



## Filarial worm

- Classification:

### Lymphatic filariasis

- Wucheria bancrofti
- Brugia malayi
- Brugia timori

### Subcutaneous filariasis:

- Loa Loa
- Onchocera volvulus
- Mansonella streptocera

### Serous cavity filariasis

- Mansonella ozzardi
- Mansonella perstans

- Wucheria bancrofti:

- It is confined to areas of tropic and subtropic.
- Morphology:
  - ✓ Adult worms:
    - ✓ They are found in lymphatic vessels and lymph nodes.
    - ✓ Adult worms are transparent, long hair like structures.
    - ✓ They are filiform in shape and both ends are tapering.
    - ✓ The tail end of male is curved ventrally and contains two spicules of unequal length, while that of the female is narrow and abruptly pointed.
    - ✓ Size of male: 2.5-4.0 cm(length) x 0.1mm (thickness)
    - ✓ Size of female: 8-10cm (length) x 0.2-0.3mm(thickness)
    - ✓ Males and females remain coiled together and it is difficult to separate them. The female is ovo-viviparous (laying eggs with embryos).
    - ✓ The life span of adult worms is 5-10 years.

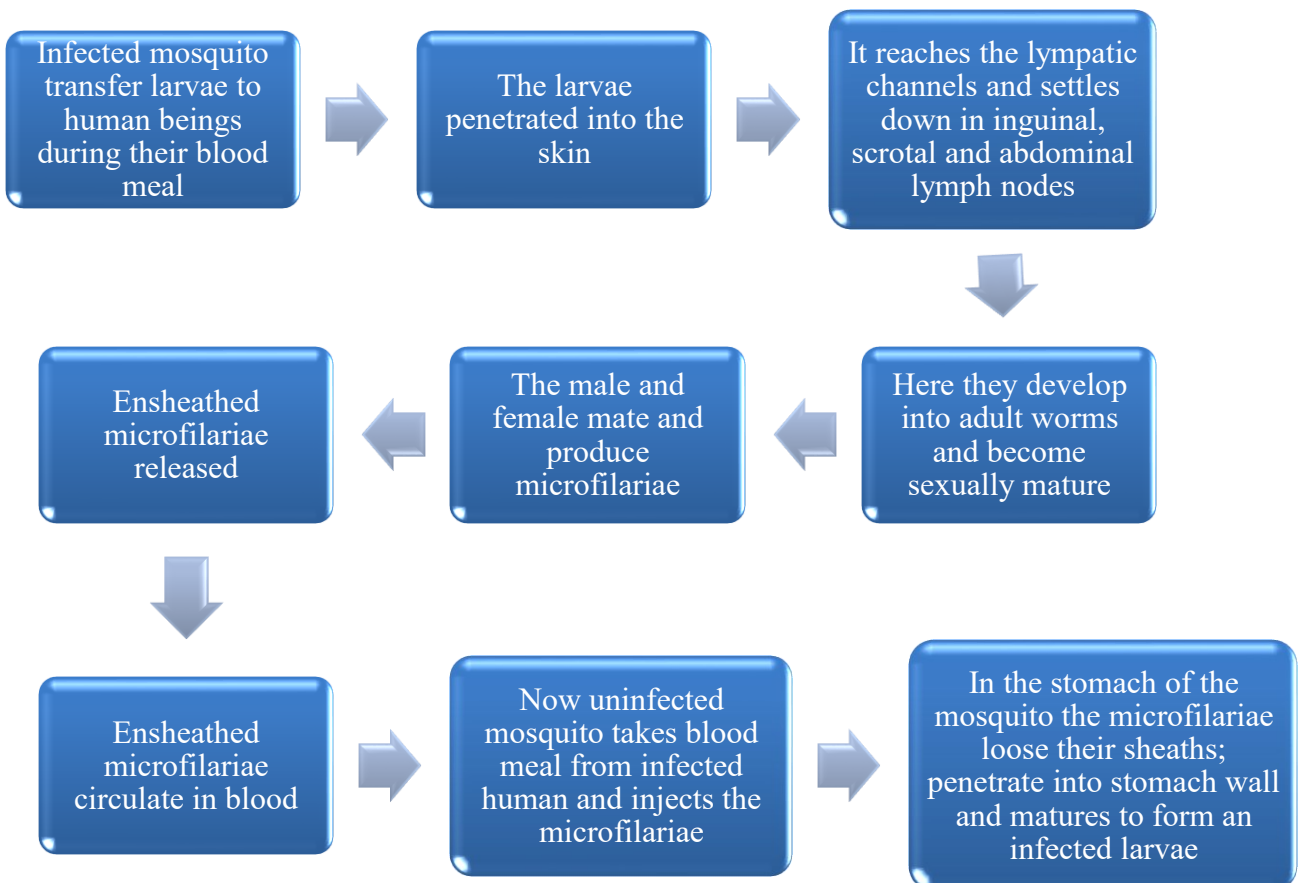
- ✓ Embryos (microfilaria):



