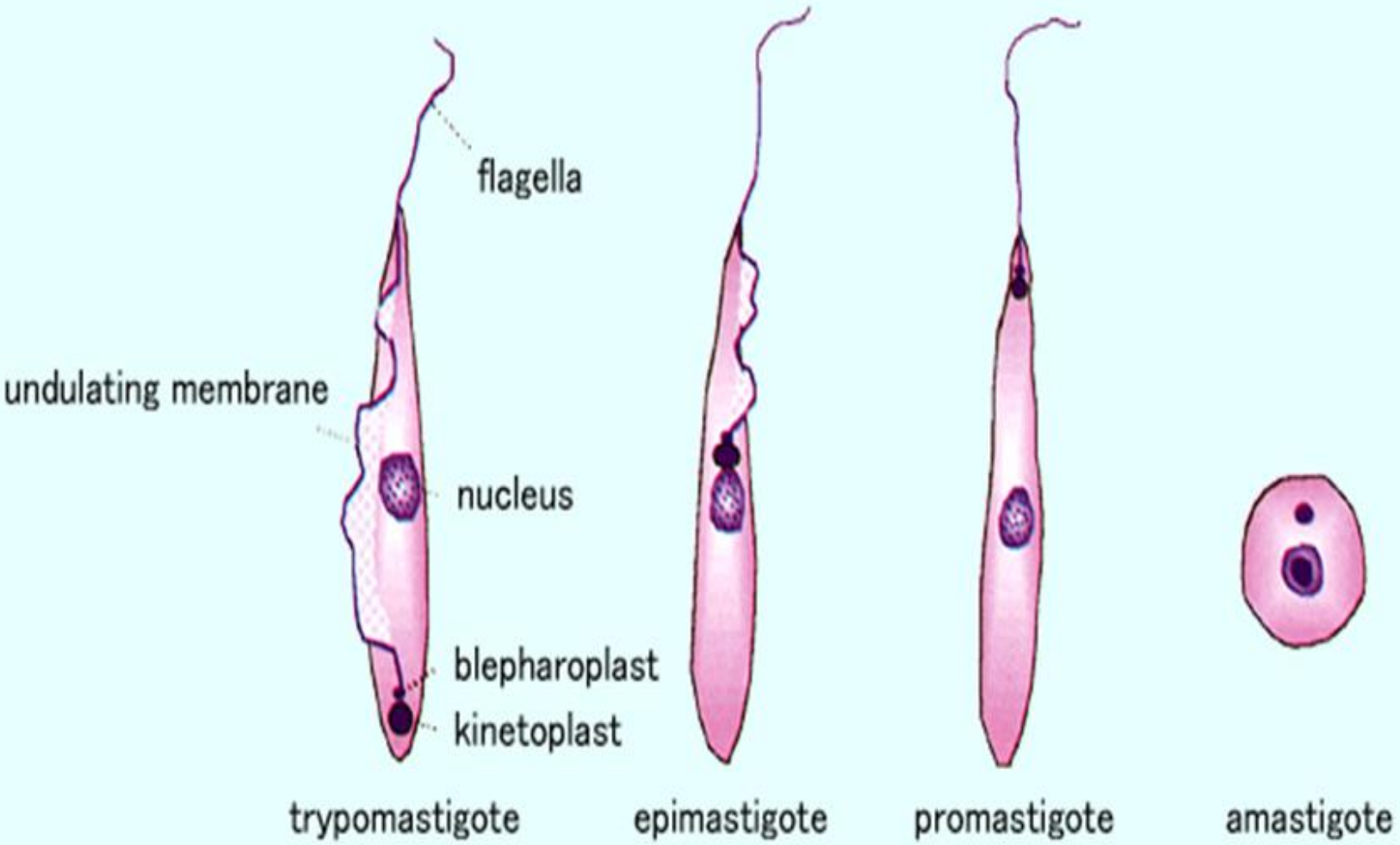
Haemoflagellates

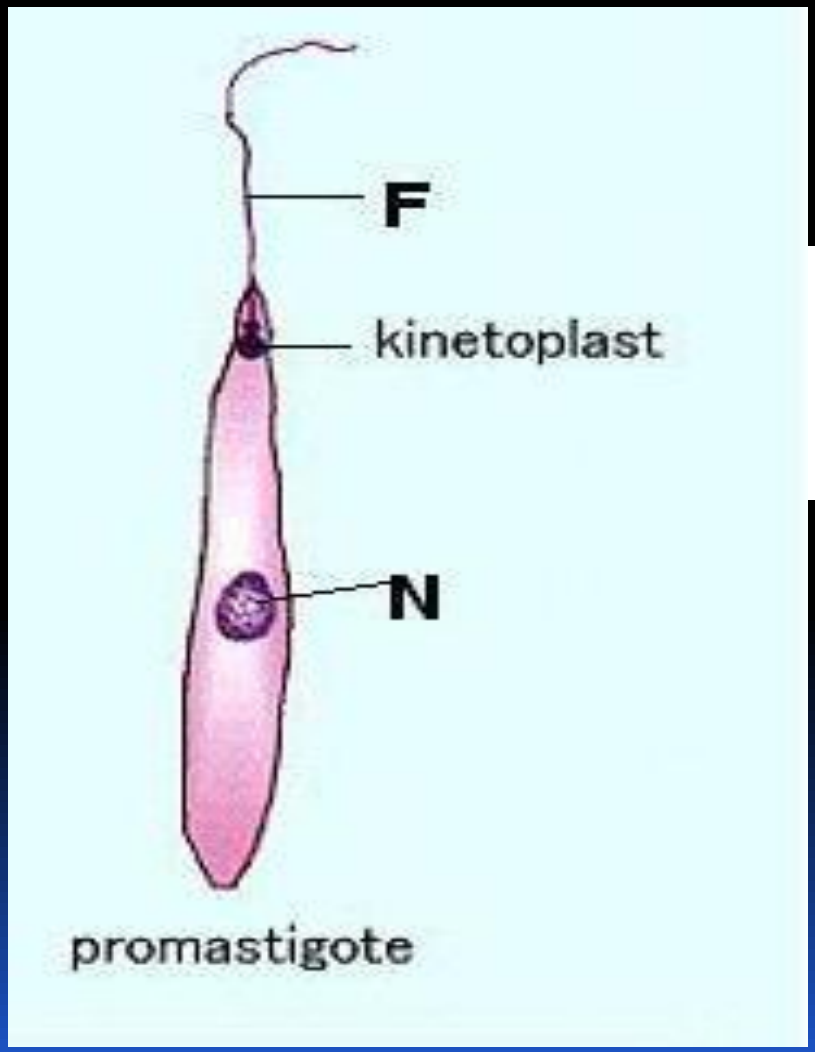
Leishmania

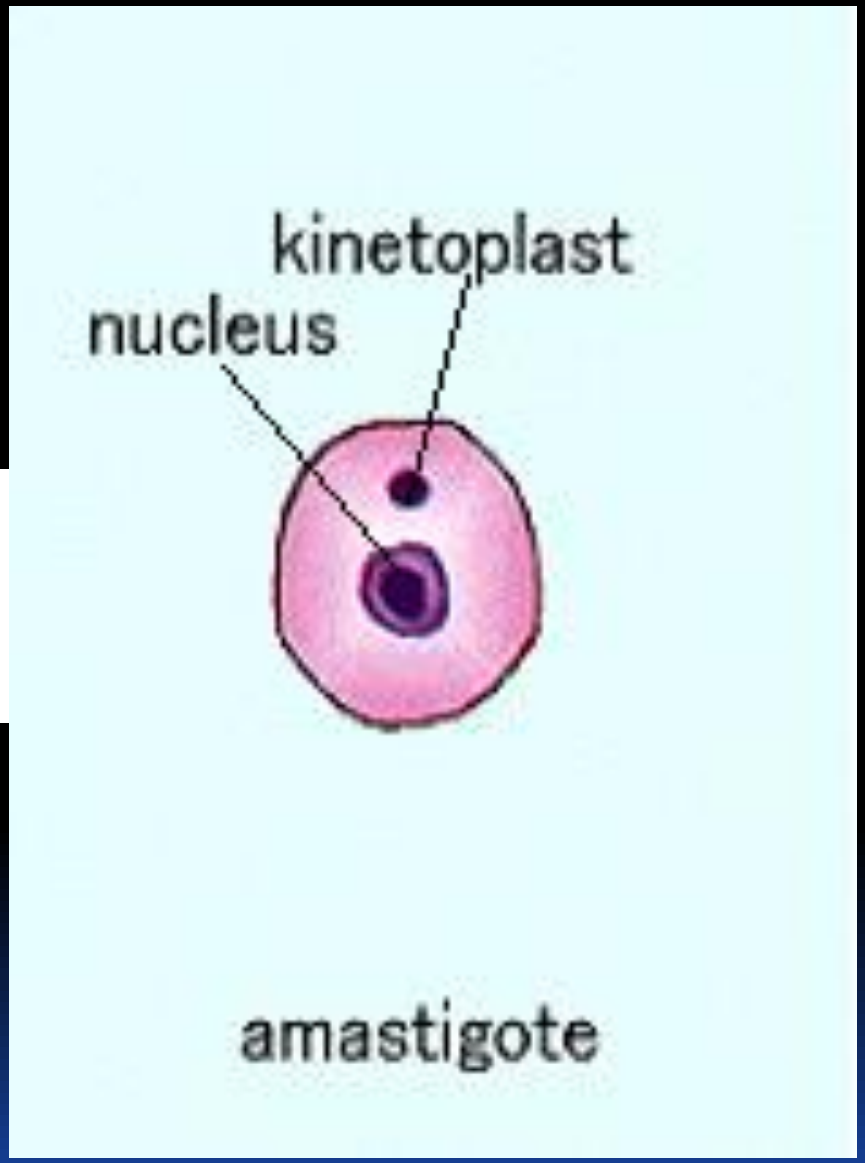
Dr. Ibrahim Alkhalife

Different stages of Haemoflagellates



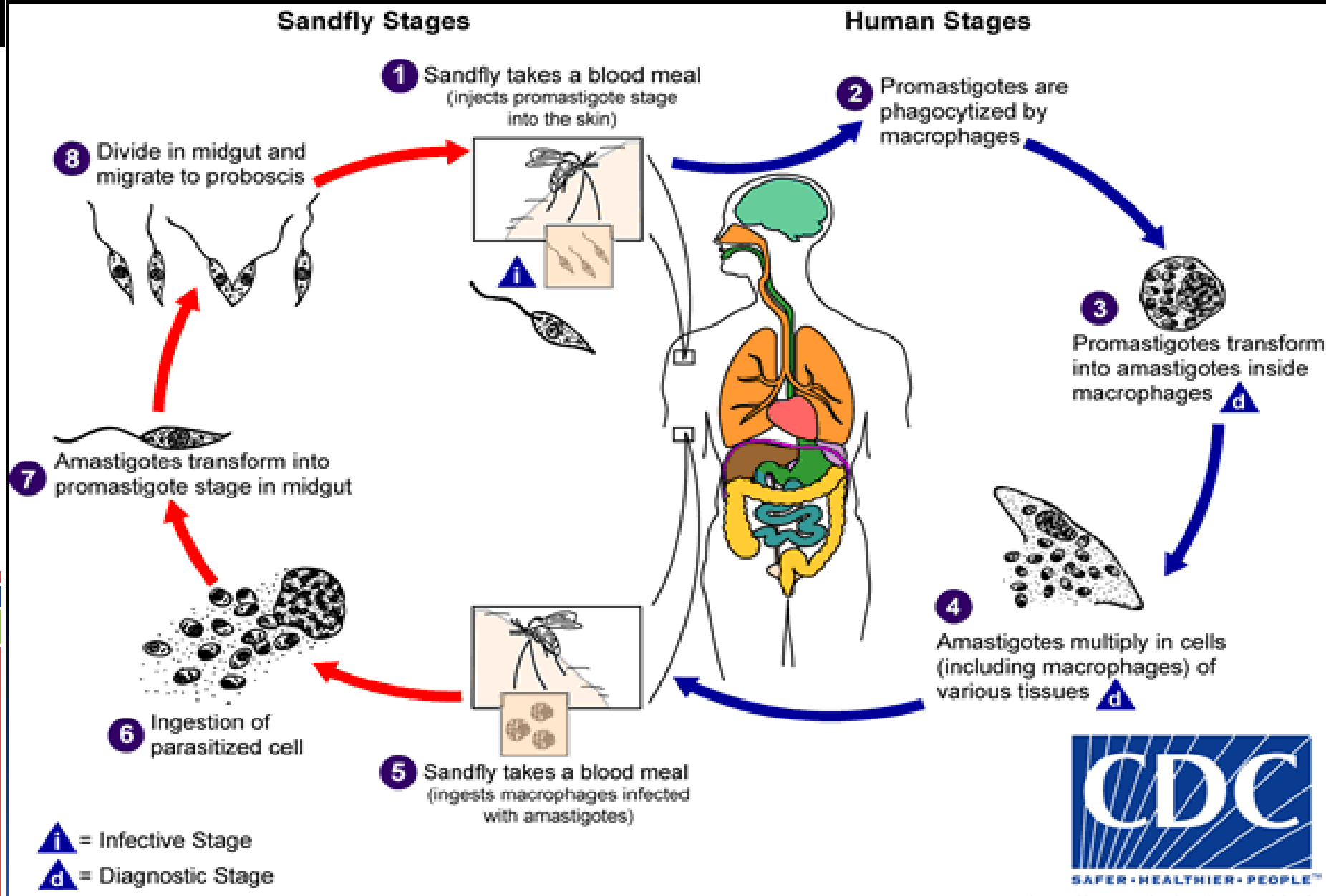
