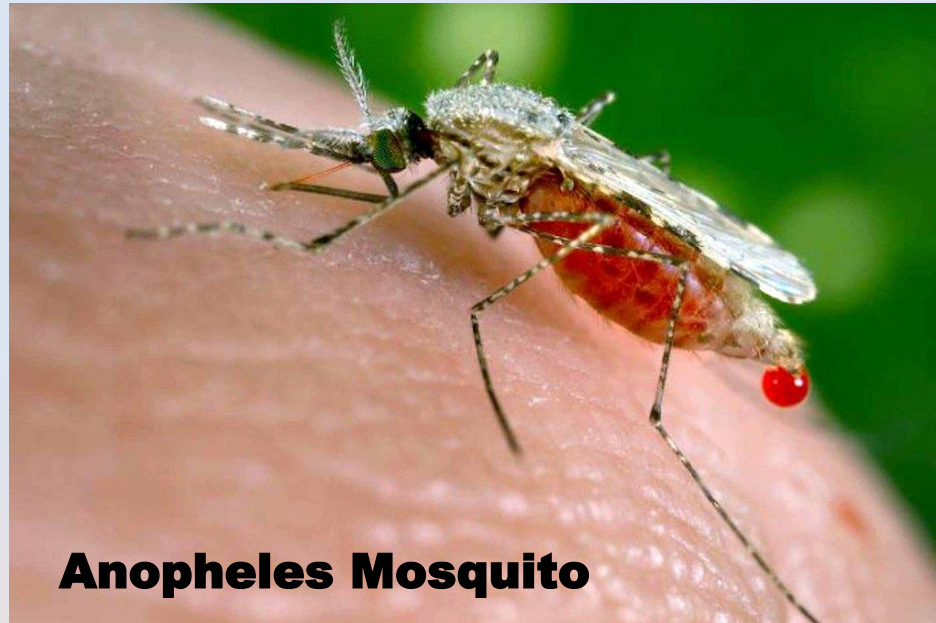


BLOOD AND TISSUE PARASITES

Microbiology Practical Class



MALARIA



➤ **LABORATORY DIAGNOSIS OF MALARIA**

Malaria Can Be Diagnosed Commonly By:

1- MICROSCOPY (LIGHT MICROSCOPE):

Uses a blood smear to identify whether parasites are present in the patient's blood.

- **Thick film:** for screening
- **Thin film:** for different species identification

2 - RAPID DIAGNOSTIC TESTS (RDTs):

RDTs are quick tests for screening that use a drop of blood from the finger tip to identify whether parasites are present in the patient or no.

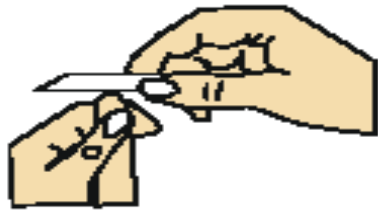
3- SEROLOGY

4- PCR

➤ LABORATORY DIAGNOSIS OF MALARIA

LIGHTMICROSCOPY

1- Preparing blood film (Thick & Thin)



1
Touch the blood drop with a clean slide.



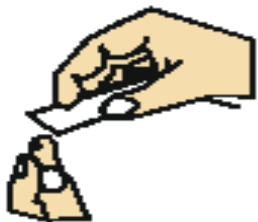
4
Take this slide and hold the edge that has the blood drop at an $\sim 45^\circ$ angle against the surface of the first slide. Wait until the blood completely spreads along the edge of the second slide.



2
Using the corner of another slide, spread the blood drop into the shape of a circle or square of $\sim 1\text{cm}^2$.



5
While holding the second slide at the same angle, rapidly and smoothly push the slide forward.



3
Gently squeeze the patient's finger again, and touch the edge of a clean slide to the newly formed blood drop.



6
Write the identification number on the slide. Wait until the thick film is completely dry before staining it.

➤ LABORATORY DIAGNOSIS

LIGHTMICROSCOPY



2- Video showing Preparing of Thin and Thick blood film

<https://youtu.be/aEAXYJ7XaCg>

➤ LABORATORY DIAGNOSIS

LIGHTMICROSCOPY

3- Interpreting Thick and Thin Films

THIN FILM



- fixed RBCs, single layer
- smaller volume
- good for species identification
- requires more time to read

