



***Plasmodium* sp. & *Eimeria* spp.**

Practical parasitology/3rd class

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***Plasmodium* sp.**

-Final host: Not host-specific , domestic animals , invertebrate that infect a wide variety of domestic and wild birds, and it is transmitted to the human.

-Intermediate host: Mosquitoes, usually *Culex*, *Anopheles*, *Aedes* spp.

-Site of infection: Inside the R.B.Cs, liver.

Diagnostic Technique: Blood examination.

- There are four types of *plasmodium*:

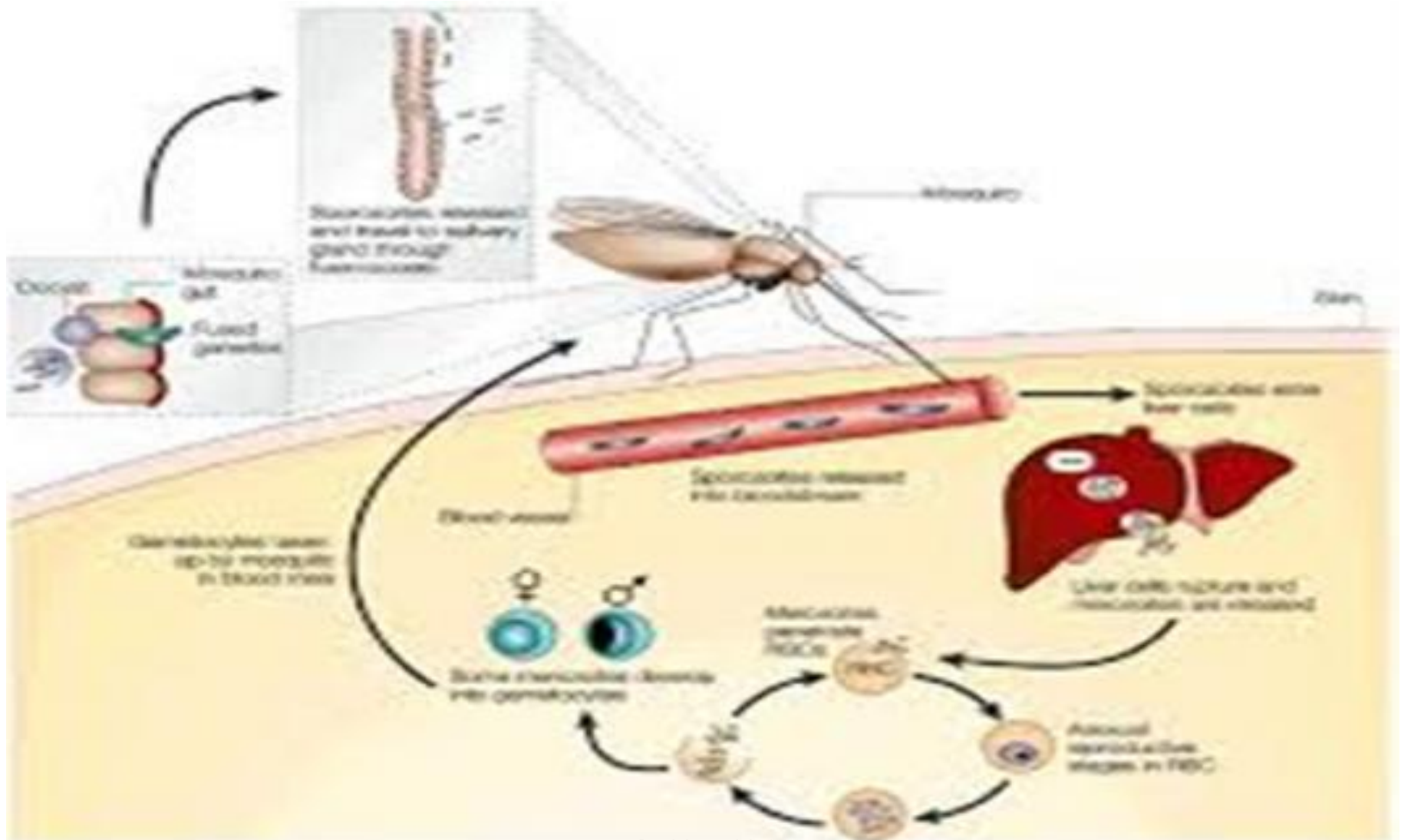
Plasmodium vivax,

