



NEW YORK STATE

Parasitology Proficiency Testing Program

Parasitology (General)

01 June 2010

The purpose of the New York State Proficiency Testing Program in the category of Parasitology (General) is to monitor the performance of applicant laboratories in detecting and identifying parasites in fecal emulsions, fecal smears, and blood films. This document reports the results for the June 2010 proficiency test in Parasitology (General).

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 to the Parasitology Laboratory for inspection and verification. Samples were authenticated by 80% of participating laboratories and/or referee laboratories.

10-F (Helminths Only)

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

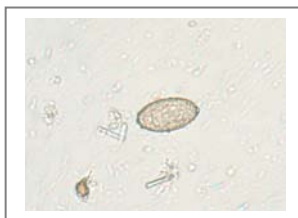
Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Clonorchis sinensis</i> / <i>Opisthorchis</i> sp.	111/118	94	9/10	Correct
No Parasites Seen	7	6	1	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Clonorchis sinensis*/*Opisthorchis* sp. was the correct response (94% and 90%). Quality control examination of 4% of this sample showed an average of 10 organisms per coverslip. Other tests performed include a Direct Immunofluorescent Assay and ELISA for *Giardia lamblia* and *Cryptosporidium* sp. which were negative for both organisms. A modified acid-fast stained smear was also negative.

Parasite Information and Diagnostic Characteristics



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. The eggs measure 28-35µm. They are thick shelled and elongated oval in shape. The most distinctive feature is the operculum, which has distinct opercular shoulders that distinguish it from similar eggs such as those of *Metagonimus yokogawai*. Other eggs with shouldered operculae are much larger. There is a knob at the abopercular end, but this may not always be clearly visible.

10-G (Helminths Only)

Correct diagnosis: *Taenia* sp.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Taenia</i> sp.	116/118	98	10/10	Correct
No Parasites Seen	2	2	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Taenia* sp.** was the correct response (98% and 100%). Quality control examination of 4% of this sample showed an average of 15 ova per coverslip. *Blastocystis hominis* was also present but should not have been reported because "Helminths Only" was requested. Other tests performed include a Direct Immunofluorescent Assay and ELISA for *Giardia lamblia* and *Cryptosporidium* sp. which were negative for both organisms. A modified acid-fast stained smear was also negative.

Parasite Information and Diagnostic Characteristics



Infection with the intestinal cestode *Taenia* sp. occurs when undercooked beef or pork containing encysted larvae is consumed. The larvae survive digestion of the meat in the stomach and attach to the wall of the small intestine, where they mature into adults. These produce proglottids which are passed into the stool and release eggs.

The diagnostic stage most often encountered is the egg, which is yellow-brown, round to oval and 35-40µm in diameter. The most distinctive feature is the strongly-colored, thick-walled, radially striated shell; the wall is much thicker than that of any of the other helminth eggs tested for in this program. The egg contains an oncosphere with visible hooks.

10-H (All Parasites)

Correct diagnosis: *Ascaris lumbricoides*.

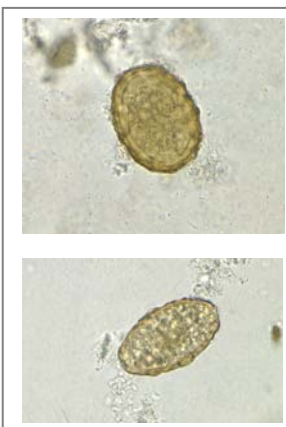
Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Ascaris lumbricoides</i>	113/118	96	10/10	Correct
<i>Trichuris trichiura</i>	66	56	5	No Penalty
<i>Hymanolepis nana</i>	28	24	0	No Penalty
<i>Diphyllobothrium latum</i>	2	2	1	No Penalty
<i>Endolimax nana</i>	1	1	0	No Penalty
No Parasites Seen	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Ascaris lumbricoides* was the correct response (96% and 100%). Quality control examination of 4% of this sample revealed an average of 8 ova per coverslip. Both fertile and infertile eggs were seen. Several other organisms were also identified during QC examination and were excluded from grading. Other tests performed include Direct Immunofluorescent Assay and ELISA for *Giardia lamblia* and *Cryptosporidium* sp. which were negative for both organisms. A modified acid-fast stained smear was also negative.

Parasite Information and Diagnostic Characteristics



Ascaris lumbricoides is one of the most common intestinal nematode infections of man, and can cause severe intestinal blockages. It is most prevalent in warm moist climates but can also be found in cooler areas. Infection is acquired when embryonated eggs in contaminated soil are ingested.

