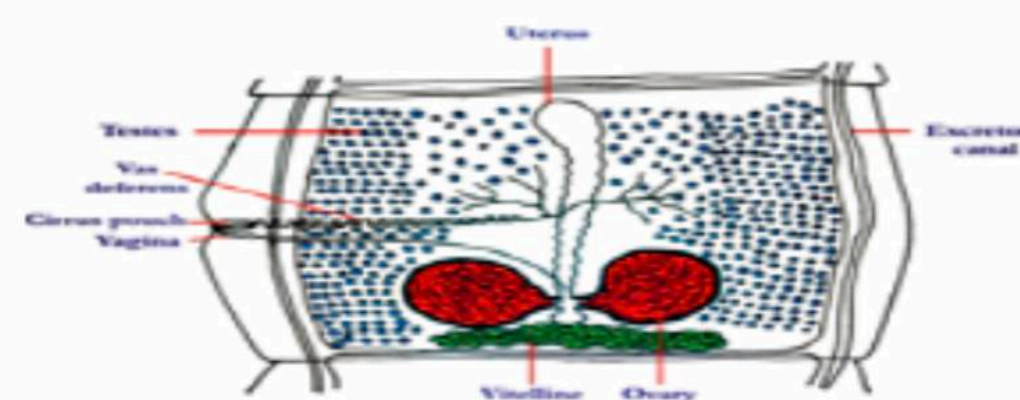
Morphology

- ▶ Rostellum armed with 2 rows of pen knife shaped hooks. [1st row – 26 and 2nd row – 46].
- ▶ Adults are upto 75 – 500 cm in length
- ▶ Each segment contains a single set of genital organ. Genital pore is irregularly alternate
- ▶ Ovary is situated at the posterior border of segment
- ▶ Uterus has median stem
- ▶ Testes are numerous
- ▶ Gravid segments are longer than wide. In gravid segment, uterus has 6 to 10 lateral branches. (Important character for identification of Taenid tapeworms).

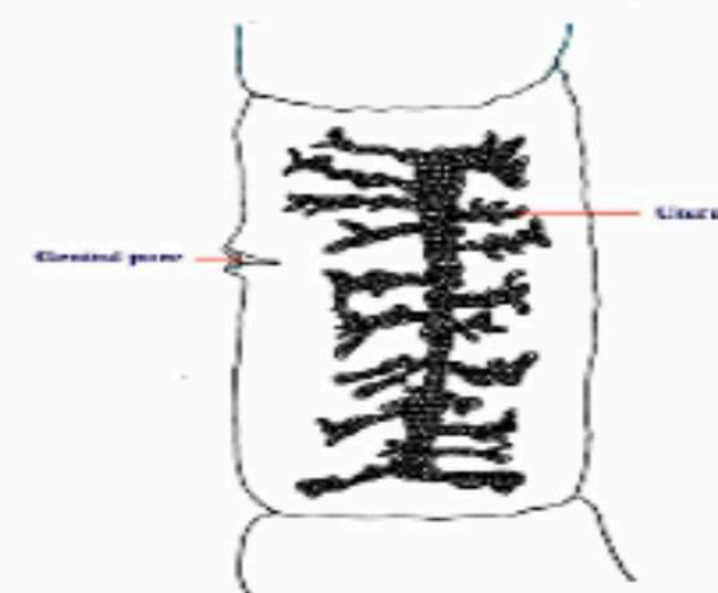
Egg

- ▶ Contain hexacanth embryo.
- ▶ They have 4 layers, made up of blocks giving radiate appearance or 'cart wheel' appearance.