Plasmodium ovale,

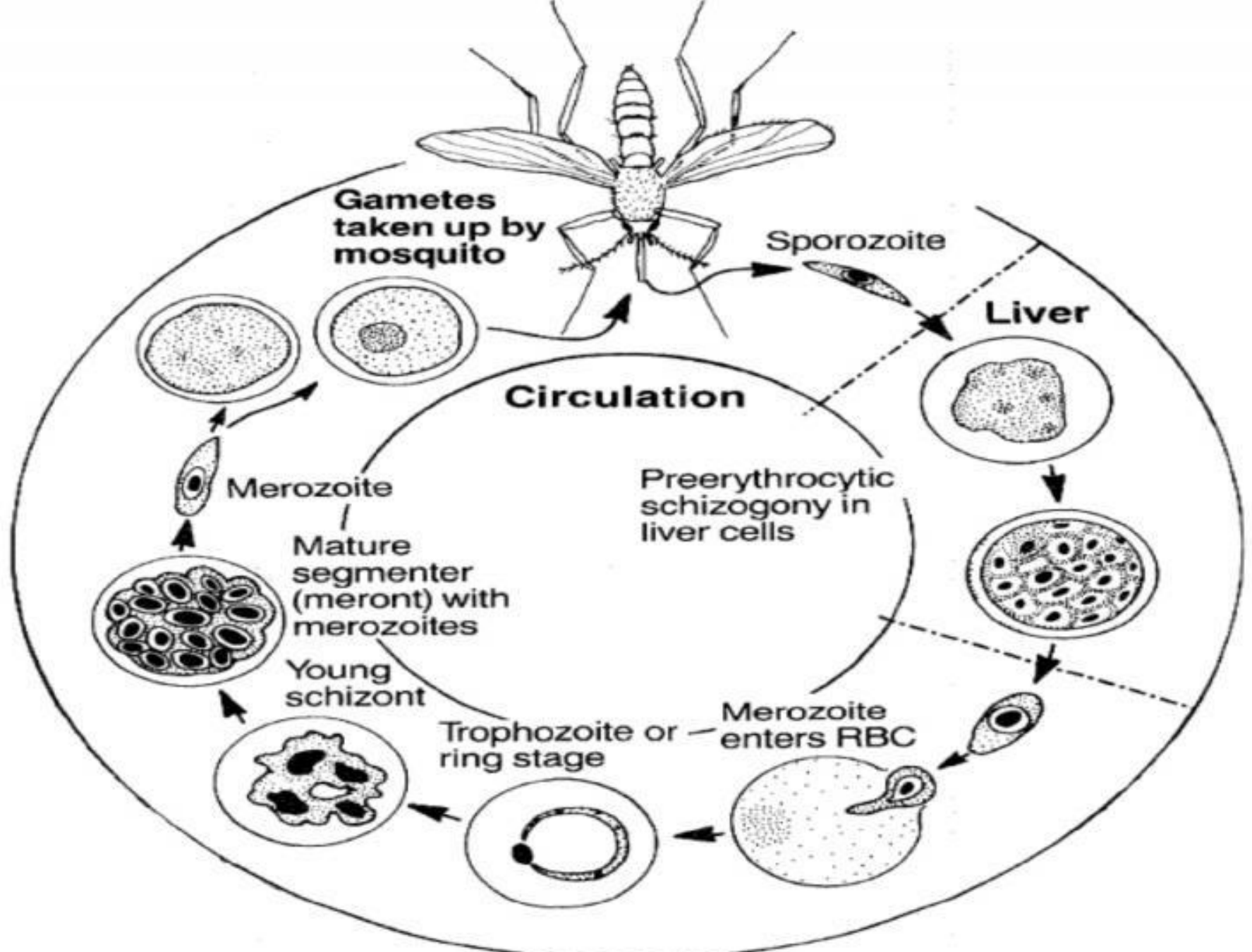
Plasmodium malaria,

Plasmodium falciparum

Life cycle of *Plasmodium* sp. :



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Morphology of *Plasmodium* spp.

Early trophozoite (ring form)

One red nucleus on the ring-like light blue cytoplasm;
single infection in a cell.

Infected RBC like normal RBCs.



Early trophozoite (ring form)

Late trophozoite

It is irregular shape like amoeboid form with pseudopodia; within cytoplasm, brown pigment granules (malarial pigment-haemozoin) appear.

