

Challenge PA1704-2

April 2017

Stool: *Trichuris trichiura*, *Ascaris species*, Hookworm

CMPT QA/QC/ Statistics

This sample was verified by two reference laboratories. Laboratories were expected to report the presence of *Trichuris trichiura*, *Ascaris species*, and Hookworm.

All challenge components are confirmed before shipping by the reference laboratories. No further statistical analysis is performed on the results beyond that described under "Suitability for grading."

SURVEY RESULTS

Reference laboratories: both reference laboratories detected the presence of *Ascaris species*, *Trichuris trichiura*, Hookworm, and *Iodamoeba bustchlii*. Other parasites detected were: *Hymenolepis nana*, *Cystoisospora belli*, *Blastocystis hominis*, *Taenia* species, and *Schistosoma mansoni*.

Participants (Table 1): 14/18 (78%) laboratories detected *Ascaris species*, *Trichuris trichiura*, and hookworm. Other parasites were reported as described in Table 1.

Suitability for Grading

A challenge component is considered suitable for grading if agreement is reached by both (100%) reference laboratories and at least 70 percent of the participants.

Parasite identification was correctly performed by both reference laboratories and greater than 70 percent of all laboratories and was thus, determined to be suitable for grading.

COMMENTS ON RESULTS

This sample was a very heterogeneous sample containing many parasites. Many other parasites were reported; the fact that not all laboratories saw or reported them may be due to distribution and concentration in the sample.

Laboratories that reported pathogens not reported by most of the laboratories should send their slides for review.

Grading

Grading was based on the criteria described above. All laboratories reporting *Ascaris species*, *Trichuris trichiura*, and Hookworm, were graded acceptable.

Those laboratories that did not report those three parasites were graded unacceptable.

Table 1. Results reported

Reported results	Labs	Grade
<i>Ascaris species</i> , <i>Trichuris trichiura</i> , Hookworm	14	Acceptable
& <i>Entamoeba coli</i>	10	
& <i>Cystoisospora (Isospora) belli</i>	9	
& <i>Hymenolepis nana</i>	9	
& <i>Iodamoeba bustchlii</i>	8	
& <i>Strongyloides stercoralis</i>	5	
& <i>Schistosoma mansoni</i>	2	
& <i>Blastocystis</i>	3	
& <i>Endolimax nana</i>	2	
& <i>Hymenolepis diminuta</i>	2	
& <i>Enterobius vermicularis</i>	2	
& <i>Giardia lamblia</i>	2	
& <i>Entamoeba histolytica/dispar</i>	1	
& <i>Dicrocelium dendriticum</i>	1	
& <i>Cyclospora cayetanensis</i>	1	
& <i>Taenia</i> species	1	
& Charcot-Leyden Crystals	8	
<i>Ascaris species</i> , <i>Iodamoeba bustchlii</i> , <i>Trichuris trichiura</i> , <i>Entamoeba coli</i> , Charcot-Leyden Crystals	1	Unacceptable
<i>Ascaris species</i> , <i>Trichuris trichiura</i> , <i>Isospora belli</i> , <i>Entamoeba coli</i> , <i>Endolimax nana</i> , <i>Iodamoeba bustchlii</i> , Charcot-Leyden Crystals	1	Unacceptable
<i>Ascaris species</i> , <i>Trichuris trichiura</i> , <i>Schistosoma mansoni</i>	1	Unacceptable
<i>Iodamoeba bustchlii</i> , <i>Cystoisospora belli</i>	1	Unacceptable
Total	18	

The following cases are particularly important:

- *H. diminuta* – it may be misdiagnosing for *H. nana*.
- Pinworm – may be misdiagnosing for Hookworm
- *Dicrocelium dendriticum*
- *Cyclospora cayetanensis* – needs an acid fast slide to confirm.

This critique will focus on *Trichuris trichiura*. For reviews of the other two main parasites found in this sample please consult critiques 1407-1 (Ascaris species) and 1404-2 (Hookworm).