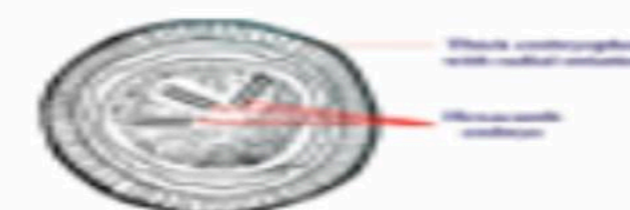
**Taenia spp.
(Mature segment)**



**Taenia spp.
(Gravid segment)**



**Taenia spp.
(Egg)**



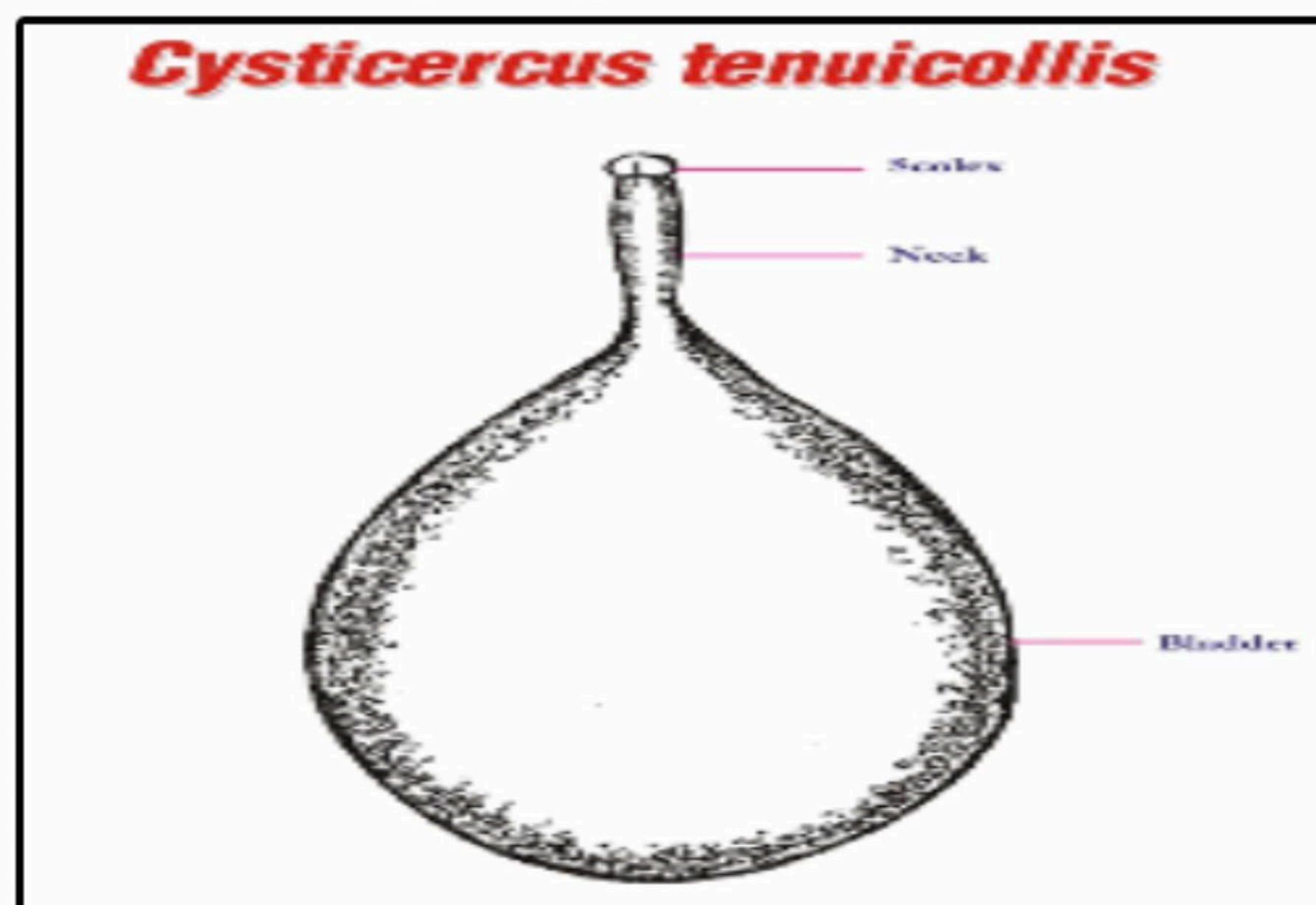


TAENIA HYDATIGENA LIFE CYCLE

- Eggs hatch in the small intestine and liberate the hexacanth embryo.
- Hexacanth embryo penetrate the intestine wall and reach liver via circulation.
- In the liver, hexacanth embryo break out of portal vessel and migrate in the parenchyma for about one month. The developing cysticercus migrate to the peritoneal cavity and attain maturity in about 53 days.
- The matured cysticercus attach to the omentum and mesenteric serosal surface of the intestinal wall. The metacestode/larval tapeworm/bladder worm stage is known as "*Cysticercus tenuicollis*".

Cysticercus tenuicollis

- 6 cm in length, consists of single invaginated scolex, attached to a fluid containing bladder by a long neck. Final host acquires infection by ingestion of *Cysticercus tenuicollis* infected meat or offals.
- Prepatent period is 51 days.





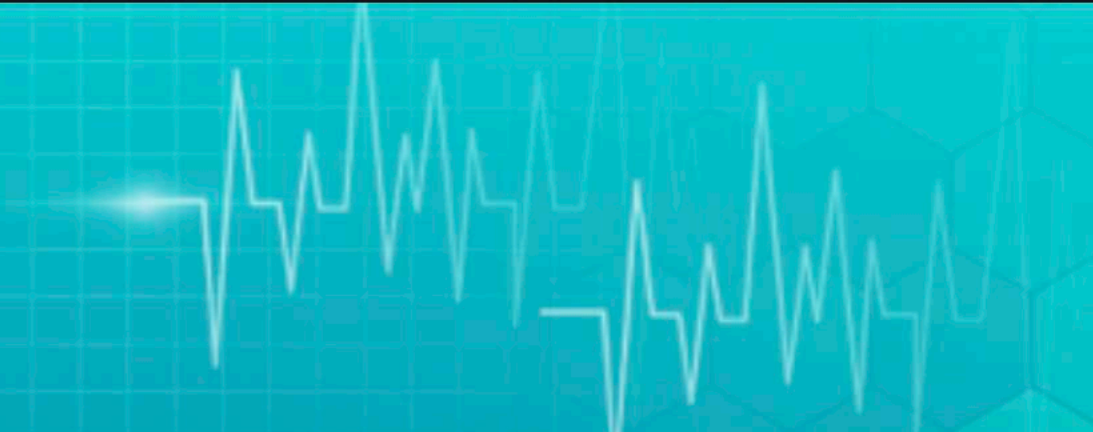
TAENIA HYDATIGENA PATHOGENESIS AND DIAGNOSIS

Pathogenesis

- ▶ The prevalence of infection is high in sheep but level of infection is low.
- ▶ The migration of *Cysticercus* in the liver cause haemorrhagic and fibrotic tract.
- ▶ Heavy infection in lambs with *C.tenuicollis* causes the condition traumatic hepatitis which is called as “hepatitis cysticercosa”. This must be differentiated from acute fasciolosis. Cysticercus in the peritoneal cavity do not cause any harmful effect.

Diagnosis

- ▶ PM examination of I/H.