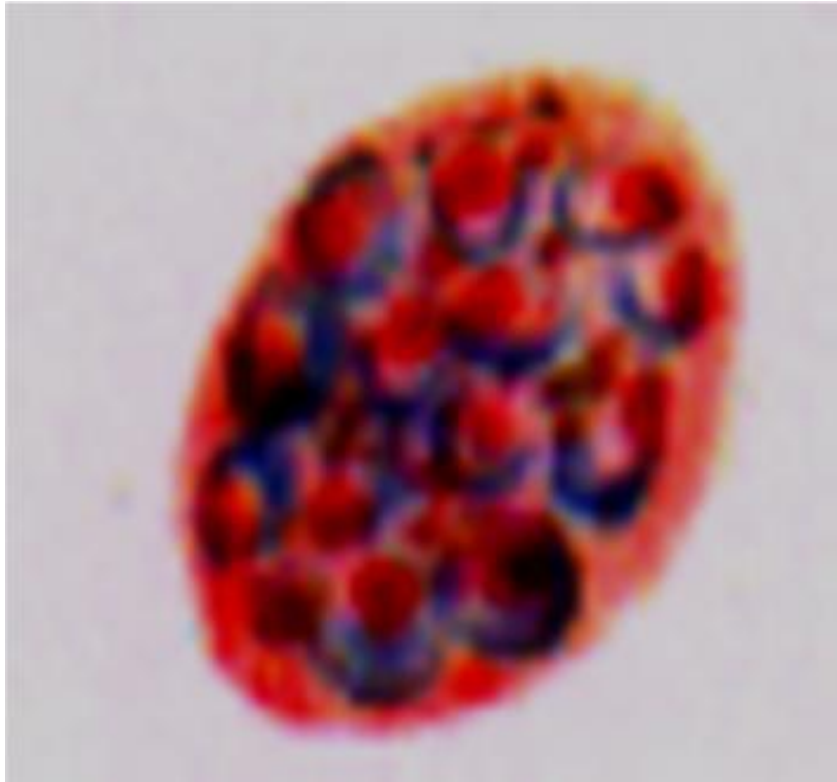
Infected RBCs are pale in color, and have schuffner's dots in it (fine red granules).



Late trophozoite

Immature schizont

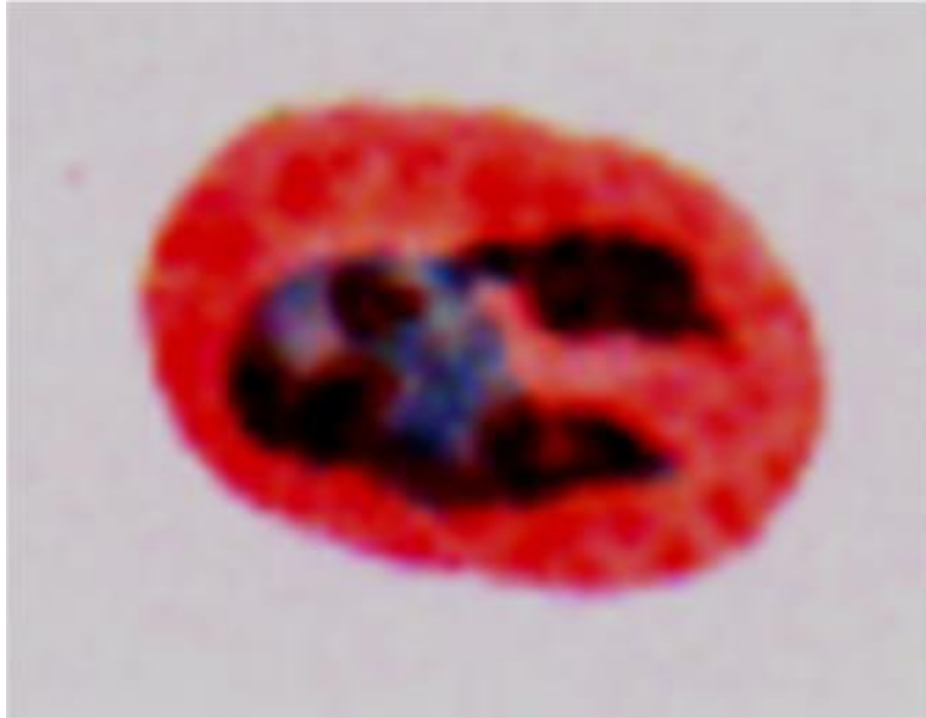
Oval in shape, nucleus divided into 2-4 or more,
malarial pigment begins to concentrate in a mass.



Immature schizont

Mature schizont

Nucleus divided into 12-24; and cytoplasm also divided, each nucleus surrounded by a portion of cytoplasm to form merozoites, malarial pigment clumped.

