

Topic

On

FAMILY - FASCIOLIDAE

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FAMILY - FASCIOLIDAE

Genus: Fasciola

Species: *Fasciola gigantica*, *Fasciola hepatica*

Common name: Liver fluke.

- *Fasciola hepatica* -Sheep liver fluke, Temperate liver fluke, Common Liver Fluke
- *Fasciola gigantica* -Giant liver fluke, Tropical liver fluke

Distribution: World wide. Commonest liver fluke in India.

Disease: It causes fluke cirrhosis or liver rot, fascioliasis or fasciolosis or clay pipe cirrhosis, pipe stem liver or gall stone formation.

Host: Cattle buffalo, sheep, goat, and also in man.

Intermediate host: Aquatic snail (*Lymnaea acuminata*)

Location: Bile duct and Liver parenchyma.

Fasciola hepatica



cephalic cone, 2 shoulders,
converging margins, smaller
in size

Fasciola gigantica



Less prominent
shoulders,
parallel
margins, larger
in size



Fasciola : Eggs



Lymnaea



Lymnaea auricularia

Fasciola gigantica

Characters :

- Leaf shaped large size. 20 - 75 mm in length, 12 mm in breadth and broader anteriorly than posteriorly.
- Anterior cone is smaller.
- shoulder are not prominent.
- Cuticle have spine (spinose tegment). The body is more transparent.
- The oral and ventral suckers are present. The ventral sucker situated at the level of shoulder and is larger than oral sucker.
- The intestinal caeca is more branched.
- Testes are 2 tandem, highly branched.
- Cirrus has short scale – like spines.
- Two follicular branched testes placed in the middle region. Single branched ovary with a coiled uterus lies anterior to the testes.

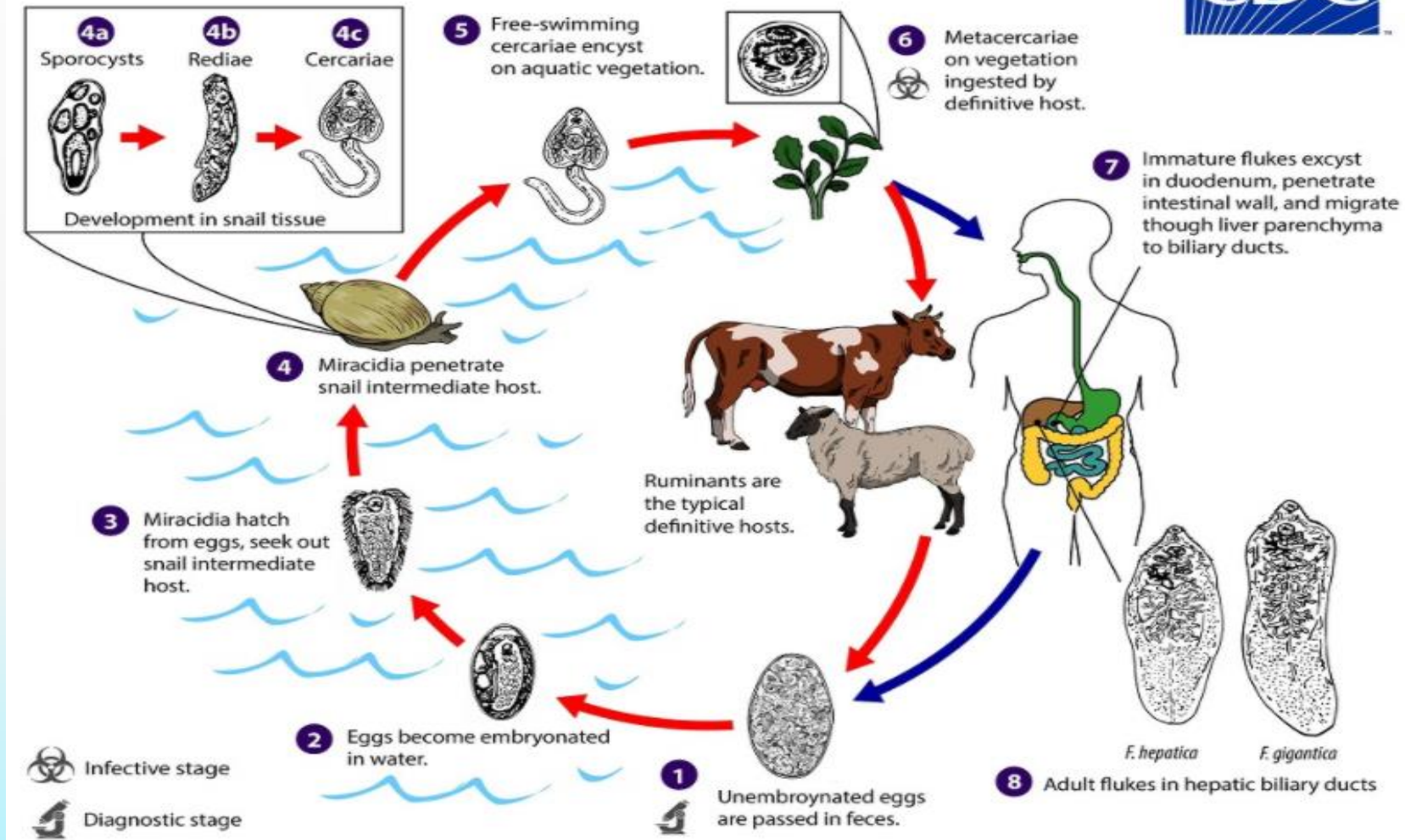
- Genital opening anterior to the ventral sucker.
- Ovary is highly branched, pre –testicular, present on the right side of the middle.
- Oviduct is short.
- Numerous vitellaria placed laterally and 2 transverse vitelline ducts.
- **Egg** is composite egg.
- ✓ Large in size. 156 - 197µm X 90 – 104 µm.
- ✓ They are oval in shape ,golden – brown in colour.
- ✓ Operculated
- ✓ The eggs are unembryonated when laid.