TAENIA MULTICEPS

Host

- Dog and wild carnivores

Location

- Small intestine

Intermediate Host

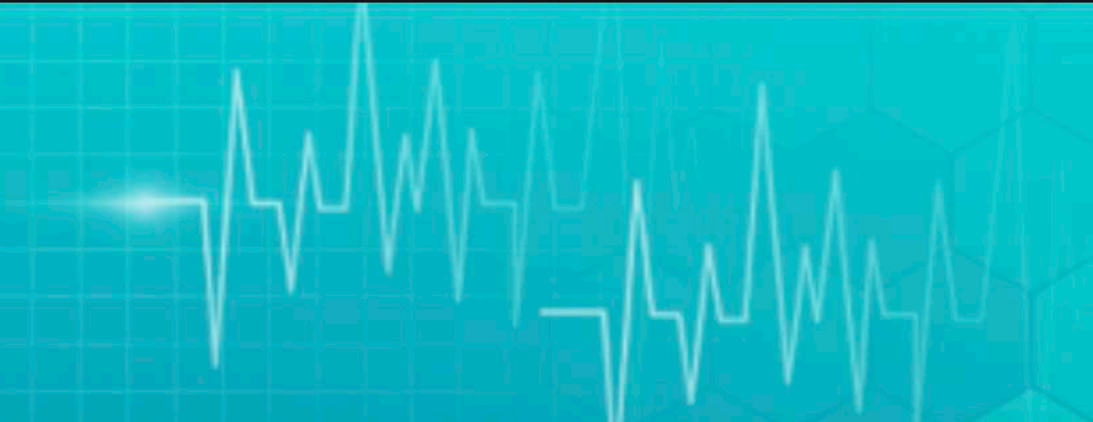
- Sheep and Goats

Larval stage

- *Coenurus cerebralis*

Morphology

- Adults are upto 40 to 100 cm in length. In the gravid segment, uterus has 14 to 20 lateral branches.
- Metacystode stage occurs in the brain and spinal cord, sometimes in goats, it may occur in s/c tissue.
- The species that occur in goats is considered as a separate spp. *Taenia gaigeri*.



TAENIA MULTICEPS LIFE CYCLE

- Eggs are ingested by I/H which hatch in the small intestine of the intermediate host. The oncosphere penetrates the intestine wall and reach the brain and spinal cord via circulation.
- Developing larval stages migrate in the brain and spinal cord leaving a tortuous yellowish grey to reddish streaks.
- Larval stage matures in 8 months. Coenurus is large, fluid containing bladder in which number of invaginated protoscolices are attached to the wall.
- Final host acquires infection by ingestion of infected meat.

