

NEW YORK STATE

Parasitology Proficiency Testing Program

Parasitology Comprehensive 4 October 2011

The purpose of the New York State Proficiency Testing Program in the category of Parasitology - Comprehensive is to monitor the performance of applicant laboratories that detect and identify parasites in fecal emulsions, fecal smears, and blood films. This document reports the results for the October 2011 proficiency test in Parasitology-Comprehensive. Most laboratories in this category previously participated in the Parasitology-General category, which was renamed after the May 2011 event.

Sample Preparation and Quality Control

All emulsions and slides used in this test were prepared by a commercial source. The emulsions were dispensed into the vials from pools which were continuously mixed during the loading process. Numerous samples of each test specimen were selected at random by the Parasitology Laboratory of the New York State Department of Health, and were assayed for quality and confirmation of organisms. Extensive quality control tests were also conducted by the supplying vendor and a detailed quality control report was submitted for inspection and verification. Samples were authenticated by at least 80% of participating laboratories and/or referee laboratories.

11-K (Helminths Only)

Correct identification: *Clonorchis sinensis*/*Opisthorchis* sp.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Clonorchis sinensis</i> / <i>Opisthorchis</i> sp.	110/110	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that *Clonorchis sinensis*/*Opisthorchis* sp. was the correct response (100%). Quality control examination of 4% of this sample showed an average of 20 ova per coverslip. Other tests performed included a Direct Immunofluorescent Assay for *Giardia lamblia* and *Cryptosporidium* sp., which was negative for both organisms, and a modified acid-fast stained smear which was also negative.

Diagnostic Characteristics and Life Cycle

Clonorchis sinensis is a trematode that parasitizes the biliary ducts of humans. Humans become infected when they eat uncooked freshwater fish that contain metacercariae. The metacercariae excyst and travel to the distal bile capillaries where the worms mature. Adult worms deposit eggs in the bile fluid and these are later discharged into the feces.



The eggs of *Clonorchis sinensis* are morphologically indistinguishable from those of *Opisthorchis* sp., thus both answers are acceptable. The ova measure 28-35µm and are thick shelled with an elongated oval shape. The most distinctive feature is the operculum, which has distinct “shoulders” where the operculum, or lid, meets the rest of the egg. These shoulders, which are easily visible, distinguish *Clonorchis* and *Opisthorchis* eggs from similar eggs such as those of *Metagonimus yokogawai*. Other eggs with shouldered operculae are much larger. There is also a knob at the abopercular end, but this may not always be clearly visible.

11-L (Helminths Only)

Correct identification: *Schistosoma haematobium*.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Schistosoma haematobium</i>	110/110	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Schistosoma haematobium*** was the correct response (100%). Quality control examination of 4% of this sample showed an average of 12 ova per coverslip. Other tests performed included a Direct Immunofluorescent Assay for *Giardia lamblia* and *Cryptosporidium* sp. which was negative for both organisms and a modified acid-fast stained smear which was also negative.

Diagnostic Characteristics and Life Cycle

Schistosoma haematobium is the causative agent of urinary schistosomiasis. It is distributed throughout Africa, India, the Middle East, and Portugal. The primary reservoir is humans and the intermediate host is the snail. Humans become infected when exposed to cercariae in fresh water. The cercariae penetrate the skin and develop into adult worms in the venous circulation. The diagnostic stage is the fully embryonated egg which is released to the environment in the urine or, in heavy infections such as the one that produced this sample, in the stool. Egg excretion is periodic, thus specimen collection strategies should be optimized to obtain the best yield. Collection of samples should occur between 12:00pm and 3:00pm, or a 24-hour urine sample should be obtained.



Schistosoma haematobium eggs have no operculum, measure approximately 112-170 μm , are light brown, and have a prominent terminal spine. The size of the egg and the position of the spine are the most useful diagnostic characteristics for discriminating between this species and other members of the genus.

11-M (Helminths Only)

Correct identification: No Parasites Seen.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	108/110	98	10/10	Correct
<i>Ascaris lumbricoides</i>	1	1	0	Incorrect
<i>Cyclospora cayetanensis</i>	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (98 and 100%). Quality control examination of 4% of this sample showed normal fecal debris with no organisms present. Other tests performed included a Direct Immunofluorescent Assay for *Giardia lamblia* and *Cryptosporidium* sp. which was negative for both organisms and a modified acid-fast stained smear which was also negative.

11-N (Protozoa Only)

Correct identification: *Dientamoeba fragilis*.

