

**KCMC Biotechnology
Laboratory, Microbiology**

**STANDARD
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PROCEDURE**

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Title: IDENTIFICATION OF NON-MALARIA BLOOD PARASITES AND *Borrelia* spp.

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Annual Review	
By	Date

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Document History:

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OTHER BLOOD PARASITES

The following non-malaria parasites and *Borrelia* spp. may be observed in blood smears from East African patients*:

Trypanosoma brucei subsp. *rhodesiense/gambiense*

Leishmania spp.

Microfilariae:

Wuchereria bancrofti

Loa Loa

Borrelia recurrentis

Borrellia duttoni

*Other species of parasites occur in other geographical locations such as North & South America, Asia.

Table 1. Disease and vectors of non-malaria parasites and *Borrelia* spp.

Parasite	Disease	Vector
<i>Trypanosoma brucei</i> subspecies <i>rhodesiense/gambiense</i>	African sleeping sickness	Tse-tse fly
<i>Wuchereria bancrofti</i>	Filariasis/lymphangitis	Mosquitoes
Loa Loa	Filariasis	Blackflies Midges Tabanid flies
<i>Borrelia recurrentis</i>	Relapsing fever	Louse
<i>Borrelia duttoni</i>		Tick

PREPARATION OF GIEMSA STAINED BLOOD SMEARS

Refer to SOP MIC.040 PREPARATION AND STAINING OF BLOOD SMEARS FOR MALARIA PARASITES for smear preparation and Giemsa stain procedures

EXAMINATION OF BLOOD SMEARS

1. Examine thick smear using high power (40X objective) for the larger parasites (trypanosomes and microfilariae).
2. Examine thick smear using oil immersion (100X) objective for *Borrelia* spp.

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3. Refer to Table 2. and reference materials for details of differentiating morphological features. This SOP is not meant to be all-inclusive for the identification of these organisms. Reference materials in textbooks and photographs on the CDC website (www.dpd.cdc.gov/DPDx) should be consulted.

Table 2. Differentiating features of non-malaria parasites and *Borrelia* spp.

Parasite	Structure	
<i>Trypanosoma brucei</i> subsp. <i>rhodesiense/gambiense</i>	Trypomastigote (14-33 um long)	Undulating membrane, central nucleus, and <u>posterior</u> kinetoplast.
<i>Wuchereria bancrofti</i>	Microfilaria	Sheathed, <u>tail devoid of nuclei.</u>
Loa Loa	Microfilaria	Sheathed but sheath does not stain with Giemsa. <u>Nuclei extend to end of tail but are irregularly arranged.</u>
<i>Borrelia recurrentis</i>	Spirochete (8-30 um long, 0.2-0.5 um wide)	Species indistinguishable
<i>Borrelia duttoni</i>		

REFERENCES:

Centers for Disease Control, Division of Parasitic Diseases website: www.dpd.cdc.gov/DPDx

Orihel, TC, Ash, LR. 2003. *Tissue Helminths*. In: Manual of Clinical Microbiology. 8th Ed. ASM Press, Washington, DC.

Bruckner, DA, Labarca, JA. 2003. *Leishmania and Trypanosoma*. In: Manual of Clinical Microbiology. 8th Ed. ASM Press, Washington, DC.