THICK FILM



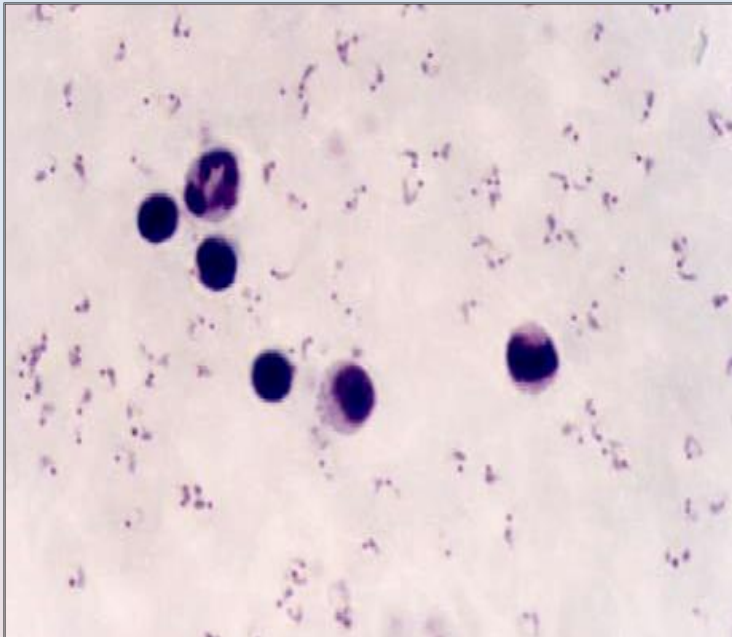
- lysed RBCs
- larger volume
- good screening test
- positive or negative

➤ LABORATORY DIAGNOSIS

LIGHTMICROSCOPY

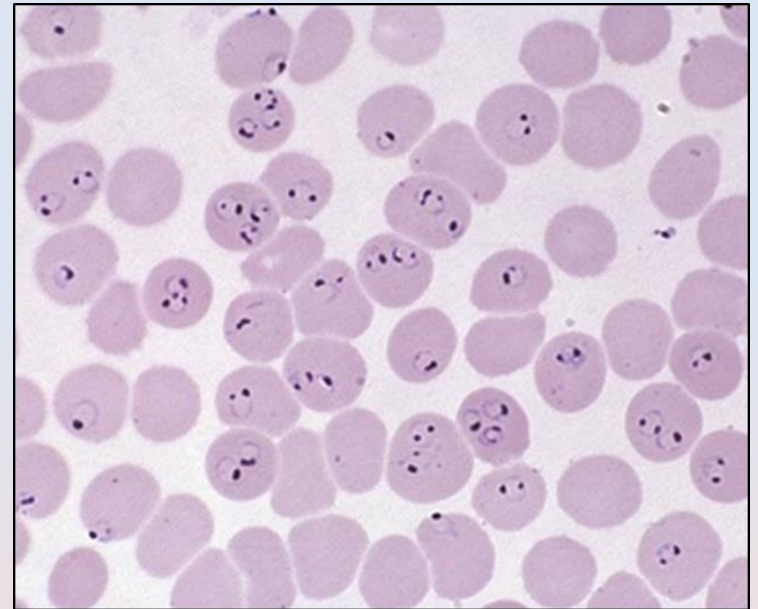
4- Microscopic image for Thick film VS Thin film

Plasmodium falciparum



Plasmodium falciparum







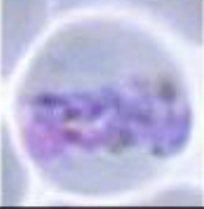



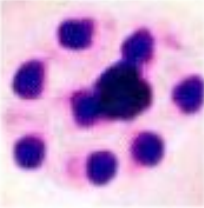
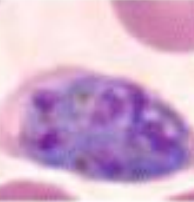




(Ring stage in thin smear)



