



Tapeworms of poultry

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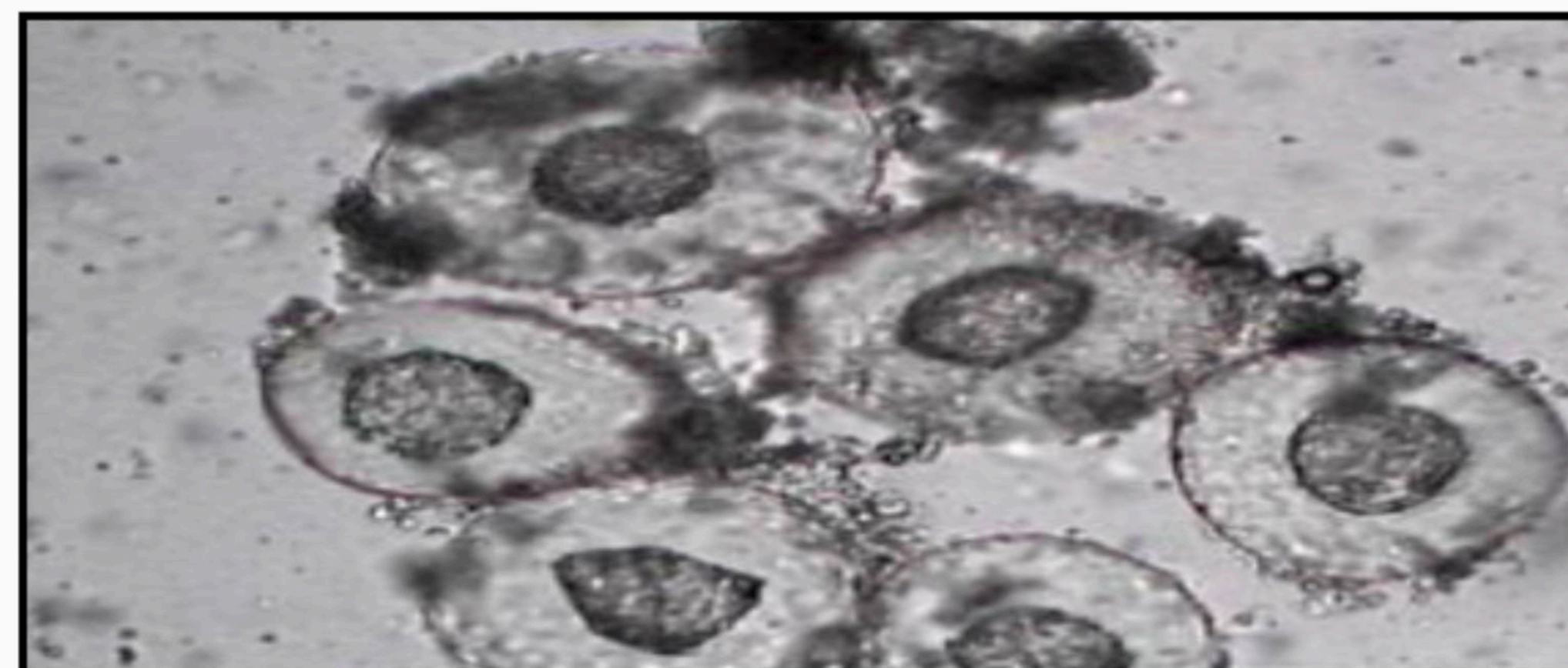
Chennai - 600 007.



TAPEWORMS OF POULTRY

There are 10 species of tapeworms affecting poultry.

- ▶ *Davainea proglottina*
- ▶ *Raillietina tetragona*
- ▶ *R.echinobothridia*
- ▶ *R.cesticillus*
- ▶ *Cotugnia digonopora*
- ▶ *Choanotaenia infundibulum*
- ▶ *Hymenolepis carioca*
- ▶ *H. cantaniana*
- ▶ *H. lanceolata*
- ▶ *Fimbriaria fasciolaris*



