Dracunculus

Dr. Ajit Kumar
Department of Veterinary Parasitology
Bihar Veterinary College
Bihar Animal Sciences University
Patna-800014

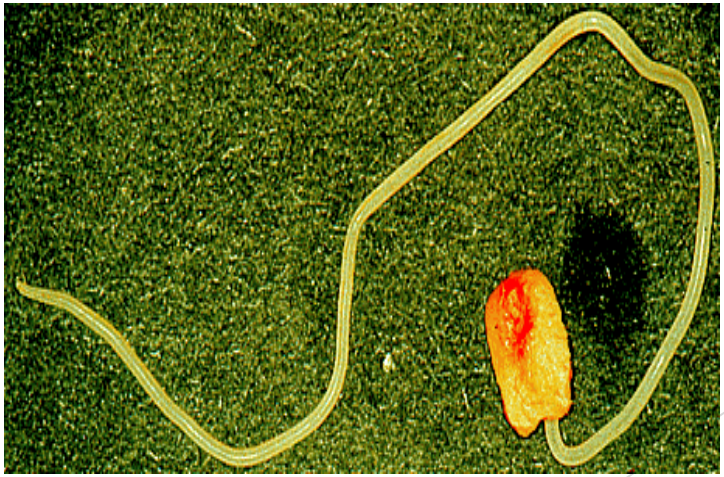
Image source: Google image

Drancuculus medinensis

Family: Dracunculidae

Species: *Dracunculus medinensis*

Common name: Guinea worm or Dragon worm or Medina worm or Serpent worm



Drancuculus medinensis

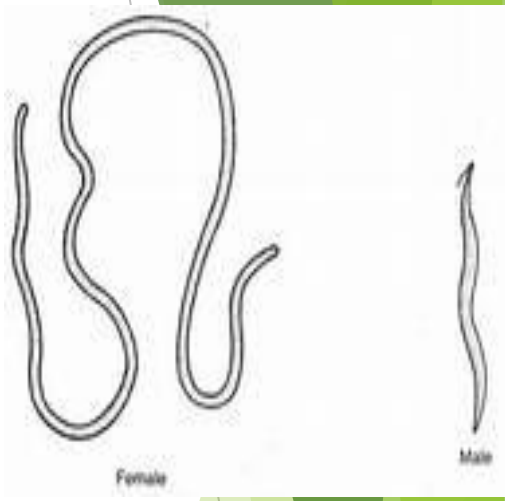
HISTORY

- Known as a parasite of humans since about 1530 B.C.
- Guinea worm is thought to be the "fiery serpent" referred to in the Bible.
- Persian physicians removing the *D. medinensis* parasite from patient during the 9th century-→

Drancuculus medinensis

Morphological Characters:

- Difference of the length of male (12-29 mm) and female (100-400 cm) is much.
- It is one of the longest nematodes known to cause infection in man.
- Worms are white in colour.
- Worm has helmet in the anterior end.
- Female worms like a twin thread without vulva.
- Female is ovoviviparous
- Male worm is much smaller and rarely recovered from infected host because he dies shortly after mating.



Dracunculus medinensis

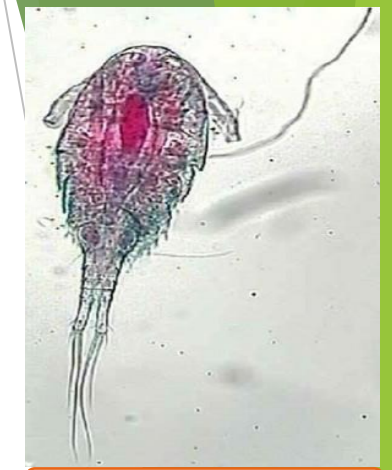
Final Hosts : Man and rarely in dog

Location: Subcuatneous tissues

Drancuculus medinensis

Life-cycle:

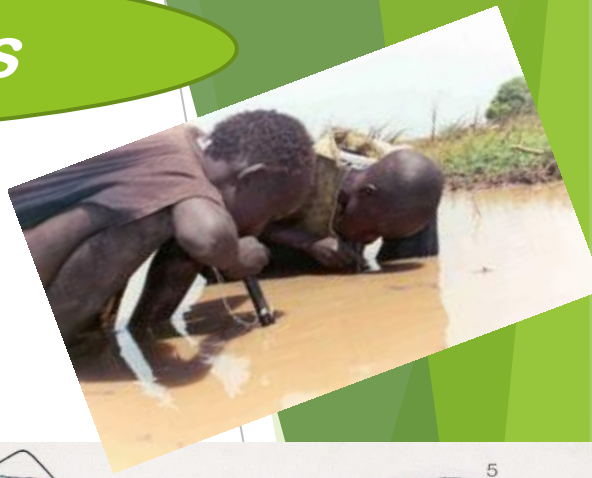
- ✓ **Indirect life-cycle**
- ✓ **Intermediate host** : Cyclops
- ✓ **Infective stage** : 3rd stage larva (L_3)