Promastigotes of *Leishmania*





Amastigote of *Leishmania*

The life cycle of *Leishmania*

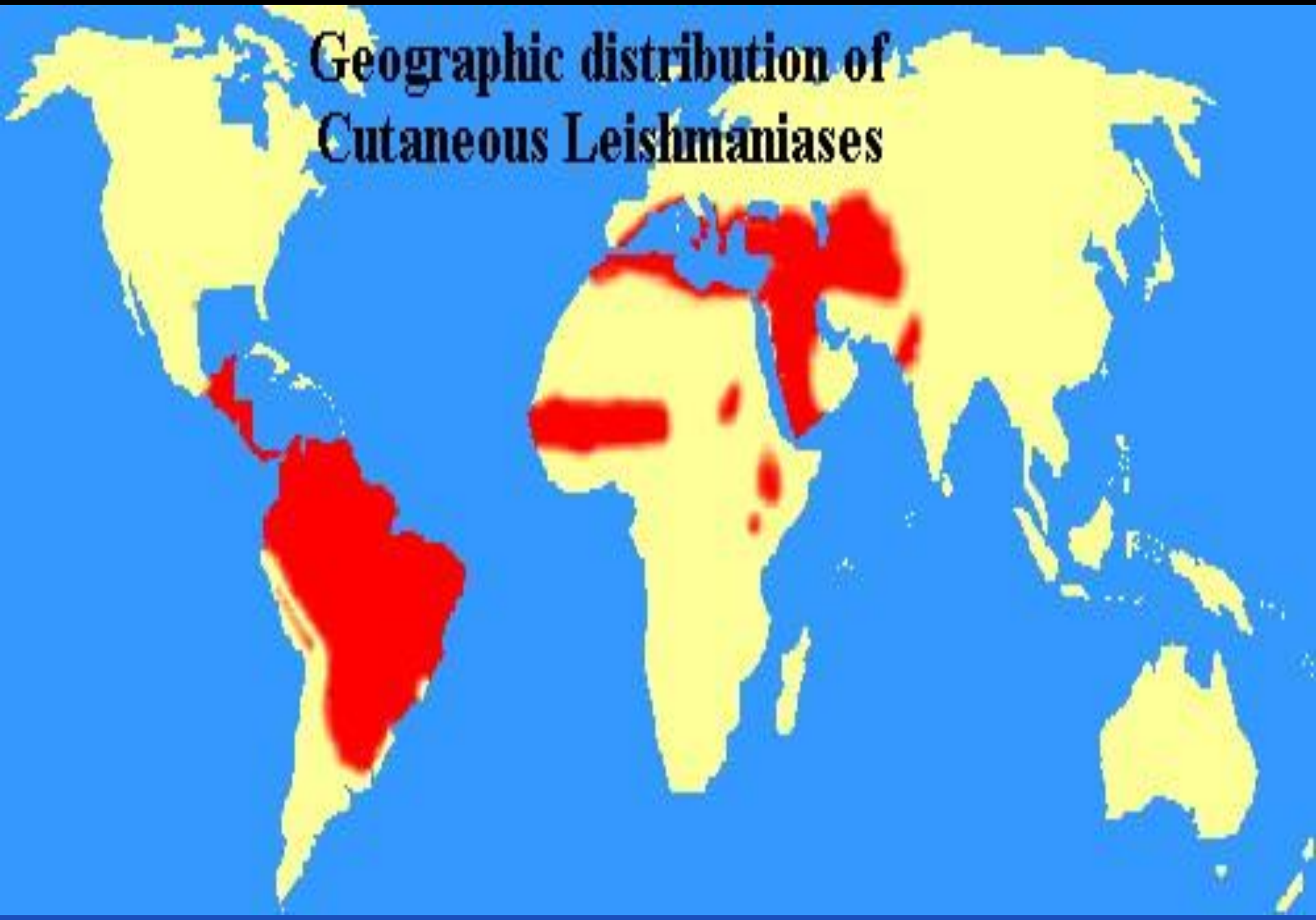


http://www.dpd.cdc.gov/dpdx

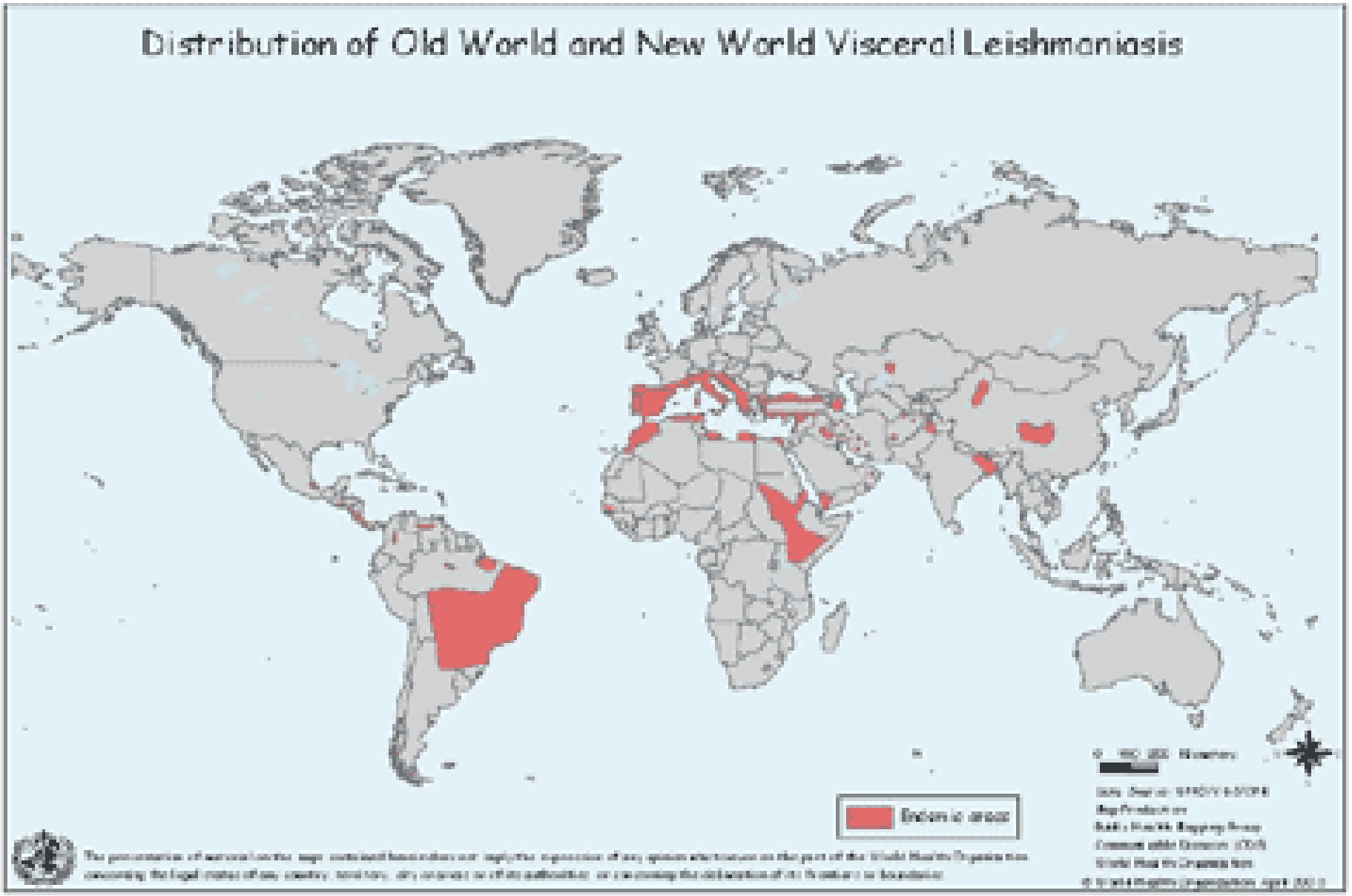
Leishmania Parasites and Diseases

SPECIES	Disease
*Leishmania tropica** *Leishmania major** *Leishmania aethiopica* *Leishmania mexicana*	Cutaneous leishmaniasis
Leishmania braziliensis	Mucocutaneous leishmaniasis
*Leishmania donovani** *Leishmania infantum** *Leishmania chagasi*	Visceral leishmaniasis

