Laboratory diagnosis of malaria

*Plasmodium malariae*

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**Basic guidelines**

A. Capillary blood should be obtained by fingerstick, or venous blood should be obtained by venipuncture.

B. Blood smears, at least two thick and two thin, should be prepared as soon as possible after collection. *Delay in preparation of the smears can result in changes in parasite morphology and staining characteristics.*

C. Schüffner’s dots can be demonstrated in Giemsa stain, which is preferred to Wright or Wright-Giemsa stains.

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In *P. malariae* infections, red blood cells (rbcs) are normal or smaller than normal (3/4×) in size.

1. **Rings**

   *P. malariae* rings have sturdy cytoplasm and a large chromatin dot.

   - Ring in a thick blood smear.
   - Rings in thin blood smears.

2. **Trophozoites**

   *P. malariae* trophozoites have compact cytoplasm and a large chromatin dot. Occasional band forms and/or “basket” forms with coarse, dark-brown pigment can be seen.

   - Trophozoite in a thick blood smear.
   - Band-form trophozoites in thin blood smears.
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Trophozoite in a thick smear.

Band-form trophozoites in thin blood smears.

“Basket-form” trophozoite in a thin smear.

“Basket-form” trophozoites in a thin smear.

Trophozoites in thin blood smears. These images show variations on the “basket-form.”
3. **Schizonts**

*Plasmodium malariae* schizonts have 6 to 12 merozoites with large nuclei, clustered around a mass of coarse, dark-brown pigment. Merozoites can occasionally be arranged as a rosette pattern.
4. **Gametocytes**

*P. malariae* gametocytes are round to oval with scattered brown pigment; they may almost fill the infected red blood cell.

Gametocytes in thick blood smears.

Gametocytes in thin blood smears.

Gametocyte in a thin blood smear.

Gametocyte in thin blood smears.