

Life Science 7

Ch 15-1

p 380-387

“Simple Invertebrates”

Objectives

- Be able to identify the symmetry of an animal.
- Describe the importance of the presence of a body cavity within animals.
- Explain how sponges are different from other animals.
- Describe the differences in the simple nervous systems of the cnidarians and the flatworms

Patterns of Symmetry

- _____ - no plane of symmetry
- _____ **symmetry**- can be divided into two equal halves along more than one plane (eg: starfish)
 - allows organism to sense things from all directions
- _____ **symmetry**- can only be divided into two equal halves along one plane (eg: humans)
 - allows specialization of head region for sensing environment (**cephalization**)

The Coelom

- most animals have a **gut**: _____

- More complex animals have a space around their gut called a **coelom**
 - the coelom allows the animal to move its _____ in a direction different from that of the _____ in its gut

Nervous Systems

- _____: groups of cells that are designed to transmit impulses to control the body
- In primitive nervous systems, groups of nerves in the head region may form a _____
- In more complex nervous systems, a larger group of neurons form the _____

Sponges (Phylum Porifera)

- 5000 species (100 FW)

- asymmetrical
- **sessile**- adults remain attached to one place
 - larvae are free-swimming
- many different shapes (globes, vases, mats), colors, sizes
- filter-feeders
- no true tissues or organs

Structure (page 347)

- _____ - tiny hard particles that make up the skeleton of some sponges
 - some sponges (like bath sponges) secrete a skeleton made of a protein called **spongin**
- _____ - large pore that water exits from
- _____ - central cavity of sponge
- _____: surround the pores of a sponge, allow water flow into sponge
- _____: flagellated cells on the interior of the spongocoel

Nutrition / Metabolism

- Water current set up by collar cells flows through pore cells, past the collar cells, and out the osculum
- Collar cells trap _____
- _____ carried out of sponge by water current

Reproduction

- asexual reproduction
 - pieces of sponge can break off, and give rise to a new sponge

Reproduction

- sexual reproduction
 - sponges are **hermaphroditic**- produce both _____
 - fertilization and embryo development take place in mesoglea (**internal fertilization**)
 - embryos eventually leave sponge through osculum
 - larva are motile, may swim around to find a suitable home

Cnidarians (Phylum Cnidaria)

- *Radially symmetrical (*=advancement)
- Acoelomates
- All cnidarians have “stinging cells” called **cnidocytes** (Greek for “_____”)

Structure

- **gastrovascular cavity**- digestive cavity

- Two body plans present
 - _____ - free-swimming form (Portugese man-o-war, jellyfish)
 - _____ - sessile form (hydras, corals, anemones)
 - may involve both forms in a life cycle
- Possess true nerve cells, but very primitive nervous system (no specific nerve pathways)

Class Hydrozoa

- Includes hydras, Portugese man-o'war
- both polyp and medusa stage present
- Portugese man-o'war is a colonial hydrozoan

Class Scyphozoa

- Includes true jellyfish
- Medusa stage dominant

Class Anthozoa

- Includes corals, sea anemone
- polyp stage dominant
- coral reefs provide habitat for large numbers of organisms
 - similar ecologically to a rain forest!
- Coral reefs under pressure from divers, coral bleaching, warmer temps

Flatworms (Phylum Platyhelminthes)

- Advancements over cnidarians
 - _____ symmetrical
 - three tissue layers, instead of two
- three main groups

Planarians

- includes planarians- live mostly in marine environ., some FW and land forms
- Digestion/excretion
 - feeds by extending its _____ (anterior section of the digestive tract) out of its mouth and sucking in food
 - undigested food passes out through pharynx (ie. **incomplete digestive system**)
 - Excretion through **flame cells**
- Nervous system
 - possess eyespots to detect light intensity/direction
 - **auricles**- used for smelling/tasting
 - possess **ganglia**- clusters of nerves (primitive brain)
 - ladder-like arrangement of nerves
- Reproduction:
 - sexually- planarians are _____
 - asexual- planarians have amazing regenerative properties

The Flukes

- _____ - require living inside a host organism
 - usually have at least two hosts throughout their life cycle
 - possess tough outer covering to protect them from host, also suckers to attach

Tapeworms

- Mostly _____
 - extremely adapted for parasitic lifestyle
 - tough tegument, cuticle
 - suckers/hooks for attachment on **scolex** (head region)
 - reduced nervous, digestive systems
- Astounding reproductive potential
 - each section called _____
 - proglottid contains testis/ovaries (hermaphroditic)
 - each proglottid may produce 100,000 eggs (grand total of 600 million eggs/year)

Roundworms

- Mostly free-living (land, salt water, FW)
- Some parasitic (plants, animals, humans)
 - *Ascaris*- found in intestines of animals
 - separate male/female sexes
 - eggs (200,000/day) hatch in intestines, larvae enter bloodstream, eventually return to intestine through respiratory system
 - severe infections can cause death by intestinal blockage or respiratory illness

Ascaris Image

Phylum Nematoda (the roundworms)

- Hookworms (*Ancylostoma*, *Necator*)
 - Larvae enter host through foot
 - enter digestive system through respiratory system
 - adults live in intestine, where they feed on the blood of host
- *Trichinella*
 - Cysts enter through ingestion of uncooked pork
 - larvae burrow into intestinal wall and mature
 - adults release more larvae which live in the muscles of host

Hookworm, Pinworm Image