- ✓ They are colourless and transparent.
- ✓ They have blunt heads and pointed tails.
- ✓ Sizes: 290 $\mu$ m – 6-7 $\mu$ m
- ✓ Embryos are covered by a hyaline sheath –
  - ✚ The sheath is much longer than the embryo so that the embryo can move forward and backward within it.
  - ✚ The somatic cells or much appear as granules and extends from the head to tail end.
  - ✚ The granules do not extend up to the tip of the tail and is a distinguishing feature of microfilaria bancrofti.
  - ✚ Embryonic forms are present in the peripheral blood of man.

- Life cycle:

- Infections occur through bite of infected female mosquito.
- W.bancrofti passes its life cycle in 2 hosts i.e.
  - Man (definitive host),
  - Female mosquito (intermediate host).
- Mosquito species which act as intermediate hosts are: culex, anopheles, and aedes.





- Pathogenesis:

- The infection with this parasite is named wucheriasis or filariasis.
- The disease is of two types:
  - 1) Classical filariasis (caused by adult worm)
  - 2) Occult filariasis (caused by embryos)

1) Classical filariasis: it leads to lymphangitis, lymph-oedema with hypertrophy of affected part (elephantiasis), lymphangiovarix, hydrocele and chyluria.

2) Occult filariasis:

- ✓ It is due to hyper-sensitivity reaction to microfilarial antigens.
- ✓ Patient develops massive eosinophilia (30-80%), hepato-splenomegaly, generalised lymph adenopathy, pulmonary symptoms.
- ✓ Microfilariae are not found in the peripheral blood.
- ✓ Classical features of lymphatic filariasis are absent.

- Laboratory Diagnosis:

- It depends on direct evidence (to search for microfilariae and adult worms) and indirect evidence (serological tests).

a) Direct evidence:

- ✚ Demonstration of microfilariae in peripheral blood film, chylous urine, exudates of lymph varix and hydrochloric acid.
- ✚ The microfilariae appear in large numbers in peripheral blood at night.
- ✚ Hence, blood film should be made in night between 10pm and 2am.

b) Indirect evidence:

- ✚ Eosinophilia (5-15%) can be detected due to allergic reaction to antigens.
- ✚ Serological tests like ELISA, indirect fluorescent antibody (IFA) and indirect haemagglutination assay (IHA) can also be used but these tests have low sensitivity and specificity.



- Loa Loa:
  - It is responsible for causing subcutaneous filariasis. It affects the conjunctiva of the eye,
  - Morphology:
    1. Adult worms:
      - ✚ Thin whitish and thread like
      - ✚ Anterior and tapers to a narrow end
      - ✚ Surrounded by a cuticle
      - ✚ Sexually dimorphic: the female is larger in size when compared to male.
      - ✚ 30-70mm x 0.3-0.5mm (size)
      - ✚ Life span : >15 years
    2. Microfilaria:
      - ✚ There is presence of sheath
      - ✚ Body has irregular curves
      - ✚ Nuclei extend to the tip of tail
      - ✚ Diurnal periodic: the presence of microfilaria is maximum in the peripheral circulation during the day.
  - Pathogenesis:
    - ✓ Loa loa filariasis is the disease produced by adult worms in human.
    - ✓ The microfilaria of this worm is not pathogenic.
    - ✓ Calabar swelling: (oedema of the connective tissue) is the typical pathologic fracture of loa loa filariasis formed as a result of an allergic response to adult worms migrating in the subcutaneous tissue.
  - Diagnosis:
    - a) Clinical diagnosis: suggested in patients with typical fugitive swellings, high eosinophilia.
    - b) Specific diagnosis: by identification of microfilaria in the peripheral blood.