NEW YORK STATE

Parasitology Proficiency Testing Program

Blood Smears Only
2 October 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 October 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 that 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-K

Correct identification: *Plasmodium ovale.*

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Plasmodium ovale	14/22	63	9/10	Correct
Plasmodium malariae	3	14	1	Incorrect
Plasmodium vivax	1	5	0	Incorrect

No Parasites Seen	4	18	0	Incorrect

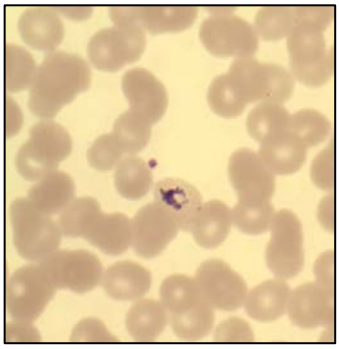
Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	2/2	100	0/10	Incorrect

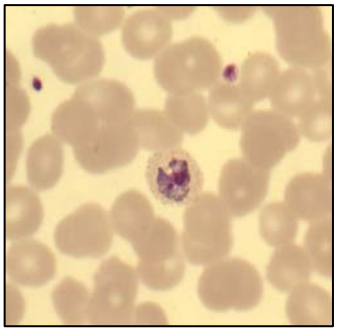
Quality Control and Referee Information

Referee laboratories agreed that ***Plasmodium ovale*** was the correct response (90%). Quality control examination of 4% of this sample showed a low parasitemia with organisms seen in every 20-30 100 X oil immersion fields. The predominant stage seen was the mature trophozoite. The infected cells are oval and contain Schüffner's stippling. The parasite cytoplasm is compact, the chromatin is large and the pigment is coarse. The overall staining quality is good.

Diagnostic Characteristics



Plasmodium ovale infections occur primarily in Central West Africa and some South Pacific Islands and accounts for fewer than 5% of all malaria cases. *P. ovale* malaria is usually less severe than other malarias and often ends in spontaneous recovery. The infected cells are usually enlarged, fimbriated, and have Schüffner's stippling. The cytoplasm of the trophozoites is usually less amoeboid than then that of *P. vivax* and the schizonts have 4-12 merozoites compared to 12-24 for *P. vivax*. The chromatin is usually very pronounced and the pigment is coarse.



Note: At least 200-300 100 X oil immersion fields should be examined before calling a specimen negative. Although the parasitemia of this specimen was quite low it should have been detectable if the minimum number of fields were examined.

12B-L

Correct identification: *Trypanosoma brucei.*

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Trypanosoma brucei	20/22	91	9/10	Correct
Trypanosoma cruzi	2	9	1	Incorrect

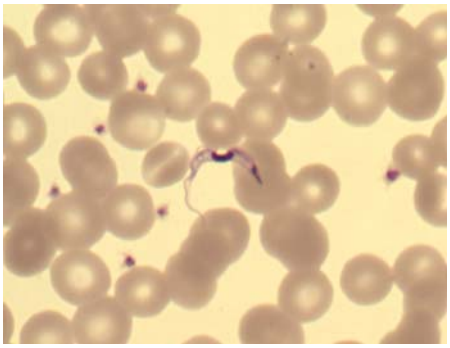
Results of Participating Laboratories Who Perform Parasite Screen

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

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Trypanosoma brucei*** was the correct response (91 and 90%). Quality control examination of 4% of this sample showed parasites in every 8-10 100 X oil immersion fields. The organisms have a large central nucleus and a small posterior kinetoplast. The overall staining quality is good.

Diagnostic Characteristics



Trypanosoma brucei is the causative agent of African sleeping sickness. It is limited to the tsetse fly endemic area of Central Africa where it has caused serious economic and social problems. Trypomastigotes are detected in the blood on thick and thin Giemsa stained smears. They measure 14-33 µm long and in some cases the undulating membrane and flagellum may be seen. The nucleus is located in the middle of the organism and the kinetoplast from which the flagellum arises is located at the blunt posterior end. On a Giemsa stained smear the cytoplasm will stain blue and the nucleus and kinetoplast will stain red or purple. Trypomastigotes of *T. cruzi* are similar but are generally shorter, have a 3-5 X larger, more prominent kinetoplast at a pointed posterior end and assume a C or U shape.

12B-M

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-N

Correct identification: *Babesia* sp..

Results of Participating Laboratories Who Perform Parasite Identification

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

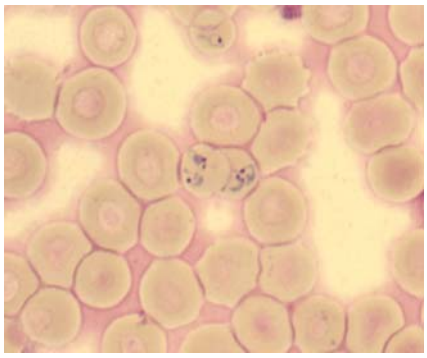
Results of Participating Laboratories Who Perform Parasite Screen

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 multiple organisms per 100 X oil immersion field. The parasites are small pleomorphic rings and are seen both inside and outside the red blood cells. The staining quality is fair.

Diagnostic Characteristics



***Babesia* sp.** has a widespread 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.

12B-O

Correct identification: *Brugia malayi.*

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Brugia malayi	18/22	81	8/10	Correct
Loa loa	3	14	1	Incorrect
Mansonella sp.	1	5	1	Incorrect

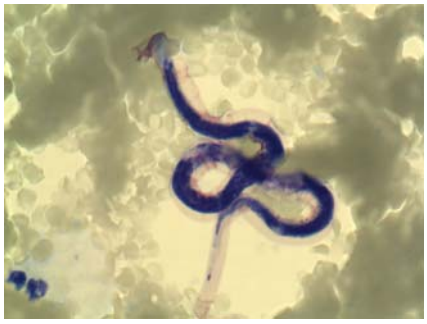
Results of Participating Laboratories Who Perform Parasite Screen

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 ***Brugia malayi*** was the correct response (81 and 80%). Quality control examination of 4% of this sample showed an average of 20 organisms per slide. They have a pink staining sheath and terminal and subterminal nuclei. The staining quality is fair.

Diagnostic Characteristics



Brugia malayi is an arthropod-borne worm that resides in the lymphatic system of humans. Infection is spread by an 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.

Scoring Information

Distribution of Scores

Score	# of labs	% of labs
100	11/24	46
80-89	10	42
60-69	3	13

Answer Key

Sample	Correct Answer	Points

12B-K	*Plasmodium ovale*	20
12B-L	*Trypanosoma brucei*	20
12B-M	No Parasites Seen	20
12B-N	*Babesia* sp.	20
12B-O	*Brugia malayi*	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 **February 5, 2013.** You are responsible for notifying us **before February 12, 2013** if you do not receive your samples. Proficiency test results must be electronically submitted through EPTRS by **February 19, 2013** 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