➤ LABORATORY DIAGNOSIS

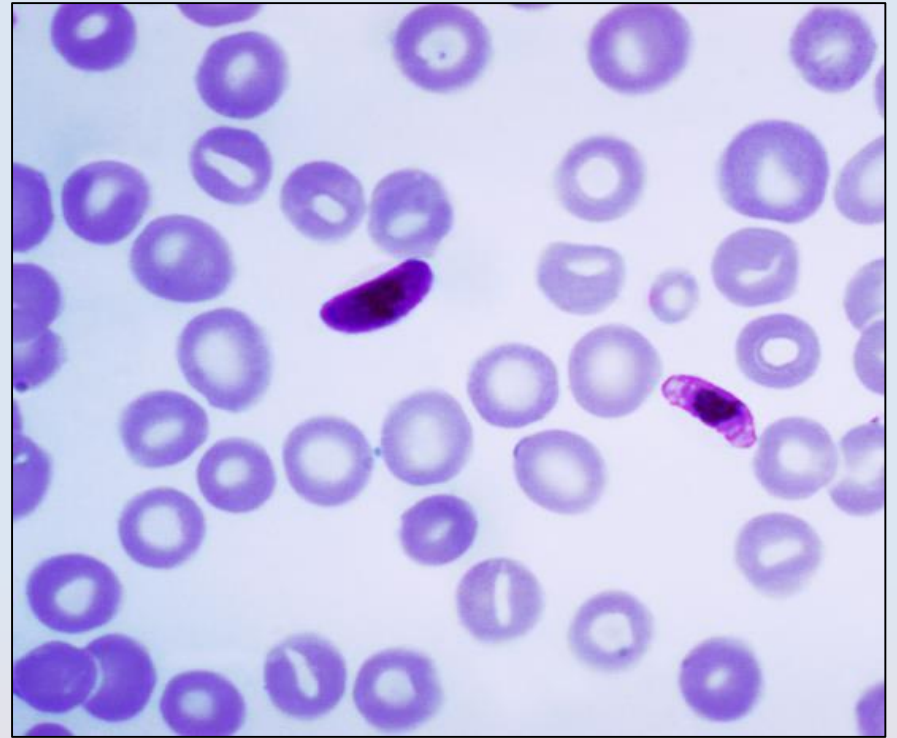
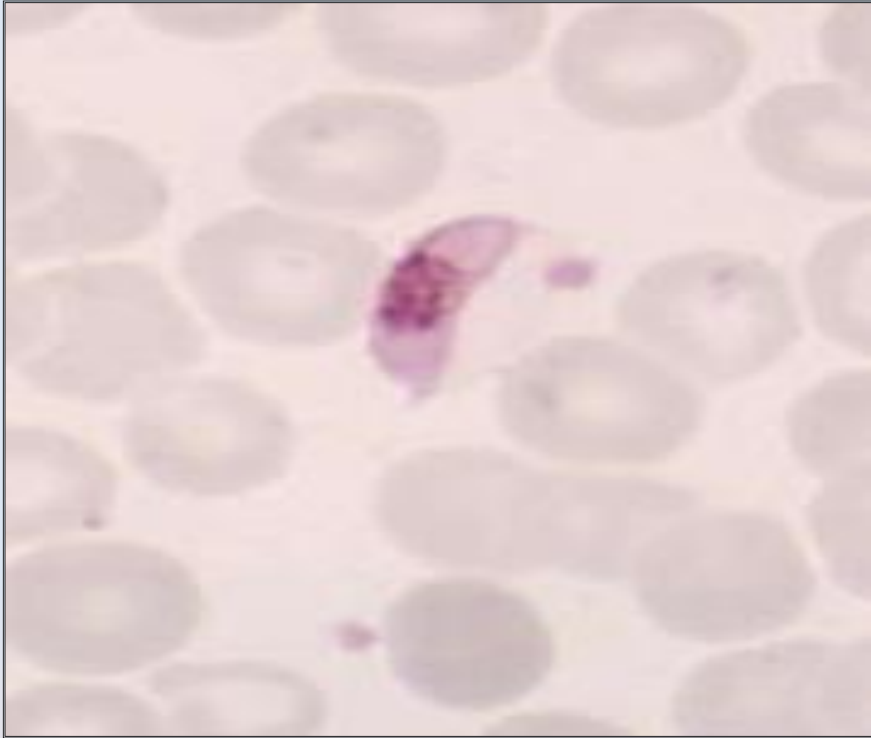
LIGHTMICROSCOPY

5- Species of Malaria (*Plasmodium Spices*) is identified by its characteristic microscopic appearance:

| Stage \ Species | Falciparum | Vivax | Malariae | Oval |
|-----------------|---|--|---|---|
| Ring Stage |  |  |  |  |
| Trophozoite |  |  |  |  |
| Schizont |  |  |  |  |
| Gametocyte |  |  |  |  |

