

Trypanosoma & Leishmania

Parasitology Department
Medical Faculty University of
Sumatera Utara

CLASSIFICATION

GENUS & SPECIES	GENERAL FEATURES
<p>Genus : Trypanosoma</p> <p>Species :</p> <ul style="list-style-type: none">■ <i>T. gambiense</i>■ <i>T. rhodesiense</i>■ <i>T. cruzi</i>	<p>The trypanosomes are extracellular & live in the blood plasma.</p> <p>Generally, they have torpedo-shaped body flattened on both sides</p> <p>The shape of the posterior varies according to the species (<i>T. cruzi</i>, have pointed extremities)</p>

CLASSIFICATION

GENUS & SPECIES	GENERAL FEATURES
<p data-bbox="205 561 852 626">Genus : Leishmania</p> <p data-bbox="205 667 499 732">Species :</p> <ul data-bbox="205 773 869 1057" style="list-style-type: none"><li data-bbox="205 773 646 837">■ <i>L. donovani</i><li data-bbox="205 878 590 943">■ <i>L. tropica</i><li data-bbox="205 984 869 1057">■ <i>L. braziliensis, etc</i>	<p data-bbox="1066 561 1856 805">The leishmanias occur as intracellular parasite in their mammalian hosts. The typical leishmanial parasite in the vertebrate is a small, oval organism. Usually found i/t macrophage & other mononuclear phagocytes</p>

Stage of Leishmania & Trypanosoma in Man & Insect Host

Stage o/t Parasites	Amastogote	Promastigote	Epimastigote	Trypomastigote
<i>L. tropica</i> & <i>L. braziliensis</i>	Intracellular in macrophages of skin & subcutaneous tissue	In midgut, later proboscis of sand fly (Phlebotomus)	Lacking	Lacking

Stage of Leishmania & Trypanosoma in Man & Insect Host

Stage o/t Parasites	Amastogote	Promastigote	Epimastigote	Trypomastigote
<i>L. donovani</i>	Intracellular in macrophages :predominantly in liver, spleen, bone marrow& lymphnodes	In midgut, later proboscis of sand fly (Phlebotomus)	Lacking	Lacking

Stage of Leishmania & Trypanosoma in Man & Insect Host

Stage o/t Parasites	Amastogote	Promastigote	Epimastigote	Trypomastigote
<i>T. gambiense</i> & <i>T. rhodesiense</i>	Lacking	Lacking	In salivary glands of Glossina	In proboscis of tsetse fly, transfer stage to man; 1 st in bloodstream, lymphnodes, CNS

Stage of Leishmania & Trypanosoma in Man & Insect Host

Stage o/t Parasites	Amastogote	Promastigote	Epimastigote	Trypomastigote
<i>T. cruzi</i>	Intracellular in macrophages : skin, lymphnodes, liver, spleen, myocardium, brain, endocrine glands	Transitional stage only	In midgut of triatomid bug	In feces of triatomid bug, transfer stage to man, present in blood stream only during acute attacks

Type	West African trypanosomiasis	East African trypanosomiasis
Causative Agent	<i>T. gambiense</i>	<i>T. rhodesiense</i>
General	<ul style="list-style-type: none"> ■ Transmission is of a <ul style="list-style-type: none"> ■ human-vector-human ■ cycle (domestic cycle) ■ Reservoirs host : wild ■ animal 	<ul style="list-style-type: none"> ■ Transmission is between animal-vector-human (sylvanic cycle) ■
Vector	<i>Glossina sp. (G. palpalis, G. tachinoides, G. fuscipes)</i>	

African trypanosomiasis divided in three phases

Phase	Clinical Features
Subcutaneous	<ul style="list-style-type: none">-48 hours after bite-local multiplication, ulcer, primary chancre (<i>T. rhodesiense</i>)
Haemolymphatic	<ul style="list-style-type: none">-3 weeks after bite-Characteristic : numerous wave o/t trypanosome populations appear at irregular intervals i/t blood stream, lymphadenopathy (Winterbottom's sign)

African trypanosomiasis divided in three phases

Phase	Clinical Features
Haemolymphatic	- intermittent attacks : pyrexia, papular skin rashes, headache, edema, joint & muscle pains
Meningoencephalitic	- The CNS is affected. Increase IgM, WBC & proteins in spinal fluid -Insomnia, motor & sensory disorders, somnolence, convulsion..... sleeping sickness

American trypanosomiasis (Chagas'disease)

- Modes of infections : blood transfusion, transplacental transmission & laboratory accidents
- The diseases :
 - Acute** : Romana's sign, chagoma, low fever, malaise, hepatosplenomegaly, lymphadenopathy, meningoencephalitis

American trypanosomiasis (Chagas'disease)