* Endemic in Saudi Arabia

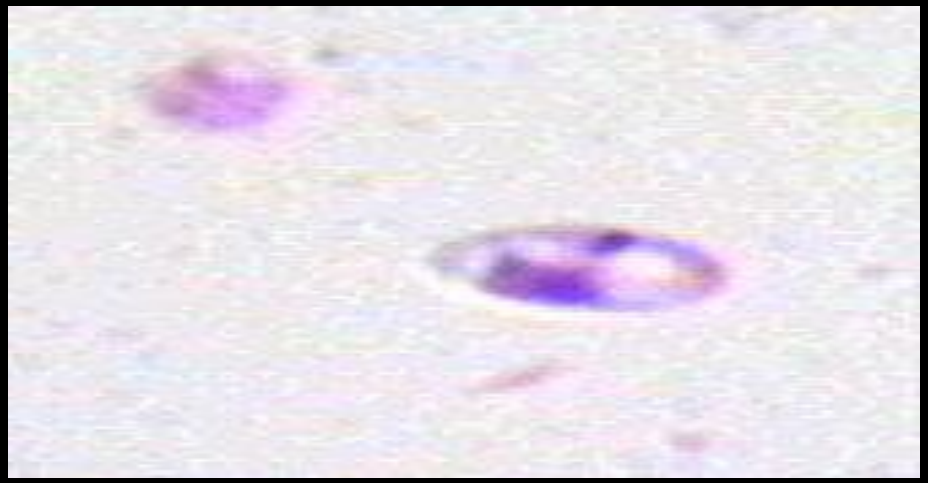

Geographic distribution of
Cutaneous Leishmaniases

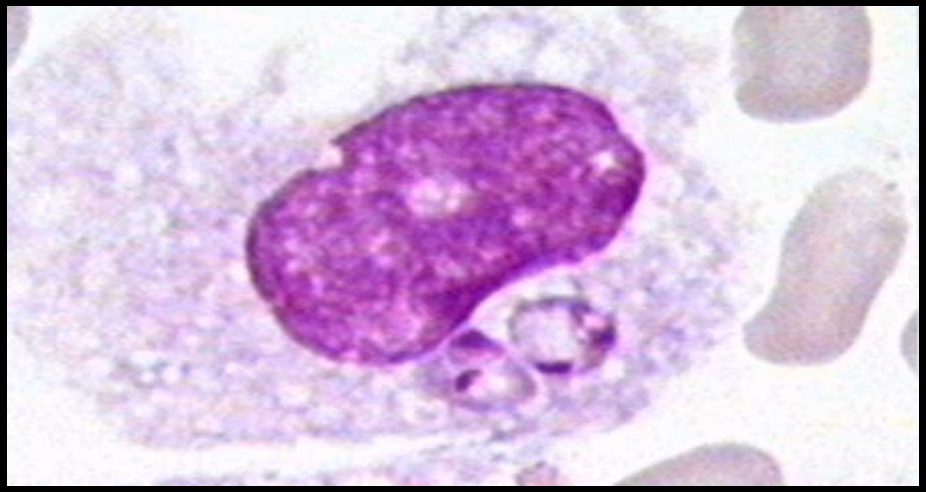
World distribution of Visceral Leishmaniasis

