

# NEW YORK STATE

## *Parasitology Proficiency Testing Program*

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### **Blood Smears Only** **19 May 2015**

The purpose of the New York State Proficiency Testing Program in the category of Parasitology - Blood Smears Only is to monitor the performance of laboratories that detect and identify parasites in blood smears. Below please find the results for the May 2015 proficiency test in Blood Smears Only.

This category is divided into two sub-categories. **Parasite Identification** is intended for labs that identify parasites and report them to the genus or species level on patient reports. **Parasite Screen** is intended for labs that report “Parasites Seen” but do not identify organisms on patient reports. Participants in both sub-categories examine the same samples, however the scoring criteria for the two sub-categories are different. When reading this critique, please ensure that you are comparing your performance to other laboratories in your sub-category.

### **Sample Preparation and Quality Control**

All slides used in this test were prepared and stained by a commercial source. Samples of each test specimen were selected at random by the Parasitology Laboratory at the Wadsworth Center, NYS DOH, and were assayed for quality and confirmation of contents. The supplying vendor also conducted extensive quality control tests and a detailed quality control report was submitted to the Parasitology Laboratory for inspection and verification. Samples were authenticated by 80% of participating laboratories and/or referee laboratories.

## 15B-F

Correct Identification: *Trypanosoma cruzi*

### *Results of Participating Laboratories Who Perform Parasite Identification*

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Trypanosoma cruzi</i>	19/20	95	10/10	Correct
<i>Trypanosoma brucei</i>	1	5	0	Incorrect

### *Results of Participating Laboratories Who Perform Parasite Screen*

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	7/7	100	10/10	Correct

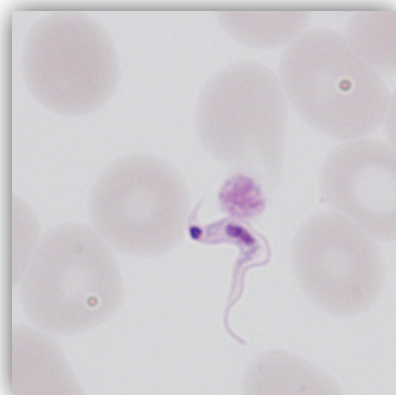
### *Quality Control and Referee Information*

Participating and referee laboratories agreed that *Trypanosoma cruzi* was the correct response (95 and 100% respectively). Quality control examination of 4% of the slides for this sample showed an average of 1 organism per 100X oil immersion field. Staining quality was good.

### *Diagnostic Characteristics*

*Trypanosoma cruzi* is distinguished from *Trypanosoma brucei* primarily by the prominence of the kinetoplast, which is much larger in *Trypanosoma cruzi*. The large, stained terminal kinetoplast was visible in the majority of organisms. About one third of the trypomastigotes in this specimen did not exhibit typical morphology. Some appeared thinner than typical and others were swollen or rounded.

*Trypanosoma cruzi* is the causative agent of Chagas disease and is spread during feeding of triatomine bugs. Trypomastigotes are detected in the blood on thin and thick smears. They measure approximately 20 µm long and usually are C or U shaped. The nucleus is located in the middle of the organism and a large kinetoplast (mitochondrial DNA) is located at the posterior end.



## 15B-G

Correct Identification: *Brugia malayi*

### Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Brugia malayi</i>	19/20	95	10/10	Correct
<i>Wuchereria bancrofti</i>	1	5	0	Incorrect

### Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	7/7	100	10/10	Correct

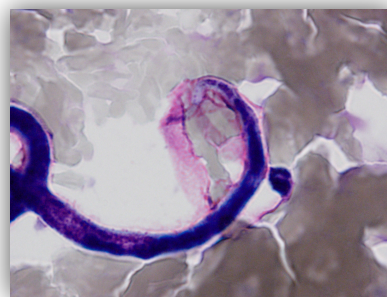
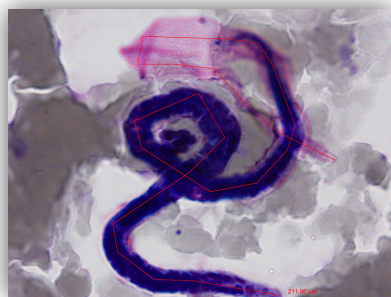
### Quality Control and Referee Information

Participating and referee laboratories agreed that *Brugia malayi* was the correct response (95 and 100% respectively). Quality control examination of 4% of the slides for this sample showed an average of 4 organisms per slide. The overall staining quality is good.