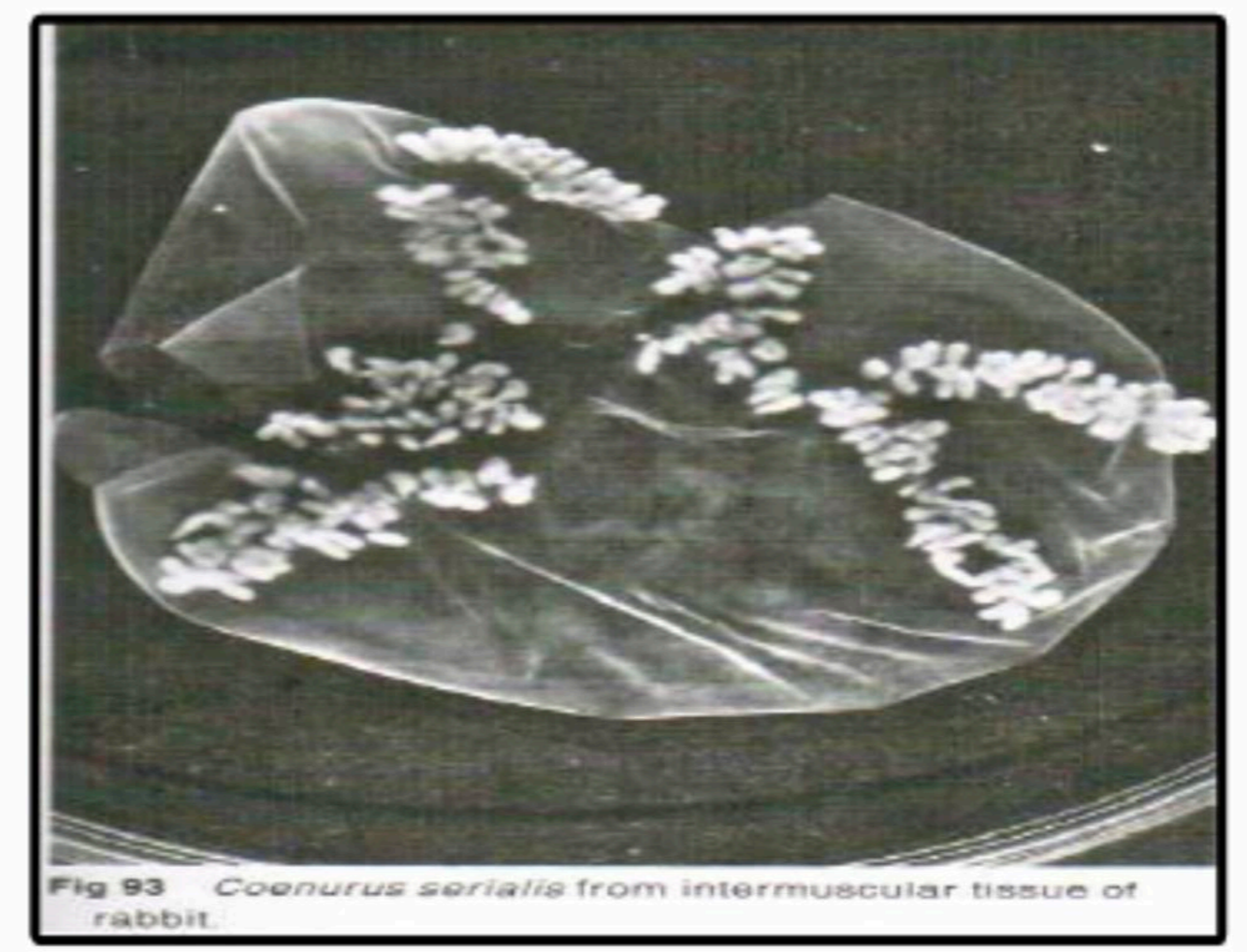
