# Tikrit University

## College of Nursing

## Basic Nursing Sciences

## Second Year - 2023-2024

# Microbiology

# Leishmania

**By: lecturer**

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# Leishmania

Subphylum: Mastigophora

Leishmania

Taxonomical classification of Leishmania

Kingdom Protista

Subkingdom Protozoa

Phylum Sarcomastigophora

Subphylum Mastigophora

Class Zoomastigophora

Order Kinetplastida

Family Trypanosomatidae

Genus Leishmania

Species donovani, tropica, mexicana, braziliensis,

aethiopica, infantum

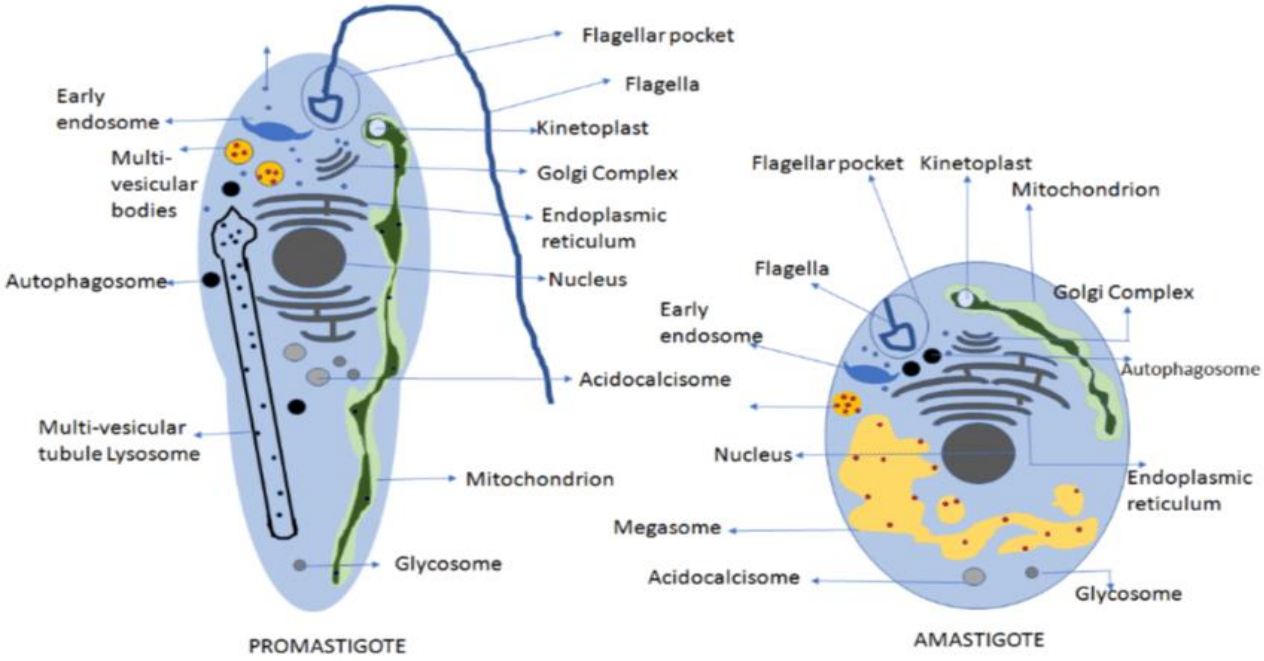
## Leishmania Parasites and Diseases

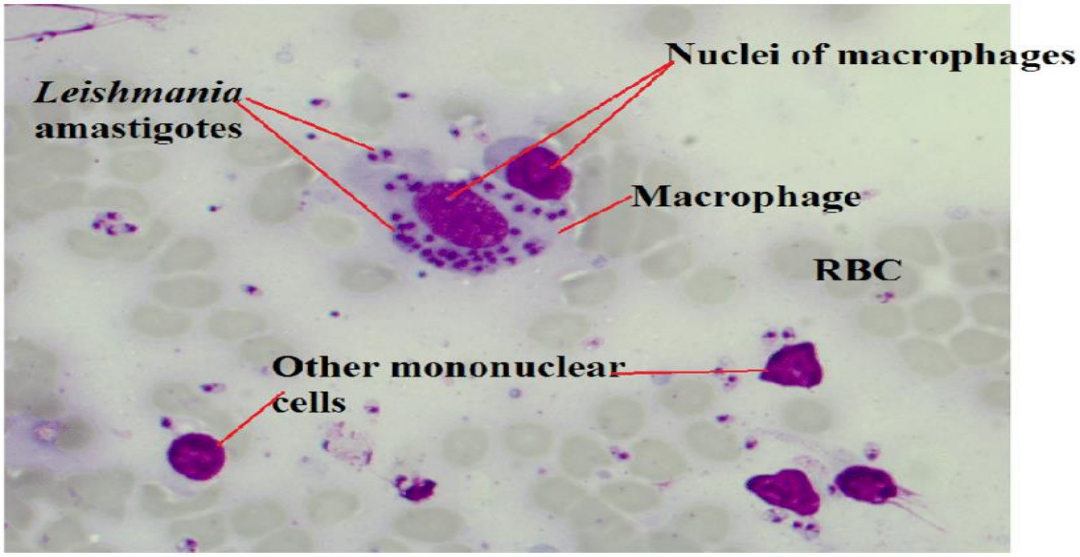
| SPECIES | Disease |
|---|---|
| Leishmania tropica major<br>Leishmania tropica minor<br>Leishmania aethiopica<br>Leishmania mexicana | Cutaneous leishmaniasis |