Copepod (Cyclops)

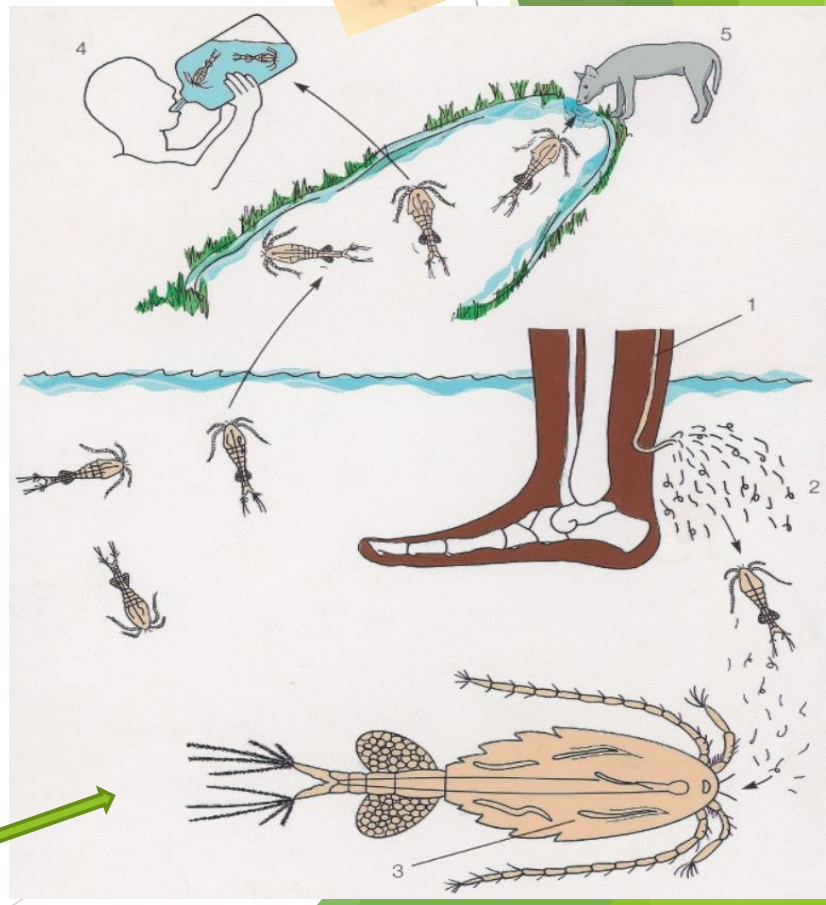
Third stage larva

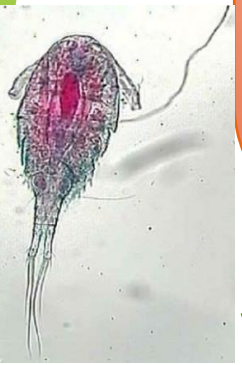
Drancuculus medinensis



Transmission:

- Final hosts get infection by the ingestion of drinking water containing cyclops infected with 3rd stage larvae