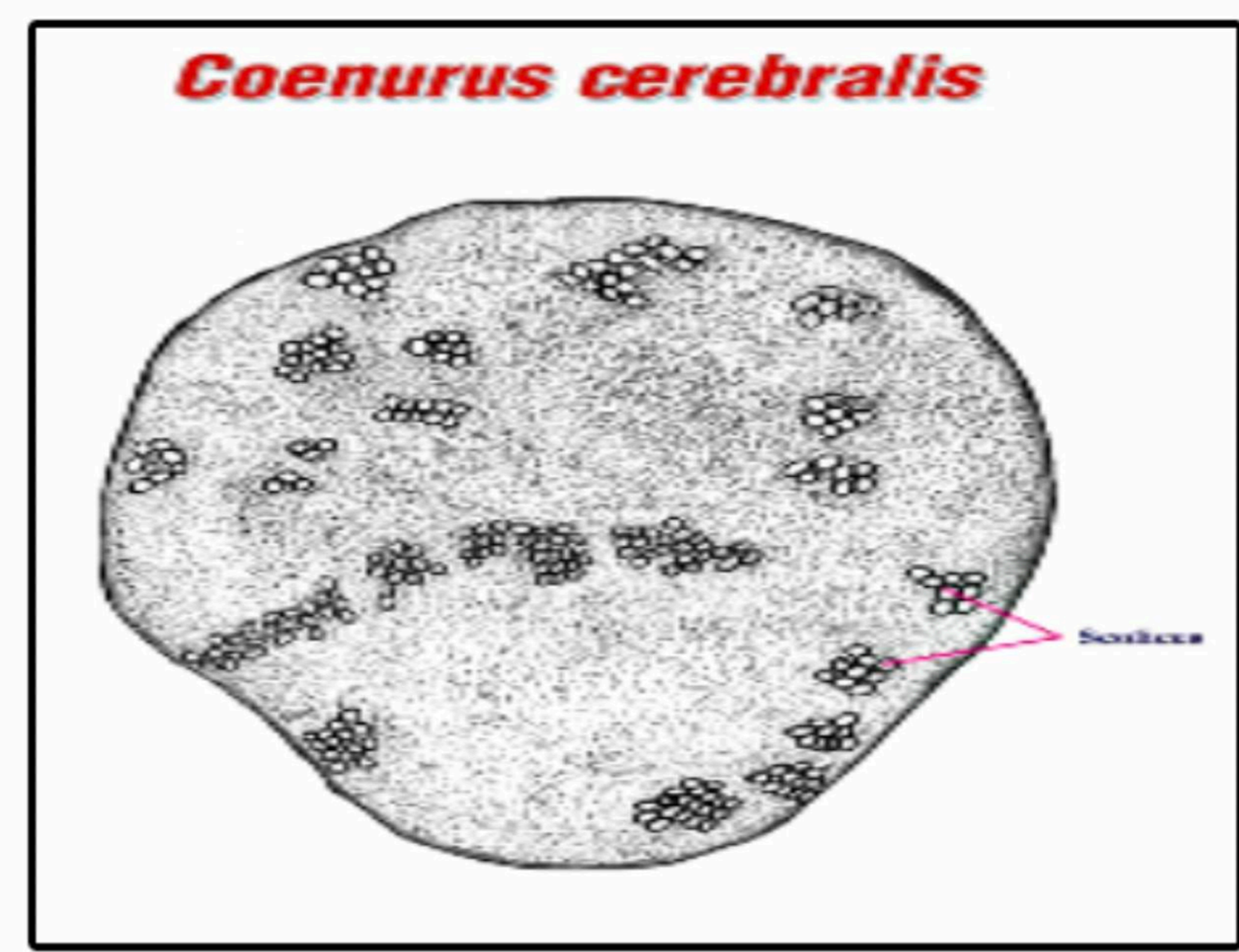
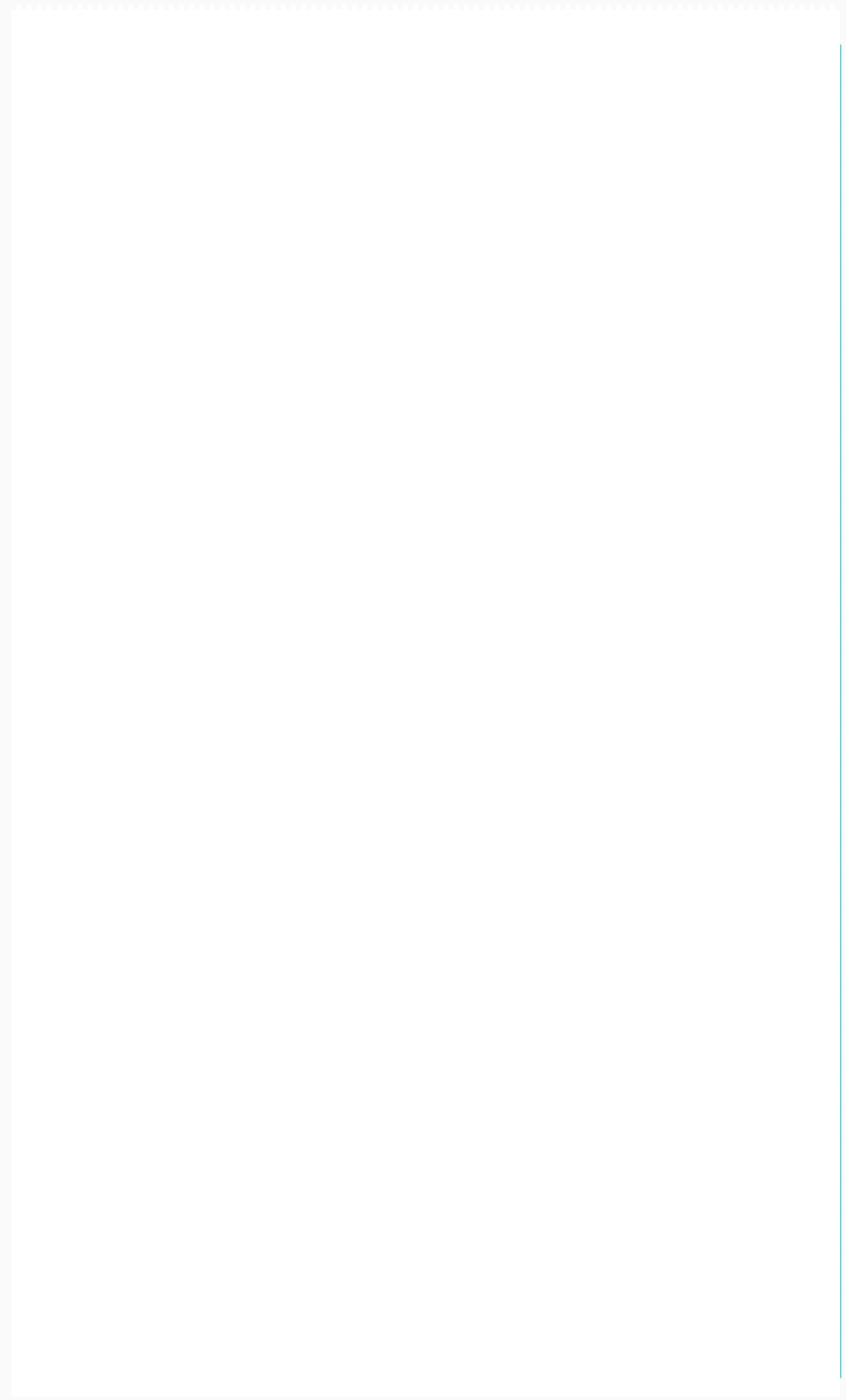