Poultry Tapeworm Eggs





Morphology

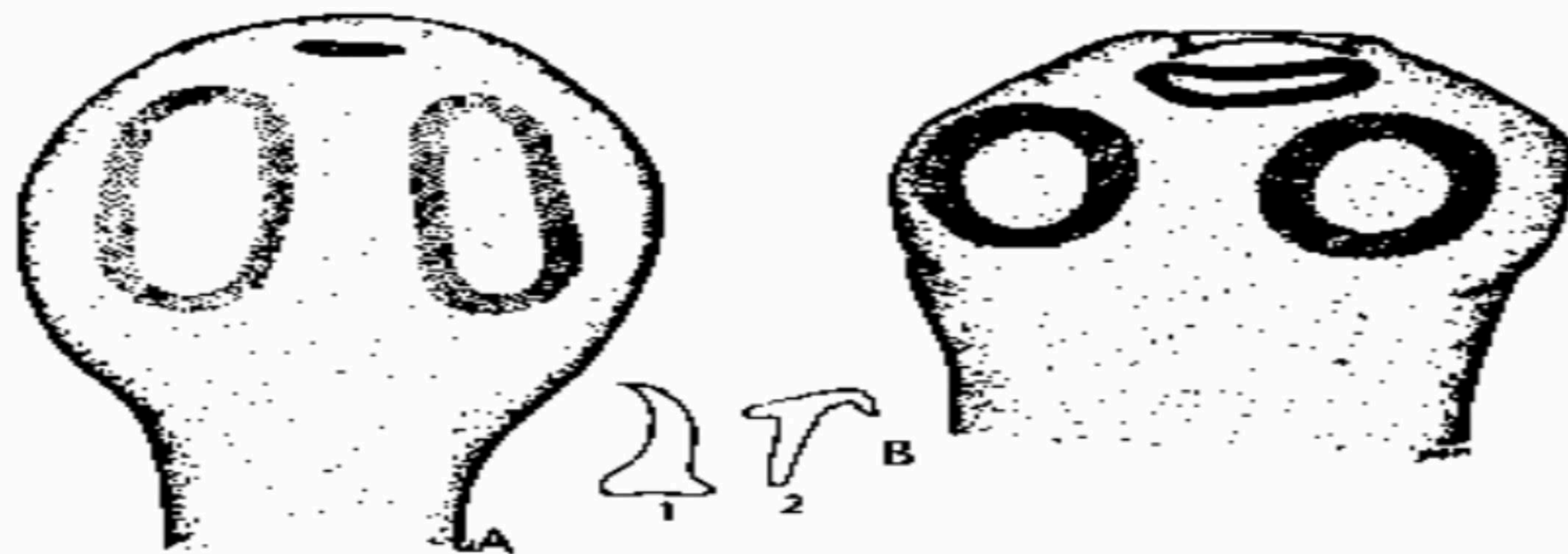


Fig. 642 Scolex of *Raillietina tetragona* (A) and scolex of *R. echinobothrida* (B); hook from sucker (1) and from rostellum (2) [3]

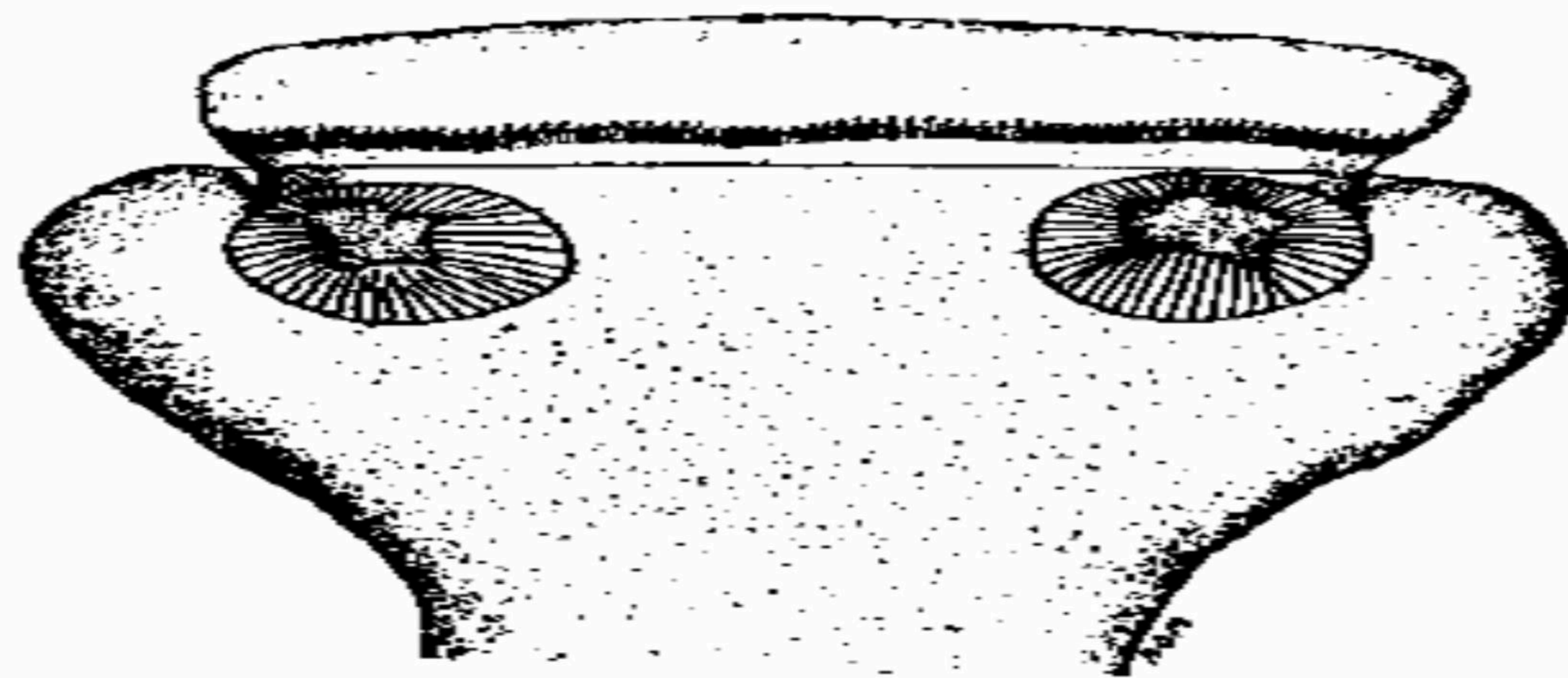


Fig. 643 Scolex of *Raillietina cesticeilus* [3]



