

# Phylum Apicomplexa

# Characteristic Features

- All members are **parasites**.

## Characteristics

1. Apical complex for penetrating host cells
2. Single type of nucleus
3. No cilia and flagella, except in certain reproductive stages (Not-self locomotion, need vector for their transmission i.e. mosquito is the vector of plasmodium)
4. Life cycles that typically include asexual (schizogony, sporogony) and sexual (gametogony) phases

# CLASS SPOROZOEAE

- In phylum apicomplexa, members of class sporozoea are most important.
- *We all are well familiar with Plasmodium, the causative agent of Malaria, it belongs to this class.*
- *Why this class is named Sporozoea??*

Because most sporozoeans producing a **resistant spore or oocyst** following sexual reproduction.

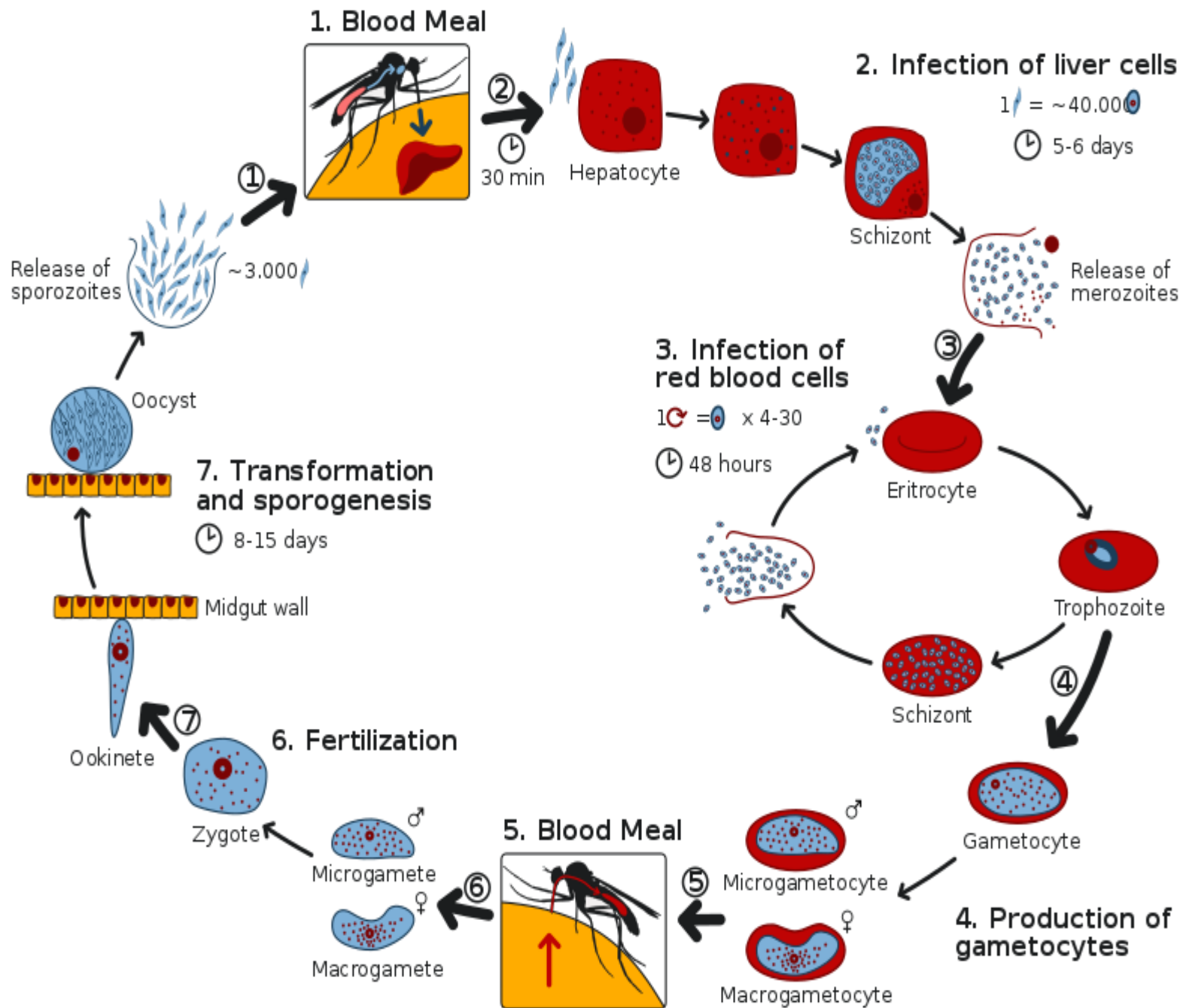
# Generalized Life Cycle

Many sporozoeans are intracellular parasites and their life cycle consists of 3 stages:

1. **Schizogony** (Multiple fission. Cells that form are called merozoites hence also named as **Merogony**).
2. **Gametogony** (Sexual phase; gametes are formed, fuse to form zygote and meiosis takes place)
3. **Sporogony** (Mitosis within oocyst, spores will form that will set free from oocyst and infect new host).



Due to these resistant spores, this class is named as sporozoea.