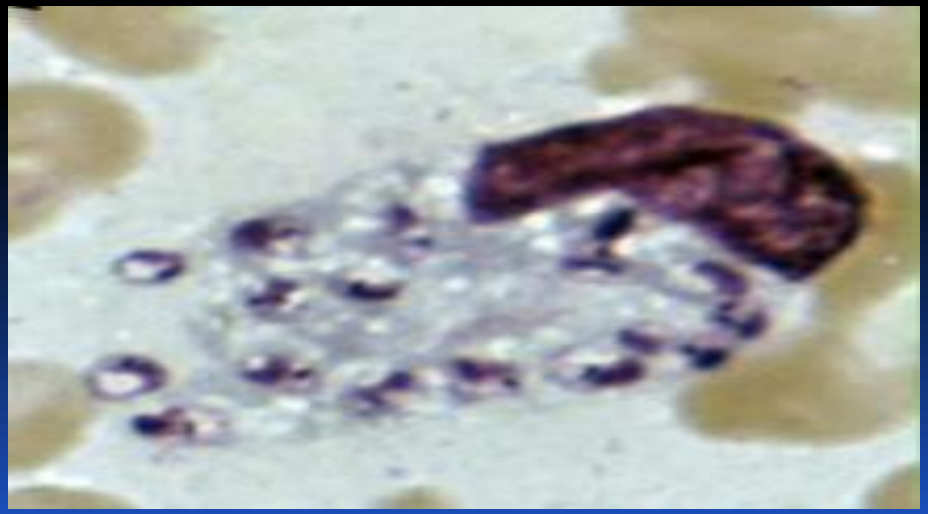


Sand fly

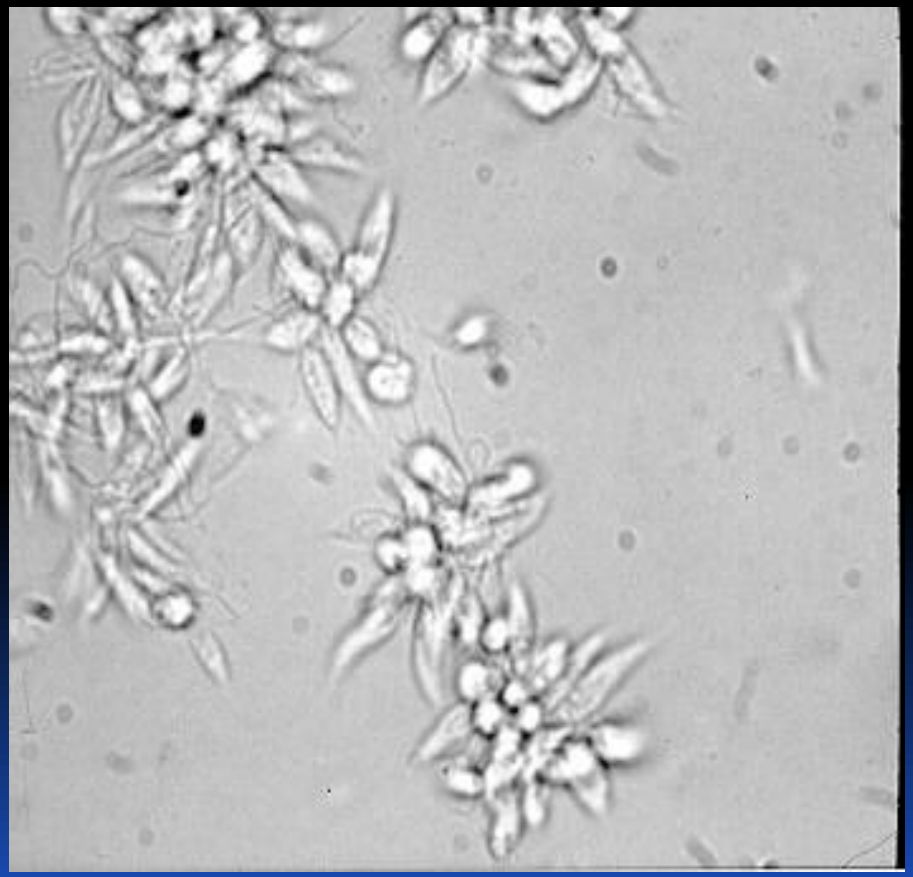
Amastigotes of *Leishmania*

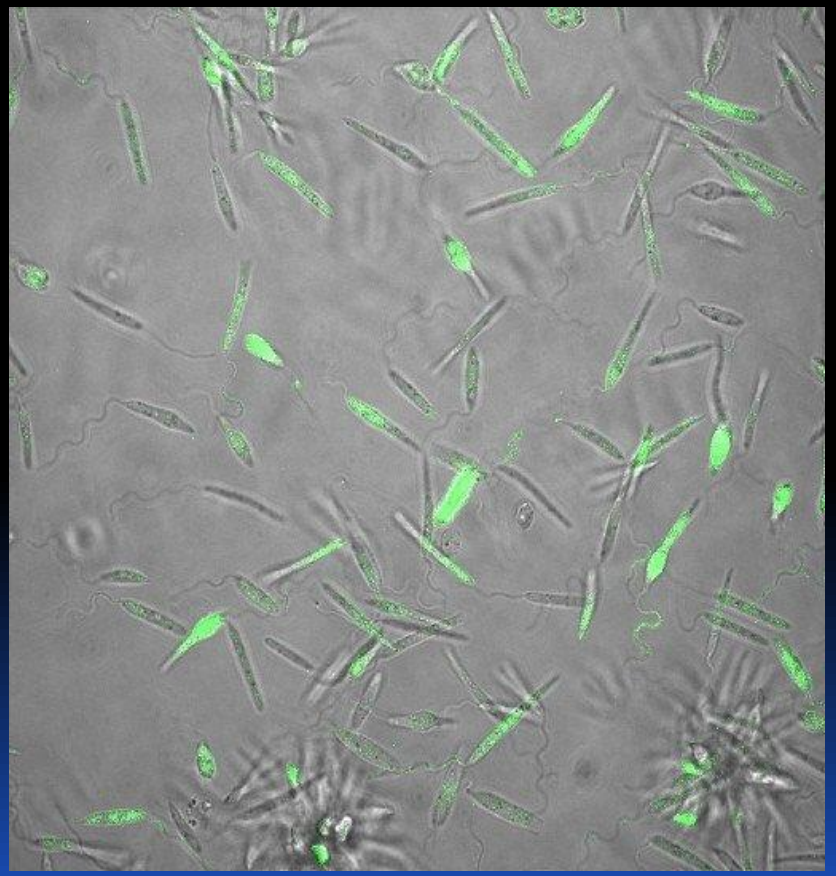




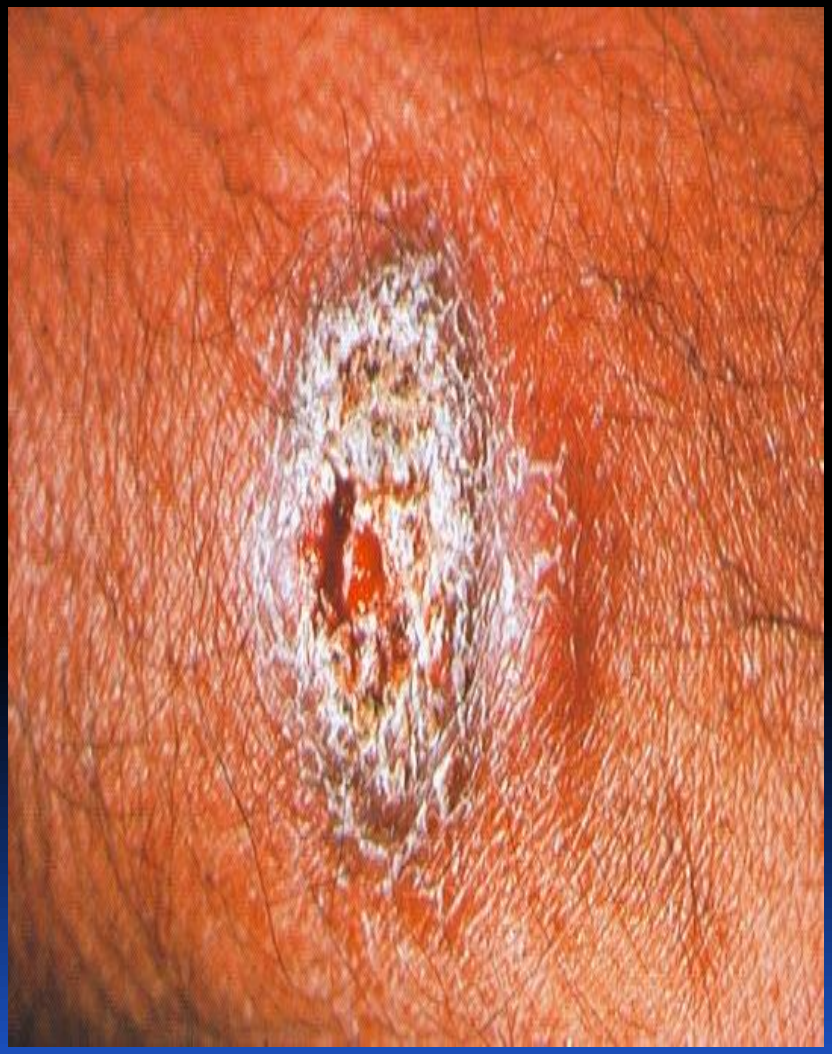


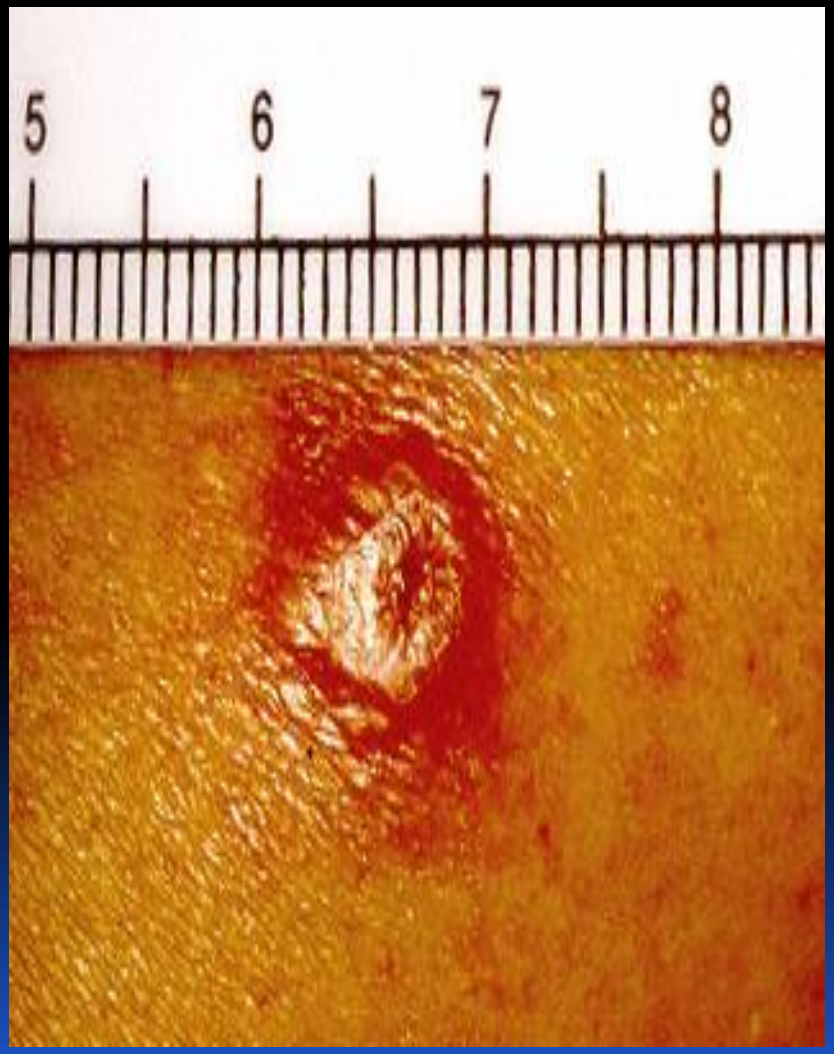
Promastigotes of *Leishmania*





lesion of cutaneous lishmaniasis





Clinical types of cutaneous leishmaniasis

- ***Leishmania major*:**

Zoonotic cutaneous leishmaniasis, wet lesions with severe reaction

- ***Leishmania tropica*:**

Anthroponotic cutaneous leishmaniasis, dry lesions with minimal ulceration

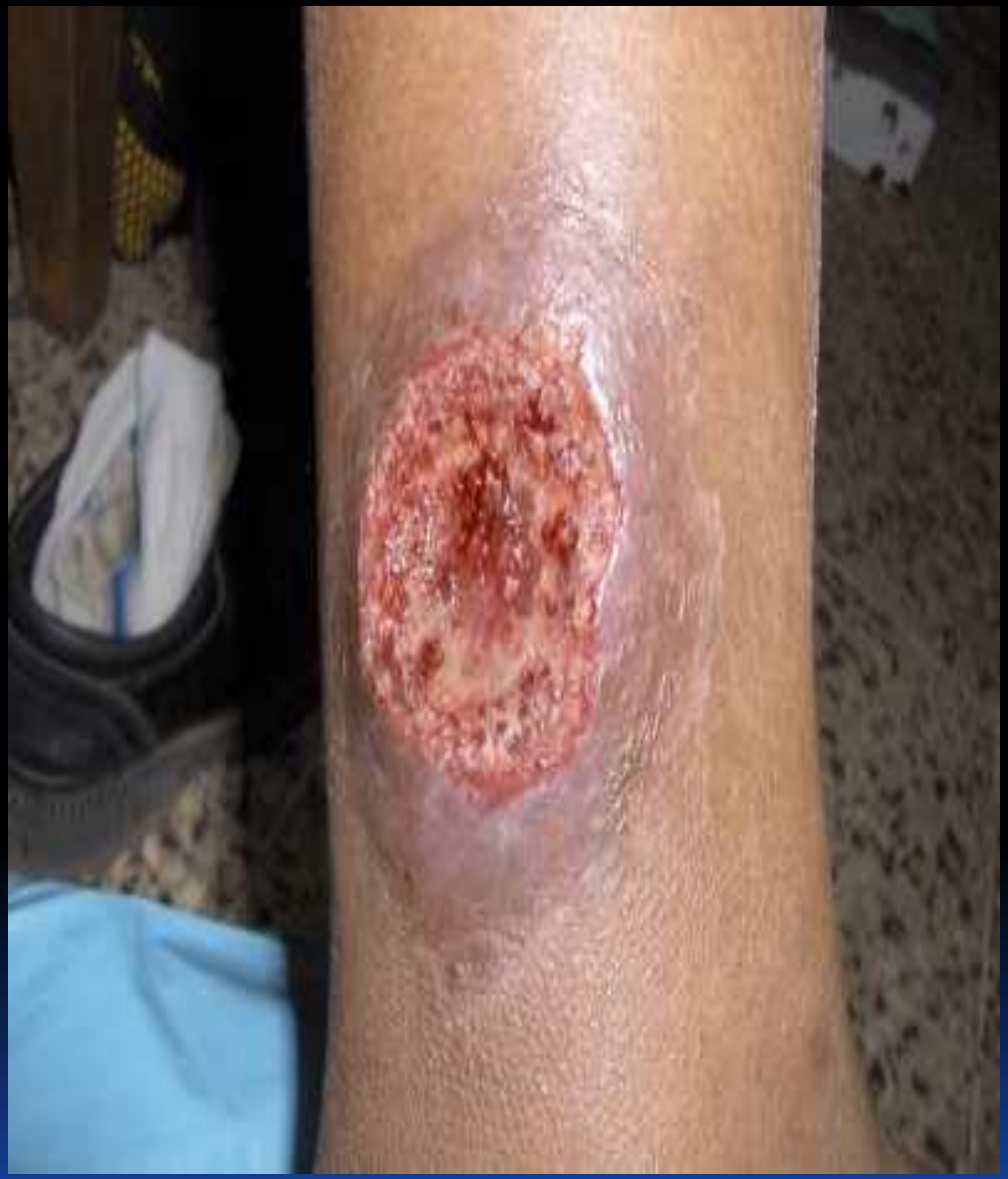
