**Lab (6)**

**Kingdom**: Protista

**Subkingdom**: Protozoa

**Phylum**: Sarcomastigophora

**Class**: Ampicomplexa (sporozoa)

**Order**: Eucoccida

**Family**: Plasmodidae

**Genus**: *Plasmodium vivax* (benign tertian malaria)

 *Plasmodium malaria* (quartian malaria)

 *Plasmodium ovale* (ovale tertian malaria)

 *Plasmodium falsiparm* (malignant tertian malaria)

**Disease name:** Malaria

**Site of infection:** Red blood cell and Liver tissue cell

***Plasmodium* requires two hosts:**

-**Definitive invertebrate host:** (vector Anopheles mosquitoes female).

-**Intermediate vertebrate host:** (mammals, birds and lizards).

**Morphology:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | P.falciparum | P.malaria | P. vivax | P.ovalae |
| Trophzoite | ring forms  | band form  | amoeboid form | compact rings in cells |
| **Schizont** | (8 – 36) merozoites. | (6–12) largemerozoites  |  (16). merozoites  | (6-12) merozoites |
| **Microgametocyte** | Larger than RBC,kidney shaped with blunt round ends | Smaller than RBC, round compact | Fillsenlarged RBC, small round or oval, compact with central nucleus | Of the size of RBCround, compact |
| **Macrogametocyte** | more slender and longer than themale  | Round or oval with peripheral nucleus | large round or oval with peripheral nucleus | Round or oval with peripheral nucleus |



**Life cycle:**

**Sexual cycle**

Occurs in mosquito (9-21 days), fusion of micro and macrogametes are infective for mosquito→ zygote→ Ookinete (~24 houre) → Oocyst

Asexual replication (sporogony) → sporozoites released → migrate through hemocoel→ invade salivary glands

**Asexual cycle**

**1-Exoerythrocytic schizogony (Liver stage)**

Sporozoites injected during mosquito feeding→ merozoites (uninucleate asexual stages) invade liver cells. After this initial replication in the liver (Exo-erythrocytic schizogony) the parasites undergo asexual multiplication in the erythrocytes.

**2-Erythrocytic schizogony (Blood stage)**

Merozoites infect red blood cells and forms the ring stage in it and transform into trophozoites that mature into schizonts (multinucleated asexual stages) , which rupture releasing merozoites . Some parasites differentiate into asexual erythrocytic stages (gametocytes) repeated erythrocytic schizogony (48hr.) in *Pf., Pv, Po.*and (72 hr.) in *Pm.*



**Symptoms:**

- **Fever**: Often irregular. The regular pattern of fever does not occur until the illness has continued for a week or more.

-**Anemia**: The anemia is hemolytic in type. It is more severe in infections with

 *P. falciparum* because in this infection cells of all ages can be invaded

-**Splenomegaly**: The spleen enlarges early in the acute attack of malaria.

-**Jaundice**: Amild jaundice due to hemolysis may occur in malaria.

**Diagnosis:**

1- Thin blood films stained with Giemsa stain.

2- Antibody test.