Results of Participating Laboratories

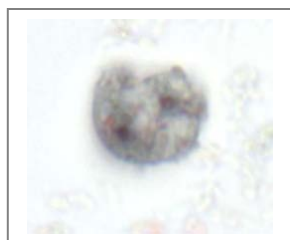
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Dientamoeba fragilis</i>	75/110	68	10/10	Correct
No Parasites Seen	25	23	0	Incorrect
<i>Endolimax nana</i>	10	9	0	Incorrect
<i>Iodamoeba butschlii</i>	2	2	0	Incorrect
<i>Chilomastix mesnili</i>	1	1	0	Incorrect
<i>Entamoeba hartmanni</i>	1	1	0	Incorrect
<i>Entamoeba coli</i>	1	1	0	Incorrect
<i>Plasmodium falciparum</i>	1	1	0	Incorrect

Quality Control and Referee Information

Referee laboratories agreed that *Dientamoeba fragilis* was the correct response (100%). Quality control examination of 4% of this sample showed rare uni- and bi-nucleated trophozoites.

Diagnostic Characteristics and Life Cycle

Dientamoeba fragilis is distributed worldwide. Despite the name, it is classified as a flagellate rather than an amoeba. There is no known cyst stage. Trophozoites are either uni- or bi-nucleated. Uni-nucleate organisms are easily confused with *Endolimax nana*. The nuclear chromatin can be fragmented, which is helpful in distinguishing this organism from *E. nana*, and no peripheral chromatin is seen. The cells themselves are amoeboid in shape and measure between 5-15 μm , with a typical range of 10-12 μm . The cytoplasm is finely granular and may contain vacuoles. The cell boundary may be difficult to discern on a trichrome stained specimen and the staining characteristics of this organism are quite variable.



11-O (All Parasites)

Correct identification: *Plasmodium falciparum*.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Plasmodium falciparum</i>	98/105	93	10/10	Correct
Parasites Seen*	1	1	0	Correct
<i>Babesia</i> sp.	4	4	0	Incorrect
<i>Plasmodium malariae</i>	1	1	0	Incorrect
No Parasites Seen	1	1	0	Incorrect

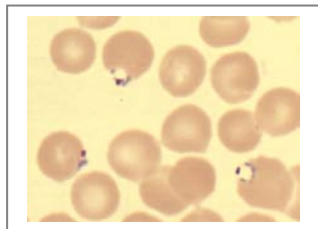
* This response can only be used by laboratories that never report *Plasmodium* to the species level on patient reports.

Quality Control and Referee Information

Participating and referee laboratories agreed that *Plasmodium falciparum* was the correct response (93 and 100% respectively). Quality control examination of 4% of this sample showed multiple parasites in every 100 X oil immersion field. Infected cells were not enlarged and had no Schüffner's stippling. The only stage seen was the ring stage trophozoite.

Diagnostic Characteristics and Life Cycle

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 RBCs leading to high parasitemia. The usual stages seen in the peripheral blood are rings and gametocytes. Since schizogony occurs in the internal organs it is rare to see other stages of parasite development, although they may be present in cases of severe malaria. The infected RBCs 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, such as those seen here, are also characteristic. Gametocytes are rounded to banana-shaped and contain a single well defined chromatin dot and coarse rice-grain-like pigment.

Scoring Information

Immunoassay Results

<i>Cryptosporidium</i>	11-K		11-L		11-M	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Cryptosporidium/Giardia	26	0	26	0	26	0
Meridian Merifluor Cryptosporidium/Giardia	19	0	19	0	19	0
Meridian Premier Cryptosporidium	1	0	1	0	1	0
Remel ProspecT Cryptosporidium EIA	17	0	17	0	17	0
TechLab Cryptosporidium II ELISA	3	0	3	0	3	0
Remel Xpect Giardia/Cryptosporidium	5	0	5	0	5	0
TechLab/Wampole Test EIA	3	0	3	0	3	0

<i>Giardia</i>	11-K		11-L		11-M	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Crypto/Giardia	26	0	26	0	26	0
Meridian Merifluor Crypto/Giardia	15	0	15	0	15	0
Meridian Premier Giardia	1	0	1	0	1	0
Remel ProspecT Giardia EIA	22	0	22	0	22	0
Remel ProSpect Giardia EZ	2	0	2	0	2	0
Remel Xpect Giardia	1	0	1	0	1	0
Remel Xpect Giardia/Cryptosporidium	5	0	5	0	4	1
TechLab/Wampole Test EIA	7	0	7	0	7	0
TechLab Giardia II ELISA	2	0	2	0	2	0

Distribution of Scores

Score	# of labs	% of labs
100	68	62
90-99	4	4
80-89	31	28
70-79	2	2
60-69	5	5

Answer Key

Sample	Correct Answer	Points
11-K	<i>Clonorchis sinensis</i> / <i>Opisthorchis sp.</i>	20
11-L	<i>Schistosoma haematobium.</i>	20
11-M	No Parasites Seen	20
11-N	<i>Dientamoeba fragilis</i>	20
11-O	<i>Plasmodium falciparum</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 wwwn.cdc.gov/clia/regs/toc.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% 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:

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

Important Reminders

The next Parasitology Proficiency Test is scheduled for **February 7, 2012**. You are responsible for notifying us **before February 14, 2012** if you do not receive your samples. Proficiency test results must be electronically submitted through EPTRS by **February 21, 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/pg.htm>

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.