

Extra intestinal helminth

Extra intestinal nematodes

Tissue nematodes

Wuchereria bancrofti

Humans are the only known reservoir host of *W. bancrofti*. Infection rates in some communities in East Africa exceed 30% of adults causing revolting swellings of the legs or genital system, known as elephantiasis in man. The adult worm occurs in tightly coiled nodular masses in the major lymphatic ducts.

The main vector is *Culex* a mosquito that is particularly common in towns and cities

Infective stage: larvae (microfilaria)

Diagnostic stage : microfilaria

Disease : elephantiasis

Vector: Culex mosquitoes

Morphology

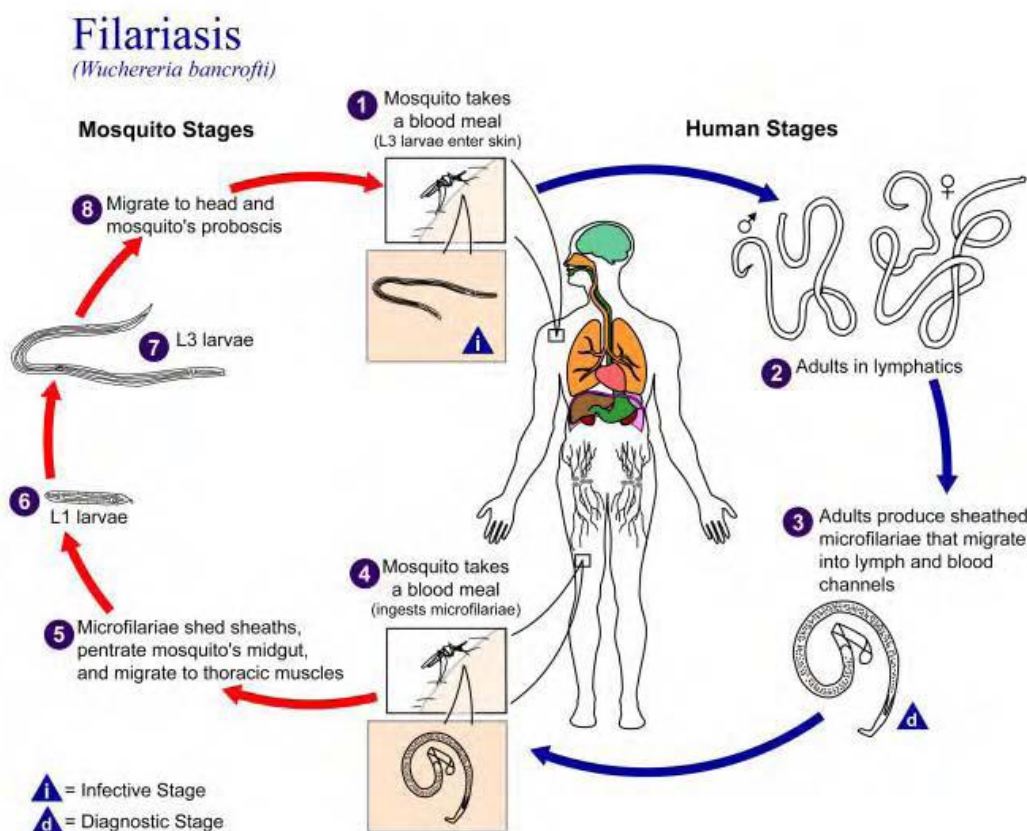
The adult worms are white and threadlike. The male measures between 2.5–4cm whereas the female is larger, measuring between 8-10cm.

The microfilariae are 230-275µm in length. The tail of the microfilariae of *W. bancrofti* tapers to a delicate point and exhibits no terminal nuclei. The sheath the microfilariae of *W. bancrofti* stains with hematoxylin stain.

Life Cycle

Microfilariae enter the host during a blood meal when the vector, a mosquito, punctures the skin. The infective larvae enter through the wound and migrate to the peripheral lymphatics where they grow to mature male and female worms. They can live there for several years. After mating, the gravid females release sheathed microfilariae into the peripheral blood where they can be detected 8-12 months after the initial infected bite.

The mosquito acquires the infection by ingestion of the microfilaria in the blood meal. The microfilariae lose their sheath on arrival in the stomach of the mosquito due to gastric juices. The larvae migrate to the thoracic muscles and develop into infective larvae over a period of 6-14 days. The larvae then migrate to the mouthparts of the mosquito which infects the host during a blood meal.



Pathogenecity and clinical features:

- ◆ The adult worm obstructs the flow of lymph in the lymph nodes and the lymphatic vessels draining the lower limbs and the external genitalia.
- ◆ The lower limbs and external genitalia become swollen. The skin becomes thick and fissured. The disease is called bancroftian elephantiasis.
- ◆ The major symptoms and findings include: lymphangitis, lymphedema, fever, headache, myalgia, hydrocele and chyluria.