Oriental sore (most common) classical self-limited ulcer

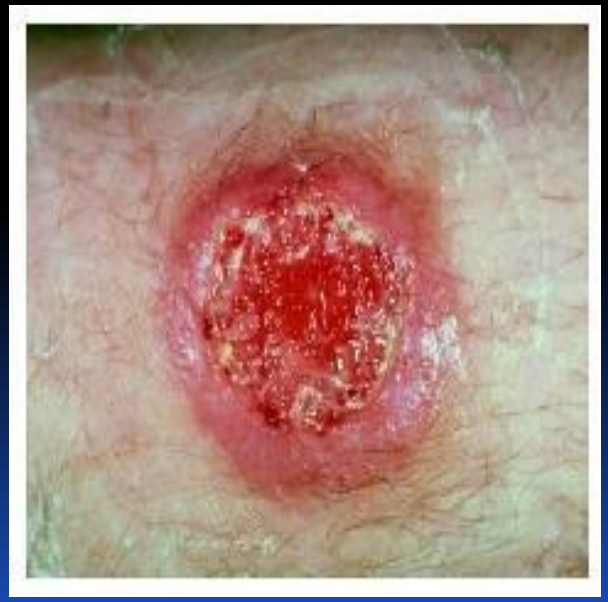
CUTANEOUS LISHMANIASIS THE COMMON TYPE

This starts as a **painless papule** on exposed parts of the body, generally the face.

The lesion ulcerates after a few months producing an ulcer with an indurate margin.
In some cases the ulcer remains dry and heals readily (**dry-type-lesion**).

In some other cases the ulcer may spread with an inflammatory zone around, these known as (**wet-type-lesion**) which heal slowly.





UNCOMMON TYPES OF CUTANEUS LISHMANIASIS

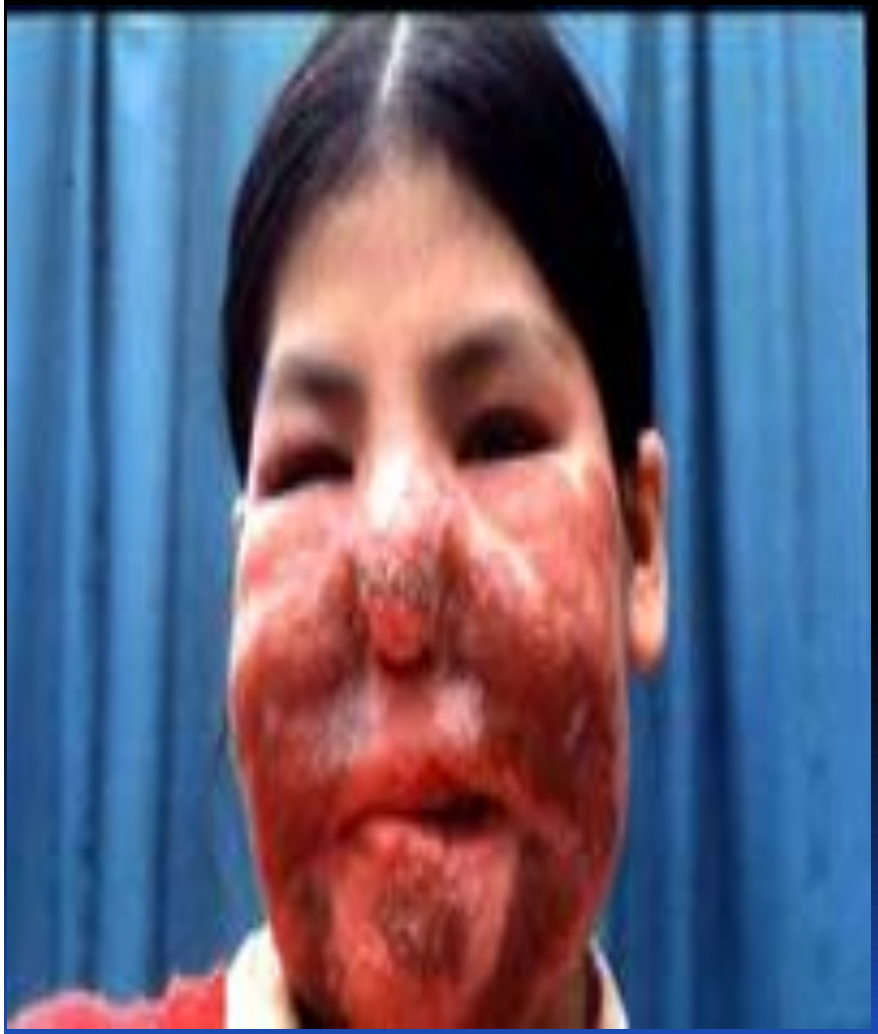
- **Diffuse cutaneous leishmaniasis** (DCL):