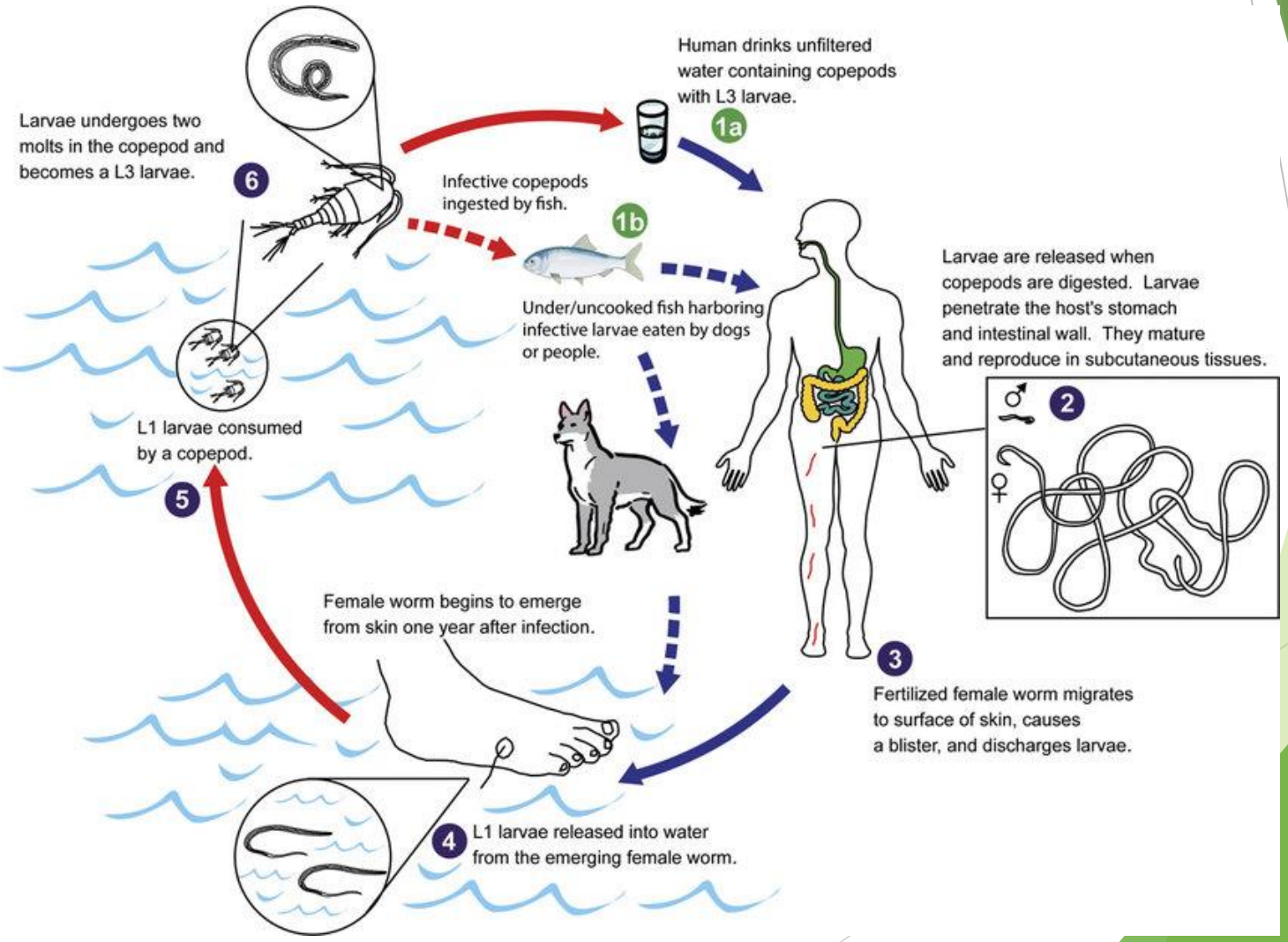




Cyclop

Drancuculus medinensis

Life-cycle:



Drancuculus medinensis

Life-cycle:

- Parasite lives in the ulcerative lesion caused by the parasite itself.
- When ulcerative lesions comes in contact with water, the uterus of parasite prolapses through the anterior end of the worm or through its mouth and ruptures, discharging a mass of L_1 larvae into water.
- L_1 larvae ingest by the Cyclops which present in water and developed in to infective 3rd stage larvae.
- Infection in final host occurs through the drinking water which contains the infected intermediate host Cyclops (*Mesocyclops leukarti*).

Worm

First stage larvae

Third stage larva

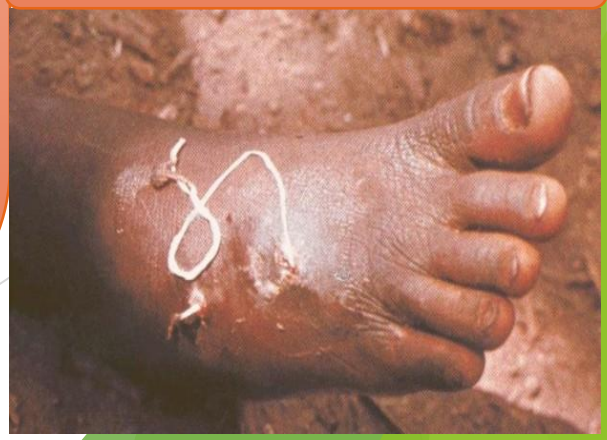
Drancuculus medinensis

Pathogenesis & Clinical signs:

- **Disease:** Dracunculiasis or dracunculiosis.
- Male worms die after fertilization and female worms migrate to superficial layer of skin where they secret a toxin and lead to formation of blister in the lower part usually legs.
- Worms cause subcutaneous swelling which later became ulcerated.
- Worms lives in the ulcerative lesion caused by the parasite itself.
- Female worms produce burning sensation in the subcutaneous tissues.