DAVAINEA PROGLOTTINA

Common name

- ▶ Dwarf tapeworm of poultry

Host

- ▶ Chicken and pigeon

Location

- ▶ Duodenum

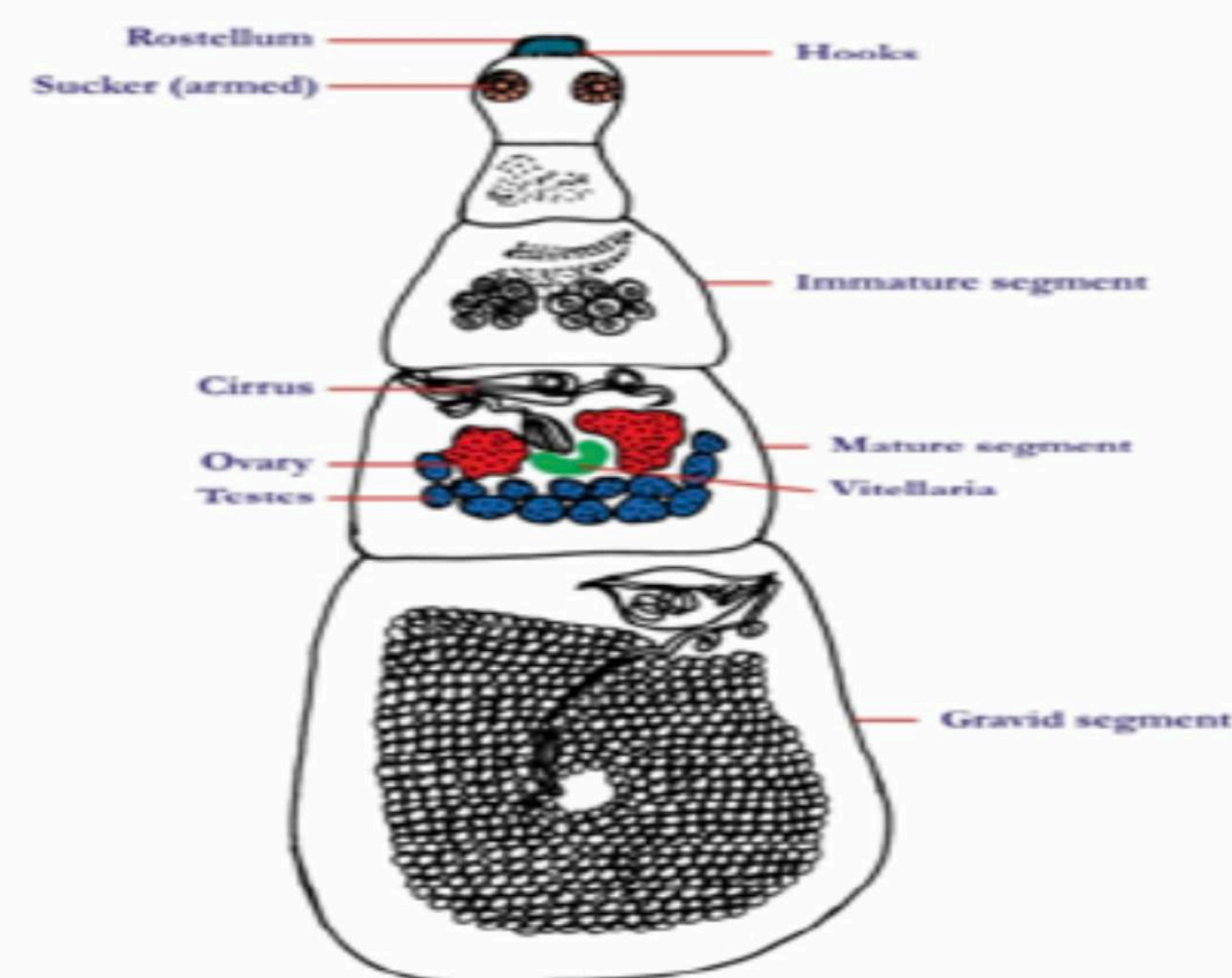
Intermediate host

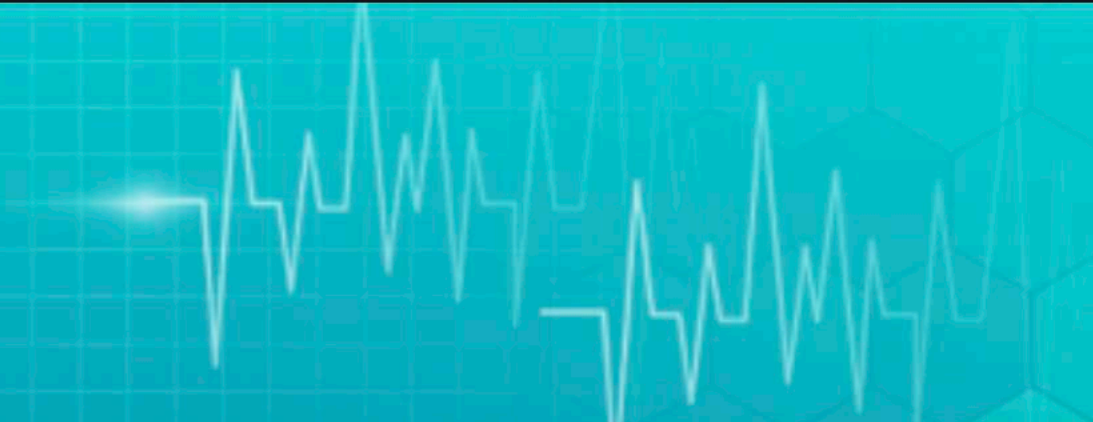
- ▶ Slug (snail without shell).
Limax and *Arion* species

Morphology

- ▶ The worms are microscopic in nature, about 0.5 to 3mm in length.
- ▶ They have only 4 to 9 segments.
- ▶ Rostellum is retractable and armed with hammer shaped hooks.
- ▶ Suckers also armed with hooks.
- ▶ Each segment has single set of genital organ.
- ▶ Genital pore opens regularly alternate.
- ▶ In the gravid segment, the uterus is replaced by egg capsule.
