

**MJF COLLEGE OF VETERINARY & ANIMAL SCIENCES,
CHOMU, JAIPUR**

DEPARTMENT OF VETERINARY PARASITOLOGY



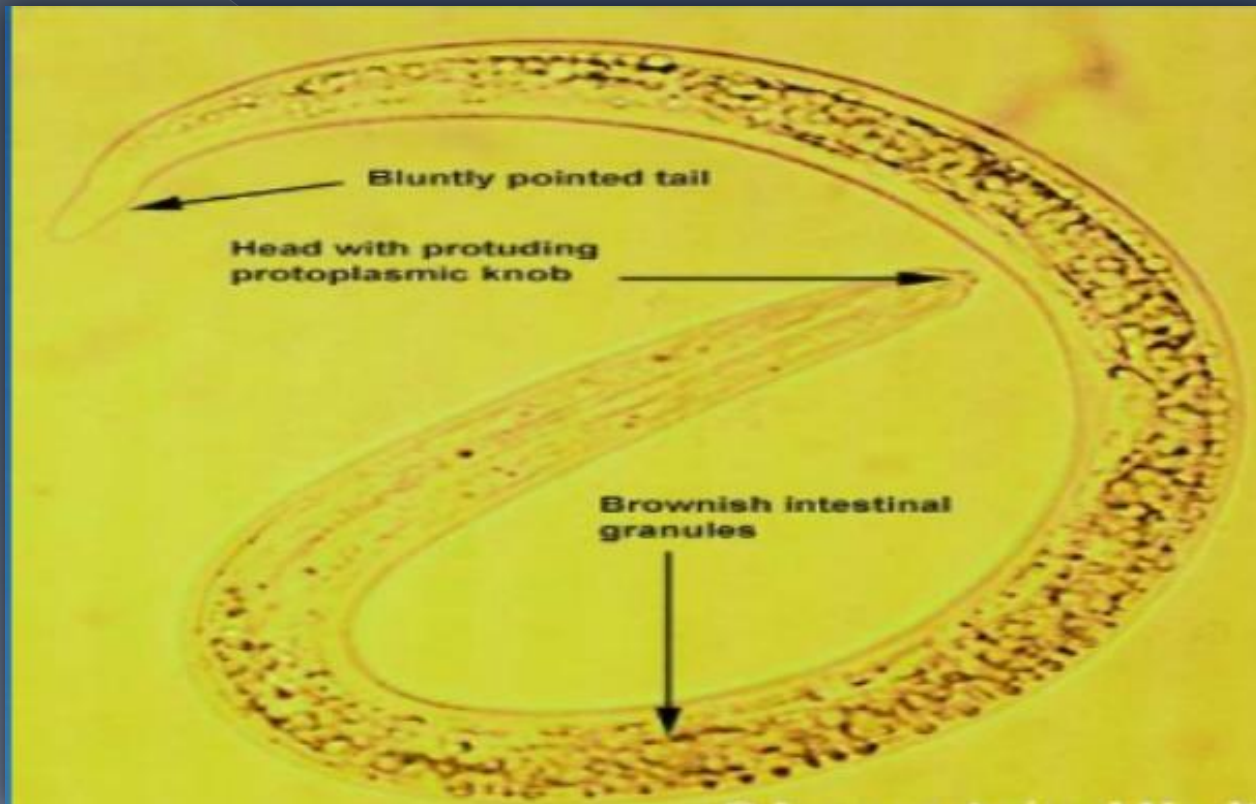
Genus- DICTYOCAULUS

Dr. Priyanka Saini
Assistant Professor
Veterinary Parasitology

Species

- ❖ *D. filaria* : Lung worm of sheep & goat.
- ❖ *D. viviparus* : Cattle & buffalo
- ❖ *D. arnfieldi* : Horse, donkey, Zebra
- ❖ *D. cameli* : Camel

Dictyocaulus filaria



Morphology

- The worms are milky white in colour.
- Female -3 - 8 cm, male 5 - 10 cm in length
- The buccal capsule is small and surrounded by 4 lips.
- The location of parasite is bronchi.
- In male the bursa is ill developed. The medio lateral & posterio lateral rays are fused together except at the tips.
- The spicules are short, stout, reticulate, dark brown in colour, equal and are boot or sock shaped.
- In female the vulva is situated just behind the middle.
- The egg contains fully developed larvae
- In the lungs, the worms are entangled together giving the appearance, "**Lumps of broken threads**".