➤ LABORATORY DIAGNOSIS

LIGHTMICROSCOPY



Plasmodium falciparum

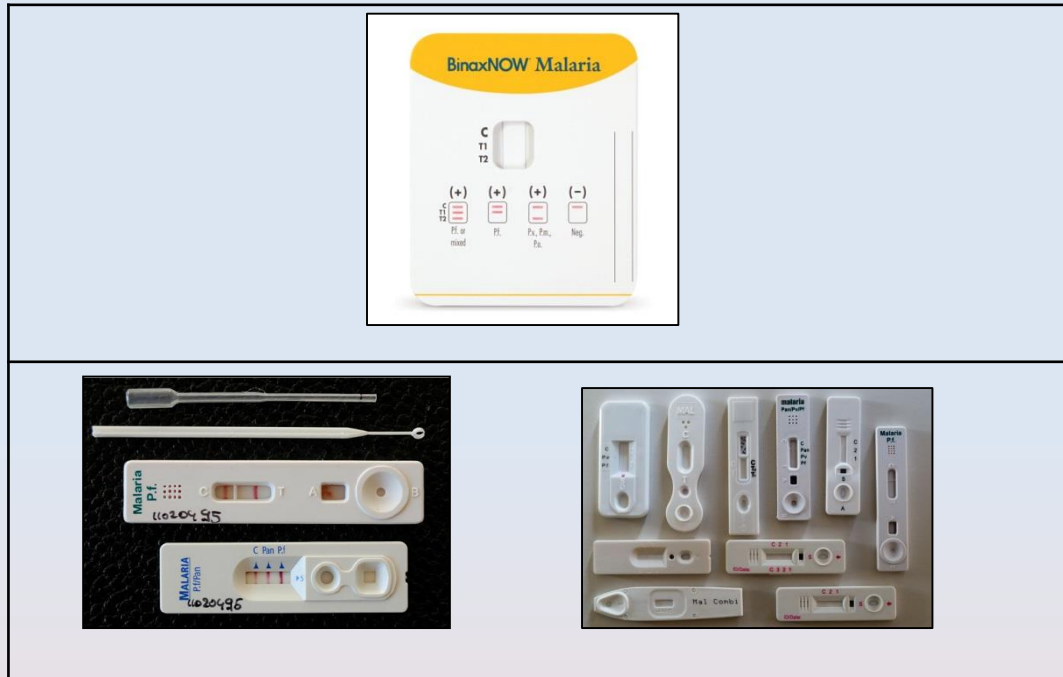
Gametocyte stage in thin smear

(characteristic banana-shaped or crescent-shaped gametocyte stage in thin smear)

➤ LABORATORY DIAGNOSIS

RAPID DIAGNOSTIC TESTS (RDTs)

1- The RADTs Test (for screening)



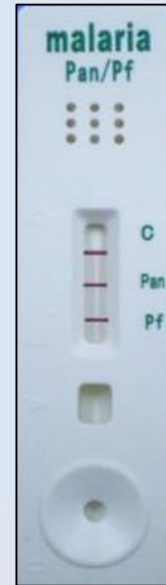
➤ LABORATORY DIAGNOSIS OF MALARIA

LIGHTMICROSCOPY

3- RADTs Result



Negative



Positive

LEISHMANIA



➤ **LABORATORY DIAGNOSIS OF LEISHMANIA**

Leishmania Can be Diagnosed Commonly By:

- **Microscopy (Light Microscope)**
- **Culture in **NNN** Medium**

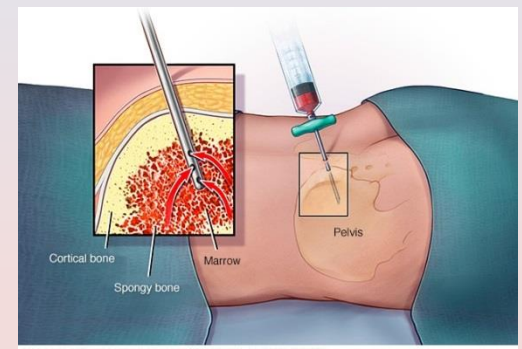
Used Samples:

- **Bone Marrow aspirate**
- Splenic aspirate
- Lymph node
- Biopsy

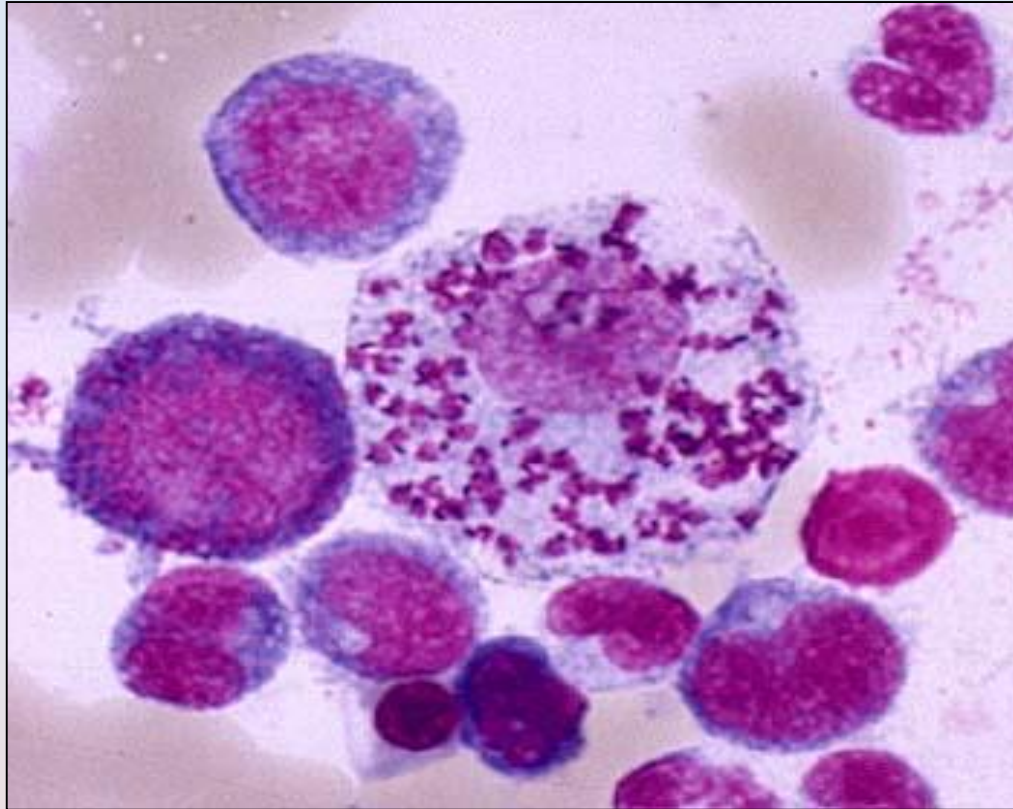
➤ LABORATORY DIAGNOSIS OF LEISHMANIA



Bone marrow aspiration



➤ **LABORATORY DIAGNOSIS OF LEISHMANIA**



Bone marrow aspirate
(Amastigotes)

Case1:

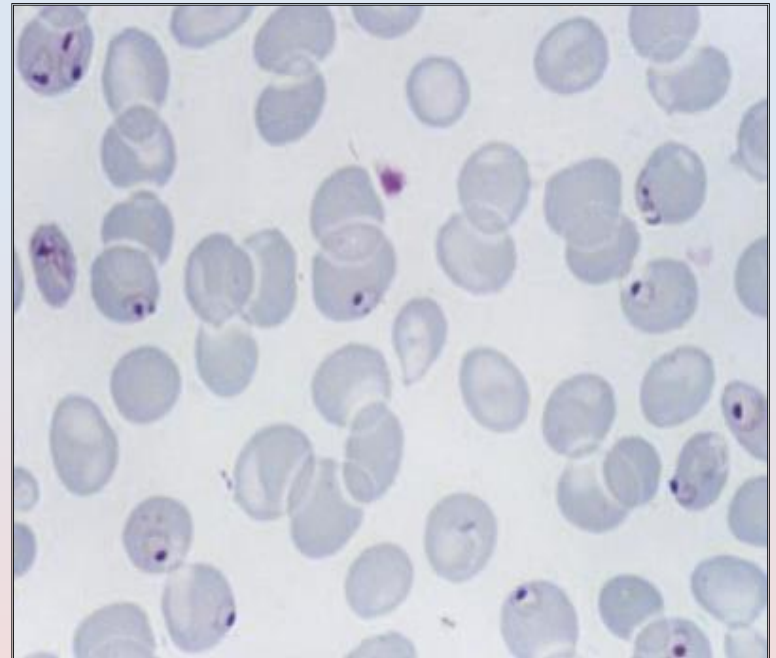
A 25 year-old male from India, who came 3 months ago was admitted in KKUH with a history of severe anaemia and intermittent high grade fever for the last two months not responding to antibiotics.

