**Field’s Stain**

**Alternative Stain for Thick Smears**
- a) Place thick smear in Solution A for 5 seconds.
- b) Wash by gently rinsing in tap water for 10 seconds.
- c) Gently shake the slide to remove excess water.
- c) Dip in Solution B for 5 second.
- d) Wash as in b) for 10 seconds.
- e) Stand on end and air dry.

**EXAMINATION OF BLOOD SMEARS**
- Thick and thin blood films should initially be reviewed at low power (100 x magnification) particularly at the edges of the thick and thin film where microfilaria, malaria parasites and trypanosomes may be concentrated.
- Thick film should then be examined systematically beginning in the center of the film and moving in a defined fashion out from the center. At least 200 oil immersion fields should be reviewed (magnification x 1000).
- Thin films should be examined systematically back and forth across the feathered end of the film for at least 300 oil immersion fields (magnification x 1000).

**Expected stain results:**

**A. Thin film**
- The background should be clean and free of debris; the color of the erythrocytes is a pale grayish pink.
- Stippling should show up Schuffner’s dots in erythrocytes containing *Plasmodium vivax* or *P. ovale* and Mauer’s spots in erythrocytes containing the larger ring forms of *Plasmodium falciparum*.

**C. Thick film**
- The background should be clean and free of debris with pale mottled gray color derived from the lyzed erythrocytes.
- Leukocyte nuclei are a deep purple
- Malaria parasites are well defined with deep red chromatin and a pale purplish blue cytoplasm.
- In *P. vivax* and *P. ovale* infections the presence of Shuffner stippling in the ghost of the host erythrocyte can be seen.
REPORTING

The presence of malaria parasites, the species identified and the level of parasitemia should be reported immediately to the attending physician and the laboratory director. High levels of parasitemia (>1% or >50,000 parasites/ul) are critical and should be reported immediately to the attending physician and the laboratory director.

Method of Determining Parasitemia in thick blood films:

- Count parasites and leukocytes separately
- If after 200 leukocytes have been counted, 10 or more parasites have been identified, record the results in the record form indicating the number of parasites seen per 200 leukocytes.
- If after 200 leukocytes have been counted nine or less parasites have been counted, continue counting until 500 leukocytes have been counted and record the parasites observed per 500 leukocytes counted.
- Report the parasite count in parasites per microlitre in relationship to the leukocyte count by the following formula: the parasites per microlitre is equal to:
  \[
  \frac{\text{# of parasites \times white blood cell count per ul}}{\text{# of leukocytes counted}}
  \]

If a white blood cell count is not available assume a white cell count of 6000/ul.

LIMITATIONS

- It may take several thick and thin blood smears to exclude the diagnosis of malaria, particularly in semi-immune individuals or on individuals on chemosuppressive therapy.
- The sensitivity of the thick smear is estimated to be 10-100 parasites/ul and therefore low parasitemias may be missed.
- It may be difficult to determine the species identification in cases with low numbers of circulating ring forms and in cases of mixed infections.
- If blood samples are old or if patients have received partial therapy the morphology of the parasites may be altered making species identification difficult.

REFERENCES
