

NEW YORK STATE

Parasitology Proficiency Testing Program

Blood Smears Only 15 May 2012

The purpose of the New York State Proficiency Testing Program in the category of Parasitology - Blood Smears Only is to monitor the performance of applicant laboratories that detect and identify parasites on blood films. This document reports the results for the May 2012 proficiency test in Blood Smears Only. Most laboratories in this category previously participated in the Parasitology-Blood Borne Parasites Only category, which was renamed after the June 2011 event.

This category is divided into two sub-categories. **Parasite Identification** is intended for labs that identify parasites and report them to the species level on patient reports. **Parasite Screen** is intended for labs who report "Parasites Seen" and never report organisms to the species level 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, 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. Numerous samples of each test specimen were selected at random by the Parasitology Laboratory of the Wadsworth Center, NYSDOH, and were assayed for quality and confirmation of contents. Extensive quality control tests were also conducted by the supplying vendor 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.

12B-F

Correct identification: *Babesia* sp.

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Babesia</i> sp.	22/22	100	10/10	Correct

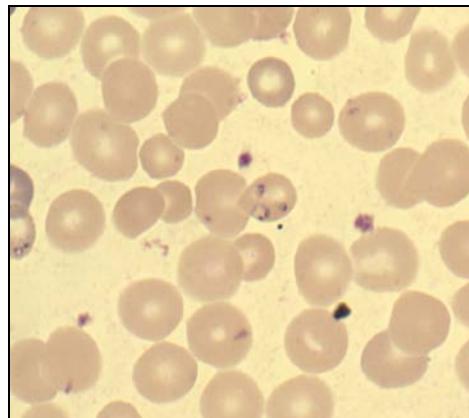
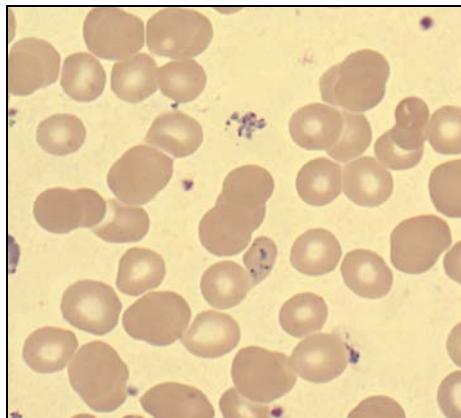
Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	2/2	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that *Babesia sp.* was the correct response (100%). Quality control examination of 4% of this sample showed parasites in every 100 X oil immersion field. Many extracellular parasites and multiply infected red blood cells are present. The overall staining quality is good.

Diagnostic Characteristics



Babesia sp. has a wide spread distribution which includes several counties in New York State. Parasites are transmitted by several species of ticks. Like malaria the parasites infect red blood cells. They appear as small, pleomorphic rings which can be confused with the early stage of *Plasmodium falciparum*. Infected cells are not enlarged and do not exhibit stippling or Mauer's dots. No other stages are ever seen and no pigment is ever present. Occasionally tetrads may be seen and parasites are often seen outside the red blood cells as shown in the image at left above.

12B-G

Correct identification: *Plasmodium vivax*.

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status

<i>Plasmodium vivax</i>	21/22	95	10/10	Correct
<i>Plasmodium ovale</i>	1	5	0	Incorrect

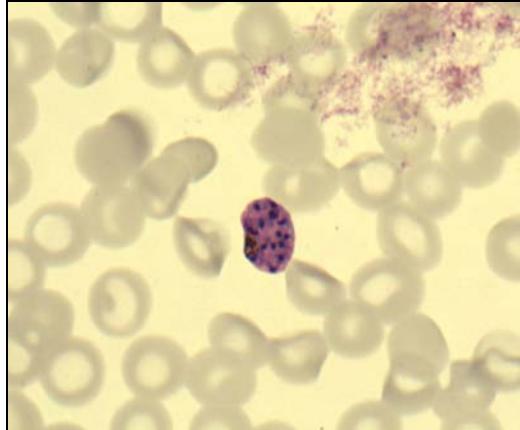
Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	2/2	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that *Plasmodium vivax* was the correct response (95 and 100%). Quality control examination of 4% of this sample showed parasites in nearly every 100 X oil immersion field. Infected cells are enlarged and Schüffner's dots are present. Parasite cytoplasm is amoeboid. The predominant stage seen was the mature trophozoite but schizonts are also present. The overall staining quality is good.