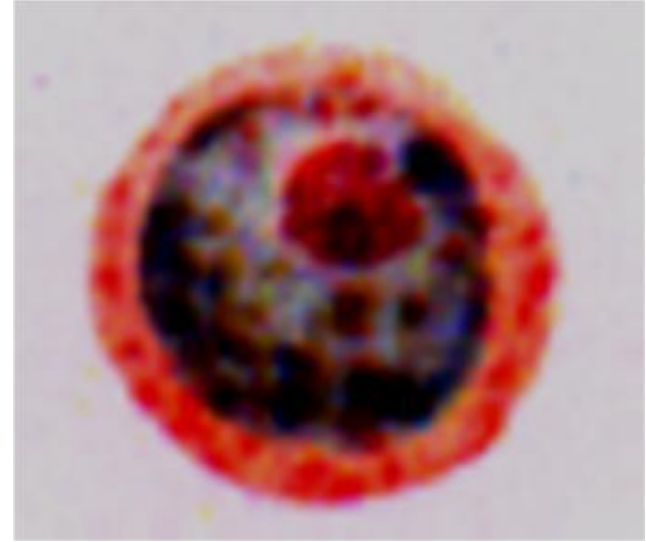


Mature schizont



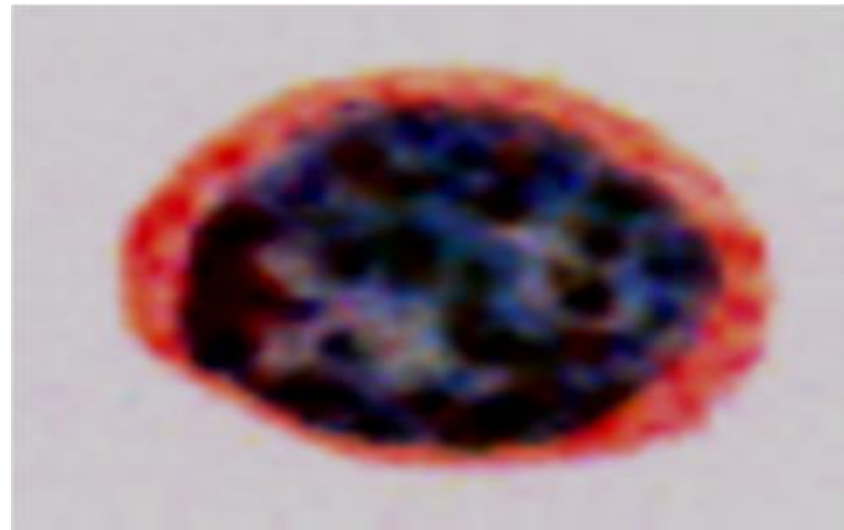
Male gametocyte (microgametocyte)

