

Trypanosoma species

Trypanosomes are hemoflagellates and three species of the genus *Trypanosoma* are responsible for disease in humans & domestic animal (zoonotic parasites).

- blood or tissue fluids; intracellular
- mostly transmitted through invertebrate vectors
- the infective stage for all species (metacyclic trypomastigote).
- Cause 2 diseases in human
 - 1- African trypanosomiasis (sleeping sickness)
 - 2- American trypanosomiasis (Chagas' disease)

Clinical disease	Trypanosome species	Vector
-African trypanosomiasis		
1- Gambian type (west African sleeping sickness)	<i>-T.gambiense</i>	-Tsetse fly (<i>Glossinia</i>)
2- Rhodesian type (east African sleeping sickness)	<i>-T. rhodesiense</i>	-Tsetse fly (<i>Glossinia</i>)
-American trypanomiasis	<i>T. cruzi</i>	Reduviid or kissing bug (<i>Triatomid</i> bug)

Development:

Anterior station - Salivaria

- **division of trypomastigotes in midgut of vector**

migration of parasite forward into the upper digestive tract (eg. salivary glands)

metacyclic trypomastigotes passed to vertebrate host when the vector feeds.

Salivarian (eg. *T. brucei gambiense*) by tse-tse fly.



Posterior station - Stercoraria

- parasite in the hindgut transforms into epimastigotes and metacyclic trypomastigotes.
- move back through the digestive tract
- metacyclic trypomastigotes are passed to the vertebrate host in the vector feces.
- Stercocarian (eg. *Trypanosoma cruzi*) by kissing bugs.

**life Cycle African Trypanosomiasis**

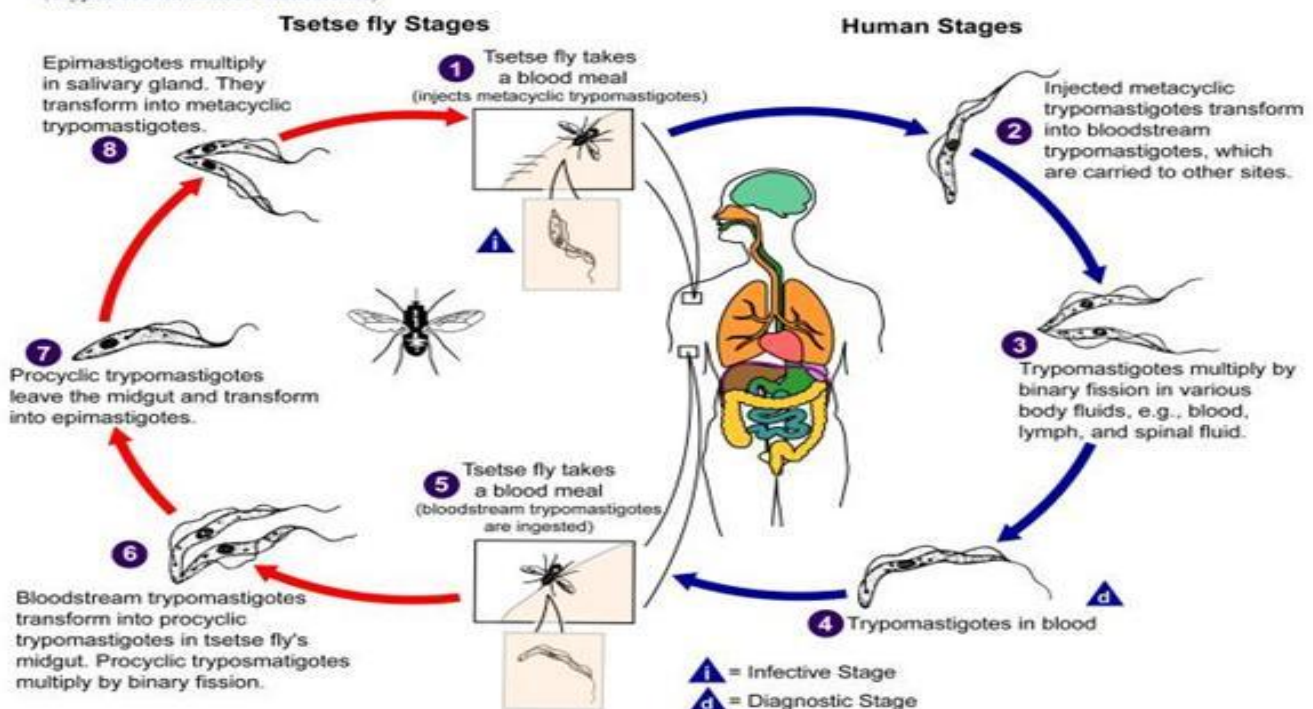
Transmission from one vertebrate to another is carried out by blood-sucking invertebrates, usually an insect. The vector for African Trypanosomiasis is the Tsetse fly, *Glossina* spp. which cause the diseases *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense*.