- Chronic :
cardiac sequelae, gastrointestinal forms
- Congenital : premature

Leishmaniasis

The disease may take one o/t following three forms :

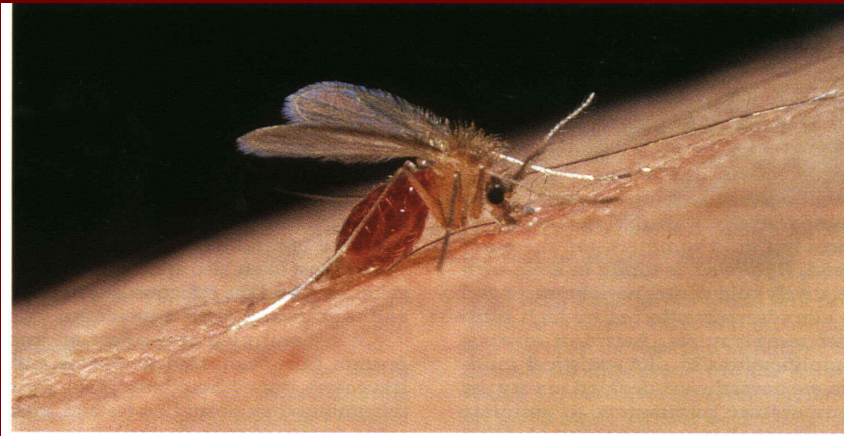
- Cutaneous leishmaniasis (Oriental sore) : multiple nodular lesion
- Mucocutaneous leishmaniasis : ulcer
- Visceral leishmaniasis : Kala Azar

Kala azar

- Causative agent : *L. donovani*,
L. infantum, *L. chagasi*
- Incubation period : 2-3 months
- Affected organ : REC o/t spleen, liver, BM,
lymph nodes, intestinal mucosa
- Dx : finding parasite in stained smears
from splenic puncture, skin test, multiple
cultures in NNN, serology

Phlebotomus sp

- Small size hairy gnats or midges : 1.5-4 mm in length
- Commonly known as the sand flies
- At rest, the 2 wings are held upward & outward, the costal margins from angles of about 60 degrees with each other & with the body



Phlebotomus sp

- The females alone have piercing mouth parts & are blood suckers
- These gnats are active at night & when there is little or no wind
- They rest in shelters in crevices, caves, among vegetation & dark corners of buildings
- Their weak, noiseless flight is usually in short 'hops'

Glossina sp

- The flies are of medium size, brownish in colour, the body is wasp-like, the wings when at rest are crossed scissors like & extend well beyond the tip o/t abdomen
- The wing venation is characteristic in that 4th longitudinal vein bends sharply upward before it meets the anterior transverse vein

Glossina sp

- The stout proboscis points bayonet-like in front o/t head
- A characteristic onion shaped bulb is situated at the base o/t haustellum
- Both sexed feed avidly & exclusively on blood



Glossina palpalis (Tse tse fly)

Reduviid bugs

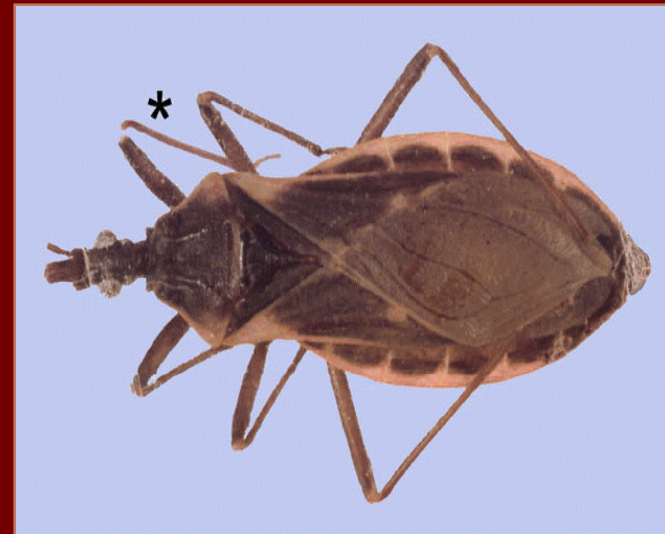
- Vector of Chagas Disease
- The head o/t arthropod is more or less elongated or cone shaped & has remarkably free movement
- The sturdy three segmented proboscis
- The piercing stylets can extend far beyond the tip o/t proboscis

Reduvid bugs

- The parasite is sucked up by the vector bugs as free trypomastigote or intracellular amastigote within the host cell
- In the midgut o/t vector, the organism becomes flagellated a& binary multiplication occurs

Reduviid bugs

- The flagellated form migrates to the hindgut & transforms into the slender metacyclic trypomastigote form. The parasites are discharged i/t feces o/t bug at the time of a blood meal



- Kissing bug
(*Triatoma infestans*)



THANK YOU