

Biology 14.1

Zoology

Need video and models and transparencies

"As new born babes desire the sincere milk of the word that ye may grow thereby."

- First Peter 2:2

Phylum Porifera

1. Sponges (Poriferans): pore bearers
 - a. Classified by size and shape.
 - b. More than 5,000 species of sponges.
2. Habitat: aquatic- salt and fresh
3. Organization: Monoblastic, epidermis with matrix called mesenchyme containing amoebocytes. No true tissues, no gut, no body cavity, no organs, no segmentation. All activity is cellular.
 - a. Collar cells in ostia (pores) move water with flagella.
 - b. Average range in size from one inch to four feet. One found to be ten feet tall.
4. Symmetry: asymmetrical, A "holey" animal, no head, no mouth. Holes are called *ostia*.
5. Integument: epidermis
6. Skeleton: soft body invertebrate, supported by spicules in matrix. Basis for further classification: Calcarea sponges have limestone skeletons. Hexactinellida have skeletons made of silica (glass sponges). Sclerospongiae have limestone and silica. Demospongiae are made of protein spongin (this class is also fresh water).
7. Muscle sys: none
8. Movement: Sessile adults. Mobile larvae.
9. Nervous system/ Senses: none
10. Behavior/activity: Pumps water through its body through pores, mostly unresponsive
11. Nutrition: Heterotrophic, (bacteria, organic debris)
12. Digestion: filters out food with flagella on cells in cavities, diffusion
13. Respiration: diffusion of oxygen and CO₂ with water
14. Circulation: none. Use diffusion.
15. Immunity: not detected
16. Excretion: simple cellular diffusion
17. Reproduction: Asexual by budding, gemmules (spore like), and fragmentation. Hermaphroditic, fertilize eggs in body resulting in larvae.
18. Life cycle: larvae to adult sponge body; or bud to form new adult body.
19. Interesting facts
 - a. Can live up to 200 years.
 - b. Filter a volume of water 100,000 times their volume every day. The sponges in the Caribbean Sea fill all the water one day.
 - c. One of the simplest animals.
 - d. Chemicals in tissues of some sponges can protect from predators as well as be medicinal.

Cnidarians (obsolete = Coelenterates)

1. Jellyfish, coral, sea anemone
 - a. Greek: *Cnidos* meaning stinging nettle.
 - b. Specialized cells (cnidocytes) house an organelle called cnida, which is a capsule with an attached hollow tubule that may penetrate its target (nematocyst).
 - c. Four main classes: corals, jellyfish, box jellyfish, and hydrozoa
2. Habitat: All are aquatic, most marine
3. Organization: Endoderm and ectoderm (diploblastic). No gut, no body cavity, no organs, no segmentation. Tentacles and stinging cells.
4. Symmetry: Usually radial symmetrical
5. Integument: ectoderm
6. Skeleton: soft body, invertebrate
7. Muscle sys: muscle-like fibers
8. Movement: Sessile larvae. Mobile adults.
9. Nervous system/ Senses: Scattered nerve nets with limited sensory capabilities (chemo/photo)
10. Behavior/activity: interactive, and taxis movement
11. Nutrition: omnivorous
12. Digestion: Gastrovascular cavity is one opening.
13. Respiration: diffusion of oxygen and CO₂ with water
14. Circulation: none
15. Immunity: possibly simple innate immune mechanism
16. Excretion: simple diffusion
17. Reproduction: Asexual reproduction (budding and fragmentation). Sexual (gametes). Dioecious (separate male and female varieties)
18. Life cycle: medusa-gametes-polyp
 - a. Polyp: tube with mouth, tentacles and basal disc. Sessile and asexual.
 - b. Medusa: bell-shaped body, free swimming, oral arms, sexual
19. Examples
 - a. The hydra: hollow tube with single opening (mouth); ectoderm (outer protection) and endoderm (inner digestion).
 - b. Coral: polyps in hard skeletons (reefs)
 - c. Arctic jelly: 6 ft bell
 - d. The *Praya dubia* has tentacles stretching as long as 131 feet.
 - e. Sea anemones: polyps, flowers of the sea
 - f. Portuguese man-of-war: not a jelly. Is a colony (siphonophore)
20. Interesting facts
 - a. Named for its appearance being like a flowering anemone.
 - b. Jellyfish are a culinary delicacy in some cultures.
 - c. Jellyfish can have up to 800 tentacles.
 - d. Reef-corals and others establish symbiotic relationship with photosynthetic dinoflagellates in their tissues.
 - e. Effort is being made to call jellyfish simply 'jellies'.
 - f. 90% of a jelly body is water.
 - g. Box jelly venom is the most deadly in the animal kingdom. 5,568 recorded deaths since 1954. The sting is so painful that human victims go into shock, drown or die of heart failure before even reaching shore.
 - h. Acceleration of a discharged nematocyst up to 5,410,000 g in 700 nanoseconds.