Fasciola hepatica

- It is a large leaf-shaped fluke.
- Body measures 16-51 mm in length and 4- 13 mm in breadth.
- Comparatively smaller than *F. gigantica* in size.
- Prominent shoulder.
- Appearance : Brown and pale grey in colour with spiny tegument.
- Suckers : There are two suckers, the oral(smaller) and the ventral(larger).
- Intestine : The intestinal caeca are highly branched.
- Testes are 2 tandem, highly branched.
- Cirrus is well developed.

- Ovary is single , highly branched, situated on the right side of the median line, anterior to testes.
- Uterus is pre testicular and filled with gas.
- Genital system : It is a hermaphrodite like other trematodes.
- Longevity : Adult live for 5 years in sheep and 9-13 years in man. Adult lays approx. 20,000 eggs/day.
- Egg
 - The eggs are smaller than F. Gigantica
 - Oval, smooth, operculate, germinal cells hexagonal
 - The eggs are unembryonated, when laid.
 - Colour :brownish yellow
 - Size :130-150 μm \times 63-90 μm .

Life cycle of *Fasciola* spp.



Pathogenesis of *Fasciola* spp.

- The pathogenesis depends on the number of metacercaria ingested
- They are two forms of this disease.
 1. Acute fasciolosis
 2. Chronic fasciolosis

Acute fasciolosis

- This is due to the Immature fluke.
- Migration from intestine to liver.
- Traumatic and necrotic lesions in liver parenchyma.
- Liver is enlarged, pale in color with hemorrhagic tracts on the liver surface.

- A complication of acute fasciolosis is the occurrence of black's disease – A condition caused by the anaerobic bacteria *Clostridium novyi* which are mainly seen in the anaerobic lesions caused by the immature trematodes.

Chronic fasciolosis

- This is due to the activity of the adult flukes.
- Hepatic fibrosis
- The presence of adult flukes in liver of like duct
- In such cases, the bile duct wall epithelium gets thickened giving the appearance of pipe stem liver and resulting in a condition called **clay pipe cirrhosis or pipe stem liver**.

Clinical signs of *Fasciola* spp.

- Affected animals shows anorexia, looks weak, emaciated.
- The most important sign is the appearance of odema especially in the sub mandibular region is referred commonly as **bottle jaw (jowl odema)** caused due to loss of proteins.
- In some cases especially in acute fasciolosis there will be diarrhea followed by constipation.
- Fasciolosis affected calf with sub mandibular swelling.

Diagnosis of *Fasciola* spp.

- By clinical symptoms
- By examination of the dung sample for the presence of fasciola egg.
- Yellow-brown eggs
- Eggs don't show for 4 months.
- Visualize adults in bile duct
- Immunological test

Treatment of *Fasciola* spp.

- Oxyclozanide – 15 – 20 mg/kg b.w orally
- Rafoxanide – 10 mg / kg bw orally
- Nitroxynil – 10 mg/ kg B.W s/c
- Diamphenithide
- Triclabendazole -10 mg/kg bwt

Control of *Fasciola* spp.

- Eradication of intermediate host – molluscicide – $\text{CuSO}_4 \cdot 7\text{H}_2\text{O}$.
- Treatment of infected animal -segregate
- flukicides- twice a year trichlobendazole, oxyclozanide to healthy animal.
- Triclabendazole is considered as the drug of choice for fasciolosis.,
- The flock should be moved to snail free pasture.
- Controls intermediate snail host.