- ▶ Each egg capsule contains single egg.

Davainea proglottina





RAILLIETINA TETRAGONA

Common name

- ▶ Largest poultry tapeworm

Host

- ▶ Chicken, pigeon and guinea fowl

Location

- ▶ Posterior half of the small intestine

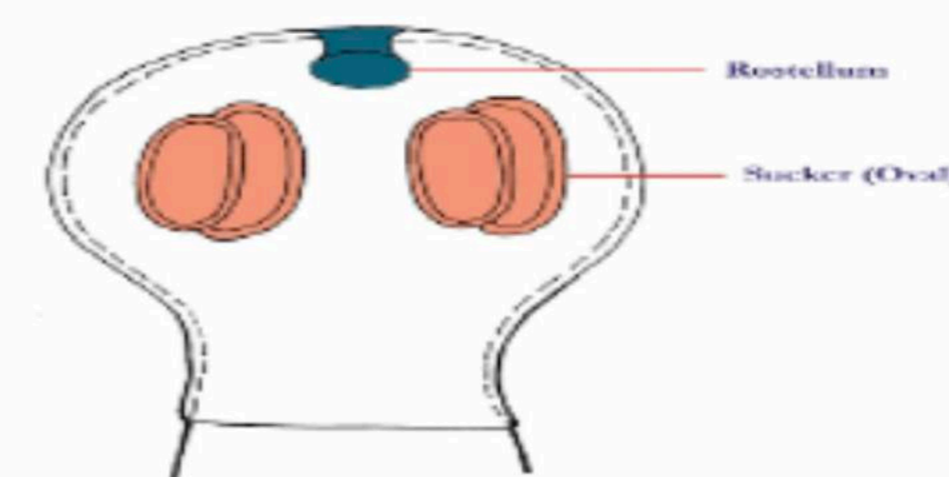
I/H

- ▶ Ants. (*Pheidole* spp. and *Tetramorium* spp.)

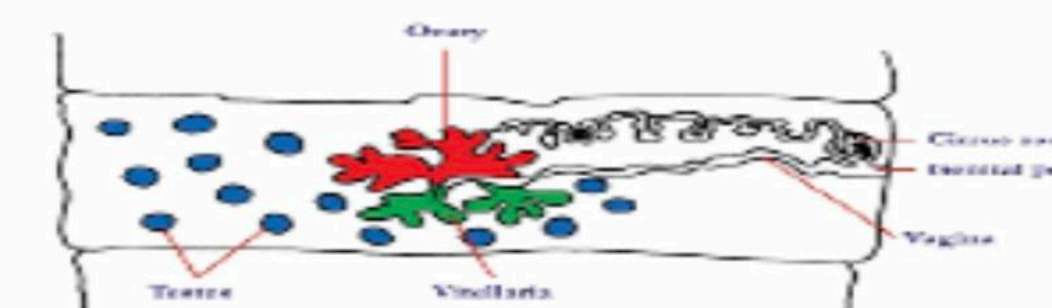
Morphology

- ▶ Adults are up to 25 cm in length. Scolex is smaller than the *R.echinobothridia*. Rostellum is armed with 1 to 2 rows of hooks. Suckers are oval in shape and armed with hooks.
- ▶ Each segment has single set of reproductive organs genital pore opens unilaterally.
- ▶ Each egg capsule contains 6 to 12 eggs.