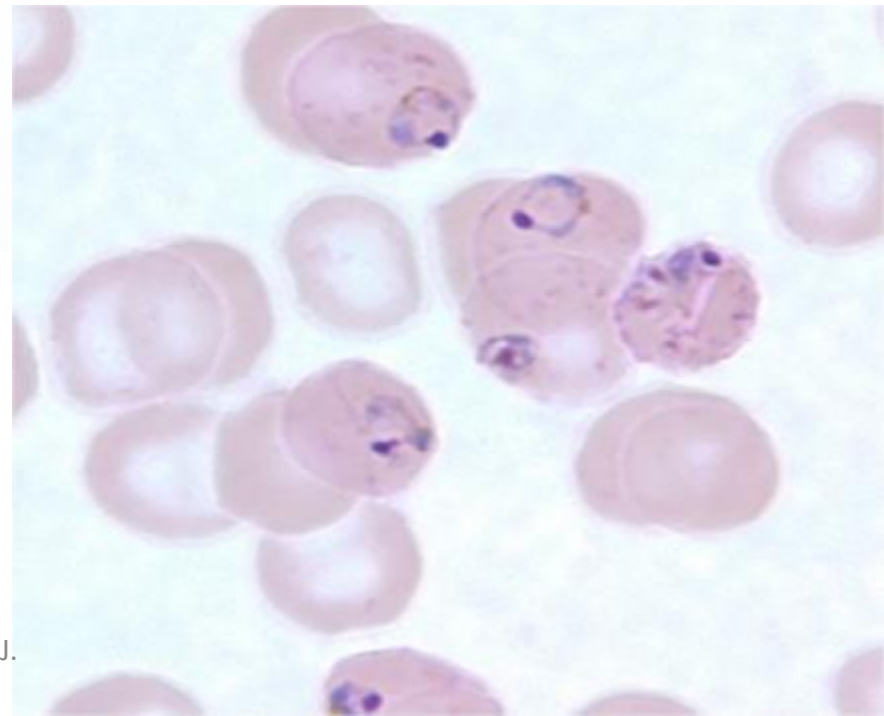
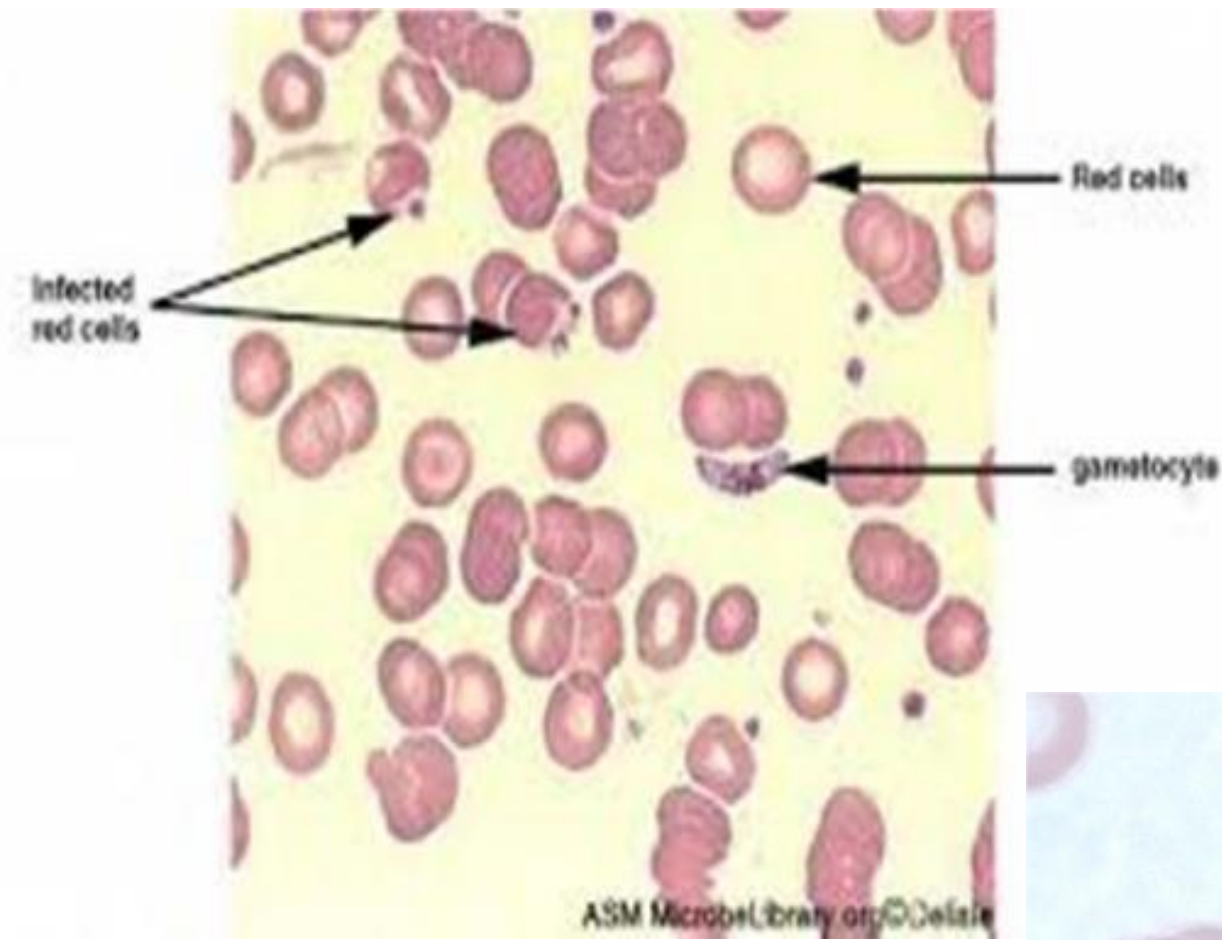
Oval in shape; 1 loose nucleus in centre of it; malarial pigments diffuse.