Life cycle

- The eggs are coughed up & swallowed.
- The L1 hatch out from the egg while they are passing through the intestine of the host and voided in the faeces.
- L1 stage can be recognised by its cuticular knob at the anterior end and brownish food granules stored in intestinal cells. Since food granules are present the L1 does not feed.
- In about 24 hours L1 moult to become L2, the cuticle of L1 encloses the L2 until the larva moult to L3.
- Sometimes the L3 may be enclosed with two cuticles. (L1 and L2).
- L2 moult to become L3 in 6 days.

- The infective larvae climb on the grass blades during early hours or cool climates.
- Infection of D/H is by ingestion of infective larvae along with herbage.
- Following ingestion of the infective larvae, it penetrates the intestinal wall and reach the lymphatic vessel.
- They are carried by the lymph to the mesenteric lymph gland where L3 moult to become L4 in 4 days. This L4 reaches the lungs via lymph and blood vessel.
- In the lungs they are arrested in alveolar capillaries then break through into air passage and become adult in the bronchi in four weeks.

Pathogenesis

- The worms in the small bronchioles cause “parasitic catarrhal bronchitis”. The condition is called as "**verminous bronchitis**" (**hoose or husk**).
- The inflammatory process extends to the surrounding peribronchial tissue and the exudate passes back into bronchiole and alveoli causes atelectasis (trapping of air in the lungs) and pneumonia.
- The secondary bacterial infection leads to severe pneumonia.

Clinical signs

- ⦿ Young animals are commonly affected, animals may cough but it is not always present.
- ⦿ The mucous exudate from the nostril and dyspnoea is very common.
- ⦿ Increased respiratory rate and abnormal lung sounds may be heard.

PM lesion

- The affected parts of bronchi contains adult worms and large amount of mucous mixed with blood.
- It is opaque in nature due to the presence of desquamated epithelial cell, leucocyte and parasite egg.
- The bronchial mucosa and peribronchial tissue is inflamed and cone shaped pneumonia may be seen.
- Compensatory emphysema and proliferation of epithelium of bronchi may occur.

Diagnosis

- Faecal examination.
- Sometimes the larvae can be seen in sputum or nasal discharge.

Treatment

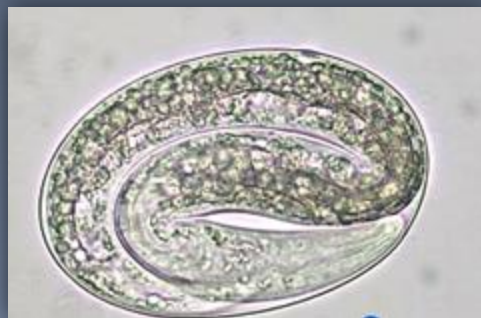
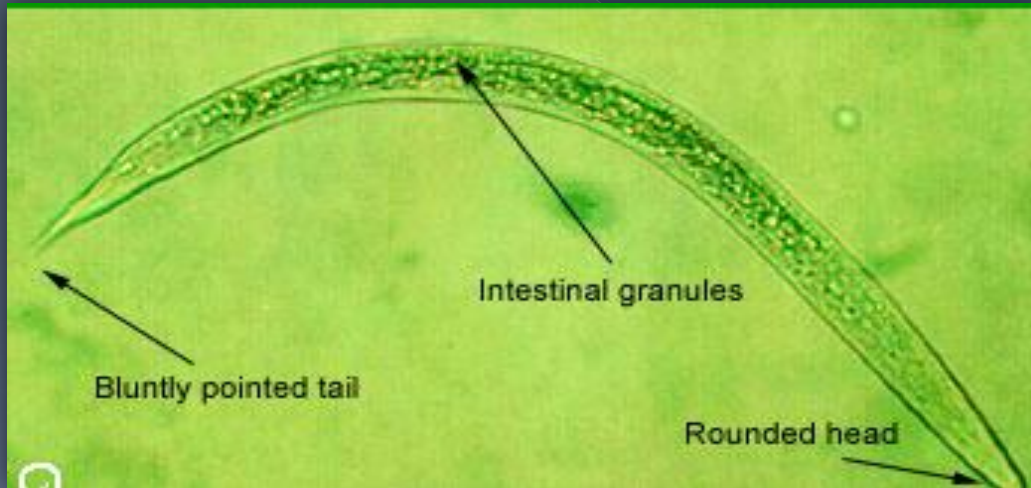
- Tetramisole - 15 mg / Kg b wt.
- Levamisole - 7.5 mg / Kg b wt. – s/c.
- Benzimidazoles and Ivermectin.