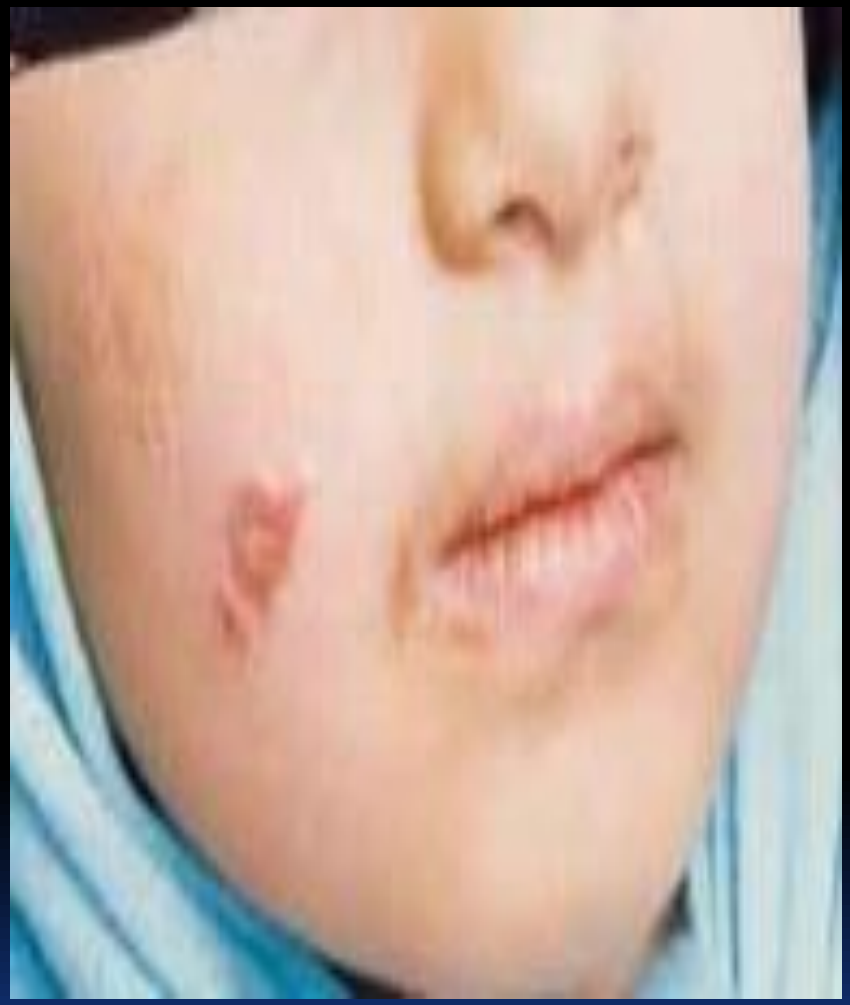
Caused by *L. aethiopica*, diffuse nodular non-ulcerating lesions, seen in a part of Africa, people with low immunity to *Leishmania* antigens. Diffuse cutaneous **(DCL)**, and consists of nodules and a thickening of the skin, generally without any ulceration, it needs numerous parasite.

- **Leishmaniasis recidiva** (lupoid leishmaniasis):

Severe immunological reaction to *leishmania* antigen leading to persistent dry skin lesions, few parasites.

Diffuse cutaneous leishmaniasis (DCL)



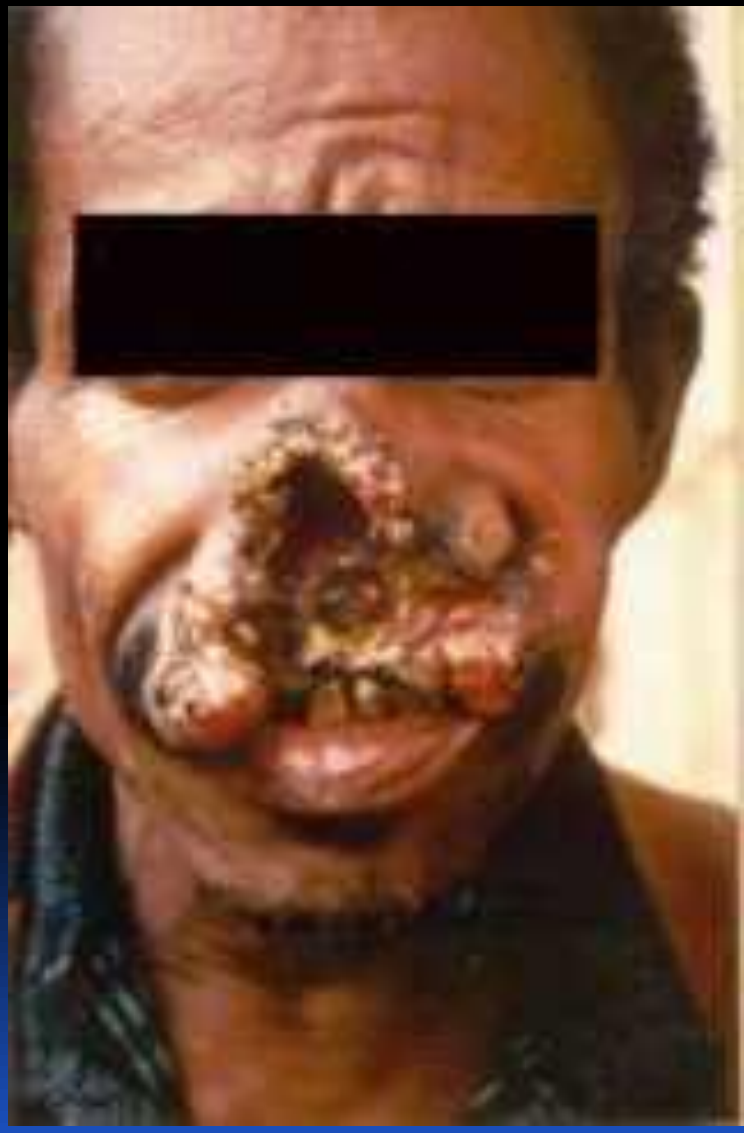


Leishmaniasis recidiva

Mucocutaneous leishmaniasis

The lesion starts as a pustular swelling in the mouth or on the nostrils. The lesion may become ulcerative after many months and then extend into the naso- pharyngeal mucous membrane.

Secondary infection is very common with destruction of the nasal cartilage and the facial bone.



cutaneous & muco-cutaneous leishmaniasis

Diagnosis

The parasite can be isolated from the margin of the ulcer.

A diagnostic skin test, known as Leishmanin test

(Montenego Test), is useful.

Smear: Giemsa stain – microscopy for LD bodies (Leishman-Donovan bodies, amastigotes).

- Skin biopsy: microscopy for LD bodies or culture in **NNN** medium for promastigotes.

NNN medium

Treatment

- **No treatment** – self-healing lesions
- **Medical:**
  - **Pentavalent antimony (Pentostam),** Amphotericin B
  - Antifungal drugs
  - +/- Antibiotics for secondary bacterial infection.
- **Surgical:**
  - Cryosurgery
  - Excision
  - Curettage

REFERENCE :WHO (2010) Control of leishmaniasis. Report of a meeting 571 of the WHO expert committee on the control of leishmaniasis. http://whqlibdoc.who.int/trs/WHO_TRS_949_eng.pdf

Visceral leishmaniasis

- There are geographical variations.
- The disease is called **kala-azar**
- *Leishmania infantum* mainly affect children
- *Leishmania donovani* mainly affects adults
- The incubation period is usually 4-10 months.
- The early symptoms are generally low grade fever with malaise and sweating.
- In later stages, the fever becomes intermittent and their can be liver enlargement or spleen enlargement or hepatosplenomegally because of the hyperplasia of the lymphoid –macrophage system.

