

NEW YORK STATE PARASITOLOGY PROFICIENCY TESTING PROGRAM

BLOOD BORNE PARASITES

03 JUNE 2008

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.

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 checked to confirm their 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.

SAMPLE 08B-F

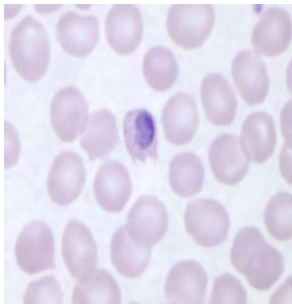
RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
<i>Plasmodium ovale</i>	3/19	16	Unauthenticated
<i>Plasmodium malariae</i>	8	42	No Penalty
No Parasites Seen	5	26	No Penalty
<i>Plasmodium vivax</i>	3	16	No Penalty

QUALITY CONTROL:

Participating laboratories failed to agree that *Plasmodium ovale* was the correct response. Quality control examination of 4% of this sample showed a low parasitemia with organisms only in every 20-30 100X oil emersion fields. The predominant stage seen was the mature trophozoite. Most infected cells were slightly enlarged and fimbriate. 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 malarias and often ends in spontaneous recovery. The infected cells are usually enlarged, fimbriate, and have Schüffner's stippling. The cytoplasm of the trophozoites is usually compact as shown in the image to the left whereas the cytoplasm of *P. vivax* is amoeboid. 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.

Mature trophozoite of *P. ovale*

SAMPLE 08B-G

RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
NO PARASITES SEEN	19/19	100	Correct

QUALITY CONTROL:

Participating 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.

SAMPLE 08B-H

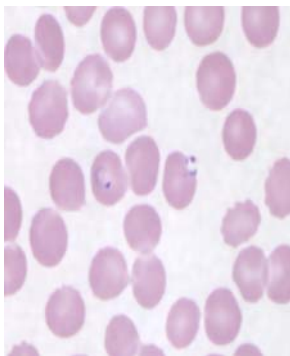
RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
<i>Plasmodium falciparum</i>	18/19	95	Correct
<i>Plasmodium malariae</i>	1	5	Incorrect

QUALITY CONTROL:

Participating laboratories agreed that ***Plasmodium falciparum*** was the correct response (95%). Quality control examination of 4% of this sample showed organisms in nearly every 100X oil emersion field. The only stage seen was the ring stage trophozoite. There were many appliqué forms, parasites with double chromatin, and multiply infected cells. The overall staining quality is good.

DIAGNOSTIC CHARACTERISTICS:



Ring stage trophozoites of *P.*

Plasmodium falciparum is one of the four species of *Plasmodium* known to infect humans. It causes the most dangerous and severe form of malaria and is always considered to be a medical emergency. Death may occur rapidly if proper treatment is not started immediately. Its distribution is limited to the tropics, primarily Africa and Asia. *P. falciparum* invades all ages of RBC's and so the parasitemia can exceed 50%. The usual stages seen in the peripheral blood are rings and gametocytes. Schizogony occurs in the internal organs so it is rare to see other stages although they may be present in cases of severe malaria. The infected RBC's are not enlarged nor do they contain Schüffner's dots. The rings are generally small, and may have one or two chromatin dots. Appliqué forms are also characteristic. The mature trophozoites are compact with a mass or a few grains of coarse pigment. Gametocytes are rounded to banana-shaped and contain a single well defined chromatin and coarse rice-grain like pigment.

SAMPLE 08B-I

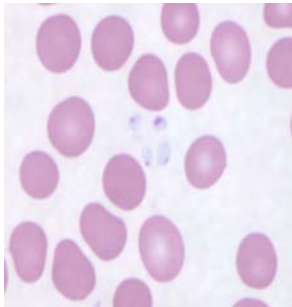
RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
<i>Babesia</i> sp.	6/19	32	Unauthenticated
No Parasites Seen	10	53	No penalty
<i>Plasmodium falciparum</i>	3	16	

QUALITY CONTROL:

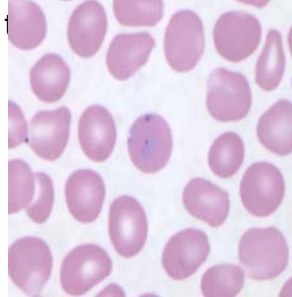
Participating laboratories failed to agree that ***Babesia* sp.** was the correct response. Quality control examination of 4% of this sample showed organisms in every 8-10 100X oil emersion fields. The only stage seen is the ring form. There are multiple rings per infected cell and parasites were seen outside the red blood cells.

DIAGNOSTIC CHARACTERISTICS:



Babesia sp. outside

***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 may 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 top image at left



Babesia sp. multiple infection

SAMPLE 08B-J

RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
NO PARASITES SEEN	19/19	100	Correct

QUALITY CONTROL:

Participating 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.

DISTRIBUTION OF SCORES

SCORE	NUMBER OF LABS	PERCENT
100	18/19	95
80	1	5

ANSWER KEY

<u>SAMPLE</u>	<u>CORRECT ANSWER</u>	<u>POINTS</u>
08B-F	<i>Plasmodium ovale*</i>	20
08B-G	NO PARASITES SEEN	20
08B-H	<i>Plasmodium falciparum</i>	20
08B-I	<i>Babesia sp.*</i>	20
08B-J	NO PARASITES SEEN	20

TOTAL POSSIBLE POINTS 100

*Specimen was unauthenticated and credit was given for any answer.

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, less than 20% of the participating laboratories **or** referees finding parasites or ova is an incorrect response. Organisms reported by 20-80% 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 **October 7, 2008**. You are responsible for notifying us **before October 14, 2008** if you do not receive your test. Proficiency test results must be electronically submitted through EPTRS by **October 21, 2008** 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 or can be accessed via the internet at:
<http://www.wadsworth.org/labcert/clep/ProgramGuide/WebGuide.pdf>

NEWS AND NOTES

The Clinical Parasitology Lab of the NYSDOH offers two mailing kits for the submission of specimens. One kit contains vials of PVA and Formalin and the other does not. These kits can be ordered by calling 518-474-4175 and requesting kit DOH-2117. Please be sure to specify whether you need preservatives or not. **Remember that the NYS Parasitology Lab only accepts specimens preserved in appropriate fixatives for the test requested.**