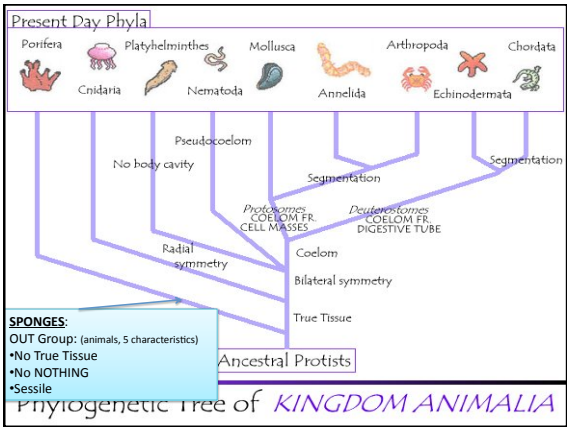
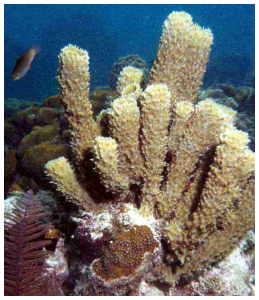
What are the five characteristics of the Animal Kingdom?

1. Animals are eukaryotic.
2. Animals cells lack cell walls.
3. Animals are multicellular.
4. Animals are heterotrophs that ingest food.
5. HOX GENES – Responsible for Segmentation
   - Only one set in Sponges



Phylum Porifera Overview

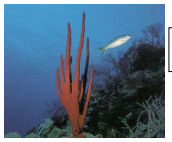
- Most primitive of the multicellular animals
  - There is some debate if sponges are complex colonial protozans and not metazoans.
- Sponges
  - Over 7,000 species, approximately 40 species that occur in local waters
  - 2% of all sponges are freshwater, none are terrestrial



tube sponges

Sponge Diversity

Live: Sponges occur in shallow water habitats and vary widely in size (up to 1m. high) and shape

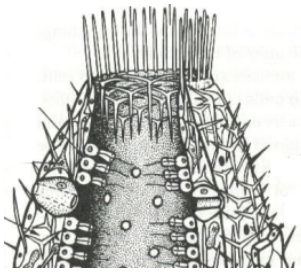


Erect Rope Sponge

Black-ball sponge

Yellow Tube Sponge

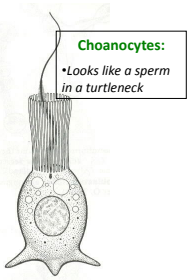
Porifera Anatomy

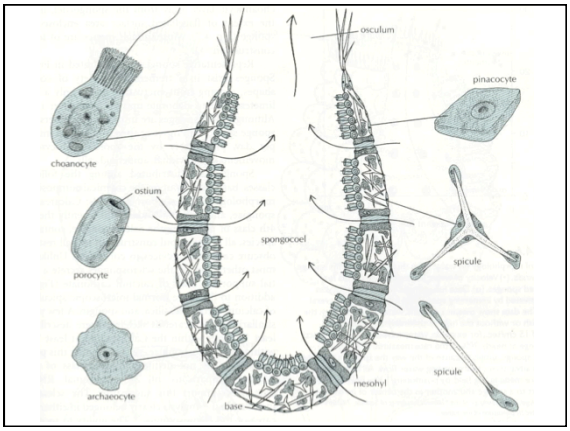


- Spongocoel
- Ostia
- Oscules

Unique Character: Collar Cells

- Choanocytes: (collar cells) act as a pump to bring water into the sponge
  - **Used for:**
    - **Digestive**: All sponges are sessile filter feeders
    - **Respiratory:** To bring in more oxygenated water for Respiration, absorbed through osmosis
    - **Excretion**: Remove cellular waste via osmosis and sweep it away
    - **Circulatory:** No circ. System but collar cells create a current to move water through it.



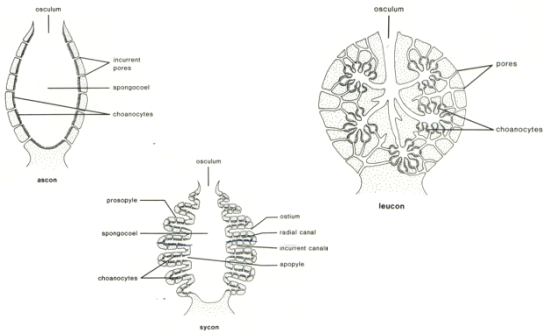


Spicules

- **Skeletal**: Collagen is stiffened by adding microscopic mineral accretions or additional protein fibers (spongin) or both.
  - Spicules: skeleton structures, made of calcium carbonate ($CaCO_3$) or silicon dioxide (SiO_2).

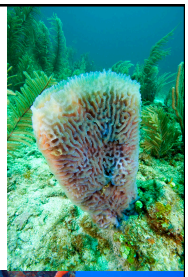
Spicules

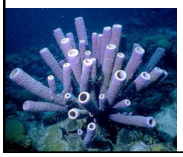
Sponge Types

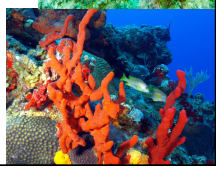


Porifera **Reproduction**

- Asexual budding
- Regeneration: can regenerate from broken pieces
- Sexual
  - Usually hermaphroditic with male and female cells scattered throughout the connective tissue.

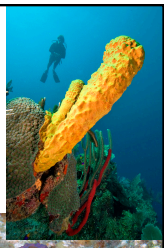


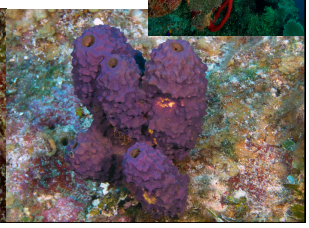




Other Systems:

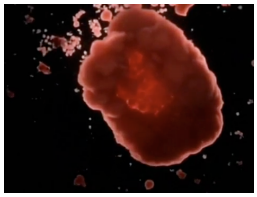
- **Nervous**: No Tissue no Nervous System
- **Muscular:** No Tissue no Muscular System
- **Immune/Lymphatic System:?**
- **Integumentary System: ?`**





Re-aggregation

- Grind up the cells and they will come back together
- Gives insight about how multicultural animals may have evolved



http://www.youtube.com/watch?v=N462jZFr13k