Ascaris eggs in stool may be found in two forms: fertilized and unfertilized. The fertilized eggs (upper image) are more regular in appearance; these are round to oval and measure 45-75µm by 35-50µm. The relatively thick, golden-brown wall is usually mammillated, but eggs may occasionally lose the outer mammillated layer (these are called “decorticated” eggs). Infertile eggs (lower image) are larger, less broad for their length, and have thinner shells, and the mamillated layer may be highly irregular. They measure 85-90µm by 43-47µm.

10-I (Protozoa Only)

Correct diagnosis: *Iodamoeba butschlii*.

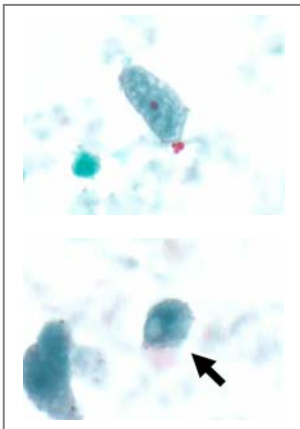
Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Iodamoeba butschlii</i>	99/118	84	8/10	Correct
<i>Endolimax nana</i>	24	20	2	No Penalty
<i>Dientamoeba fragilis</i>	3	3	0	Incorrect
<i>Entamoeba coli</i>	2	2	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Iodamoeba butschlii* was the correct response (84% and 80%). Quality control examination of 4% of this sample showed trophozoites in almost every oil immersion field. Very few cysts were seen.

Parasite Information and Diagnostic Characteristics



Iodamoeba butschlii is distributed worldwide and is nonpathogenic. Infection occurs via the fecal oral route.

Trophozoites of *Iodamoeba butschlii* measure 8-20µm. The nucleus has a large karyosome and no peripheral chromatin. The cytoplasm can be granular and contains many vacuoles. It can be difficult to differentiate the trophozoites of *Iodamoeba butschlii* (top image) from *Endolimax nana*, the primary difference being that *E. nana* trophozoites are generally smaller. The cysts of the two species are very distinctive. Cysts of *I. butschlii* (bottom image) measure 5-20µm and contain a single nucleus with a large karyosome and no peripheral chromatin. They also have a large well-defined glycogen vacuole. Cysts of *E. nana* measure 5-10µm, are round to oval, and contain four nuclei.

10-J (All Parasites)

Correct diagnosis: No Parasites Seen.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	107/112	96	10/10	Correct
<i>Babesia</i> sp.	2	2	0	Incorrect
<i>Plasmodium malariae</i>	1	1	0	Incorrect
<i>Plasmodium falciparum</i>	1	1	0	Incorrect
<i>Plasmodium</i> sp.	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (96% and 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.

Scoring Information

Immunoassay Results

<i>Cryptosporidium</i>	10-F		10-G		10-H	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Crypto/Giardia	23	0	23	0	23	0
Meridian Merifluor Crypto/Giardia	18	0	18	0	18	0
Remel Prospect Cryptosporidium EIA	21	0	21	0	21	0
Remel Xpect Cryptosporidium	1	0	1	0	1	0
Remel Xpect Giardia/Cryptosporidium	5	0	5	0	5	0
TechLab/Wampole Test EIA	6	0	6	0	6	0

<i>Giardia</i>	10-F		10-G		10-H	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Crypto/Giardia	24	0	24	0	24	0
Meridian Merifluor Crypto/Giardia	14	0	14	0	14	0
Remel Prospect Giardia EIA	26	0	26	0	26	0
Remel ProSpect Giardia EZ	2	0	2	0	2	0
Remel Xpect Giardia	2	0	2	0	2	0
Remel Xpect Giardia/Cryptosporidium	5	0	5	0	5	0
TechLab/Wampole Test EIA	6	0	9	0	9	0

Distribution of Scores

Score	# of labs	% of labs
100	93	73
90-99	0	0
80-89	29	23
70-79	1	1
60-69	3	2
50-59	1	1

Answer Key

Sample	Correct Answer	Points
10-F	<i>Clonorchis sinensis</i>	20
10-G	<i>Taenia</i> sp.	20
10-H	<i>Ascaris lumbricoides</i>	20
10-I	<i>Iodamoeba butschlii</i>	20
10-J	No Parasites Seen	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 correct. Similarly, reporting of a parasite identified by less than 10% of the participating laboratories **or** referees 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:

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

Important Reminders

The next Parasitology Proficiency Test is scheduled for **October 5, 2010**. You are responsible for notifying us **before October 12, 2010** if you do not receive your samples. Proficiency test results must be electronically submitted through EPTRS by **October 19, 2010** in order to receive a score. 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

In conjunction with the Northeast Regional Meeting of the American Society for Microbiology Meeting on November 9 and 10 in Albany, the Parasitology Laboratory will be conducting a half-day workshop called "Separated at Birth". This workshop will feature parasites that are morphologically similar and can be challenging to differentiate.