



NEW YORK STATE

Parasitology Proficiency Testing Program

Blood Borne Parasites 03 February 2009

The purpose of the New York State Proficiency Testing Program in the category of Blood Borne Parasites is to monitor the performance of applicant laboratories in detecting and identifying parasites on blood films. This document reports the results for the February 2009 proficiency test in Blood Borne Parasites.

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 Unit of the David Axelrod Institute for Public Health, 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 New York State Parasitology Laboratory for inspection and verification. Samples were authenticated by 80% of participating laboratories and/or referee laboratories.

09B-A

Correct diagnosis: No Parasites Seen.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	17/18	94	10/10	Correct
<i>Babesia</i> sp.	1/18	6	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that No Parasites Seen was the correct response (94% and 100% respectively). 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. No inclusions are present.

09B-B

Correct diagnosis: *Trypanosoma cruzi*.

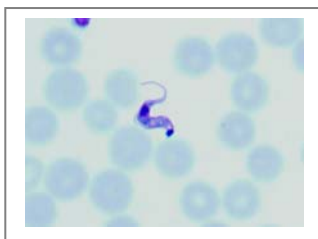
Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Trypanosoma cruzi</i>	18/18	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 an average of 1 organism per every 15-20 100X oil immersion fields. The staining quality is good with typical staining characteristics.

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. 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.

09B-C

Correct diagnosis: No Parasites Seen.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	18/18	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that No Parasites 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. No inclusions are present.

09B-D

Correct diagnosis: *Babesia* sp.

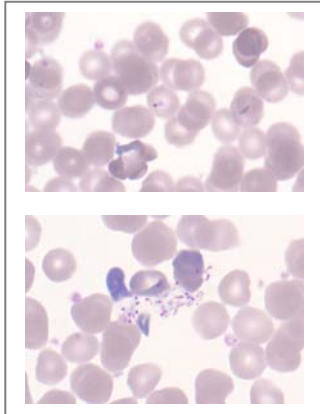
Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Babesia</i> sp.	15/18	83	10/10	Correct
<i>Plasmodium falciparum</i>	2/18	11	0	Incorrect
<i>Plasmodium vivax</i>	1/18	6	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Babesia* sp.** was the correct response (83 and 100%). Quality control examination of 4% of this sample showed multiple organisms in every 100X oil immersion field. The staining quality was good and there were **many** organisms outside the red blood cells which is typical for *Babesia* sp. but not for *Plasmodium falciparum*.

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.

09B-E

Correct diagnosis: *Plasmodium ovale*.

Results of Participating Laboratories

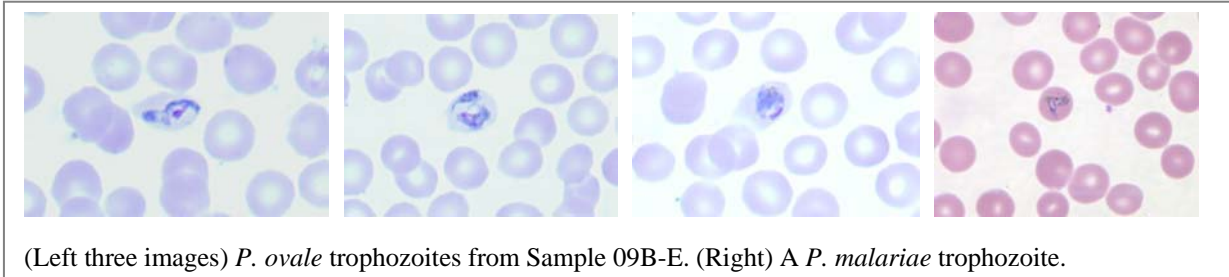
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Plasmodium malariae</i>	15/18	83	10/10	Unauthenticated
<i>Plasmodium vivax</i>	2/18	11	0	
<i>Plasmodium ovale</i>	1/18	6	0	

Quality Control and Referee Information

Participating and referee laboratories failed to agree that ***Plasmodium ovale*** was the correct response but did agree that *Plasmodium* sp. was present (100%). Therefore credit was given for reporting any species of malaria. Quality control examination of 4% of this sample showed a low parasitemia with organisms in every 20-30 100X oil immersion fields. **Remember that at least 200-300 oil immersion fields should be examined before calling a specimen negative.** The predominant stage seen was the mature trophozoite. Most infected cells were slightly enlarged. The overall staining quality is good although little stippling was seen.

Diagnostic Characteristics

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



The three images above, taken from this sample, show mature trophozoites in enlarged oval cells. The cytoplasm is fairly compact, the chromatin is prominent, and the pigment is coarse. *Plasmodium malariae* **does not** enlarge the infected cell and in fact infected cells are often smaller than uninfected ones, as demonstrated in the image shown on the right.

Scoring Information

Distribution of Scores

Score	# of labs	% of labs
100	13/19	68
80	5/19	26
0	1/19	5

Answer Key

Sample	Correct Answer	Points
09B-A	No parasites seen	20
09B-B	<i>Trypanosoma cruzi</i>	20
09B-C	No parasites seen	20
09B-D	<i>Babesia</i> sp.	20
09B-E	<i>Plasmodium</i> sp.*	20

TOTAL POSSIBLE POINTS 100

* Specimen was authenticated to the genus level and credit was given for any species of malaria reported.

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 20% of the participating laboratories **or** referees finding parasites or ova is an incorrect response. Organisms reported by more than 20% 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:

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

Important Reminders

The mailout dates for Parasitology have been changed from the first Monday of February, June, and October to the first Tuesday.

The next Parasitology Proficiency Test is scheduled for **June 2, 2009**. You are responsible for notifying the New York State Parasitology Unit **before June 9, 2009** if you do not receive your test. Proficiency test results must be electronically submitted through EPTRS by **June 16, 2009** or you will receive a zero. These requirements are clearly stated in your NYS Proficiency Testing Handbook provided by the NYS Clinical Laboratory Evaluation Program, and can be accessed via the Internet at: <http://www.wadsworth.org/labcert/lep/ProgramGuide/WebGuide.pdf>

News and Notes

As announced in the October mailing, the **grading policy has changed** beginning with this proficiency exam. 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 is in effect. Under the new scoring system, grades are based only on the specimen or organism types processed by your laboratory. For example, if your laboratory does not diagnose microfilarian infections, your score on this test would have been based on the four other specimens, each of which will be worth 25% of the total. Laboratories that process all of the types of samples included in the exam will not observe any changes in scoring method.