Infective stage :-Metacyclic trypomastigotes

Sleeping Sickness, African (African trypanosomiasis)

(*Trypanosoma brucei gambiense*)

(*Trypanosoma brucei rhodesiense*)



Pathogenesis African trypanosomiasis

General

- Trypanosomes live in blood, lymph nodes, spleen – therefore not intracellular
- Particularly abundant in intercellular spaces in brain

Humans

- Local reaction: painful sore at site of bite, disappears after a couple of weeks
- Trypanosomes reproduce rapidly once enter blood and lymph system – generalized invasion of all organs
- Winterbottom's sign – swollen nodes at base of skull
- CNS signs – increased apathy, dullness, tremors, convulsions, coma, death

Laboratory Diagnosis of African trypanosomiasis

Laboratory diagnosis of African Trypanosomiasis is by:

- Examination of blood for the parasites
- Examination of aspirates from enlarged lymph glands for the parasites
- Examination of the CSF for the parasite
- Detection of trypanosomal antibodies in the serum

Pathogenesis American Trypanosomiasis

General

- Trypomastigote enter blood;
- Invade host cells of RES, skeletal and cardiac muscle
- Cell breakdown, release of amastigotes; Infection of additional cells
- Production of neurotoxins affecting conducting systems
- Muscles lose ability to contract, Megacolon, - esophagus, heart

Laboratory Diagnosis of American Trypanosomiasis

Laboratory diagnosis of South American trypanosomiasis is by:

- Examination of blood.
- Xenodiagnosis
- Blood culture
- Serology

1. Examination of Blood

a) Thick and thin blood films are made and stained with Fields stain and examined as for malaria parasites. Wet preparations of blood can also be examined for motile trypanosomes.

b) Buffy coat examination - Trypanosomes are centrifuged in a microhematocrit tube for 5 minutes. Parasites can be seen microscopically at the junction of the packed red cells and plasma. This technique is rapid and sensitive.

Trypanosoma cruzi can often be seen in C, U or S shapes in stained films.

2. Xenodiagnosis

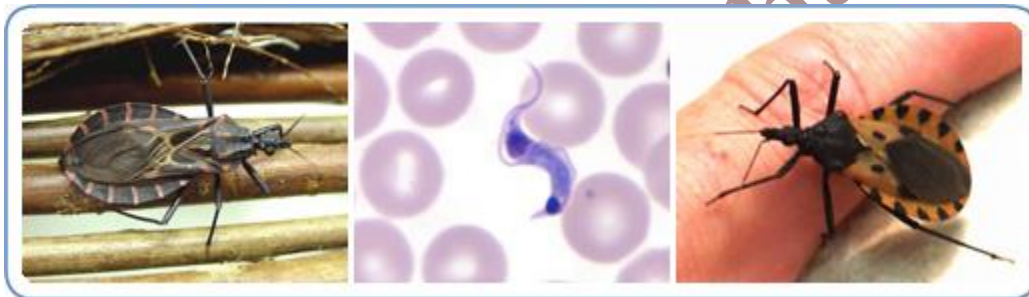
Xenodiagnosis is useful in chronic and sub acute (low parasitaemia) disease. Sterile bugs are fed on patients by attaching a black bag containing the bugs to the arm of the patient and allowing them to feed for 30 minutes. Twenty five to thirty days later the bugs are dissected and the contents of the hindgut and rectum are examined microscopically for the presence of trypanosomes.

3. Blood Culture

4. Serology



Trypanosome brucei



Trypanosoma cruzi

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