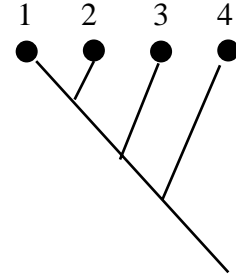
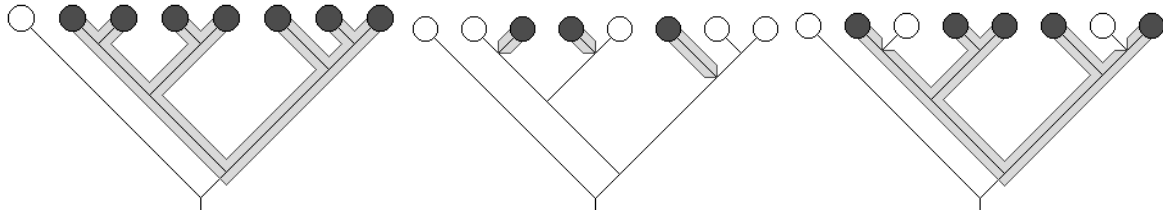


1. (5 pts) Matching (5 pts): Assume that the cladogram below represents the true phylogenetic relationship among species #1, #2, #3, and #4. Assume also that all shared characteristics are homologous. Match the following terms with the descriptions below: autapomorphy, symplesiomorphy, synapomorphy.

- A. Characteristic present in #1 and #2 only: _____
- B. Characteristic present in #1, #2, and #4: _____
- C. Characteristic present in #2 only: _____



2. (5 pts) Indicate whether the taxa indicated below (each taxon consisting of the shaded part of the tree) are monophyletic, paraphyletic, or polyphyletic



- A. _____
- B. _____
- C. _____

3. (2 pts) Which of the above terms (#2) would describe a category that included that included only flying animals, regardless of phylogeny? _____

4. (2 pts) If birds are left out of the Class Reptilia and placed in a separate Class Aves, because they have many unique, derived characteristics, which of the terms used in question #2 applies to the Class Reptilia? _____

5. Matching (6 pts) - pick the best match, use answers only once:

- | | |
|------------------------------|--|
| _____ Jean Lamarck | A. Discovered <i>Giardia</i> in his own feces |
| _____ Joseph Leidy | B. Described malaria life cycle |
| _____ Ronald Ross | C. Probable victim of Chagas disease |
| _____ August Krogh | D. Proposed inheritance of acquired characters |
| _____ Antony van Leeuwenhoek | E. Comparative respiration physiology |
| _____ Charles Darwin | F. Father of American parasitology & vertebrate paleontology |

6. (22 points, 2 pts each). Define the following terms.

a. heterotroph

b. homology

c. convergent evolution

d. animal

e. actinopod

f. schizogony

g. pseudocoelom

h. anhydrobiosis

i. saprobic

j. benthic

k. Krogh's principle

7. (24 points - 4 pts each). Short answer.

A. Why are more phyla found in marine habitats than in terrestrial habitats?

B. (Wilson chapter): what evidence led Erwin to triple the estimate of insect species?

C. What is meant by phylogenetic systematics?

D. Name and define two different forms of asexual reproduction.

E. Describe the function of a protonephridial system.

F. Why did the Aswan dam cause parasite problems in Egypt?

G. How do fleas contribute to tapeworm problems in pets? What species of tapeworm?

H. Name 3 things that Nemertines have, but flatworms don't have.

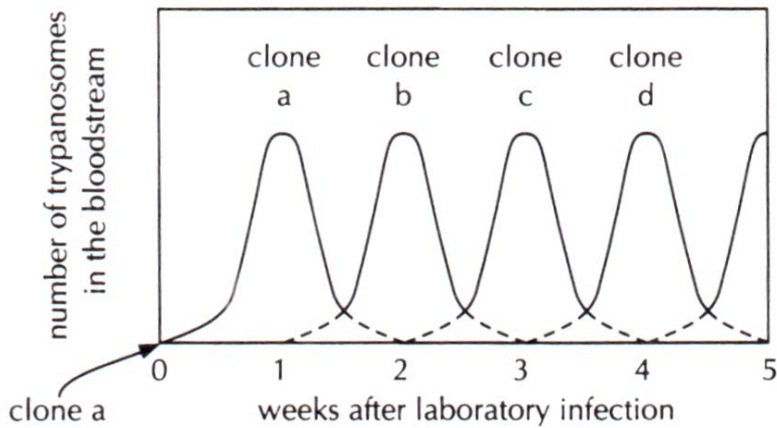
8. (6 pts) You went on the summer field course to Puerto Rico and swam in a lake. Several months later you are suffering from jaundice, blood in your stools, liver enlargement, and venous hypertension (high blood pressure). Your stools also contain eggs like this:



A. What species might be responsible for your problems?

B. Are you likely to be contagious to your roommate? Explain why or why not, in terms of the life cycle of the organism.

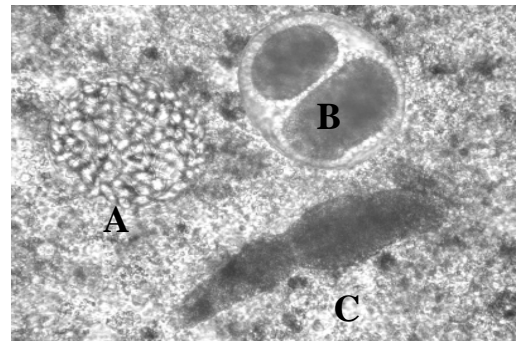
9. (6 pts) Explain the following graph, in terms of what you know about the African flagellates that cause sleeping sickness and nagana.



10. (14 pts- 2 each) Malaria short answer.

- A. What life cycle stage of malaria transmitted from a person to a mosquito?
- B. What life cycle stage of malaria transmitted from a mosquito to a person?
- C. What is an ookinete and where would it be found?
- D. Where are malaria trophozoites found? Be specific.
- E. Why does malaria cause anemia?
- F. How was William Gorgas responsible for the completion of the Panama Canal?
- G. What does tonic water have to do with malaria?

11. (6 points). We observed this organism, called *Monocystis*, in the seminal vesicles of the annelid *Lumbricus*. Name the life-cycle stages that are labeled (A,B,C), name the processes that they undergo, and describe their role in the life cycle.