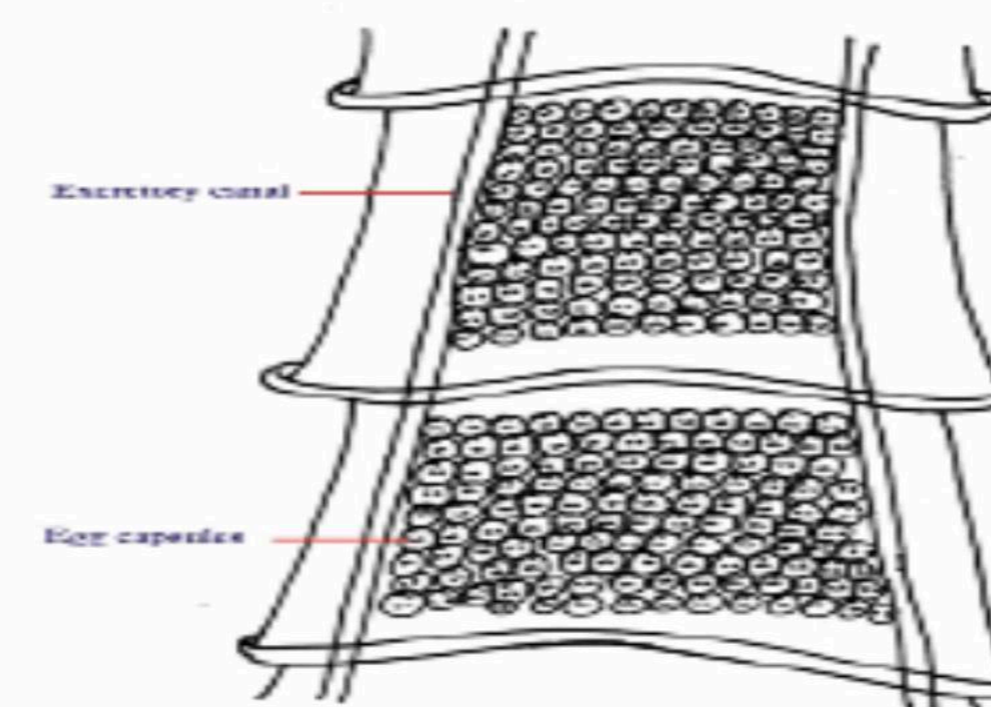
Raillietina tetragona
(Scolex)



Raillietina tetragona
(Mature segment)



Raillietina tetragona
(Gravid segment)