Blister formation

Ulcerative lesion containing worm



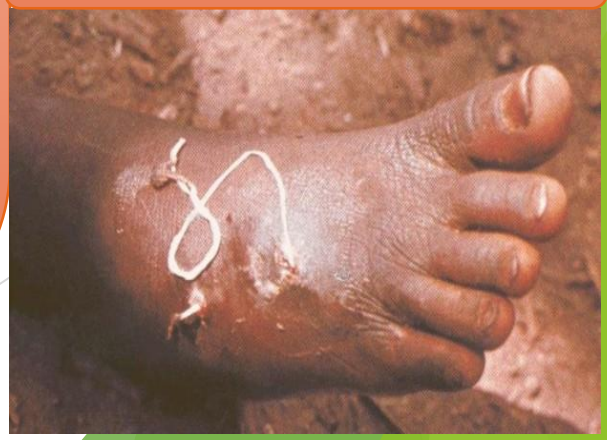
Drancuculus medinensis

Pathogenesis & Clinical signs:

- **Emergent worm:** Allergic reaction, blister formation and burning pain
- Secondary bacterial infection
- **Non-emergent worms:** Fail to reach skin and worms became calcified which leads to cellulitis, arthritis, paraplegia etc.
- Slight fever, itchy rash, nausea, vomiting, diarrhoea, blister formation, burning sensation , ulceration etc.

Blister formation

Ulcerative lesion containing worm



Drancuculus medinensis

Diagnosis:

- On the basis of clinical signs like blister formation, ulcerative lesions, pain, lameness etc.
- Detection of worms in lesions
- X-ray examination
- IFAT, ELISA etc. immunodiagnostic test.,

Drancuculus medinensis

Treatment :

- ✓ No drug treatment available but drugs like Niridazole and Thiabendazole can be used for quick extraction of adult female worms from lesions.
- ✓ Removal of worms and care is only treatment :-
  - Remove the worm by gently rolling the worm daily around a small stick (Ancient method).
  - Worms are tied to a small stick and gradually rolled up gently to avoid breaking the worm which may otherwise lead to the necrosis of the neighbouring tissue after death of the worm left inside the lesion.

Drancuculus medinensis

Treatment :

- Affected body part is immersed in water to coax more of the worm out.
- Gently worm is pulled until reach the resistance
- After resistance is met, pulling is stopped so worm does not break.
- Portion of worm that is emerged is wrapped around the stick to maintain some tension so the worm can not retract back into the lesion
- Tropical application of antibiotics to prevent secondary bacterial infection
- Steps are repeated until the entire worm is removed

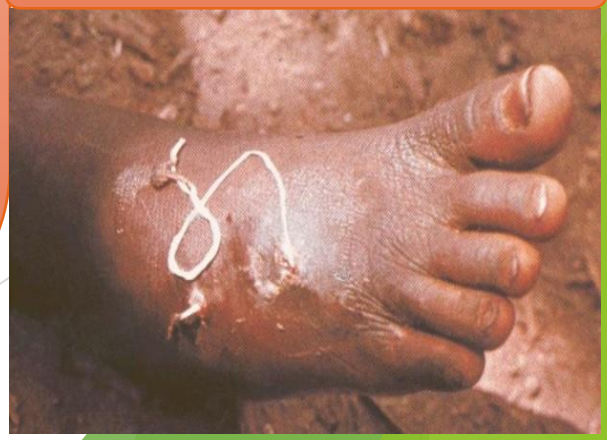
Drancuculus medinensis

Pathogenesis & Clinical signs:

- Male worms die after fertilization and female worms migrate to superficial layer of skin where they secret a toxin and lead to formation of blister in the lower part usually legs.
- Worms cause subcutaneous swelling which later became ulcerated.
- Worms lives in the ulcerative lesion caused by the parasite itself.
- Female worms produce burning sensation in the subcutaneous tissues.

Blister formation

Ulcerative lesion containing worm



Drancuculus medinensis

Control:

- Drinking of safe water i.e. boiled or chlorinated or filtered or hand pump water.
- Preventing the infected person from going near water source
- Prevent growth of copepod (Cyclops) by controlling sunlight or using larvicide
- General awareness

Drancuculus medinensis

Control:

Guinea Worm Eradication Programme (GWEP) :

Guinea Worm disease free country by the World Health Organisation in February 2000 is a major milestone in the history of disease eradication in India.

THANK YOU