Topic
On
Family: Paramphistomatidae

Robin Singh
Assistant Professor
Veterinary Parasitology

Family: Paramphistomatidae

- *Paramphistomum cervi*
- *Cotylophoron cotylophorum*
- *Gastrothylax crumenifer*
- *Fischoederius elongatus*
- *Fischoederius cobboldi*
- *Explanatum explanatum (Gigantocotyle explanatum)*
- *Gastrodiscus secundus*
- *Gastrodiscoides hominis*
- *Pseudodiscus collinsi*

Paramphistomum cervi

Host - Cattle, buffalo, sheep and goat

Location - Adults in Rumen and reticulum, Immature flukes in Duodenum

Intermediate host -Snail (*Indoplanorbis exustus*)

Morphology:

- Body is thick, conical,elongate with blunt ends.
- Ventral sucker is situated at the posterior end, large and strongly developed.
- Intestinal caeca coiled (3-4 coils) and terminate at about the level of middle of ventral sucker.
- Testes lobed and tandem.
- Genital sinus enclosing genital opening. The cuticle is spineless. The vitelline glands are lateral and are strongly developed.

Cotylophoron cotylophorum

- Host - Cattle, buffalo, sheep and goat
- Location- Rumen
- Intermediate host - *Indoplanorbis exustus*

Morphology

- Small to medium sized.
- Body is pear shaped.
- In fresh specimens, the dorsal surface is convex with slightly concave ventral surface.
- Ventral sucker sub-terminal.
- Intestinal caeca are simple.
- Testes are tandem in position.
- Genital sucker is distinct and surrounds the genital pore.
- Numerous vitelline glands fill the lateral aspect of the fluke.

Gastrothylax crumenifer

- Host - Cattle, buffalo, sheep and goats
- Location- Rumen
- Intermediate host - *Gyraulus convexiusculus*
- **MORPHOLOGY**
- In fresh specimen, the flukes appear fleshy and red in colour.
- Ventral pouch appears dark red in colour.
- Ventral sucker is terminal.
- Intestinal caeca are straight and terminate in front of the ovary.
- Ventral pouch is large extending up to the ventral sucker and opens behind the oral sucker.
- Testes are placed side by side; the ovary is placed behind testes.
- At about middle of the body, the uterus crosses from one side to the other (right to left).

Fischoederius elongatus

- Host -Cattle, buffalo, sheep and goat
- Location -Rumen
- Intermediate host -*Lymnaea luteola*

Morphology

- Ventral pouch is comparatively smaller.
- Ventral sucker is terminal.
- Uterus lies in the middle through out its course and does not cross from one side to the other.
- Testes lie dorso-ventrally.
- Intestinal caeca extend up to the posterior end of the body.

Fischoederius cobboldi

- Host -Cattle, buffalo, sheep and goat
- Location - Rumen
- Intermediate host - *Lymnaea luteola*

Morphology

- Ventral pouch is comparatively smaller.
- Ventral sucker is terminal.
- Uterus lies in the middle through out its course and does not cross from one side to the other.
- Testes lie dorso-ventrally.
- Intestinal caeca extend up to the posterior end of the body.

Explanatum explanatum (Gigantocotyle explanatum)

- Host -Cattle, buffalo, sheep and goat
- Location - Bile duct and liver
- Intermediate host - *Indoplanorbis exustus*

Morphology

- Fleshy body with very large sized ventral sucker at posterior end.
- Testes are lobed and placed diagonally.
- Ovary is behind the testes just above the ventral sucker.
- Intestinal caeca are unbranched.

Gastrodiscus secundus

- Host - Equines and elephants
- Location - Caecum and colon
- Intermediate host - *Indoplanorbis exustus*

Morphology

- Body is divided into two portions - an anterior globoid or cone shaped and a posterior papillated discoid or saucer shaped.
- Oral / oesophageal pouches present.
- Ventral sucker is small and placed sub terminally.
- Testes are branched and diagonally placed.