Diagnostic Characteristics



Plasmodium vivax is the most common species of malaria to infect humans. It may account for as much as 80% of all malaria cases. It also has the widest distribution. Infected red cells are usually enlarged and stain paler than uninfected ones. They may also contain Schüffner's dots. The trophozoites, like the one in the image at right above, are generally amoeboid and have a large chromatin. Occasionally cells will contain more than one parasite. Mature schizonts, like the one in the image at left above, contain 12-24 merozoites and gametocytes are round and fill the entire cell. Pigment is fine and scattered

12B-H

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	22/22	100	10/10	Correct

Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	2/2	100	10/10	Correct

Quality Control and Referee Information

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

12B-I

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>	18/22	82	8/10	Correct
<i>Wuchereria bancrofti</i>	4	18	2	No Penalty

Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	2/2	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that *Brugia malayi* was the correct response (82 and 80%). Quality control examination of 4% of this sample showed greater than 30 microfilariae per coverslip. Even though the staining quality was poor the organisms clearly show the characteristic pink staining sheath and terminal and sub terminal nuclei. Although *Wuchereria bancrofti* was reported by 20% of referee laboratories and was graded as "No Penalty" in order for you to receive credit for this sample you had to report the correct answer of *Brugia malayi*.

Diagnostic Characteristics



Brugia malayi is an arthropod-borne worm that resides in the lymphatic system of humans. Infection is spread by the arthropod intermediate host, in this case the mosquito. Adult female worms produce large numbers of sheathed larvae called microfilariae which can be detected in the peripheral blood. These microfilariae range in size from 177-230 µm and have a clearly visible pink sheath when stained with giemsa stain. *Wuchereria bancrofti* and *Loa loa* also have sheaths but they are not well stained with giemsa. *Brugia malayi* is also characterized by the presence of two terminal nuclei the second of which is located in the tip of the tail As shown in the image at right above. *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.

12B-J

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>	22/22	100	10/10	Correct

Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	2/2	100	10/10	Correct

Quality Control and Referee Information

Participating and Referee laboratories agreed that *Trypanosoma cruzi* was the correct response (100%). Quality control examination of 4% of this sample showed parasites in every 8-10 100 X oil immersion fields. They have a central nucleus and a large prominent kinetoplast. The staining quality is good.

Diagnostic Characteristics



Trypanosoma cruzi is the causative agent of the zoonosis Chagas disease. It is a major health problem in Latin America. The organism is transmitted through the feces of the reduviid bug when it takes a blood meal. Trypomastigotes are detected in the blood on thin and thick smears. They measure approximately 20µm and usually are C or U shaped but they can also appear broad and stumpy as shown in the image at left above. The nucleus is located in the middle of the organism and a large kinetoplast is located at the posterior end. A flagellum arises from the kinetoplast and follows the undulating membrane to the anterior end where it projects as a free flagellum. On giemsa stained smears the cytoplasm stains blueish while the nucleus and kinetoplast stain purple or red. *Trypanosoma cruzi* is

distinguished from *Trypanosoma brucei* primarily by the prominence of the kinetoplast which is much larger in *Trypanosoma cruzi*.

Scoring Information

Distribution of Scores

Score	# of labs	% of labs
100	20/24	83
80-89	3	13
60-69	1	4

Answer Key

Sample	Correct Answer	Points
12B-F	<i>Babesia</i> sp.	20
12B-G	<i>Plasmodium vivax</i>	20
12B-H	No Parasites Seen	20
12B-I	<i>Brugia malayi</i>	20
12B-J	<i>Trypanosoma cruzi</i>	20

TOTAL POSSIBLE POINTS 100

Grading

The answer key was derived from the response of all participating laboratories as per **CLIA Regulations**, Part 493, Subpart I, Section 493.917. These regulations can be viewed at www.phppo.cdc.gov. These regulations state that 80% or more of participating laboratories **or** referee laboratories must identify the parasite for it to be correct. Similarly, reporting of a parasite identified by less than 10% of the participating laboratories **or** referees finding parasites or ova is an incorrect response. Organisms reported by more than 10% but less than 80% of the participating laboratories **or** referees are "Unauthenticated", and are not considered for grading.

Each sample has a maximum value of 20 points. Credit is given according to the formula:

$$\frac{\text{Number of correct responses by lab}}{\text{\# Correct Parasites Present + \# Lab's Incorrect Answers}} \times 100$$

Important Reminders

The next Parasitology Proficiency Test is scheduled for **October 2, 2012**. You are responsible for notifying us **before October 9, 2012** if you do not receive your samples. Proficiency test results must be electronically submitted through EPTRS by **October 16, 2012** or the laboratory will receive a score of zero. These requirements are stated in the NYS Proficiency Testing Handbook provided by the NYS Clinical Laboratory Evaluation Program or can be accessed via the Internet at:

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

News and Notes

Beginning with the February 2009 proficiency exam, the **grading policy changed**. In order to make the score on the NYS Parasitology PT exam more accurately reflect laboratory performance, and be more consistent across categories, a new scoring system was put into effect. Under the new scoring system, grades are based only on the specimen or organism types processed by your laboratory.