Female gametocyte (macrogametocytes)

Oval in shape;
1 compact nucleus not in centre of it





Eimeria spp.

Host range: mammals, birds, reptiles and fish.

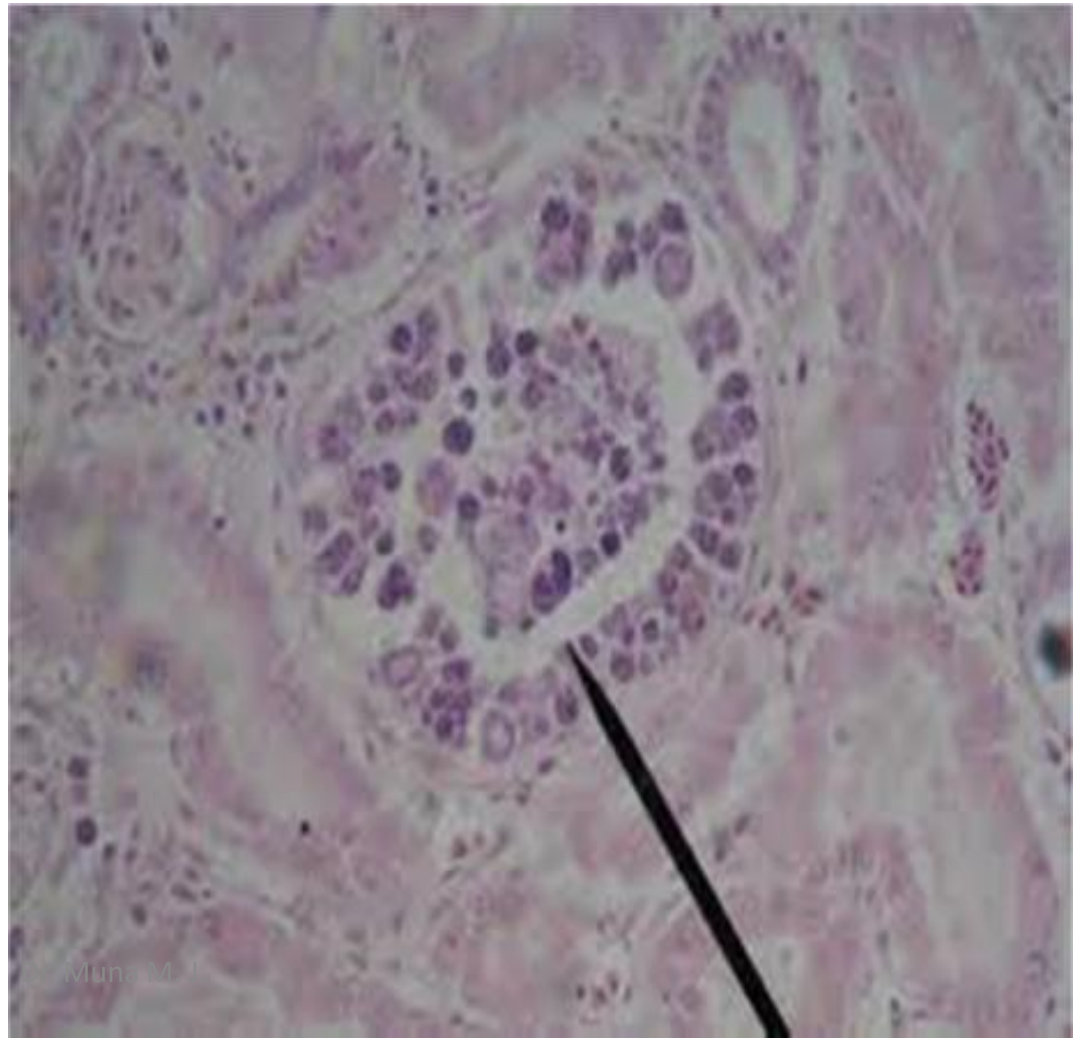
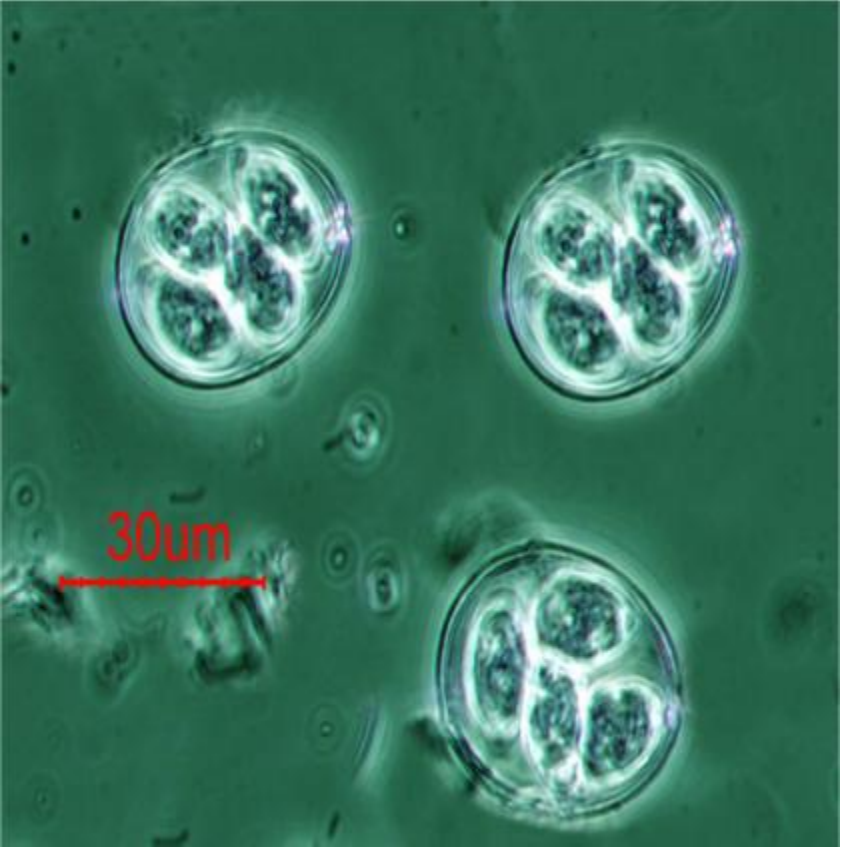
Site of infection: in the intestinal mucosa (small and/or large intestines) whereas some species develop in the liver, gall bladder.