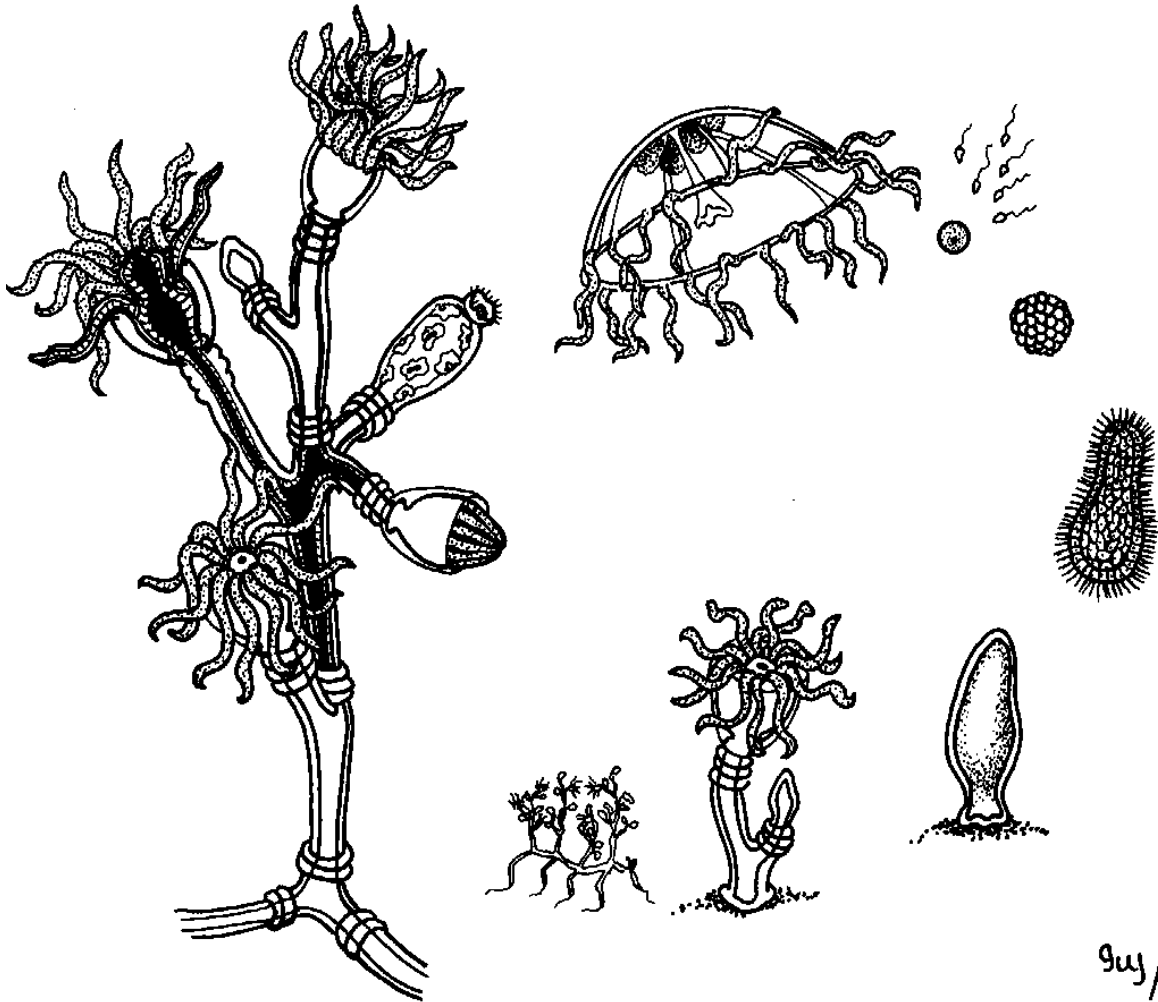


12. (12 points) Label the diagram as completely as possible.

Phylum _____

Class _____

Genus _____



Livingstone, © BIODIDAC.

Extra credit: Explain why you think that the life cycle stage at left above should be considered to be a single individual, or several.

13. (10 pts) Protist matching. Each answer is used only once.

- | | |
|---|--|
| _____ closely related to Animalia | A. Excavate flagellates |
| _____ macro and micronuclei | B. Apicomplexa |
| _____ all are parasitic | C. <i>Toxoplasma gondii</i> (Apicomplexa) |
| _____ Granuloreticulose pseudopods | D. Choanoflagellata |
| _____ Actinopods & silica test | E. <i>Trichonympha</i> (Parabasalida) |
| _____ in eutrophic freshwater | F. Ciliophora |
| _____ important insect mutualists | G. <i>Arcella vulgaris</i> (Sarcodina) |
| _____ avoid cats when pregnant | H. Radiolaria |
| _____ made Darwin ill | I. <i>Trypanosoma cruzi</i> (Kinetoplastida) |
| _____ mitochondria lacking or primitive | J. Foraminifera |

14. (10 pts) Radiata matching. Each answer is used only once.

- | | |
|----------------------------------|---------------------------------------|
| _____ ate the anchovies | A. Scleractinia |
| _____ sailing | B. <i>Physalia</i> and <i>Velella</i> |
| _____ freshwater polyp | C. Hydrozoan medusae |
| _____ possess velum | D. Athecata |
| _____ colonial polyps are bare | E. <i>Mnemiopsis leydyi</i> |
| _____ pinnate tentacles | F. acontia |
| _____ contain nematocysts | G. cnidoblasts |
| _____ includes hermatypic corals | H. siphonoglyph |
| _____ ciliated groove | I. Octocorallia |
| _____ mesenteric threads | J. <i>Hydra</i> |

15. (10 pts) Sponge matching. Each answer is used only once.

- | | |
|-------------------------------|-------------------|
| _____ Silicious reef builders | A. Calcarea |
| _____ Skeletal support | B. Cladorhizida |
| _____ Food capture | C. Demospongia |
| _____ Asexual reproduction | D. Archaeocyatha |
| _____ all extinct | E. Hexactinellida |
| _____ Lets water in | F. Spicules |
| _____ Lets water out | G. Gemmules |
| _____ Most diverse class | H. Osculum |
| _____ Carnivorous sponges | I. Choanocyte |
| _____ Amphiblastula larva | J. Porocyte |

16. (10 pts) Platyhelminthes matching. Each answer is used only once.

- | | |
|-----------------------------------|-----------------------------|
| _____ Turbellaria | A. rostrum |
| _____ produce yolk cells | B. live in blood vessels |
| _____ homologous with opisthaptor | C. vitellaria |
| _____ tegument | D. proglottid |
| _____ adult <i>Schistosoma</i> | E. synapomorphy of 3 clades |
| _____ Monogenea | F. larval tapeworms |
| _____ allow regeneration | G. mainly on fish gills |
| _____ sporocysts and redia | H. found in snails |
| _____ hydatid cyst | I. neoblasts |
| _____ segment of cestode | J. some are terrestrial |