

Confirming Helminth Infection

ABSTRACT

We are using materials available from Ward (preserved eggs) and Carolina Biological (living *Hymenolepis diminuta* eggs in feces) to simulate parasite identification with tests based on protocols routinely used by practicing veterinarians. For the first activity we simply mix eggs from three or four helminths and students use a key to identify which species are represented. The benefits of the first part of the activity is that the preserved eggs are those of human parasites and so working with them can lead to a discussion of the impact of important human helminth parasites and their life cycle. Students prepare their own sample of living eggs of *H. diminuta* to test for infection, given sucrose solutions they also prepare that differ in specific gravity. This activity simulates common flotation tests conducted by veterinarians to test for parasite infection. It's a fun exercise for students, and they are working with a relatively safe parasite (in terms of potential for human infection). We supplement the exercises with material that discusses other protocols used for testing for parasite infection.

The activity is based on kits available from Wards (Item # 36224) and Carolina Biological (Item # 132234).

Prior to this activity students have identified eggs from a mixture also available from Wards. This is a very expensive kit and we furnish slides to students with a mixture of eggs from three of the different species sent. A color pictorial guide, developed in house, is provided to help identify the eggs of various species. This is our first laboratory exercise and so a way for students to become familiar with our microscopes, attached video cameras and the software used to capture (BTV) and edit (Photoshop) photomicrographs.

The kit that was used to develop the exercise that is part of our second laboratory is one available from Wards which furnishes iodine solution (to stain eggs) and reagent grade sucrose so that a solution of 125% or 1.25 specific gravity can be produced.

In the activity different groups of students will mix and work with sucrose solutions to simulate floatation tests routinely used in veterinary practice.

Experimentation has found that solutions equal or greater than recommended by the Wards kit, will cause numerous eggs to be found in the feces supplied by Carolina Biological that contain *Hymenolepis diminuta* eggs. These are large eggs, easily located by students. Staining with iodine solution does not greatly add in egg resolution and so will not be used.

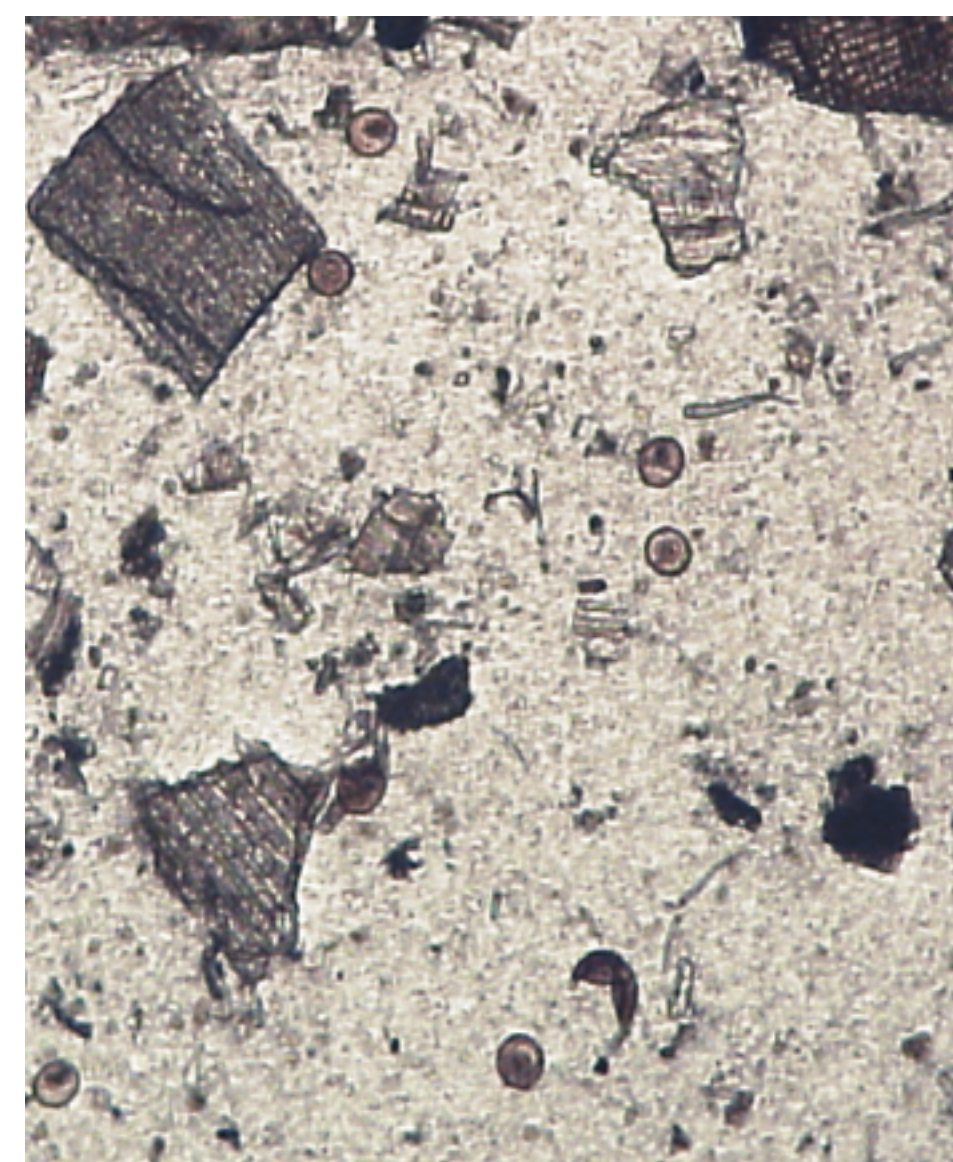
The samples provided to date from Carolina Biological are from heavily infected rats and so several eggs from (from 6-12) will float and adhere to cover slips in solutions with specific densities above 1.22.