| Leishmania braziliensis | Mucocutaneous leishmaniasis |
| Leishmania donovani<br>Leishmania infantum | Visceral leishmaniasis |

## Morphology

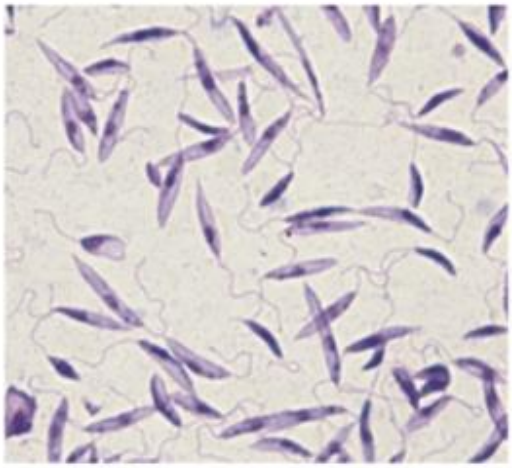
Digenetic Life Cycle

- 1- Promastigote
- 2- Amastigote

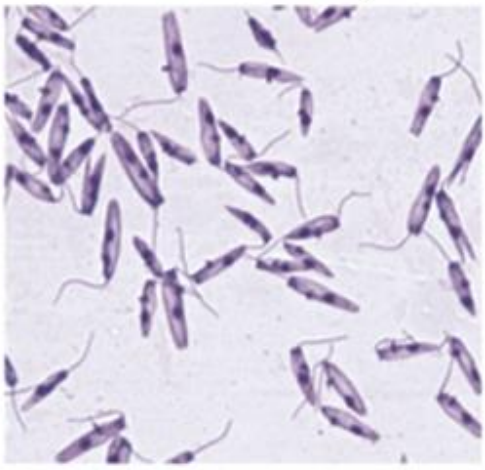


*Leishmania infantum*
laboratory sample



Sample of the new parasite
isolated from skin lesion



## 1- Promastigote:

• Vector phase

• Reside in the gut of sandfly

• Spindle shaped with 1 free flagellum

• Nucleus; cytoplasm; kinetoplast; basal body

## 2- Amastigote:

• Human phase, reside in macrophage

• Very, very minute elliptical body

• No free flagellum

• Nucleus: deep red, located at one side

• Cytoplasm: blue (after right stain)

