

Name \_\_\_\_\_

Platyhelminthes

Ecology & Evolutionary Biology 4274  
Lecture Exam #2

October 30, 2009

**This exam consists of TWO (2) SECTIONS. You must complete both Sections.**

**SECTION I: You must answer all 12 questions. However, note that in many cases you are responsible for answering only a subset of the parts of the question. If you answer more parts than indicated in the instructions provided, your answers will be graded in order, and you will be graded only on the number of questions you are required to answer. Feel free to use labeled diagrams as appropriate to augment your answers.**

1. Describe the pathogenicity in the definitive host associated with infection of 3 of the following 5 platyhelminth species: (6 points)

(i) *Nanophyetes salmincola*

(ii) *Dactylogyrus vastator*

(iii) *Fasciola hepatica*

(iv) *Echinococcus granulosus*

(v) *Paragonimus westermani*

2. From the list below, circle the taxa that you would expect to possess a neodermis at some point in their lives. (8 points)

Gyrocotylidea

*Polystoma*

triclad

*Gyrodactylus*

Amphilinidea

*Schistosoma japonica*

*Temnocephala*

*Taenia saginata*

3. Describe a scenario in which a person might acquire an infection of *Clonorchis sinensis*. (4 points)

4. For 5 of the following 8 taxa, provide an example of a larval stage. Note that the larval stage you list need not be characteristic of the taxon in general, however, it must be found in at least 1 species in the taxon indicated. (5 points)

larval stage

Polyopisthocotylea

\_\_\_\_\_

Trematoda

\_\_\_\_\_

*Diphyllobothrium*

\_\_\_\_\_

Platyhelminthes

\_\_\_\_\_

*Paragonimus westermani*

\_\_\_\_\_

Cercomeromorpha

\_\_\_\_\_

Aspidobothrea

\_\_\_\_\_

Cestoda

\_\_\_\_\_

5. Mr. Tasane has decided to establish a petting zoo using animals he has obtained from a number of wild and domestic sources. To date, included in his zoo are: a sheep, a deer, a tiger (perhaps not the best of choices for a petting zoo), a wolf (also not the best of choices), and a pig. Identify 3 platyhelminth parasite species that the animals in his “zoo” might harbor. In each case, indicate the animal in his “zoo” that is likely to host the species you have identified. Among his parasitologically-savvy employees, the job of shoveling “dung” is least popular. In each case indicate whether the workers assigned to shoveling dung at his “zoo” might be at risk for acquiring an infection of the species you have identified. (9 points)

Platyhelminth species	“zoo” animal host	workers potentially infected? (yes/no)
(i) _____	_____	_____
(ii) _____	_____	_____
(iii) _____	_____	_____

6. For 5 of the following 7 platyhelminth species, identify the stage INFECTIVE TO the host indicated: (10 points)

*Taenia solium*: human \_\_\_\_\_

*Echinococcus granulosus*: caribou \_\_\_\_\_

*Dactylogyrus*: fish \_\_\_\_\_

*Clonorchis sinensis*: fish \_\_\_\_\_

*Taenia saginata*: human \_\_\_\_\_

*Paragonimus westermani*: crab \_\_\_\_\_

*Dicrocoelium dendriticum*: ant \_\_\_\_\_

7. Sarah and her family have just moved to a new house in Florida. She was excited to learn that the house is on the shore adjacent to a little cove. She went swimming the day they moved in, and had a splendid time. She went for a swim again the second day but complained that her arms and legs were very itchy. Indeed, her mother noticed numerous small, red raised bumps on her skin. Assuming Sarah has inadvertently inserted herself into the life-cycle of a parasitic platyhelminth, answer the following questions: (7 points)

(i) What type of larval stage has she encountered?

(ii) To what phylum does the parasite belong?

(iii) Identify one type of invertebrate and one type of vertebrate (other than Sarah) that, based on the presence of this parasite in the cove, also inhabits the cove. In each case justify your answer.

8. Compare and contrast (i.e., describe a similarity AND difference between) 3 of the following 5 pairs of terms. (9 points)

monozoic vs. polyzoic

apolytic vs. anapolytic

mature vs. gravid

sequential polyembryony vs. simultaneous polyembryony

proglottized vs. non-proglottized

9. For 3 of the following 5 platyhelminth species, in order to diagnose infection in the definitive host describe: the type of sample you would take and the life-cycle stage you would expect to see in order to positively diagnose an infection. (6 points)

	Type of sample	life-cycle stage
<i>Schistosoma haematobium</i>	_____	_____
<i>Fasciola hepatica</i>	_____	_____
<i>Taenia solium</i>	_____	_____
<i>Paragonimus westermani</i>	_____	_____
<i>Diphyllobothrium latum</i>	_____	_____

10. You are a movie writer who has been assigned the task of developing a winning story line for a new platyhelminth parasite film. Your story must fulfill the following criteria: (1) takes place in a terrestrial setting, (2) involves a human who, if not actually infected with the parasite in the movie, at least has the potential to be infected with the parasite, (3) the life-cycle of the parasite includes at least one other animal species beyond humans, (4) the parasite is particularly pathogenic or there is a certain amount of intrigue associated with its life-cycle. Describe a story line you might develop that would fulfill these criteria (you may assume you are working on a relatively high budget film). (4 points)

11. Identify 2 differences between a paratenic and an intermediate host. Be certain to indicate which host possesses which condition of the features you have identified. (4 points)

(i)

(ii)

12. Describe 1 distinguishing feature for four (4) of the following 6 platyhelminth taxa. The features you list may include the types of hosts parasitized, life-cycle stages, or morphological features, but be certain they apply to ALL members of the group indicated. (8 points)

(i) *Dicrocoelium dendriticum*

(ii) Cercomeromorpha

(iii) Spathebothriidea

(iv) Caryophyllidea

(v) *Fasciolopsis buski*

(vi) *Schistosoma*

**SECTION II. Complete 20 of the 24 blanks in the following table. Be as specific as possible. If a particular column does not apply to a species write “N/A” in the appropriate blank; in such instances this will count as an answer. If only a single intermediate host is present in the life-cycle of a particular species, consider it to be the first intermediate host. Each row must represent a different parasite species. (20 points)**

Platyhelminth species (full scientific name)	1 larval stage residing in first intermediate host	Stage infective to definitive host	Site occupied in definitive host
		cercaria	
<i>Taenia solium</i>			
			liver
			lungs
	procercoid		
	hydatid cyst		
<i>Clonorchis sinensis</i>			
			gut