WHAT IS THE DIAGNOSIS?

Malaria or *Plasmodium Falciparum*

Mention other way for diagnosis?

RADTs, Serology or PCR

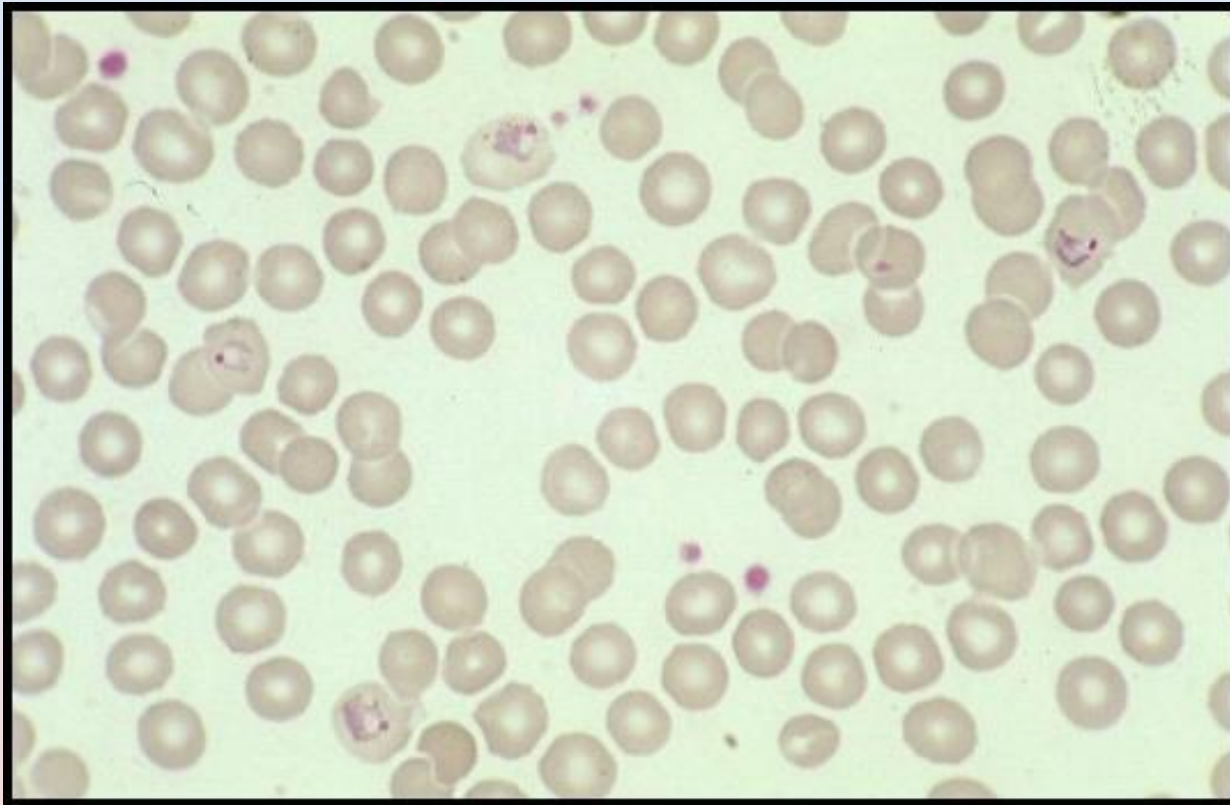


Case2:

A businessman who makes frequent trips to Thailand , presents with intermittent fever.

WHAT IS THE DIAGNOSIS?

Malaria or *Plasmodium sp*



Case3:

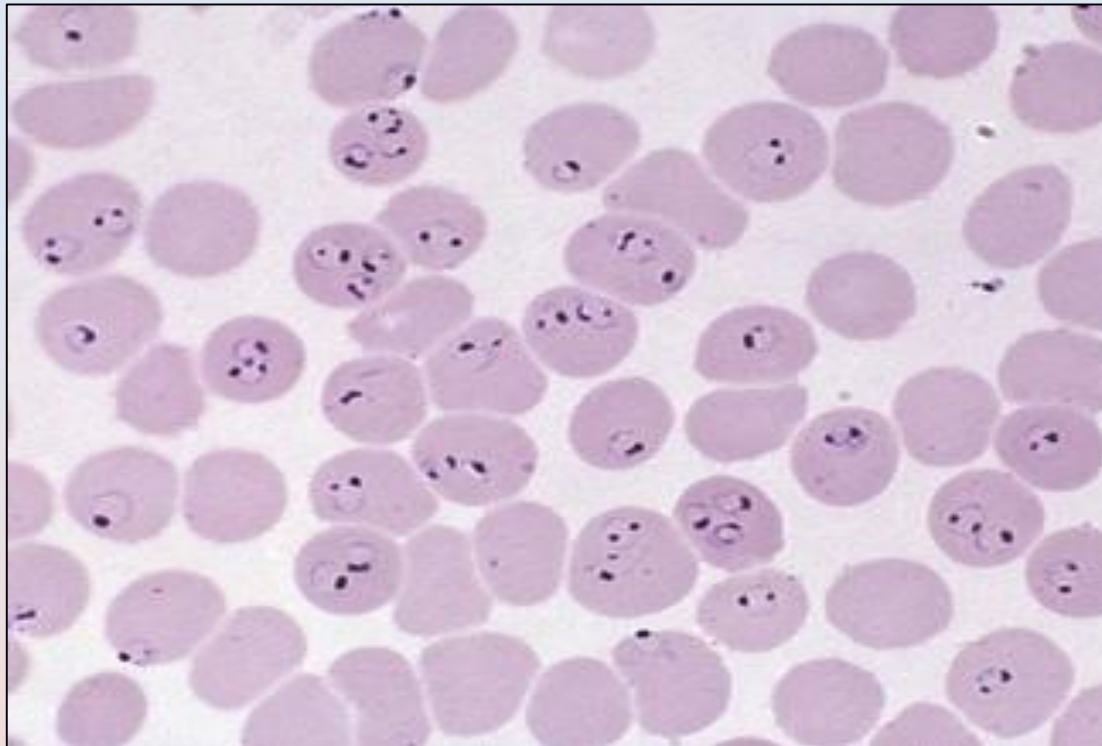
A student in KSU who returned three weeks from vacation in Africa , he developed intermittent fever last week and lost consciousness a short time ago.

WHAT IS THE DIAGNOSIS?

Malaria

WHAT IS THE PATHOGEN?

Plasmodium falciparum



Case4:

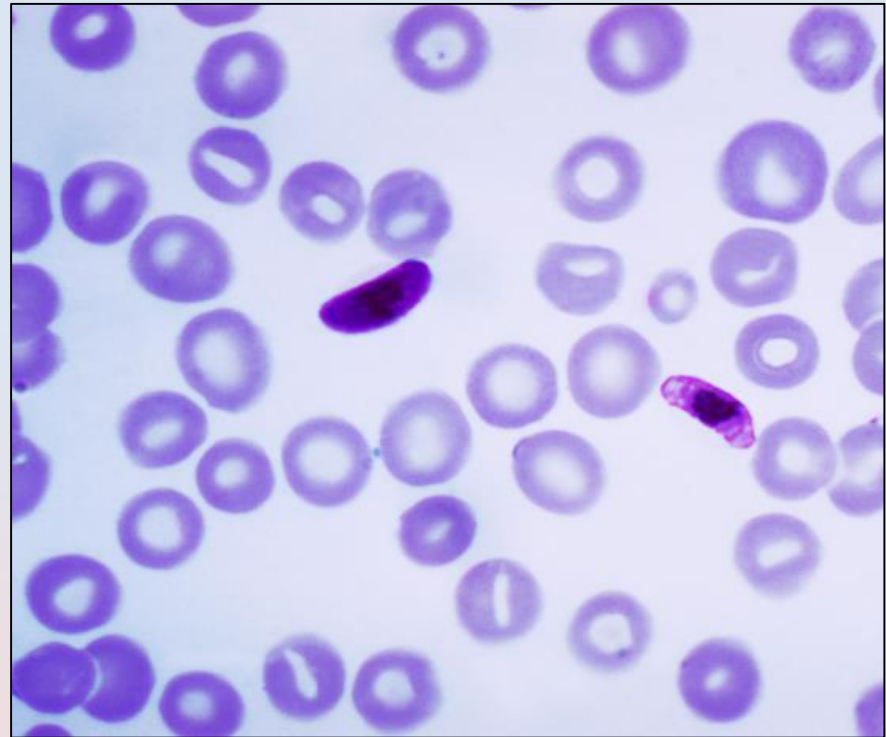
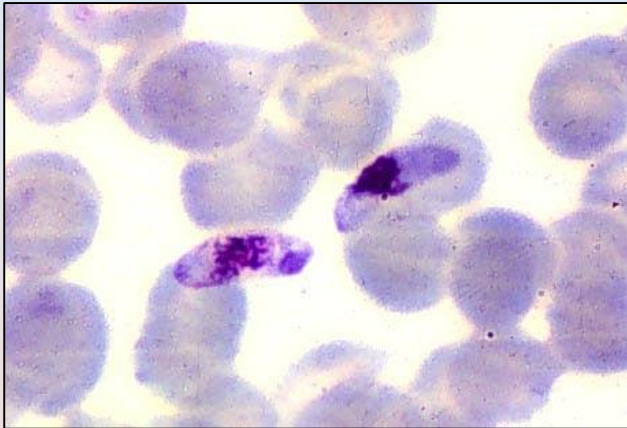
The patient was then treated with schizontocidal antimalarial drugs, a follow-up blood film is shown .