• Kinetoplast: basal body

## Main Points of Life Cycle

• Host: man and sandfly

• No sexual development in the host

• Residing site: macrophage

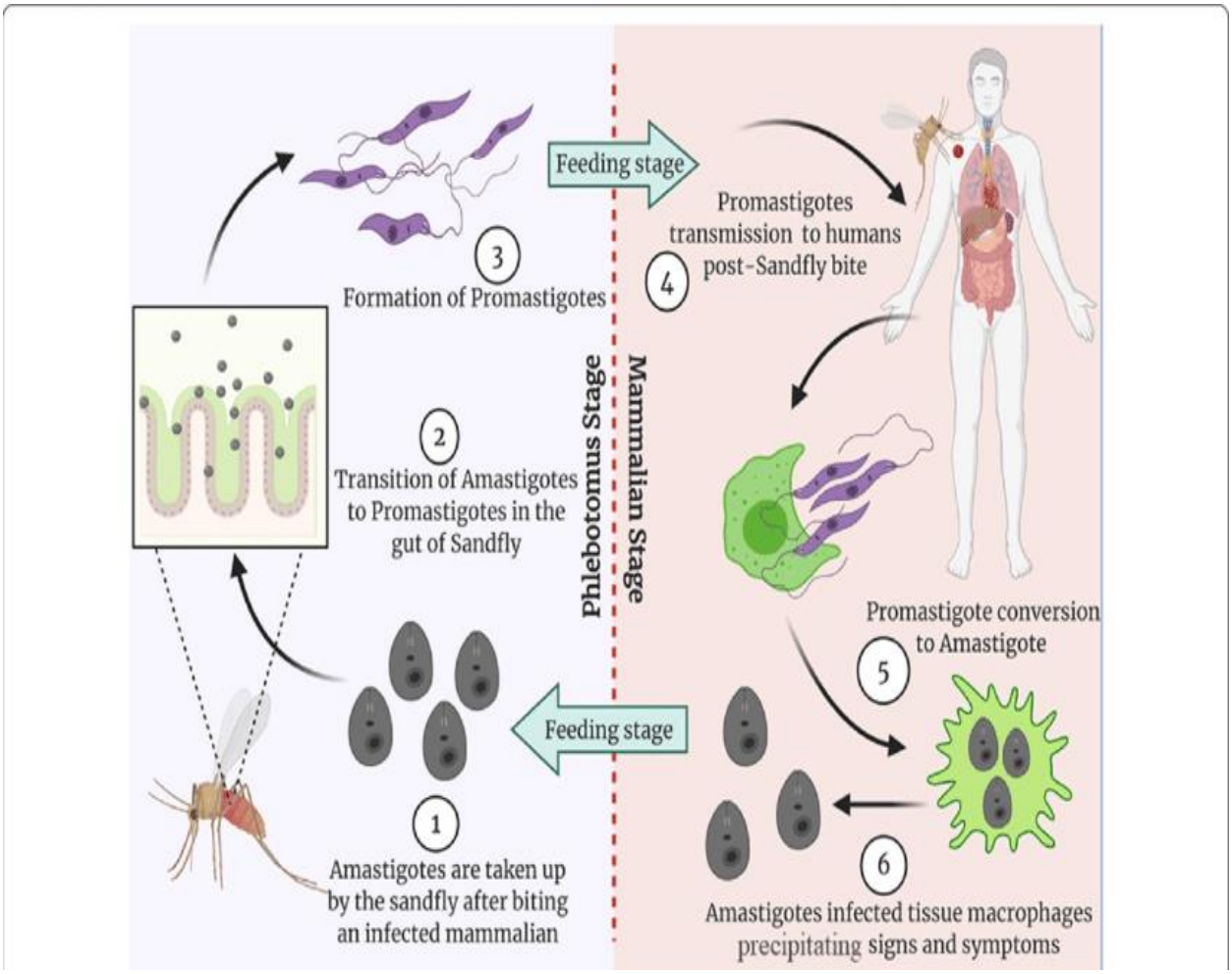
• Infective stage: promastigote

• Diagnostic stage: Amastigote

• Infective route: inoculation of sandfly

• Reservoir host: dog

• Infection could also via transfusion



## Clinical Spectrum of Leishmaniasis

**Cutaneous Leishmaniasis (CL)** Skin, Mucous membranes most common form, relatively benign self-healing skin lesions (simple CL)

**Mucocutaneous Leishmaniasis (MCL)**

simple skin lesions that metastasize to mucosae (especially nose and

mouth region)

**Visceral Leishmaniasis** (VL) Liver, Spleen, Bone marrow

Fatal (90% untreated), generalized infection of the reticuloendothelial

system, high mortality


Cutaneous leishmaniasis of the face.

## Visceral Leishmaniasis

Skin changes

Dark pigmentation or depigmentation (butterfly pigmentation) (also called Kala azar means black fever)


## Diagnosis of C. Leishmaniasis

**Clinically:**

Ulcer with sharp cut indurated margin

**Microscopy:**

To detect amastigotes at the edge of the ulcer by aspiration or biopsy

**Culture:**

To detect promastigotes

**Serological tests**

## Diagnosis of V. Leishmaniasis

**Clinically**:

Fever, hepatosplenomegaly

**Microscopy**:

To detect amastigotes in blood, liver, spleen, lymph node, bone marrow

**Culture**:

To detect

promastigotes

Animal inoculation

**Serological tests**