It cause coccidiosis disease

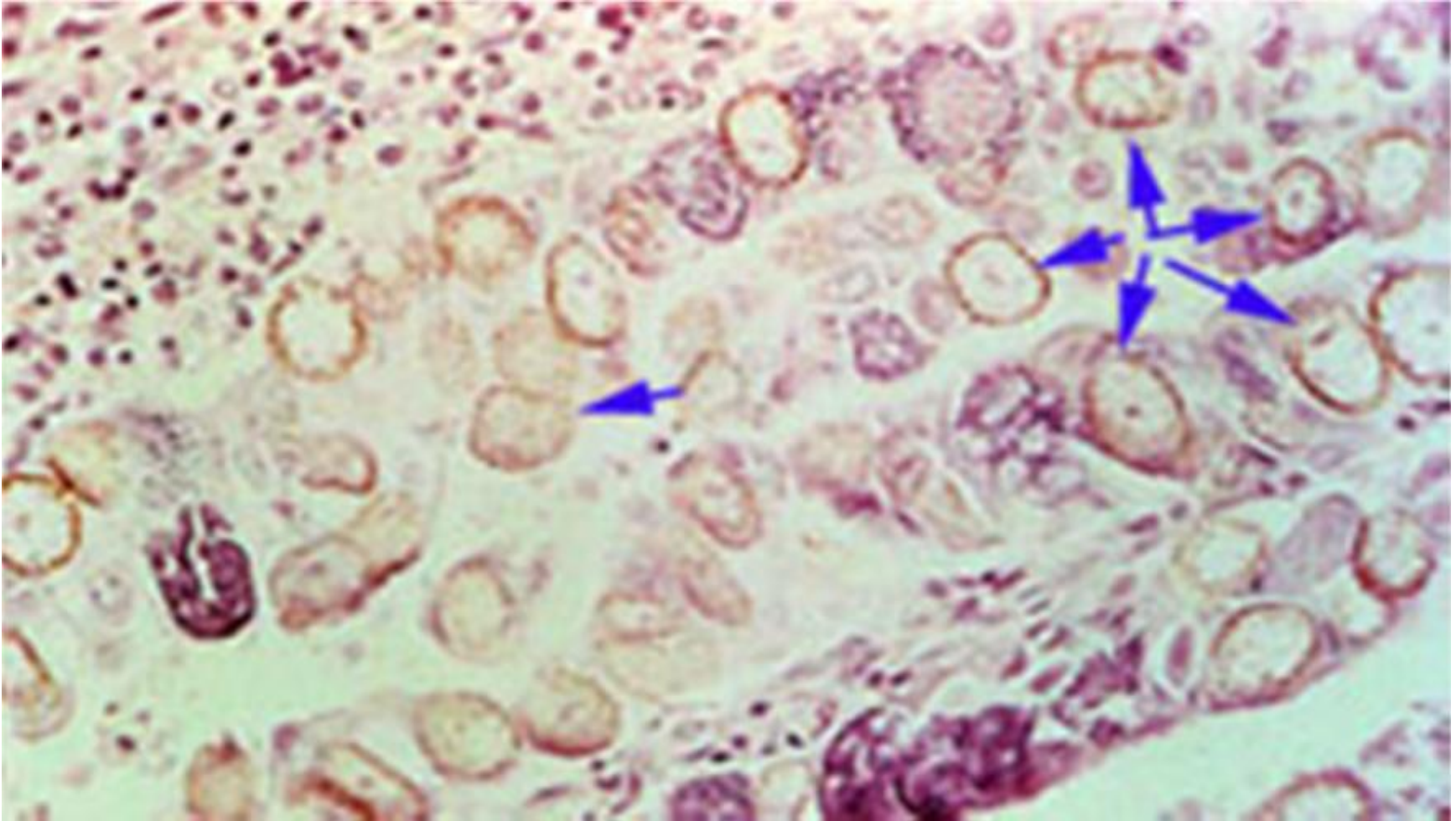
Morphology:

1. The host ingests a sporulated oocyst :**are round or ovoid. They are yellowish** colored. A sporulated oocyst contain 4 sporocysts each with 2 sporozoites (8 sporozoites are released from the oocyst.).
2. The sporozoites becomes a **schizont**: look like a round cell full of merozoites. Schizont begin as small basophilic rounded cells (mother merits) located intracellular within host cells.

3. Mature schizonts appear as membrane-bound clusters of small basophilic bodies (similar to bunches of grapes).
4. **The merozoites:** look like small banana shaped objects
5. the merozoites develops into **Gamonts** either a macrogametocytes or a microgametocyte.
microgamonts (♂) apparent as multinucleate basophilic stages ultimately shedding small bi flagellated microgamete's ; and
macrogamonts (♀) evident as uninucleated eosinophilia cells with a single ovoid nucleus



Oocyst of *Eimeria* in tissue



Eimeria sp. in the intestine of a goat. Many macrogametes (blue arrows) can be seen.

Sarcocystes spp.