### Diagnostic Characteristics

The presence of a sheath that stains pink with Giemsa is diagnostic for *Brugia malayi*. *Wuchereria bancrofti* and *Loa loa* also have sheaths but they do stain well. *Brugia malayi* is also characterized by the presence of two terminal nuclei the second of which is located in the tip of the tail. *Wuchereria bancrofti* has no nuclei in the tip of the tail and *Loa loa* has a continuous row extending all the way to the tip.

*Brugia malayi* is an arthropod-borne nematode found in Asia. Adult females produce large numbers of sheathed larvae called microfilariae, which can be detected in the peripheral blood. The periodicity of *Brugia* favors detection in blood specimens collected between 10 PM and 2 AM, with about a 2-week window for the nematodes to adjust to a new time zone.



## 15B-H

Correct Identification: *Plasmodium malariae*

### Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Plasmodium malariae</i>	18/21	86	9/10	Correct
<i>Plasmodium vivax</i>	1	5	0	Incorrect
No Parasites Seen	2	9	1	Incorrect

### Results of Participating Laboratories Who Perform Parasite Screen

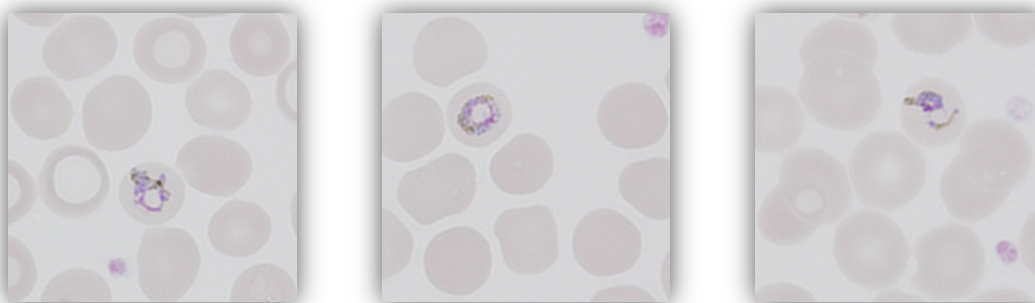
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	2/6	33	9/10	Correct
No Parasites Seen	4	67	1	Incorrect

### Quality Control and Referee Information

Participating and referee laboratories agreed that *Plasmodium malariae* was the correct response (86 and 90% respectively). Quality control examination of 4% of the slides for this sample showed an average of 8 organisms in every 40X field. Staining quality was good.

### Diagnostic Characteristics

The predominant stages of *Plasmodium malariae* observed in this specimen were mature trophozoites and schizonts. *P. malariae* tends to infect older red blood cells and therefore results in a lower parasitemia than *P. falciparum*. Infected cells are normal in size, or smaller than uninfected cells, a characteristic not observed with the other species that infect humans. The trophozoites can appear as compact band forms or basket forms. *P. malariae* is most likely to be confused with *P. knowlesi*, which has increasingly been recognized as a human pathogen in Southeast Asia. The schizonts contain 6-12 merozoites arranged in a rosette or an irregular cluster. Infected cells are not enlarged, or fimbriated, nor do they exhibit stippling. The ring stage is short lived and not usually seen.



## 15B-I

Correct Identification: *Babesia* species

### Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Babesia</i> sp.	20/21	95	10/10	Correct
<i>Plasmodium</i> sp.	1	5	0	Incorrect

### Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	6/6	100	10/10	Correct

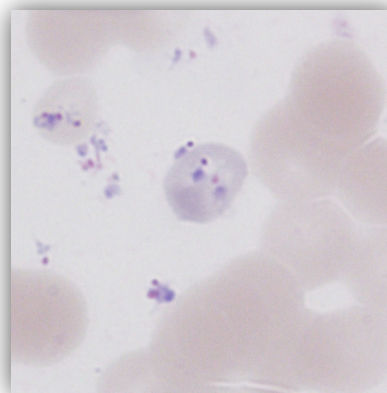
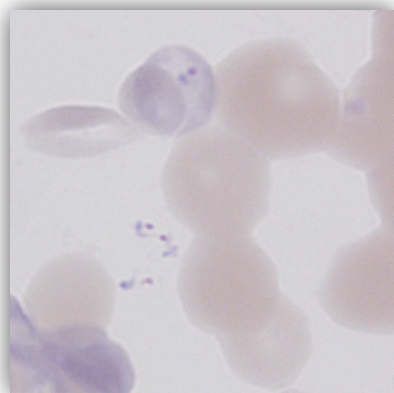
### Quality Control and Referee Information

