

Metabolism :-

- ① Nourishment is obtained saprozoically through body surface from host cells.
- ② Gaseous exchange in respiration and elimination of excretory products also occur by diffusion through body surface.
- ③ Sexual reproduction is unknown and asexual reproduction always

Takes place by longitudinal binary fission.

Life cycle -

It is a digenic parasite i.e. requires two hosts for its life cycle.

Primary host : vertebrate or man.

Secondary (Intermediate) host : Invertebrate (blood fly → sandfly)

Genus: *Phlebotomus*

Phlebotomus

Reservoir host : dogs, jackals (Russia), gerbils and squirrels (Kenya)

Note Reservoir host is a host which serves as a where parasite does not undergo any change simply waits for its introduction into the host.

(I) LIFE CYCLE IN MAN :-

Divided in three stages :-

- (1) Infection.
- (2) Multiplication
- (3) Spread of infection.

(1) Infection :-

In India, *L. donovani* is transmitted to man by sandfly (*Phlebotomus argentipes*). The insect vector shows enormous numbers of parasites in its buccal cavity and pharynx after feeding.

When such a sandfly bites a man or crushed by slapping its infectious molecules from pharynx and buccal cavity get transmitted to man.

(2) Multiplication:-

The parasite introduced to human body are in promastigote/leptomonad form. Some of them entering the blood circulation, directly become destroyed. While those entering the cells of reticulo-endothelial system (liver, spleen, bone marrow and lymph nodes) change into amastigote or leishmanial forms. These undergo slow multiplication by binary fission so that the host cells become greatly enlarged.

(3) Spread of Infection:-

When number of parasites reaches 50 to 200 or even more, the host cell ruptures. The liberated parasites are taken up by new host cells and the multiplication cycle is repeated so that reticulo-endothelial system becomes progressively infected. Some of the free amastigotes become phagocytosed by neutrophils and monocytes (macrophages). These heavily parasitised cells wander through the general blood circulation leading to a general infection.

(II) LIFE CYCLE IN SANDFLY:-

Two stages -

- (1) Transfer to sandfly
- (2) Development in sandfly:-

(1) Transfer to sandfly :-

When a sandfly sucks blood of an infected person, it obtains free amastigotes as well as the parasitized neutrophils and monocytes along with the blood meal.

(2) Development in sandfly :-

In the midgut of sandfly, a mastigote forms become elongated and acquire a free flagellum, then changing into promastigote forms. These multiply by longitudinal binary fission. In 6-9 days, no. of parasite become enormous and they spread into the pharynx and buccal cavity. The salivary glands are not infected. Transmission into a new host occurs when such a heavily infested sandfly bites the host.