

Biology of Invertebrates
Cnidaria Chapter 6 Questions

Be sure you are familiar with the following:

Polyp and medusa body plan; tissue organization (diploblastic, mesoglea); cnidocytes and nematocysts, two-way digestive system

1. According to the author what functional disadvantages do Cnidaria suffer because they are lacking a one-way digestive system?

One way processing of food is much more efficient because the digestive system can specialize in function; also in the cnidaria system new food cannot be ingested until digestion of old food is completed; or this is very inefficient

2. Review the arrangement of the cnidaria nervous system as shown for the Scyphozoa. What aspects of the nervous system would you say are well matched with the overall radially symmetrical body plan of medusae?

The nerve net, the umbrellar nerve ring and the radially positioned ganglia are all consistent with the radial symmetry of the medusa.

3. What are epitheliomuscular cells and what function do they have?

External cell layer that also produces muscle fibers; thus they are both skin cells and muscle cells

4. What is the role of the gastrovascular canals in the scyphozoa? What organs play the same role in other animals...say vertebrates?

Distributing nutrients and removing waste from remote parts of the body; this is equivalent to the circulatory system of other animals.

5. Hydroids are unusual among animals in forming branching (“bushy”) colonies that look like plants to the untrained eye. Briefly explain/identify the following characteristics of hydrozoan colonies:

a. thecate : *hydroid can pull into a protective calyx*

b. polymorphic: *more than one type of individual in the colony*

c. gonozooid: *a reproductive hydranth or zooid from which gametes, larvae or juvenile medusae emerge.*

6. Examine the two major hypotheses about Cnidarian evolution shown in the cladograms in Figure 6-17. Earlier in the text the author states that according to the latest molecular genetic studies the Cubozoa are the most derived of all Cnidarians. Does this new discovery from molecular genetics support one or the other cladogram, or answer the question of whether the polyp or medusa came first in the evolution of Cnidaria?

It indicates that the more complex anthozoan polyp is the ancestral condition and that medusae evolved later in the medusozoid lineage that includes hydroids, scyphozoa and cubozoa. If this is true then there has been a trend toward reduced complexity in the

cnidarian polyp from complex anemone polyps to simple hydro and scyphomedusan polyps.

For the class Anthozoa, I'd like you to focus your attention on two aspects of the reading: first of all, the structure of the polyp and secondly the diversity of the group.

7. The gastrovascular cavity of an anemone is very complex compared to that of a hydroid like Hydra. How is this complexity related to (or help to facilitate) the larger size of the anemone body?

More folds in the gastrodermis provides not only added support but more surface area for digestion.

8. The subclass Hexacorallia contains the stony corals. What is a hermatypic coral?
A hermatypic coral is a reef building coral that is associated with algae symbionts.

9. What is different about the Octocorallia (compared to Hexacorallia) in terms of polyp structure and skeletal composition?

The polyp has tentacles in multiples of 8. The skeleton is diffuse or made of gorgonin.