R. ECHINOBOTHRIDIA

Host

- ▶ Chicken and turkey

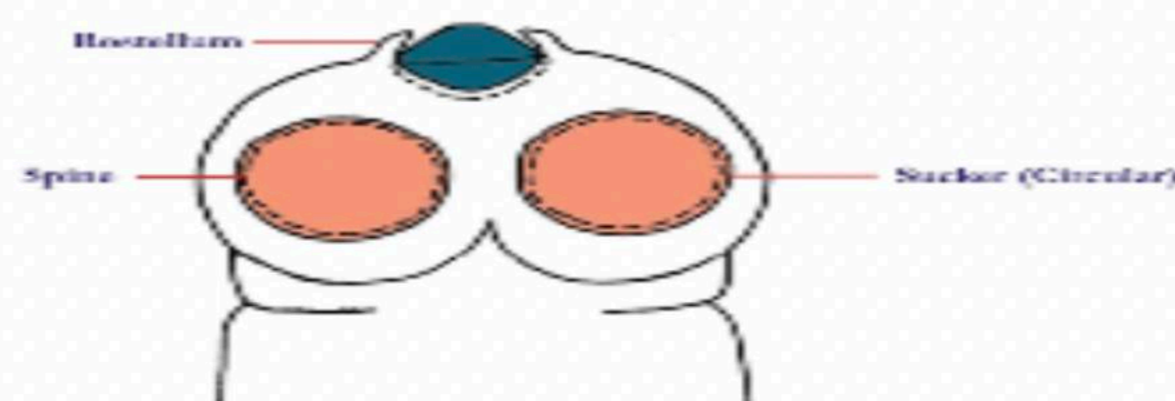
Location

- ▶ Small intestine

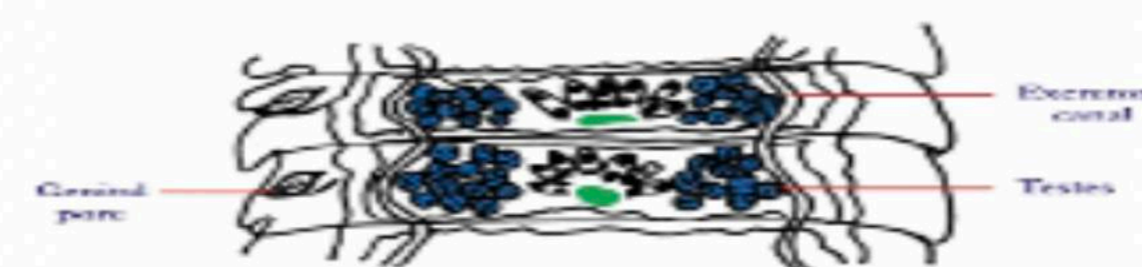
Intermediate Host

- ▶ Ants. (*Tetramorium* spp.)
- ▶ Causes Nodular taeniosis
- ▶ Scolex is large in size when compared to *R. tetragona*.
- ▶ Rostellum heavily armed with two rows of hooks. Suckers are circular in shape.
- ▶ Each segment has single set of genital organ. Genital pore irregularly alternate
- ▶ Gravid segments are separated by windows in progottids.
- ▶ Each egg capsule contains 6 to 12 eggs.

Raillietina echinobothrida
(Scolex)



Raillietina echinobothrida
(Mature segment)