Immunoprophylaxis

- The vaccination consists of two doses of 1000 x-ray irradiated larvae each.
- The vaccination done at two months of age.
- The interval between first and second dose is one month.
- The animal must be prevented from exposure to infection until two weeks after 2nd dose.
- Reinfection is necessary after two weeks for maintaining of immunity.
- Dictol is a vaccine against cattle lungworms containing irradiated larvae.
- Difil is a vaccine against sheep lung worms containing irradiated larvae.

Dictyocaulus viviparus

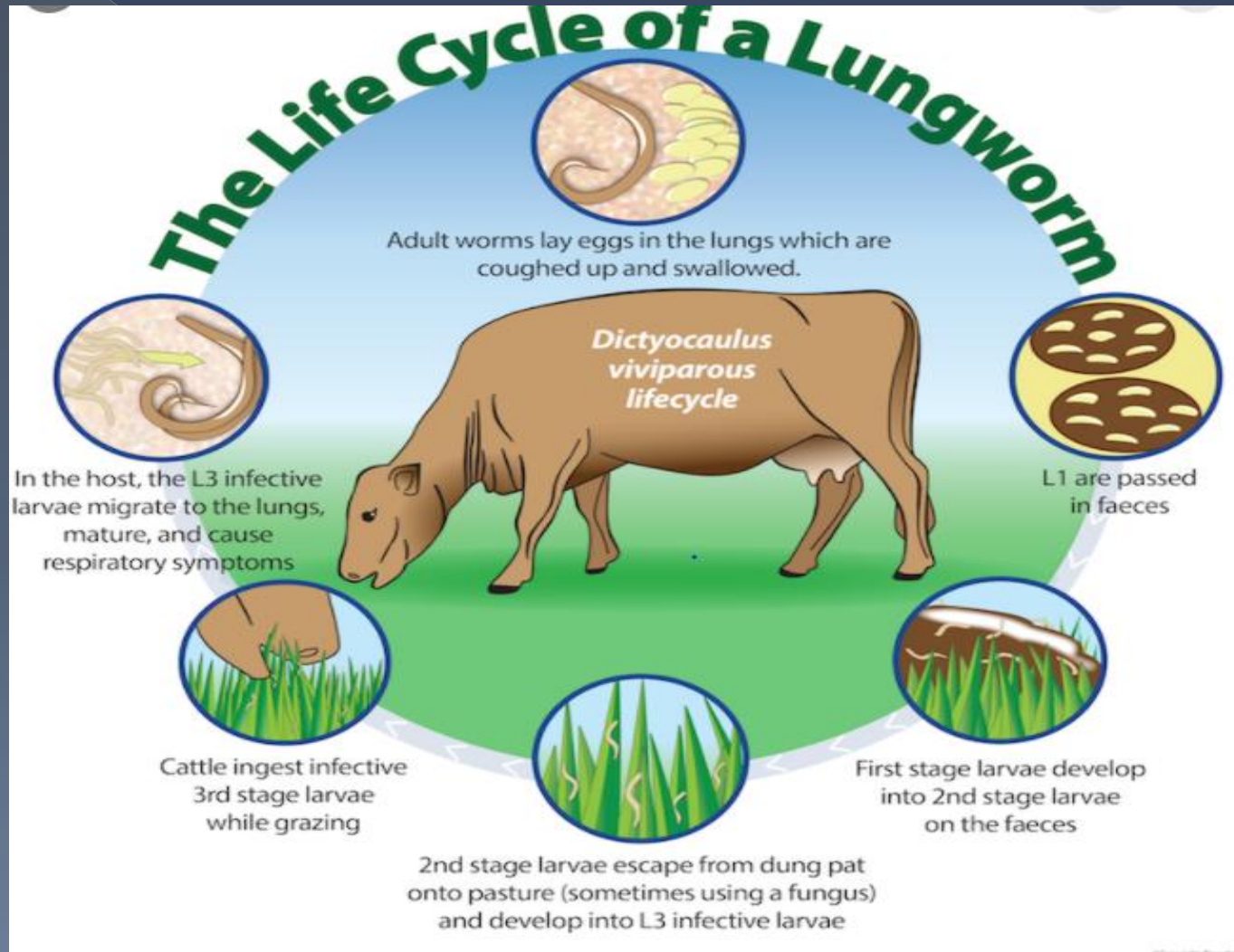
- Host: Cattle, buffalo
- Location: Bronchi



