



Parasitology (General)

02 June 2009

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 2009 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 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.

09-F (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.	124/125	99	10/10	Correct
<i>Ascaris lumbricoides</i>	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Taenia* sp.** was the correct response (99 and 100%). Quality control examination of 4% of this sample showed an average of 10 ova 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.

Diagnostic Characteristics



The diagnostic stage of the intestinal cestode *Taenia sp.* is the characteristic egg found in stool. These eggs are yellow-brown, round to oval and measure 35-40 μm . They have a thick radially striated shell and contain an oncosphere with visible hooks. Infection occurs when raw or poorly cooked beef or pork containing encysted larvae is ingested. The larvae are digested out of the meat in the stomach and attach to the wall of the small intestine. The adult worms mature in about 5-12 weeks and begin to produce proglottids containing infective eggs. These eggs are passed in the stool to the environment where the cycle is continued.

09-G (All Parasites)

Correct diagnosis: *Hymenolepis nana*

Results of Participating Laboratories

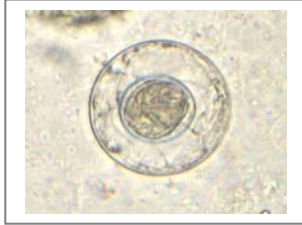
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Hymenolepis nana</i>	124/125	99	10/10	Correct
<i>Giardia lamblia</i>	2	2	1	No Penalty
<i>Cryptosporidium sp.</i>	4	4	0	Incorrect
<i>Balantidium coli</i>	1	1	0	Incorrect
<i>Fasciola hepatica/ Fasciolopsis buski</i>	1	1	0	Incorrect
<i>Chilomastix mesnili</i>	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Hymenolepis nana* was the correct response (100%). Quality control examination of 4% of this sample showed greater than 30 ova per coverslip. Hooks and filaments are visible in some of the eggs. Other tests performed include Direct Immunofluorescent Assay and ELISA for *Giardia lamblia* and *Cryptosporidium sp.* which were positive for *Giardia* and negative for *Cryptosporidium*. A modified acid-fast stained smear was negative.

Diagnostic Characteristics

Hymenolepis nana also known as the dwarf tapeworm is an intestinal cestode acquired by ingesting eggs from the environment or rarely by ingesting infected beetles. Internal autoinfection is also possible. *H. nana* is the only human tapeworm that doesn't have an intermediate host and transmission occurs from person to person. It has a worldwide distribution and is more commonly seen in children. The diagnostic stage is the egg recovered in stool. These eggs are spherical, thin shelled, and measure 30 to 47µm in diameter. They have a six hooked oncosphere with two polar thickenings from which filaments arise. These filaments are visible in the space between the embryo and the outer shell. Eggs of *H. nana* can be confused with the eggs of *Hymenolepis diminuta* and careful measurement with a calibrated ocular micrometer is essential. The eggs of *H. diminuta* are much larger measuring 70-85 µm.



09-H (All Parasites)

Correct diagnosis: *Balantidium coli*.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Balantidium coli</i> .	123/125	98	10/10	Correct
<i>Fasciola hepatica</i> / <i>Fasciolopsis buski</i>	43	34	3	No Penalty
<i>Chilomastix mesnili</i>	4	3	1	No Penalty
<i>Blastocystis hominis</i>	4	3	1	No penalty
<i>Paragonimus westermani</i>	1	1	0	Incorrect
<i>Entamoeba coli</i>	1	1	0	Incorrect
<i>Hymenolepis nana</i>	1	1	0	Incorrect
<i>Schistosoma japonicum</i>	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Balantidium coli*** was the correct response (98 and 100%). Quality control examination of 4% of this sample revealed greater than 30 *Balantidium coli* trophozoites and an average of 4 *Fasciola hepatica*/*Fasciolopsis buski* ova per coverslip. 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.