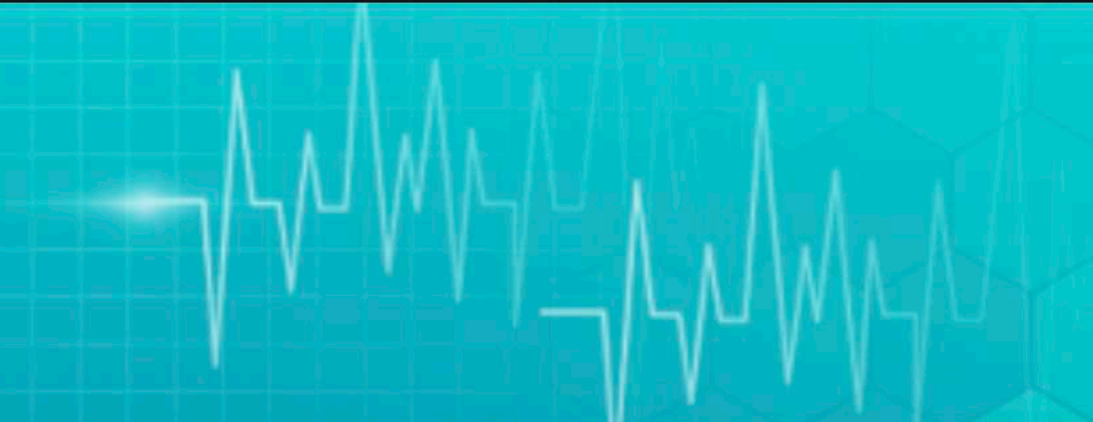