## Life cycle of Plasmodium

### 1. Blood meal:

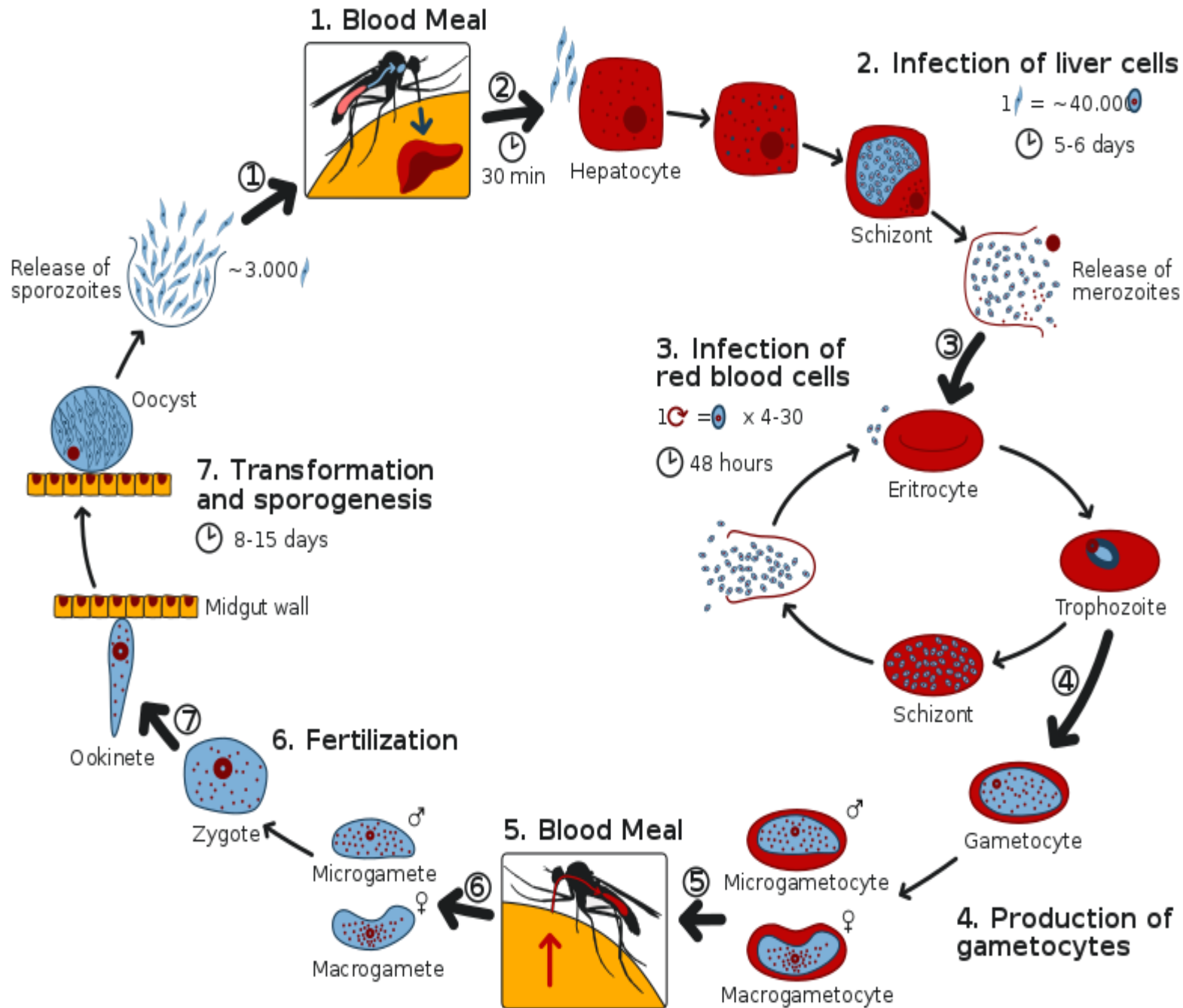
When a mosquito having plasmodium spores take a blood meal from a healthy person, from mosquito saliva, its spores enter into healthy human's blood. Blood carries it to liver.

### 2. Infection of liver cells

Liver cells are called Hepatocyte. Here plasmodium divide by schizogony/ merogony and named merozoite. Hepatocyte infected by plasmodium spore is called schizont.

### 3. Infection of RBCs

Merozoites now infect RBC, multiplying in it and infecting other RBCs. Some of these merozoites will differentiate to form Gametocytes, starting gametogony.



#### 4. Production of Gametocytes:

Gametocytes are of two types:  
 Microgametocyte: small in size and is male gamete  
 Macrogametocyte: Its large in size and is female gamete.

Macrogametocyte: Its large in size and is female gamete.

#### 5. Blood meal:

These gametocyte will circulate in infected human blood.

When another mosquito takes a blood meal, these gametocytes will be transferred to its gut.

#### 6. Fertilization:

Zygote will be formed after fusion, it will attach to gut wall and develop into an ookinete.

#### 7. Transformation and sporogenesis:

Ookinete is transformed into oocyst and within oocyst, mitosis will produce a number of spores. These spores will move to mosquito saliva and the cycle will be repeated.

# Four species of *Plasmodium*

- *P. vivax* (paroxysms recur every 48 hours)
- *P. falciparum* causes the most virulent form of malaria in humans. Paroxysms are more irregular than in the other species. It remains one of the greatest killers of humanity, especially in Africa.
- *P. malariae* (paroxysms recur every 72 hours)
- *P. ovale*: (rarest)

Paroxysm: a sudden recurrence or attack of a disease

# Thankyou

You may ask questions related to phylum apicomplexa.

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