Experimentation has also indicated that *H. diminuta* eggs can be kept for 3-4 months in a refrigerator. The recommendation from Carolina Biological is that the eggs be used within a two week period.

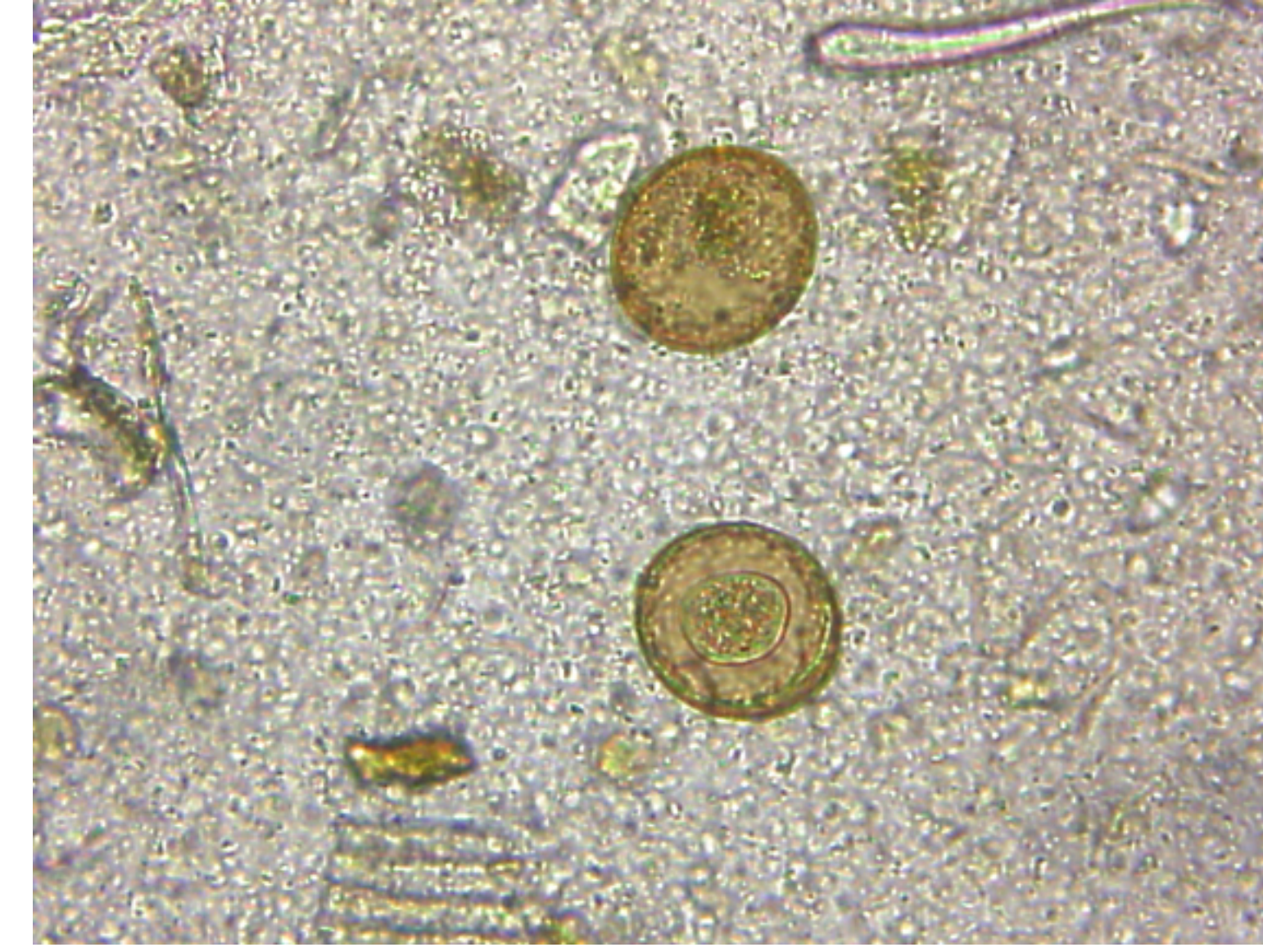
One of the useful references made available to students: <http://www.vet.utk.edu/diagnostic/parasitology/Detections%20of%20Parasitic%20Infections%20by%20Fecal%20Exam.pdf>

Marianne Niedzlek Feaver
Kelsie A. Gardner*
Biology, NCSU
mnfeaver@ncsu.edu

Students first examine a slide containing a small amount of feces to become familiar with H. diminuta eggs.