Diagnostic Characteristics



Balantidium coli is usually found in warmer climates but can occur in cooler climates. It is the only pathogenic ciliate to infect humans and the largest of all pathogenic protozoa. The trophozoites measure 50-100 micrometers by 20-50 micrometers and these protists are completely covered with cilia. They have two nuclei. One is a large bean-shaped macronucleus and the other is a small micronucleus. The nuclei in this preparation were difficult to see due to the large number of vacuoles present in the cytoplasm. The

anterior end of the organism is slightly pointed and in most cases the cytosome is visible. Cysts measure 50-70 micrometers and also have a macro- and micronucleus. No cysts were seen in quality control examination of this specimen.

09-I (Protozoa Only)

Correct diagnosis: *Giardia lamblia*.

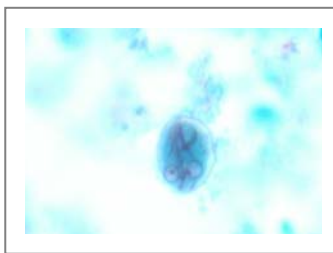
Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Giardia lamblia</i>	125/125	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Giardia lamblia*** was the correct response (100%) Quality control examination of 4% of this sample showed cysts in almost every 100X oil immersion field. Rare trophozoites are also present.

Diagnostic Characteristics



Giardia lamblia is the most commonly diagnosed flagellate in humans. It has a worldwide distribution and is more prevalent in children than in adults. Trophozoites are pear shaped and measure 10-20 μm . They have 2 nuclei, 4 pair of flagella, 2 axonemes, and 2 median bodies. The infective cysts are oval and measure 11-15 μm . They contain 4 nuclei usually located at one end, filaments, and median bodies.

09-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	115/119	97	10/10	Correct
<i>Babesia</i> sp.	2	2	0	Incorrect
<i>Plasmodium vivax</i>	1	1	0	Incorrect
<i>Plasmodium ovale</i>	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (97 and 100%). Quality control examination of 4% of this sample showed no parasites but Howell-Jolly bodies are present. These can sometimes resemble the small pleomorphic rings of *Babesia* sp..

Scoring Information

Immunoassay Results

<i>Cryptosporidium</i>	09-F		09-G		09-H	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Crypto/Giardia	19	0	19	0	19	0
Meridian Merifluor Crypto/Giardia	21	0	17	4	21	0
Remel ProspecT Cryptosporidium EIA	22	0	21	1	22	0
Remel Xpect Cryptosporidium	1	0	1	0	1	0
Remel Xpect Giardia/Cryptosporidium	4	0	4	0	4	0
TechLab/Wampole Test EIA	6	0	6	0	6	0

<i>Giardia</i>	09-F		09-G		09-H	
METHOD	-	+	-	+	-	+
Meridian ImmunoCard STAT Crypto/Giardia	20	0	20	0	20	0
Meridian Merifluor Crypto/Giardia	16	0	15	1	16	0
Remel ProspecT Giardia EIA	28	0	4	24	28	0
Remel ProSpect Giardia EZ	2	0	2	0	2	0
Remel Xpect Giardia	3	0	3	0	3	0
Remel Xpect Giardia/Cryptosporidium	4	0	4	0	4	0
TechLab/Wampole Test EIA	9	0	9	0	9	0

Distribution of Scores

Score	# of labs	% of labs
100	119	89
90-99	7	5
80-89	4	3
70-79	2	2
60-69	0	0
50-59	1	1

Answer Key

Sample	Correct Answer	Points
09-F	<i>Taenia</i> sp.	20
09-G	<i>Hymenolepis nana</i>	20
09-H	<i>Balantidium coli</i>	20
09-I	<i>Giardia lamblia</i>	20
09-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 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:

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

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 6, 2009**. You are responsible for notifying us **before October 13, 2009** if you do not receive your test. Proficiency test results must be electronically submitted through EPTRS by **October 20, 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 or can be accessed via the Internet at: <http://www.wadsworth.org/labcert/clep/ProgramGuide/WebGuide.pdf>

News and Notes

Beginning with the February 2009 proficiency exam, the **grading policy has 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 is in effect. Under the new scoring system, grades will be based only on the specimen types processed by your laboratory. For example, if your laboratory does not process blood smears, your score will be based on the four fecal 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.