NAME THE PARASITE?

Plasmodium falciparum

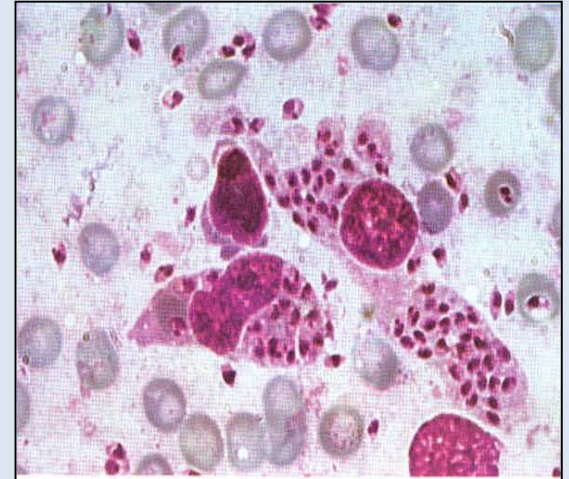
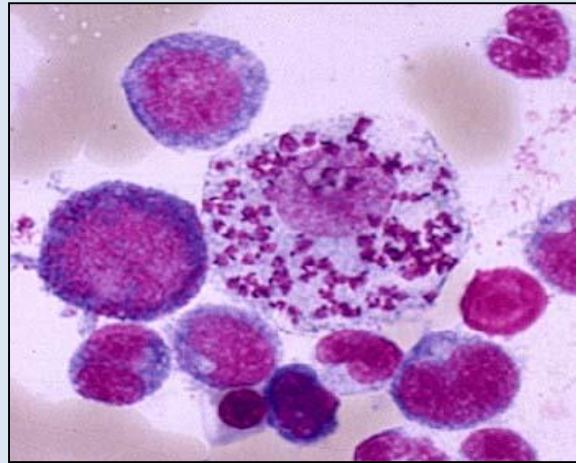
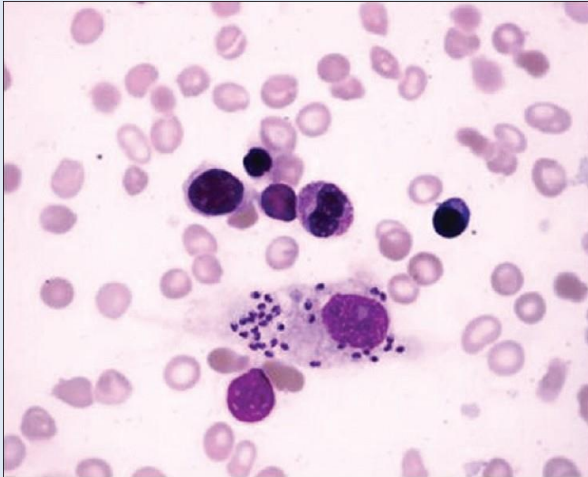
IN WHAT STAGE ?

Gametocyte stage



Case 5 :

A 7 year old child presented with anemia , hepatospenomegaly and fever. Not responding to antimalarials and antibiotics . Bone marrow aspirate smear is shown:



WHAT IS THE DIAGNOSIS?

Viseral Leishmania

IDENTIFY THE PARASITE STAGE ?

Amastigote Stage