IDENTIFICATION

The primary diagnosis of *Trichuris trichiura* infection is by demonstration of the presence of the characteristic eggs in feces. Eggs measure 50 to 55 by 20 to 24mm, they are brown, thick walled with mucoid plugs at both ends (Figure 1).

Because light infections usually cause no symptoms and do not require therapy, Garcia recommends the quantitation of the eggs in stool.¹

Previous or ongoing therapy with mebendazole or other drugs has been associated with distorted –much larger- eggs in feces.

Adult worms are rarely passed in feces. When seen, they have a cylindrical coiled body and a coiled thicker tail, giving them the appearance of a whip (hence, also called whipworm).. Worms are whitish, and the males (30 to 45mm) are shorter than the females (35 to 50mm).²

LIFE CYCLE

Human infection is acquired through ingestion of embryonated eggs from the soil. The eggs hatch in the small intestine and release larvae that mature and attach to the mucosa in the colon. Egg production starts 60 – 70 days after the infection. Adult females shed 3,000 to 20,000 eggs/day. Unembryonated eggs are passed in the stools and become infective in 15 to 30 days.^{2,3}

CLINICAL RELEVANCE

Most infections are light with minimal or no clinical symptoms. High worm load however, may cause chronic dysentery-like syndrome, bloody stools leading to anemia, pain in the lower abdomen, weight loss, damage to the intestinal mucosa, allergic response, and growth retardation in children.

The severity of the symptoms is also related to the health status of the host and the length of the infection.

Mixed infections of whipworm and *Entamoeba histolytica/dispar*, hookworm, or *Ascaris* species are not uncommon.^{1,4}

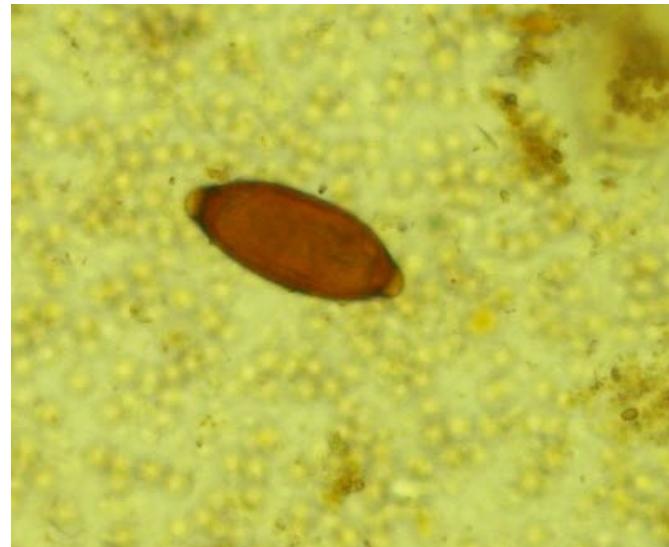


Figure 1. *Trichuris trichiura* egg. Photograph courtesy of BCCDC/BCPHMRL, Parasitology laboratory.

Epidemiology and prevention

The distribution of *T. trichiura* is worldwide but is more common in warm, moist areas of the world; *T. trichiura* infections occur more frequently in areas with poor sanitation practices and among children.¹

TREATMENT

Mebendazole and albendazole are the drugs of choice to treat *T. trichiura* infections.⁵

REFERENCES

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2. Sheorey H, Biggs B-A, Traynor P. Nematodes. In: Versalovic ea, ed. *Manual of Clinical Microbiology*. Vol 2. 10th ed. ed. Washington, DC: ASM; 2011:2200.
3. CDC, DPDx (Division Parasitic Diseases). Trichuriasis. Available at: <http://dpdx.cdc.gov/dpdx/HTML/Trichuriasis.htm>. Accessed October 23, 2011.
4. Bogitsh BJ, Carter CE, Oeltmann T.N. Intestinal nematodes. In: *Human Parasitology*. third ed. Burlington, MA: Elsevier Academic Press; 2005:348.
5. Drugs for Parasitic Infections. Medical Lett Drugs Ther; August 2004.