NEW YORK STATE

Parasitology Proficiency Testing Program

Parasitology Comprehensive
7 February 2012

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 February 2012 proficiency test in Parasitology-Comprehensive. Most laboratories in this category previously participated in the Parasitology-General category, which was renamed after the June 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.

12-A (Helminths Only)

Correct identification: *Hymenolepis nana*.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Hymenolepis nana	106/107	99	10/10	**Correct**
No Parasites Seen	1	1	0	**Incorrect**

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Hymenolepis nana*** was the correct response (99 and100%). Quality control examination of 4% of this sample showed an average of 15 ova per coverslip. Other tests performed included a Direct Immunofluorescent Assay, which was positive for rare *Cryptosporidium* sp, and rare *Giardia lamblia.* 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; 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 47 µm 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.

12-B (All Parasites)

Correct identification: *Paragonimus westermanni*.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Paragonimus westermanni	102/107	95	10/10	**Correct**
Chilomastix mesnili	6	6	0	**No Penalty**
Endolimax nana	1	1	0	**No Penalty**
Fasciola hepatica/ Fasciolopsis buski	1	1	0	**Incorrect**
Diphyllobothrium latum	1	1	0	**Incorrect**
No Parasites Seen	3	3	0	**Incorrect**

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Paragonimus westermanni*** was the correct response (95 and 100%). Quality control examination of 4% of this sample showed an average of 2 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. Also present in low numbers were *Endolimax nana* and *Chilomastix mesnili*.

Diagnostic Characteristics

The diagnostic stage of ***Paragonimus westermanni*** is the characteristic egg found in stool or sputum. These eggs are yellow-brown, ovoid, and have a prominent operculum. They measure 80-120 µm by 45-70 µm and have a thickened shell at the abopercular end.

Humans become infected when they ingest uncooked shellfish containing metacercariae. These metacercariae excyst in the duodenum and migrate into the lungs where they mature and release their eggs into the sputum. The eggs are then coughed up and released into the environment or swallowed and passed in the feces.

12-C (Helminths Only)

Correct identification: *Strongyloides stercoralis*.

Results of Participating Laboratories

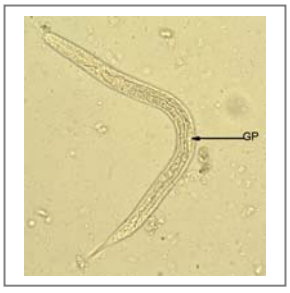
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Strongyloides stercoralis	107/107	100	10/10	**Correct**

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Strongyloides stercoralis*** was the correct response (100%). Quality control examination of 4% of this sample showed an average of 8 larvae 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

Strongyloides stercoralis is an intestinal nematode with a very complex life cycle. Infection is acquired when filariform larvae in the soil penetrate the skin and are carried in the blood to the lungs. From the lungs they travel up the trachea and are swallowed. Once in the intestine they develop into mature female worms and begin to produce eggs by parthenogenesis. These eggs, which are rarely seen, hatch in the intestine into rhabditiform larvae. The larvae pass in the feces and develop into male and female worms in the soil where they complete their life cycle.



The diagnostic stage is the rhabditiform larvae passed in the stool. They measure 180-380 µm, have a short buccal cavity, and a prominent genital primordium shown by the arrow.

12-D (Protozoa Only)

Correct identification: No Parasites Seen.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	105/108	97	10/10	**Correct**
Endolimax nana	2	2	0	**Incorrect**
Dientamoeba fragilis	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 normal fecal elements and no organisms present.

12-E (All Parasites)

Correct identification: *Trypanosoma cruzi.*

Results of Participating Laboratories

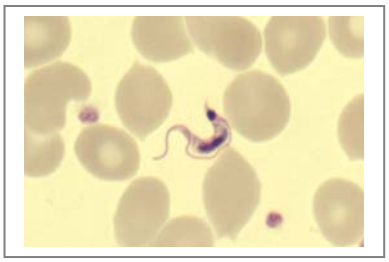
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Trypanosoma cruzi	101/102	99	10/10	**Correct**
Trypanosoma brucei	1	1	0	**Incorrect**
No Parasites Seen	1	1	0	**Incorrect**

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Trypanosoma cruzi*** was the correct response (99 and 100% respectively). Quality control examination of 4% of this sample showed parasites in almost every 100 X oil immersion field. Organisms have a central nucleus and a prominent kinetoplast.

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 20 µm 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. *Trypanosoma cruzi* is distinguished from *Trypanosoma brucei* primarily by its smaller size and the prominence of the kinetoplast, which is much larger in *Trypanosoma cruzi.*



Scoring Information

Immunoassay Results

Cryptosporidium	**12-A**		**12-B**		**12-C**	
METHOD	**-**	**+**	**-**	**+**	**-**	**+**
Meridian ImmunoCard STAT Cryptosporidium/Giardia	27	0	27	0	27	0
Meridian Merifluor Cryptosporidium/Giardia	14	5	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	6	0	6	0	6	0
TechLab/Wampole Test EIA	3	0	3	0	3	0
TechLab Giardia/ Cryptosporidium Quick Check	1	0	1	0	1	0

Giardia	12-A		12-B		12-C	
METHOD	**-**	**+**	**-**	**+**	**-**	**+**
Meridian ImmunoCard STAT Crypto/Giardia	27	0	27	0	27	0
Meridian Merifluor Crypto/Giardia	15	0	15	0	15	0
Meridian Premier Giardia	1	0	1	0	1	0
Remel ProspecT Giardia EIA	21	3	24	0	24	0
Remel ProSpect Giardia EZ	2	0	2	0	2	0
Remel Xpect Giardia	2	0	2	0	2	0
Remel Xpect Giardia/Cryptosporidium	6	0	6	0	6	0
TechLab/Wampole Test EIA	7	0	7	0	7	0
TechLab Giardia II ELISA	2	0	2	0	2	0
TechLab Giardia/ Cryptosporidium Quick Check	1	0	1	0	1	0

Distribution of Scores

Score	# of labs	% of labs
100	98	92
90-99	0	0
80-89	7	7
70-79	1	1
60-69	1	1
0	1	1

Answer Key

Sample	Correct Answer	Points
12-A	*Hymenolepis nana*	20
12-B	*Paragonimus westermanni*	20

12-C	*Strongyloides stercoralis*	20
12-D	No Parasites Seen	20
12-E	*Trypanosoma cruzi*	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:

(# of Correct Responses/ (# of Correct Responses + # of Incorrect Answers)) X 100

Important Reminders

The next Parasitology Proficiency Test is scheduled for **May 15, 2012.** You are responsible for notifying us **before May 22, 2012** if you do not receive your samples. Proficiency test results must be electronically submitted through EPTRS by **May 29, 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

There will be an intensive one-day hands-on workshop on the identification of blood borne parasites held on May 8, 2012 at the Center for Medical Science in Albany, NY. For registration information please go to http://www.wadsworth.org/parasitology/index.htm or phone us at 518-474-4177 or send an email to parasit@wadsworth.org

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.