Morphology

- Male is 4-5.5 cm long and female is 6-8 cm long.
- The worm closely resembles the *D. filaria*, but the medio and posterolateral rays are completely fused and the spicules are only 0.195-0.215 mm long.
- The egg measure 82-88 by 33-38 μm .

LIFE CYCLE



Pathogenesis and clinical signs

- Lungworm infection is characterised by bronchitis and pneumonia and typically affects young cattle during their first grazing season on permanent or semi-permanent pastures.
- In the course of a heavy primary infection, four stages can be distinguished:
 1. **The Penetration Phase** (days 1-7 p.i.) during which larvae penetrate into the body of the host and migrate to the lungs.
 2. **The Prepatent Phase** (days 8-25 p.i.) during which larvae develop in the lungs.

3. **The Patent Phase** (days 26-60 p.i.) when the worms are mature and egg-producing.

4. **The Post-Patent Phase** (days 61-90 p.i.) which is normally the recovery phase after the adult worms have been expelled.

- ⊙ Most of the major clinical signs occur during the prepatent and patent phases and are caused by primary parasitic pneumonia.
- ⊙ The gradual development of bronchitis and pneumonia results in coughing and increased breathing rate, accompanied by varying degrees of anorexia, weight loss and laboured breathing.

- Fever may occur when there is secondary bacterial infection. The severity and duration of signs relate to the number of larvae ingested and the rate of ingestion.
- Infection is associated with two main lesions.
- A parasitic bronchitis characterised by the presence of large numbers of adult worms in frothy white mucus in the bronchi;
- secondly, the presence of collapsed areas around infected bronchi. This is a parasitic pneumonia caused by the aspiration of eggs and L1 into the alveoli.
- During the post-patent phase, although the clinical signs are abating, the tissues are still inflamed and residual lesions may persist for weeks to months.

Clinical Signs

- Widespread coughing in grazing cattle
- Loss of condition
- Increase in respiratory rate (Tachypnoea)
- Difficulty breathing (Dyspnoea)
- Reduced milk yield in adult cows

Diagnosis

- Clinical signs of bronchitis, rapid breathing and coughing.
- Demonstration of larvae in the faeces.

Treatment

- Diethylcarbamazine- 22 mg/kg/day for three days.
- Tetramisole- 15 mg/kg, Levamisole 7.5 mg/kg.

Control

- ⦿ Grazing management should be improved.
- ⦿ Vaccinate calves in herds with a history of lungworm
- ⦿ Treat all purchased cattle to prevent introducing lungworm to husk-free herd

Immunoprophylaxis

- ⦿ The vaccine consists of 2 doses of 1000 irradiated larvae given at an interval of 1 month to young calves of 3-8 weeks of age.
- ⦿ The protective immune response fades in the absence of reinfection.
- ⦿ The vaccine has a very short shelf – life of 10-15 days.

THANK

YOU