Presentation

- Fever
- Splenomegaly, hepatomegaly, hepatosplenomegaly
- Weight loss
- Anaemia
- Epistaxis
- Cough
- Diarrhoea

Untreated disease can be fatal

After recovery it might produce a condition called post kala-azar dermal leishmaniasis (PKDL)

Fever 2 times a day due to kala-azar

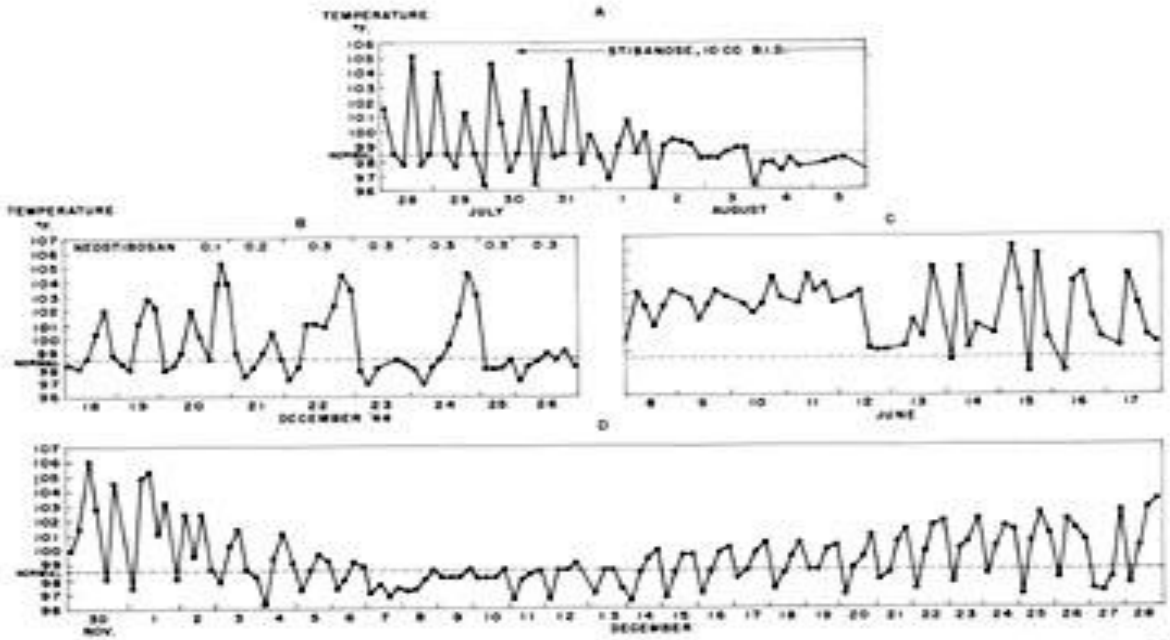
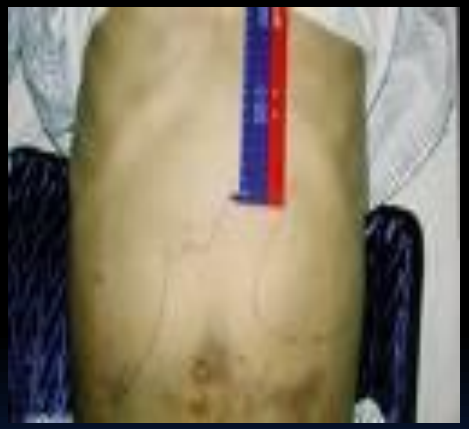


FIGURE 1.—Types of fever in untreated kala-azar and response to specific therapy. A. Daily intermittent fever before treatment. Note double daily peaks. This type of fever was present in this patient for almost 3 months before treatment. Note prompt control of fever after institution of specific therapy (200 cc. stibanose). No relapse occurred during 6 months' observation. B. Note control of fever in this patient within 6 days after institution of specific treatment (Neostibosan, 5.0 gm.). Before treatment, two rises in temperature (101°–105° F.) occurred daily for 4 months. The tertian periodicity that occurred during treatment may also occur in untreated patients and may simulate the form of malaria caused by *Plasmodium vivax*. C. Period of sustained fever simulating typhoid. Note characteristic double peaks later. D. Spontaneous remission and exacerbation of fever without treatment simulating undulant fever.

Hepatosplenomegaly in visceral leishmaniasis



Visceral leishmaniasis

Diagnosis

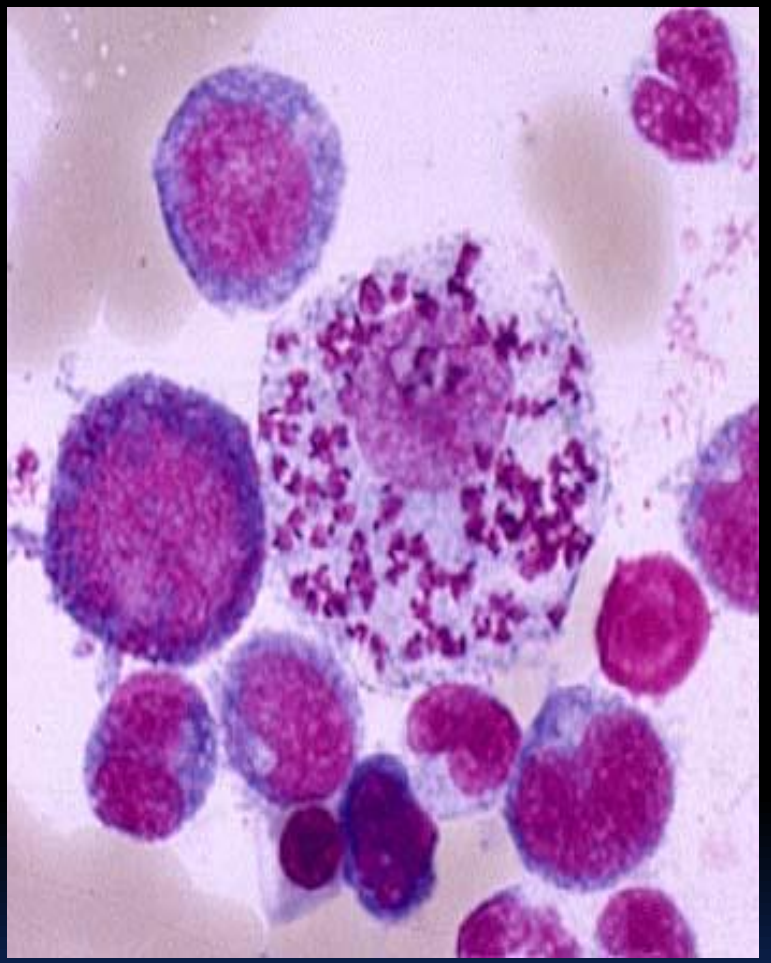
(1) Parasitological diagnosis:

Bone marrow aspirate
Splenic aspirate

Lymph node
Tissue biopsy

1. microscopy (LD bodies)
2. culture in NNN medium (promastigotes)

Bone marrow aspiration

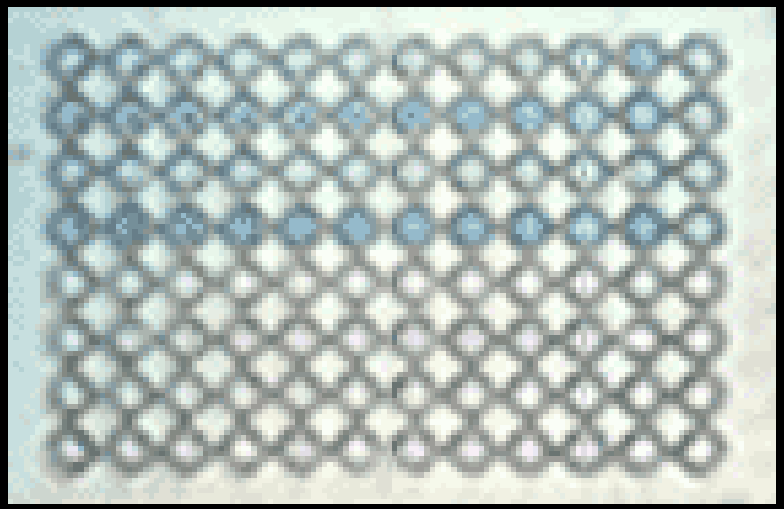


Bone marrow amastigotes

(2) Immunological Diagnosis:

- Specific serologic tests: Direct Agglutination Test (DAT), ELISA, IFAT
- Skin test (leishmanin test) for survey of populations and follow-up after treatment.

DAT test



ELISA test

Treatment of visceral leishmanisis

- Recommended treatment varies in different endemic areas:
  - Pentavalent antimony-sodium stibogluconate (Pentostam)
  - Amphotericin B

Treatment of complications:

- Anaemia
- Bleeding
- Infections etc.

REFERENCE :WHO (2010) Control of leishmaniasis. Report of a meeting 571 of the WHO expert committee on the control of leishmaniasis. http://whqlibdoc.who.int/trs/WHO_TRS_949_eng.pdf