R. CESTICILLUS

Host

- ▶ Chicken

Location

- ▶ Small intestine

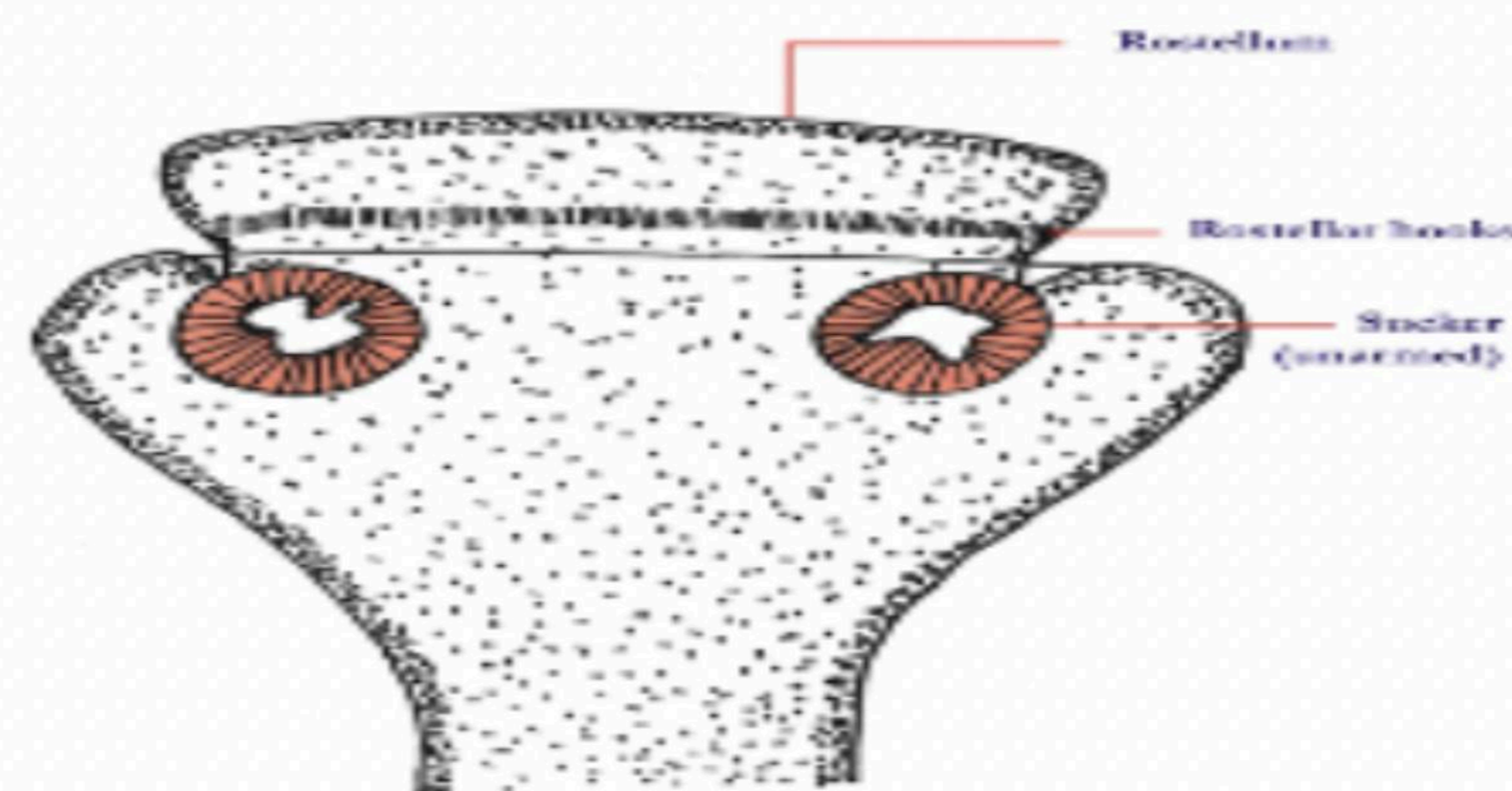
Intermediate Host

- ▶ Dung beetles

Morphology

- ▶ Usually 4 cm in length. Rarely it attains 15 cm. Scolex is very wide.
- ▶ Large rostellum armed with 400 to 500 small hooks.
- ▶ Suckers are indistinct and are not armed.
- ▶ Each segment contains single set of genital organs. Genital pore unilateral.
- ▶ Each egg capsule has single egg.

Raillietina cest icillus
(Scolex)



COTUGNIA DIGONOPORA

Common name

- ▶ Double pored poultry tapeworm

Host

- ▶ Chicken

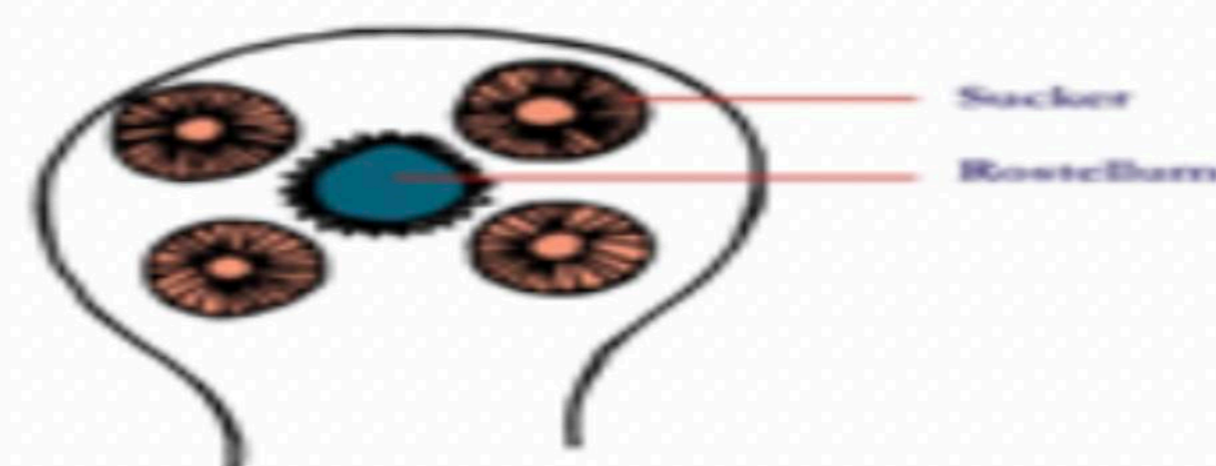
Location

- ▶ Small intestine
- ▶ Intermediate Host
- ▶ Ants. (*Pheidole* spp., *Monomorium floricola*)

Morphology

- ▶ Rostellum is armed with two rows of hooks.
- ▶ It has cup like muscular suckers.
- ▶ Each segment contains two sets of genital organs.
- ▶ Eggs capsule contain single egg.

Cotugnia spp. (Scolex)





AMOEBOTAENIA SPHENOIDES

Host

- ▶ Chicken

Location

- ▶ Small intestine

Intermediate host

- ▶ Earthworm

Morphology

- ▶ Small worm, elongate triangular shape. 4 mm long and 1 mm wide.
- ▶ Rostellum bears 12-14 hooks.
- ▶ There are about 20 proglottids.
- ▶ Testes 12 or more in number and lie near the posterior border of the segment.
- ▶ Uterus is sac-like and slightly lobed.