Host range: Parasites of this genus occur in carnivores (definitive hosts) and herbivores (intermediate hosts). Members of this genus are generally nonpathogenic in the definitive host, but highly pathogenic to the intermediate host.

Species in this genus infect reptiles, birds and mammals.

Site of infection: *Sarcocystes* are nearly always in skeletal muscle or esophageal muscle

Morphology

Oocyst: containing two sporocysts each one contain 4 sporozoites. **The oocysts** produced in the intestine of the carnivore definitive host will sporulated immediately (in the host's intestine) and the fragile oocyst wall will usually rupture (again while still in the host), thus the diagnostic stage is the **sporocysts(containing 4 sporozoites)**.

Sporocysts: It is oval shaped; each sporocyst contains four banana-shaped sporozoites. Mature sporocysts are infective stage to other susceptible hosts.

Sporozoites: morphology is very similar to that for bradyzoites.

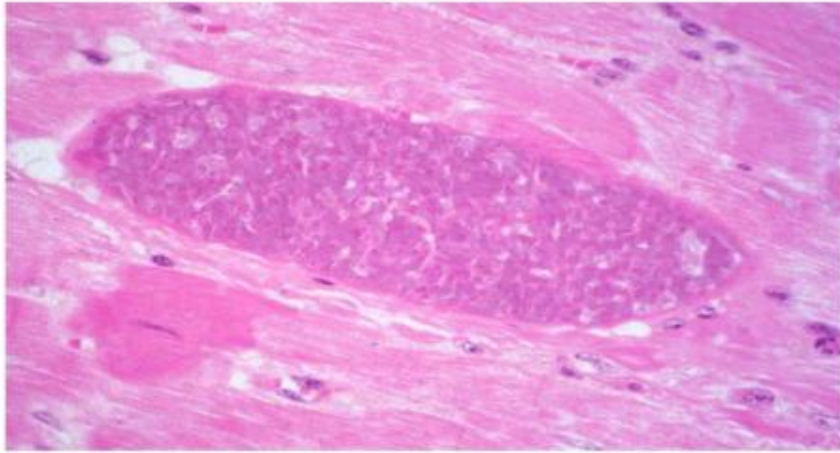
Sarcocystes or Miescher's tube: This is spindle shaped structure with thick striated wall (are present in the bovine skeletal muscles), In the middle of the Miescher's tube there are large numbers of merozoites called bradyzoites, which are fusiform, elongated & cylindrical .The tube is divided into many compartment by septa. While in the periphery ,there is usually a rounded fully developed cells called metrocystes.

Bradyzoites: have distinct anterior and posterior ends.

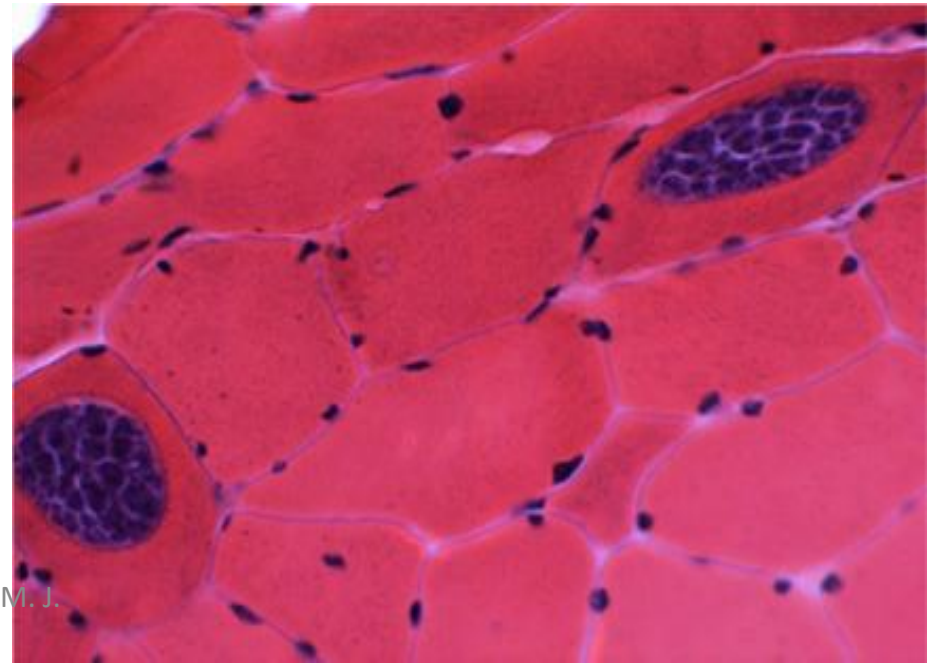
Gamonts: macrogamonts are rounded and microgamonts are elongated or slender with bi-flagellated.

Sarcocystis cruzi

S. cruzi is seen in the heart of a cow.



Miescher's tube containing merozoites



THANK YOU