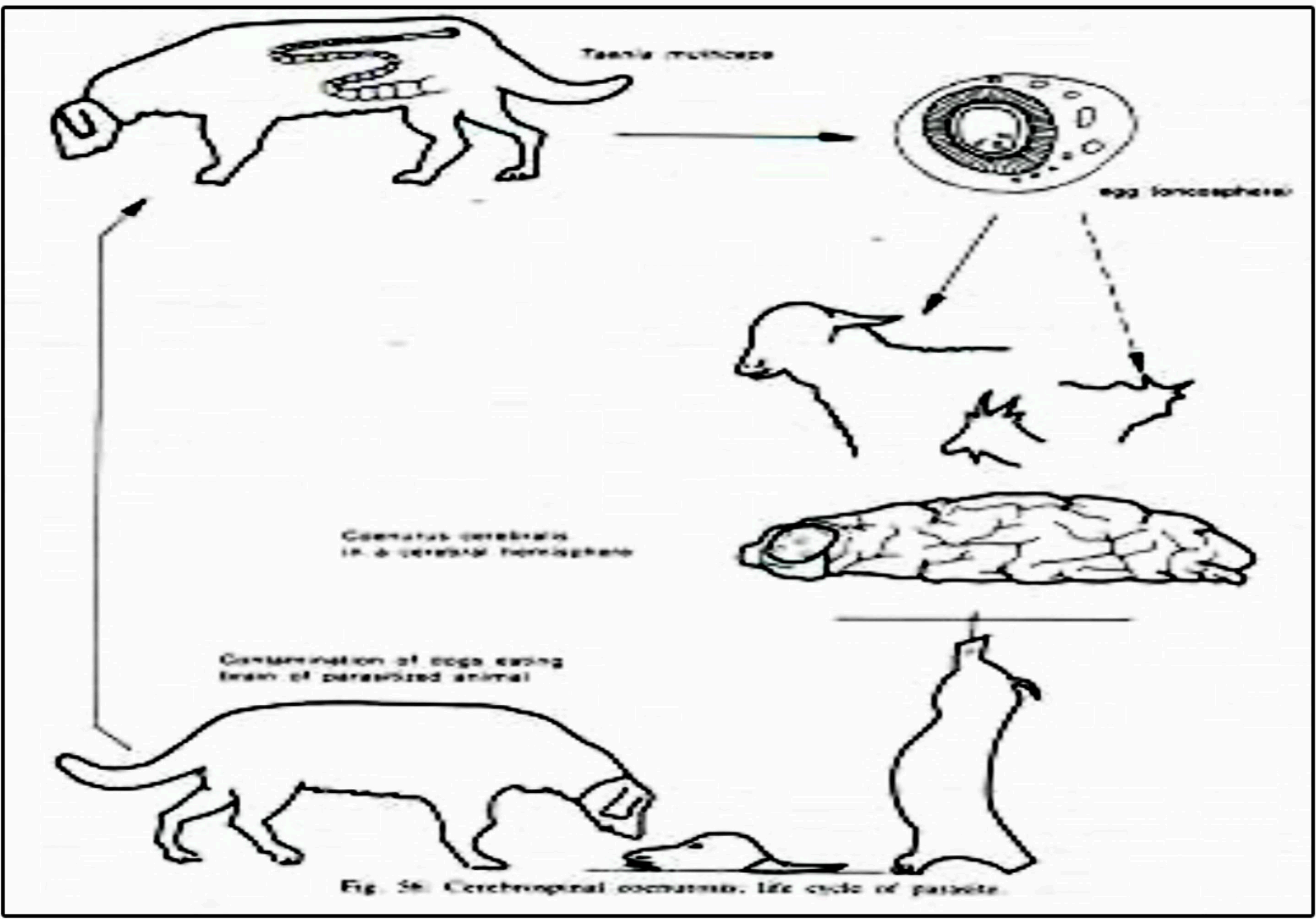


