Lecturer : Nerran K.F.AL- Rubaey
Practical parasites
Lab - 6 -

Malaria

Classification of Malaria

Phylum	Class	Blood Species
Apicomplexa	Sprozoa	**Plasmodium vivax*
		**Plasmodium ovale*
		**Plasmodium malariae*
		**Plasmodium falciparum*

Plasmodium vivax causes (Benign Tertian Malaria)

There are six morphologic forms of *Plasmodium vivax* include :

- Ring form :

Delicate cytoplasmic ring measuring 1/3 RBC diameter , single chromatin dot serves as the connecting point of this delicate ring , a vacuole is invisible inside the ring . The parasite may be first visible as a crescent-shape mass at the outer edge of the blood cell , a location known as accole or appliqué .

- Developing Trophozoites :

Irregular amoeboid appearance ,ring remnants common , a single large chromatin dot is present among the cytoplasmic material . The vacuole remains visible and basically intact until the late stage of development ,and presence of brown pigment .

- Immature Schizonts :

Characterized by the presence of multiple chromatin bodies that emerge from progressive chromatin division , cytoplasmic material is present and often contain clumps of brown pigment .

- Mature Schizonts :

(12 to 24) merozoites (average of 16) occupying majority of the RBC , these merozoites surrounded by cytoplasmic material , and brown pigment may be present .

- Microgametocytes :

Consist of a large pink to purple chromatin mass when Giemsa Stained ,which is surrounded by a colorless to pale halo . Brown pigment common evenly distributed .

- Macrogametocytes :

Characterized by round to oval homogeneous cytoplasm and an eccentric chromatin mass , often located against the edge of the parasite . Delicate light pigment may be visible throughout the parasite .

- Other morphological characteristics :

Red blood cells infected with *Plasmodium vivax* tend to become enlarged and distorted in response to the presence of growing parasites.
The morphologic forms of *Plasmodium vivax* , with exception of early ring forms that are less than (8 to 10) hours post infection , may contain Schuffner,s dots (also referred to as eosinophilic stippling) . This characteristic is also typically seen in RBC infected with *Plasmodium ovale* .

Laboratory Diagnosis

All morphologic stages of *Plasmodium vivax* may be seen on thick and thin peripheral blood films . Using the thick smears to identify the presence of malarial organisms and the thin smears to speciate them .

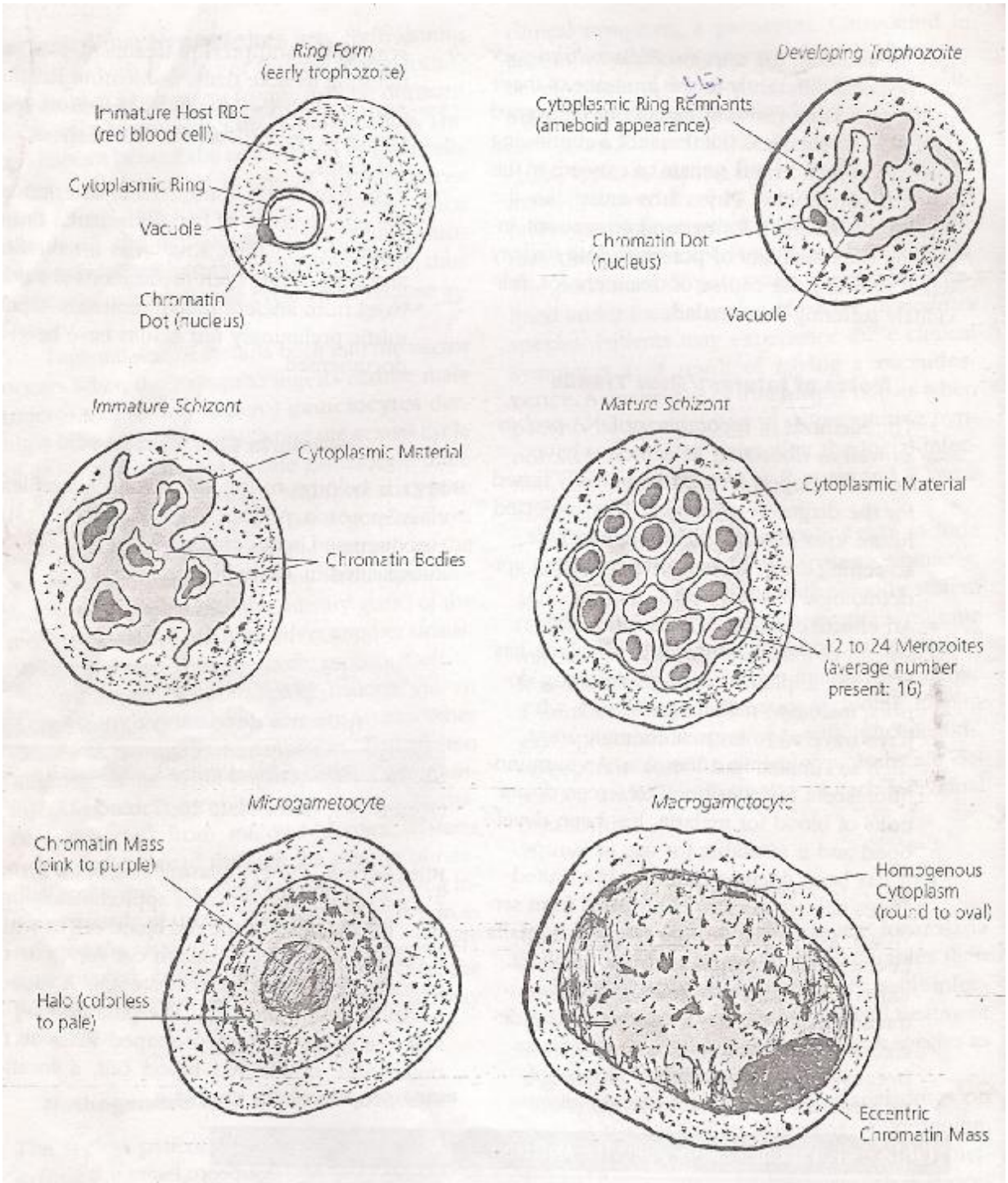

Figure (1) : Commonly seen morphologic forms of *Plasmodium vivax* .