Amoebotaenia sphenoides





HYMENOLEPIS CARIOCA

Host

- ▶ Chicken

Location

- ▶ Small intestine

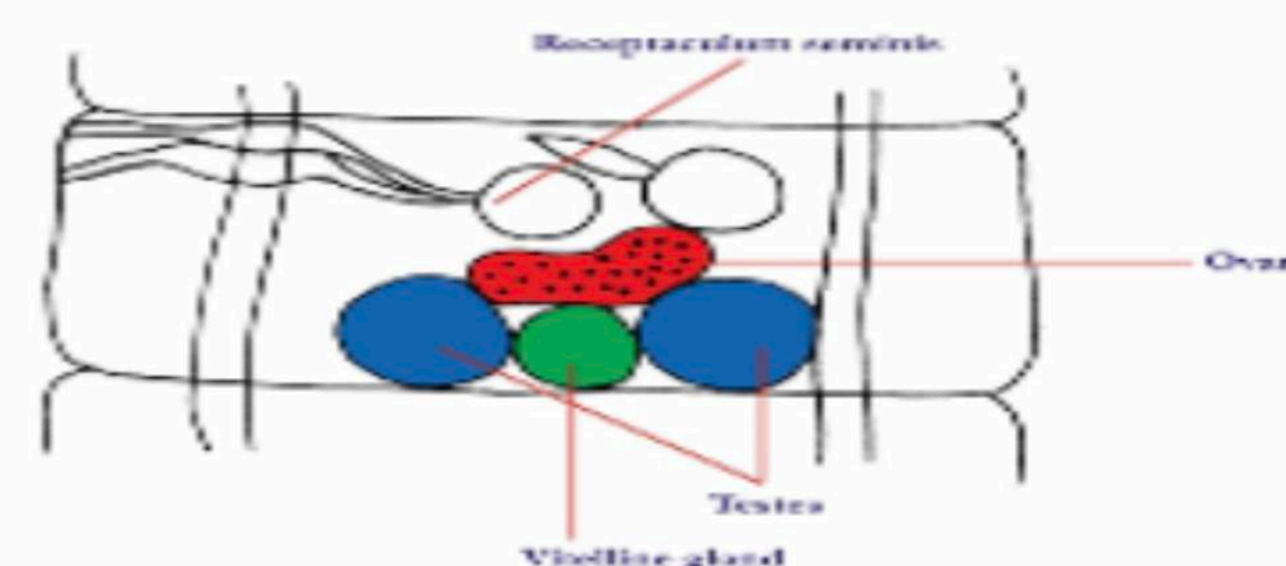
Intermediate Host

- ▶ Dung beetles, flour beetles and *Stomoxys calcitrans*

Morphology

- ▶ Rostellum armed with spanner shaped hooks.
- ▶ Segments are very small. Each contains single set of reproductive organ. Genital pore is unilateral.
- ▶ Each segments contains three testes. One testes on poral side while the other two on aporal side.
- ▶ Eggs are covered with 3 layers and is rugby ball shaped.

Hymenolepis spp. (Mature segment)





H. LANCEOLATA

Host

- ▶ **Ducks**

Location

- ▶ **Small intestine**

Intermediate Host

- ▶ **Aquatic crustaceans**

Morphology

- ▶ **Similar to *H. carioca***



LIFE CYCLE OF POULTRY TAPEWORMS

- ▶ **Gravid segments are passed in the droppings of birds and are crawling on the surface of droppings, during this process, eggs are released. Egg contains hexacanth embryo.**
- ▶ **Eggs are ingested by intermediate hosts where they hatch and develop into cysticercoid in about 3 weeks time.**
- ▶ **Infection of poultry is by ingestion of infected I/H.**



TAPEWORMS OF POULTRY PREPATENT PERIOD

- | | |
|-----------------------------|---------|
| ▶ <i>D. proglottina</i> | 14 days |
| ▶ <i>R. tetragona</i> | 21 days |
| ▶ <i>R. echinobothridia</i> | 20 days |
| ▶ <i>R. cesticillus</i> | 13 days |
| ▶ <i>C. infundibulum</i> | 15 days |
| ▶ <i>C. digonopora</i> | 20 days |
| ▶ <i>Hymenolepis spp.</i> | 20 days |



TAPEWORMS OF POULTRY EPIDEMIOLOGY AND PATHOGENESIS

Epidemiology

- ▶ Tapeworm infections are common in free range birds than the intensive system of rearing. Free range birds have more access to eat I/H than birds reared under confined environment.
- ▶ Sometimes heavy tapeworm infection occurs in intensive system of management as this system provides conducive environment for breeding of I/H like flies, beetles and ants.

Pathogenesis

- ▶ *D. proglottina* is most pathogenic tapeworm. The worms are penetrate deeply between the villi causes necrosis and haemorrhagic enteritis. Sometimes death may occur due to intestinal obstruction.
- ▶ Chronic infection characterized by reduced growth rate, emaciation and weakness.
- ▶ *R. echinobothridia* is most pathogenic causes nodules formation in the intestine is called as “**Nodular taeniasis**” in poultry. Hyperplastic enteritis may also occur.
- ▶ All other tapeworms are less pathogenic but in heavy infection results in reduced egg production and general weakness.



TAPEWORMS OF POULTRY DIAGNOSIS, TREATMENT AND CONTROL

Diagnosis

- ▶ Macroscopic or gross examination of dropping for the presence of gravid segment.
- ▶ PM examination of representative bird from affected flock.

Treatment

- ▶ Niclosamide - 75 mg/Kg b wt.
- ▶ Arecoline hydrobromide (Arica nut).
- ▶ Praziquantel - 15 mg/Kg b wt.
- ▶ Closantel - 7.5 mg/Kg b wt.

Control

- ▶ Elimination of I/H is very important by
 - Hygienic maintenance of poultry shed.
 - Applying chemical compounds like BHC and HCH.
 - Insect growth regulators like larvadex may be used against *Musca spp.*
 - Laris (Cyromazine) - Chitin inhibitor may be used against I/H develop.
- ▶ Periodical deworming of birds.



Thank you