Fig 93 Coenurus serialis from intermuscular tissue of rabbit





Life cycle





TAENIA MULTICEPS PATHOGENESIS

- ▶ **Adult worms are not pathogenic in D/H (Dog) but the larval stages are highly pathogenic in I/H (Sheep). In lambs the migrating larval stage causes, “acute menigo encephalitis” which is chronic in nature and associated with one *Coenurus* or two *Coenuri*.**
- ▶ **Developing *Coenurus* produces high degree of brain tissue damage causing neurological condition which is referred to as Gid or Staggers or Sturdy. The neurological symptom depends upon the location of cyst in the CNS.**
- ▶ **If the cyst is located in one of the cerebral hemisphere the animal will hold its head to one side and turn in a circle towards the affected side. The eye on the opposite side may be blind.**



- **If the cyst is situated in the anterior part of the brain, the animal will hold its head against the chest and may walk with high steps or may walk in a straight line until it meets an obstacle and remain motionless.**
- **If the cyst is present in the ventricle, the movement will be backward.**
- **If the cyst is present in the cerebellum, the animal will be hyperaesthetic and may have incoordination, jerky or staggering gait or may remain motionless.**
- **If the cyst is present in the surface of the brain, the skull may be subjected to “pressure atrophy” and so perforation of the skull may occur.**



Thank you