Plasmodium ovale causes (Benign Tertian / Ovale Malaria)

- Ring form :

The typical *P. ovale* ring form is similar in most respects to that of *P. vivax* .There is only two notable differences . First , the *P. ovale* ring is larger in size than *P. vivax* . Second , the *P. ovale* ring is thicker and more amoeboid in appearance than that of *P. vivax* .

- Developing Trophozoites :

The *P. ovale* developing trophozoite maintains its ring appearance as it matures . The amoeboid tendencies common in this stage of *P. ovale* are much less evident than those of *P. vivax* .

- Immature Schizonts:

The typical P. ovale immature schizont consist of progressively dividing chromatin material surrounded by cytoplasmic material , often maintains circular shape early in development .

- Mature Schizonts :

Parasites occupy three quarters of RBC , rosette's of an average of eight merozoites .

- Micro/ Macrogametocytes :

Similar to *P.vivax* only a smaller in size.

Laboratory Diagnosis

All developmental stages of *P. ovale* may be seen in blood film preparations . As with the other *Plasmodium* species , both thick and thin blood smears are usually examined , using the thick smears to identify the presence of malarial organisms and the thin smears to speciate them .

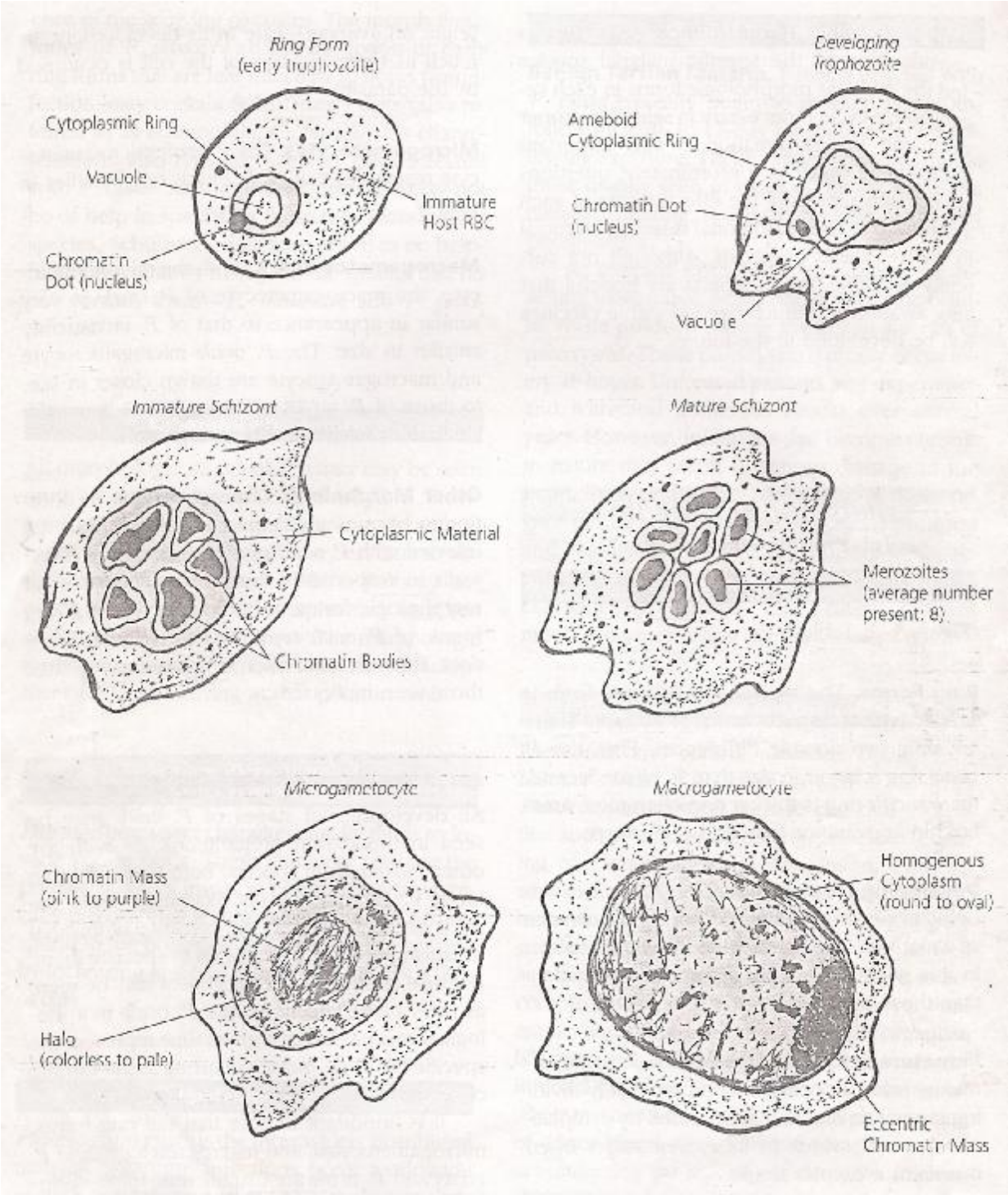

Figure (2) : Commonly seen morphologic forms of *Plasmodium ovale*.