BSc Hons Part III
For Degree III Students

ECONOMIC ZOOLOGY

Vectors of Kalazar, Malaria and Filaria their Biology, mode of infection, Prevention and Control.

KALAZAR — (Black fever)-

Introduction- Kalazar is a disease caused by a parasitic protozoan Leishmania donovani which causes fever, enlargement of the spleen, liver and rheumatic pains in human beings mostly in Bihar, Bengal, china and Sudan. It causes many deaths in epidemic form. It is a parasite of human blood and some other organs like spleen.

Systematic Position

Phylum - Protozoa
Sub phylum - Sarcomastigophora
Super class - Mastigophora
class - Zoomastigophora
order - Kinetoplastida
Genus - Leishmania
Species - donovani

The species L. donovani were reported by Leishman (1903) and Donovan (1903) hence the name is Leishmania donovani

Habits and Habitat — It is an intracellular parasite found in cells of liver, spleen, bone marrow / leucocytes, lymphatic glands etc. It is transmitted through the bite of sandflies.

Shape and Size - The parasite lives in 2 forms leishmanial and leptomonad which alternate between a vertebrate (Man) and an invertebrate (Sandfly host)

(1) Leishmanial or amastigote form:

It is microscopic, rounded rounded or oval, with a central or eccentric nucleus, blepharoplast and Kinetoplast but no free flagellum. It is about 2-4 μ in diameter formed intracellularly in blood cells or reticuloendothelial cells.

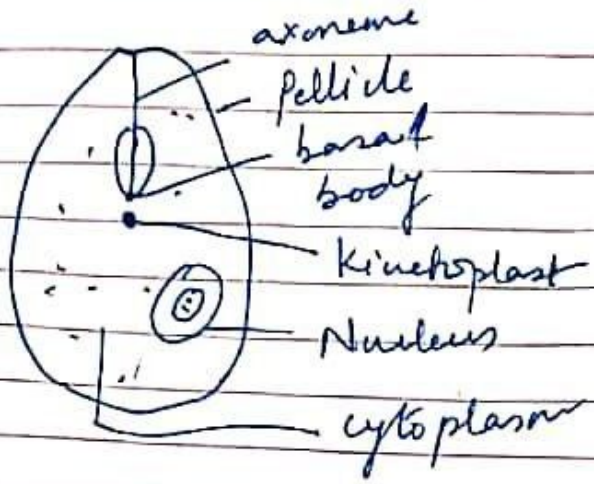
(2) Leptomonad or Promastigote form - It is elongated Slender and Spindle Shaped with a large centrally placed nucleus blepharoplast Kinetoplast and a long free flagellum. It is about 15-20 μ in length and 1-2 μ in width. It is found in midgut of invertebrate host Sandfly.

Cell Structure — The cell body is covered externally by a very thin, delicate, elastic covering called pellicle giving a definite shape to the body and does not form any undulating membrane.

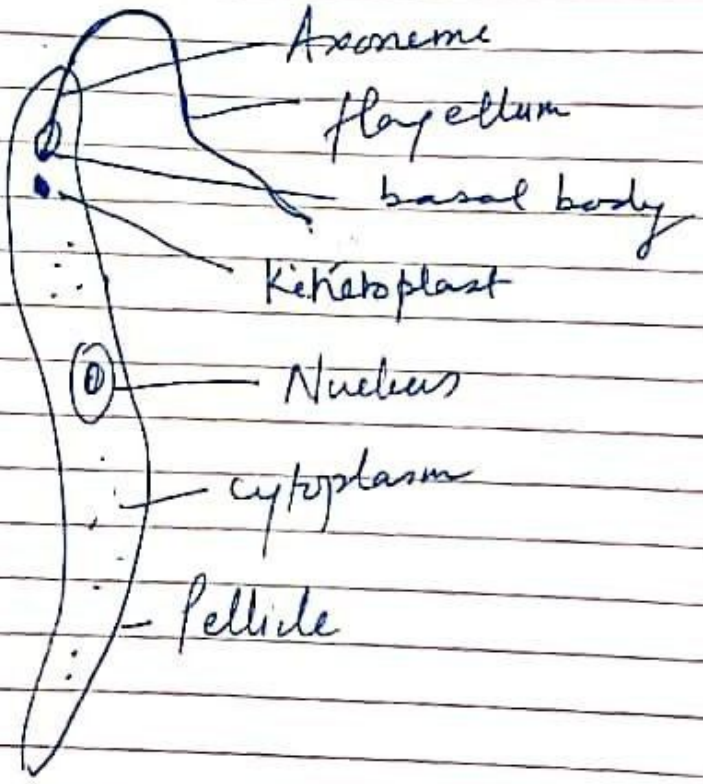
In leptomonad form a single, long and free flagellum is present arising from a phenute basal body or blepharoplast attached to a parabasal body or Kinetoplast at the base.

The cytoplasm is colourless, homogeneous and contains blepharoplast, Kinetonucleus, rhizoplast, Golgi body, mitochondrion vacuole and nucleus.

The cell contains a single large spherical nucleus in the middle of the body consisting of central karyosome or nucleolus.



Amastigote or Leishmanial form in man



Promastigote or leptomonad form in Sandfly