Gastrodiscoides hominis

- Host- Man and pig (natural host)
- Location- Caecum, colon
- Intermediate host -Planorbid snail

Morphology

- Pyriform in outline and bright reddish in colour.
- Body is divided into two parts, anterior being smaller than posterior and without papillae.
- Oral pouches present.
- Ventral sucker has prominent deep cleft.

Pseudodiscus collinsi

- Host - Equines
- Location - Caecum, colon
- Intermediate host - *Indoplanorbis exustus*

Morphology

- Body tapering anteriorly and rounded posteriorly.
- Oral pouches present.
- Intestinal caeca wavy.
- Testes deeply lobed placed side by side.
- Ovary single, posterior to testes but lateral in position

Life cycle of *paramphistomum spp.*

- Paramphistomum have an indirect life cycle with fresh water snail as the intermediate hosts.
- Adult flukes in the stomach lay eggs that are shed outside with the feces.
- About 2 weeks later **miracidia** hatch out of the eggs. They swim in the water until they find a suitable snail.
- They penetrate into the snail and continue development to **sporocysts** and **rediae**, which can multiply asexually and produce daughter rediae.
- Each redia produces several **cercariae**, the next developmental stage. Out of a single miracidium up to 30 cercariae can develop.

- The free life of the cercariae is short, varying from several minutes to a few hours.
- They encyst on vegetation and become **metacercariae**, which are infective stage for final hosts.
- The metacercariae may remain viable for at least 29 days or 5-6 months under laboratory conditions.

Development in the final host

- Livestock ingests metacercariae while grazing in contaminated pastures.
- Once in the small intestine the young flukes leave the cysts, attach to the intestinal mucosa and continue development.
- They feed on the tissues of the gut wall.
- Later on they detach from the gut's wall and migrate to the rumen, where they complete development to adult flukes and start producing eggs.
- After ingestion by the final host it takes 2 to 4 months for metacercariae to complete development and start laying eggs **(pre-patent period)**.

Pathogenesis

- The immature flukes are highly responsible for causing the pathogenesis by their presence in the small intestine.
- The immature flukes attach very strongly and get embedded in the mucosa of the intestine and they are commonly called as plug feeder.
- Adult flukes are non pathogenic.
- Metacercariae swallowed and young flukes reach the intestine, later migrate to rumen and reticulum via duodenum and abomasum, before becoming mature in 6 weeks to 4 months.
- The immature flukes attach to the intestinal mucosa causing irritation resulting in enteritis

Clinical signs

- The clinical condition caused by immature parasite is known as immature amphistomiasis.
- The immature amphistomes is called in hindi as “gillor”, “pitto” or “bissi rog”.

Symptoms

- ✓ oedema
- ✓ Anorexia
- ✓ Diarrhoea (watery scour) with blood traces,
- ✓ Affected animals feel thirsty and drink water frequently, the animal also shows in bottle jaw which is characteristic of flukes infection.
- ✓ Anaemia – the visible mucous membrane become pale.
- ✓ Dullness, weight loss

Lesion

Gross lesion

- Ascites
- Hydropericardium
- Petechial haemorrhages
- Hypertrophy

Microscopic lesion

- Immature flukes may be seen in the deeper layer of the mucosa and in the wall of the gut.

Diagnosis

- By clinical signs.
- By faecal examination
- Presence of snail Intermediate host
- Immature flukes in diahorrheal feaces
- Postmortem examination

Treatment and control

- ✓ Oxyclozanide – 15 – 20 mg/kg BW orally 3-5 days.
- ✓ Hexachlorophene- 20 mg/kg BW orally single dose
- ✓ Bithionol - 40 mg/kg for 3 days
- ✓ Lintex – 50 mg/kg at weekly interval
- ✓ Niclosamide 50- 100 mg/kg BW.

Control

- Control of snail Intermediate host.
- Proper drainage of water from lakes and ponds.
- Periodical deworming of the animal


Thank
you!