Participating and referee laboratories agreed that ***Babesia* species** was the correct response (95 and 100% respectively). Quality control examination of 4% of the slides for this sample demonstrated *Babesia* in every 100X oil immersion field. Both intracellular and extracellular parasites were observed and the staining quality was good.

### Diagnostic Characteristics

***Babesia microti*** infects red blood cells and appears as small, pleomorphic rings. Although the parasite could be confused with the early trophozoites of *Plasmodium falciparum*, the rings are generally smaller, and extracellular parasites can be observed. The images below show examples of well-formed ring stage parasites outside the red blood cells. Infected cells are not enlarged and do not exhibit stippling or Maurer's dots. No other stages are seen and no pigment is present.

*Babesia microti* is endemic in the northeastern United States and is currently found in more than 20 counties of New York State, primarily on Long Island and along the Hudson Valley. The parasite is transmitted by *Ixodes scapularis*, the deer tick, which can also carry *Borrelia burgdorferi*, *Anaplasma phagocytophilum* and in rare cases Powassan/deer tick virus.



## 15B-J

Correct Identification: No Parasites Seen

### *Results of Participating Laboratories Who Perform Parasite Identification*

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	19/21	90	10/10	Correct
<i>Plasmodium falciparum</i>	1	5	0	Incorrect
<i>Plasmodium malariae</i>	1	5	0	Incorrect

### *Results of Participating Laboratories Who Perform Parasite Screen*

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	6/6	100	10/10	Correct

### *Quality Control and Referee Information*

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (90 and 100% respectively). Quality control examination of 4% of the slides for this sample showed erythrocytes of normal size and staining characteristics. Normal blood elements are present and exhibit typical staining characteristics. The overall staining quality was good.

## Scoring Information

### Distribution of Scores

Score	# of labs	% of labs
100	18	67
90-99	0	0
80-89	6	22
70-79	0	0
60-69	3	11
0-59	0	0

### Answer Key

Sample	Correct Answer
15B-F	<i>Trypanosoma cruzi</i>
15B-G	<i>Brugia malayi</i>
15B-H	<i>Plasmodium malariae</i>
15B-I	<i>Babesia</i> species
15B-J	No Parasites Seen

### Grading

The answer key was derived from the response of all participating laboratories as per **CLIA Regulations**, CFR Title 42, Part 493, Subpart I, Section 493.917. These regulations can be viewed at [www.cdc.gov/clia/Regulatory/default.aspx](http://www.cdc.gov/clia/Regulatory/default.aspx). These regulations state that 80% or more of participating laboratories **or** referee laboratories must identify the parasite for it to be authenticated as a correct answer. Similarly, reporting of a parasite identified by less than 10% of the participating laboratories **or** referees is an incorrect response. Organisms that are not authenticated, but which were reported by more than 10% but less than 80% of the participating laboratories **or** referees are "Unauthenticated", and are not considered for grading.

Credit is given according to the formula:

$$[\# \text{ of Correct Responses} / (\# \text{ of Correct Responses} + \# \text{ of Incorrect Responses})] \times 100$$

For example, if a sample contained one principal parasite and the laboratory reported it correctly but reported the presence of an additional parasite, which was not present, the sample grade would be:

$$1/(1+1) \times 100 = 50 \text{ percent.}$$

## Important Reminders

The next Parasitology Proficiency Test is scheduled for **October 6, 2015**. Participating labs will need to notify us **before October 13, 2015** if the samples are not received. Proficiency test results must be electronically submitted through EPTRS by **October 21, 2015** or the laboratory will receive a score of zero. This and additional information can be found in the NYS Proficiency Testing Program Guide provided by the NYS Clinical Laboratory Evaluation Program, which can be accessed via the Internet at:

<http://www.wadsworth.org/labcert/clep/ProgramGuide/WebGuide.pdf>