Under the stereo scope
80x

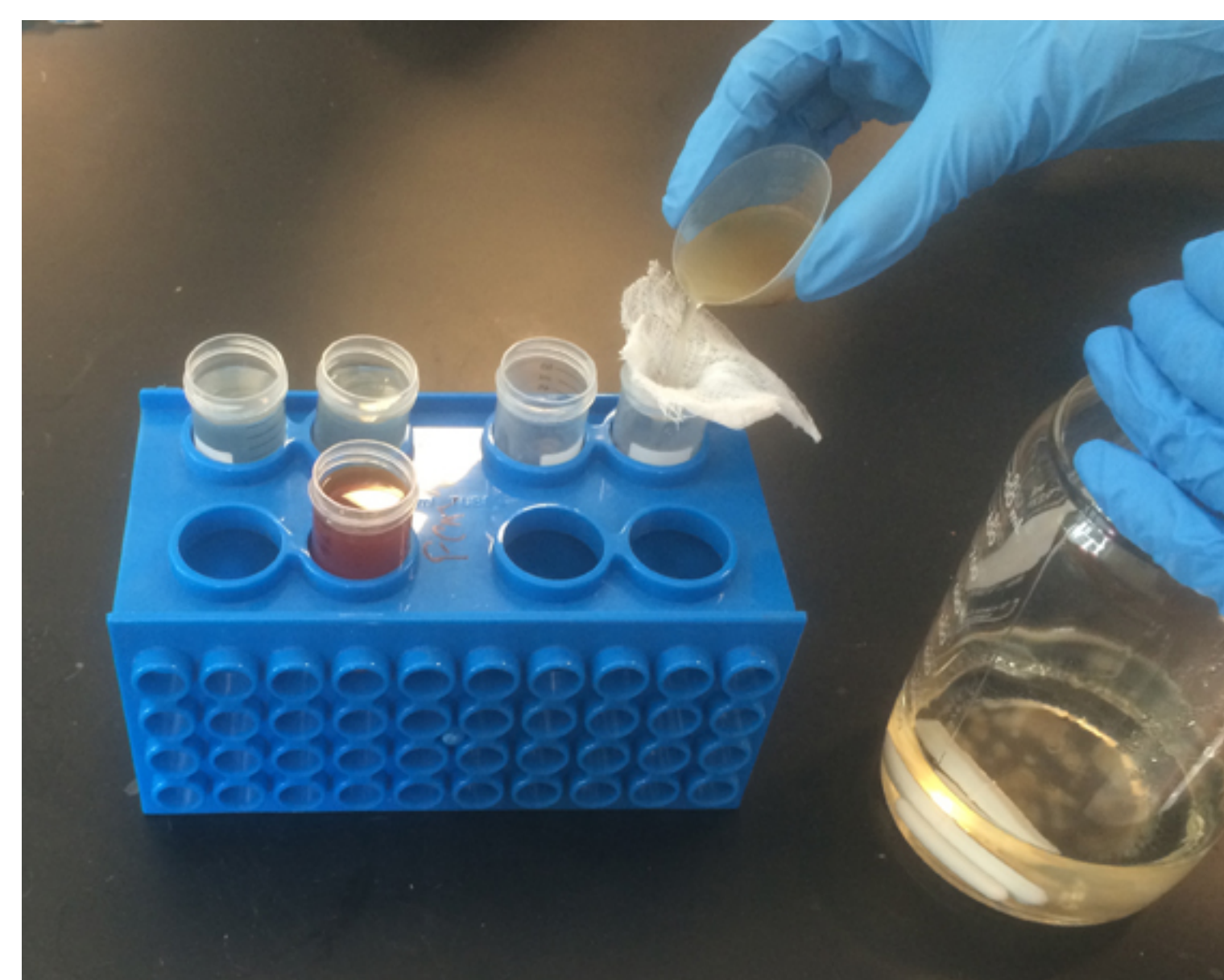


200x



400x

Students conduct floatation tests to determine which solution, of those available of different specific gravities, yields the greatest number of eggs. Questions at the end of the exercise, ask students to predict the specific gravity solutions best used for various parasite species.



Preparing the floatation tests. Sucrose solution is placed in test tube, fecal material is added, then more sucrose solution is added to fill test tube.



Arrow points to cover slip that is floating on sucrose solution.

* Undergraduate research
assistant volunteer