Diagnosis

- ◆ Blood film examination after staining by Giemsa or Leishman stain to detect microfilaria. The film should be taken by night.

Loa loa

The eye worm, *Loa loa*, causes Loiasis. The insect vectors include mango flies of **Chrysops**. Loiasis is endemic in Central and West Equatorial Africa. The abundant rubber plantations provide a favorable environment for the vector to transmit the disease.

Infective stage: larvae (microfilaria)

Diagnostic stage : microfilaria

Disease : loiasis

Vector : chrysops insect

Morphology

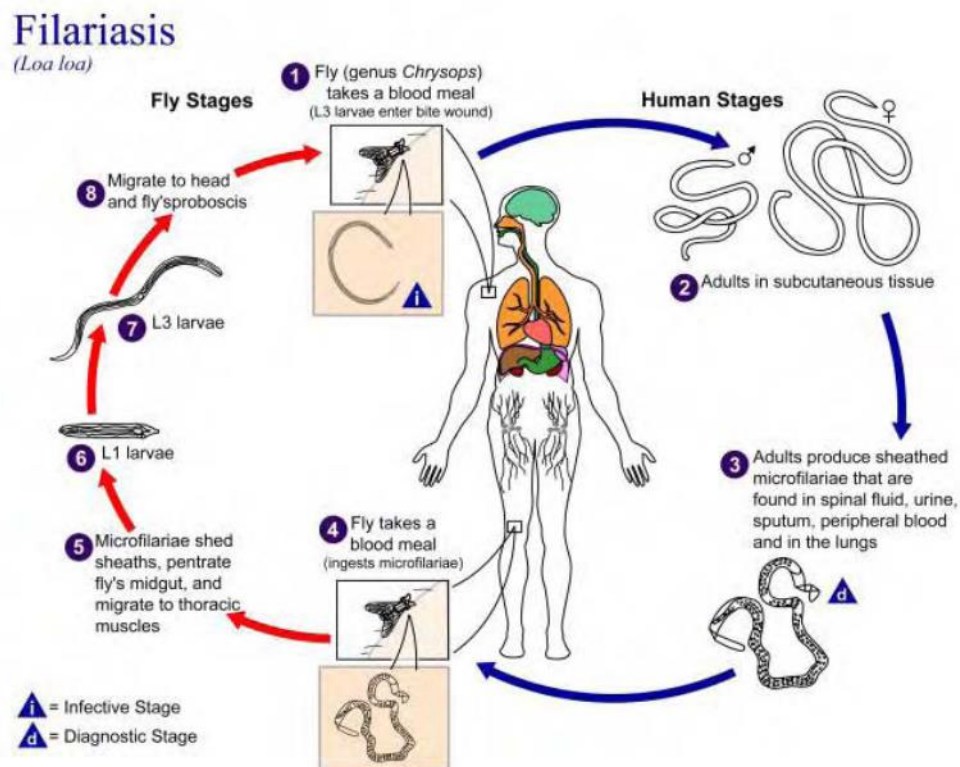
Adult male worms: 30-34 mm in length

Adult female worms: 40-70 mm in length

Life cycle

The adult worms live in the subcutaneous and deep connective tissues and the microfilariae are found in the peripheral blood, where they can be ingested by the *Chrysops* fly (day biting fly). The adults can live in the tissues for up to 17 years. Once the microfilariae have been taken up by the *Chrysops* during a blood meal they develop within the fat body. They develop through to L3 within 10–12 days. The microfilariae, L3 reenter the hosts blood stream when the fly takes another blood meal. They reach adult worms within 4- 6 months living in the subcutaneous and deep connective tissues.

The microfilariae exhibit diurnal periodicity, the highest numbers being detected in blood between 10am and 2pm.



Pathogenecity and Clinical Disease

The microfilaria have a sheath. Their diurnal periodicity corresponds to the feeding pattern of the insect vector, which bites humans from 10:00 AM to 4:00 PM.

Many patients infected with *Loa loa* appear to be asymptomatic and the migration of the adult worm through the subcutaneous tissues often goes unnoticed, unless passing beneath the conjunctiva of the eye. They can be seen crossing the eye, but it is a rapid process taking approximately 15–20 minutes.

Incubation period is about one year.

- 1- It causes **(calabar swelling)** beneath the skin due to parasites.
- 2- There is fever, pain, pruritus, urticaria, allergic reactions, retinopathy, glomerulonephritis, meningo-encephalitis etc.

Laboratory diagnosis

- Detection of microfilaria in peripheral blood, urine, sputum, CSF - stained with Giemsa or unstained
- Eosinophilia