

# TYPE STUDY : LEISHMANIA DONOVANI (PROTOZOA)

## Systematic position:

Phylum : Protozoa  
Subphylum : Sarcomastigophora.  
Superclass : Mastigophora.  
Class : Zoomastigophora  
Order : Kinetoplastida.  
Genus : Leishmania  
Species : donovani

The species L. donovani was reported simultaneously by Leishman and from London (1903) and Donovan from Madras (1903) and thus named as Leishmania donovani.

Leishmania is an important zooflagellate which is pathogenic in nature and is ~~class~~ closely related to Trypanosoma. Various species of Leishmania infect man, cattle, dog, sheep, horse etc. and cause serious diseases collectively called as Leishmaniasis.

Carrier for all the types of Leishmania is blood-sucking sandflies belonging to genus Phlebotomus, and all are the parasites of intracellular kind in

leucocytes of blood or in cells of liver and spleen. *Leishmania donovani* causes a malarial-like oriental disease in man called **Kala-azar**, **Dumdum fever** or **Black fever**.

### Distribution:

India, China, Russia, Mediterranean countries and in parts of Africa and South America.

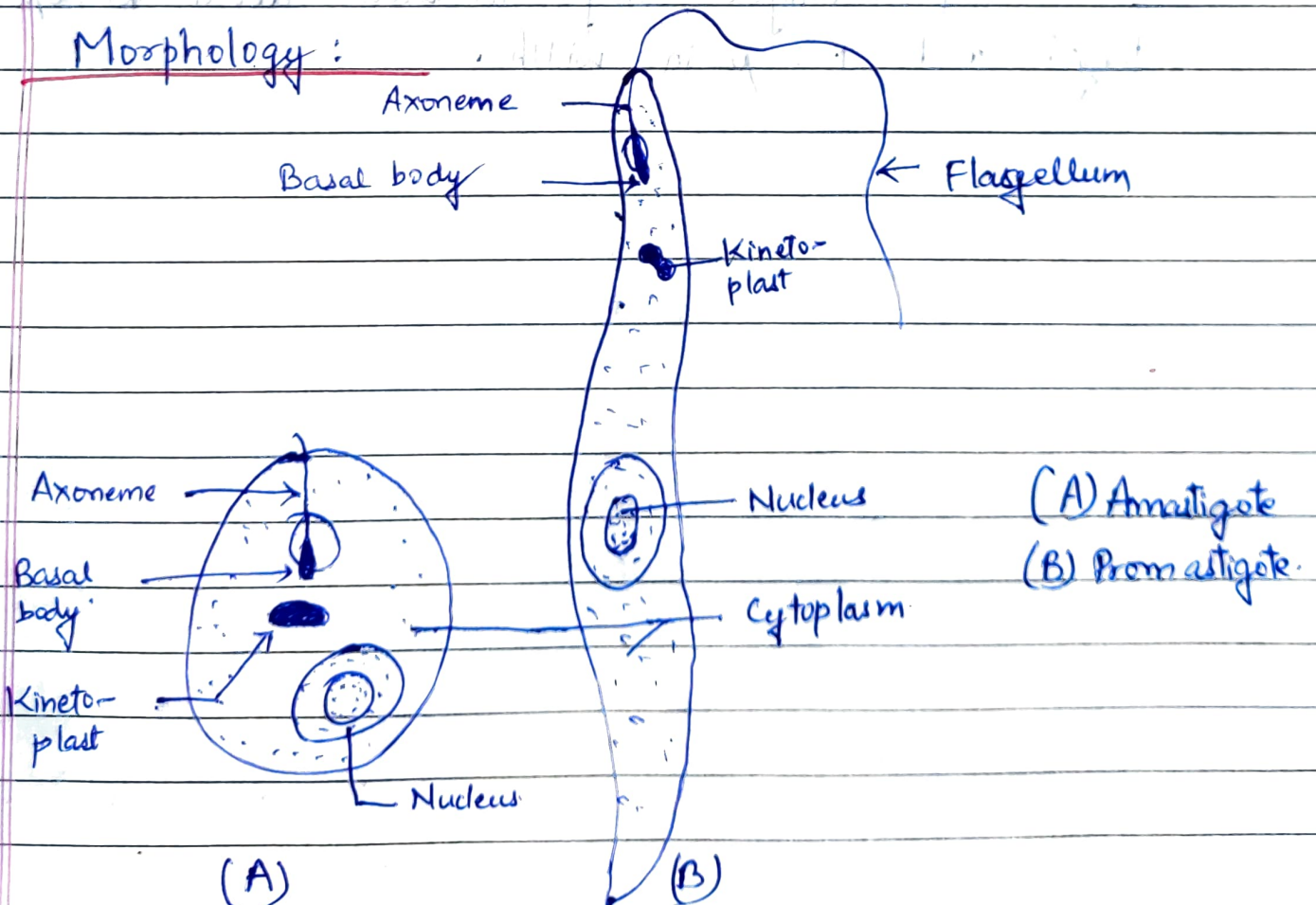
In India, it is endemic in Assam, Bengal, Bihar, Orissa, Tamil Nadu and eastern part of Uttar Pradesh.

### Habitat:

Intracellular parasite in leucocytes or cells of liver, spleen, bone marrow, lymphatic glands, etc.

It is causative agent of disease known as Kala-azar resulting in fever, enlargement of spleen, and reduction in white blood corpuscles in blood. It is transmitted through bite of sandflies.

### Morphology:



## (I) Shape and Size :-

Leishmania occurs in two forms leishmanial and leptomonad.

Leishmanial = Found in vertebrate

Leptomonad / Promastigote = Invertebrate (Sandfly).

1. Leishmanial or Amastigote form: Found intracellularly in blood cells or reticulo-endothelial cells of the vertebrate host or man. It is microscopic rounded/oval with a central eccentric nucleus, blepharoplast and kinetoplast but no free flagellum. It measures  $2\mu$  to  $4\mu$  in diameter.

2. Leptomonad / Promastigote form: It is found in midgut of invertebrate host or sandfly. It is elongated, slender, and spindle shaped with a large centrally placed nucleus, blepharoplast, kinetoplast and a long free flagellum. A fully formed promastigote stage measures about 15-20 $\mu$  in length and 1-2 $\mu$  in width.