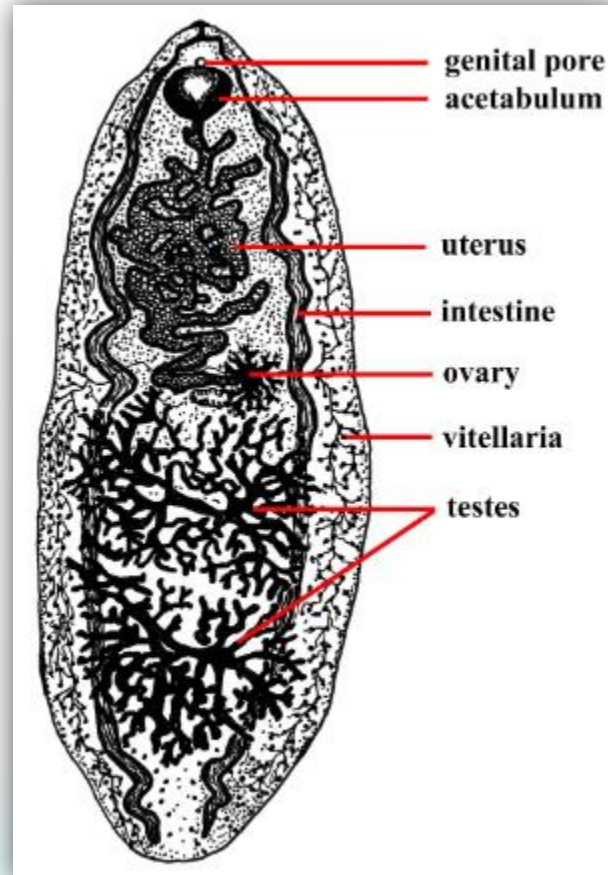
Fasciolopsis buski

- Definite Host - Man and pigs
- Location - Small intestine of man & pig
- Common names - giant intestinal fluke, Intestinal fluke of man.
- INTERMEDIATE HOST - Planorbis sp,
Water plants -- water calotrop, water chesnut.

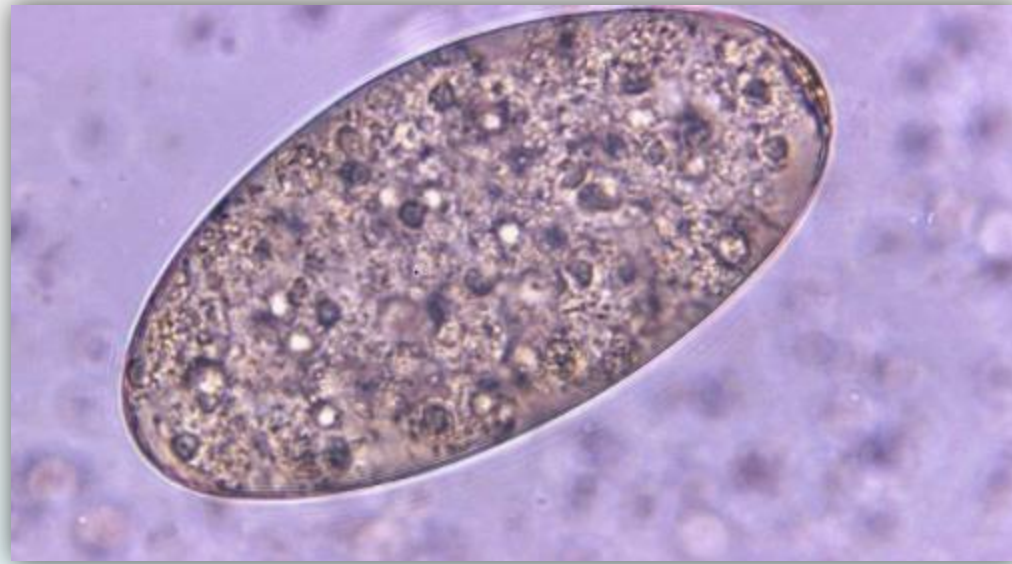


Morphology of *Fasciolopsis buski*

- Largest fluke 3 – 7.5 by 0.8 – 2 cm.
- Body is oval shaped and shoulders are absent.
- Cuticle is spiny.
- Ventral sucker is larger than the oral sucker.
- Intestinal caeca simple.
- *F. buski* is hermaphroditic.
- Testes in the posterior third of the body are branched and lie in tandem position.
- Ovary is branched anterior to testes in the middle region, vitellaria occupy lateral fields.



Fasciolopsis buski



Egg - Thin shelled, oval, operculate, brown colored

Life cycle of *Fasciolopsis buski*

- Immature eggs are discharged into the intestine and stool .
- Eggs become embryonated in water
- When fully developed, egg hatches to release miracidium. which invade a suitable snail intermediate host .
- In the snail the parasites undergo several developmental stages (sporocysts , rediae , and cercariae).
- The cercariae are released from the snail and encyst as metacercariae on aquatic plants. The mammalian hosts become infected by ingesting metacercariae on the aquatic plants.
- After ingestion, the metacercariae excyst in the duodenum and attach to the intestinal wall.

- There they develop into adult flukes (20 to 75 mm by 8 to 20 mm) in approximately 3 months, attached to the intestinal wall of the humans and pigs .
- The adults have a life span of about one year.

Pathogenesis & clinical signs

- The intestinal mucosa causing a local inflammation or deep ulcerative lesions in heavy infections.
- It produces abdominal pain, diarrhoea, oedema and ascites.

Diagnosis

- Based on clinical signs,
- Eggs in faeces.

Treatment

- Niclosamide – 60 mg /kg BW orally.
- Praziquantel – 20 mg /Kg BW orally.

Control

- Intermediate host control.
- Proper disposal of faeces of human and pig .
- Proper cooking.



Thank
you