

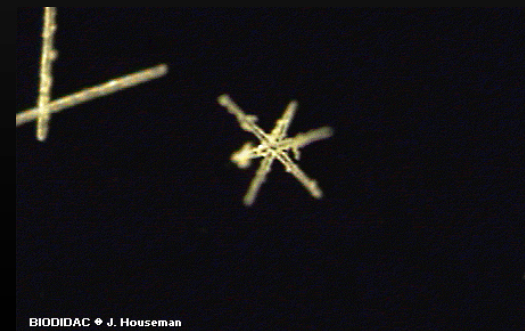
# basal animalia

porifera, cnidaria

# porifera

- **PHYLUM PORIFERA**

- Sponges, no tissues or organs, cellular level of organization
  - outer layer is made of cells called pinacocytes
  - choanocytes (collar cells)
    - Flagella move in a random manner to move water for feeding and respiration
  - Mesohyl - nonliving separating layer between internal and external cells
    - archaeocytes – undifferentiated cells in the mesohyl - can differentiate into any type of cell (like stem cells)
    - Sclerocytes – amoeboid cells that make mineral spicules (“sponge skeleton”)
    - spicules -- can be monaxon, triaxon, tetraaxon or hexaxon and are composed of either calcium carbonate or silicon



# water flow

- **Ostia – small entrance, Osculum – large exit**

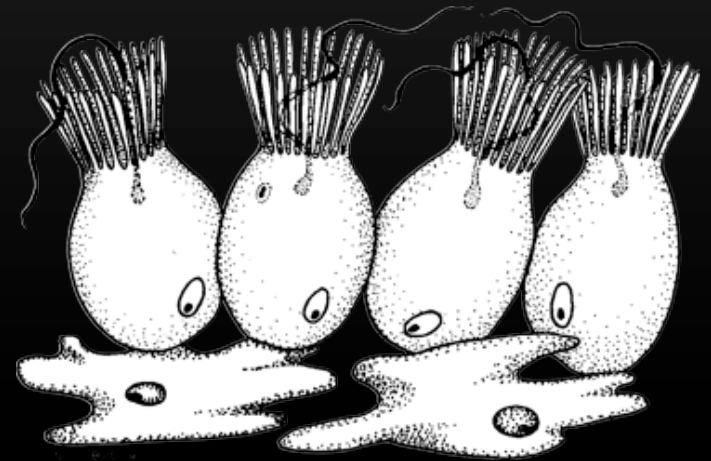
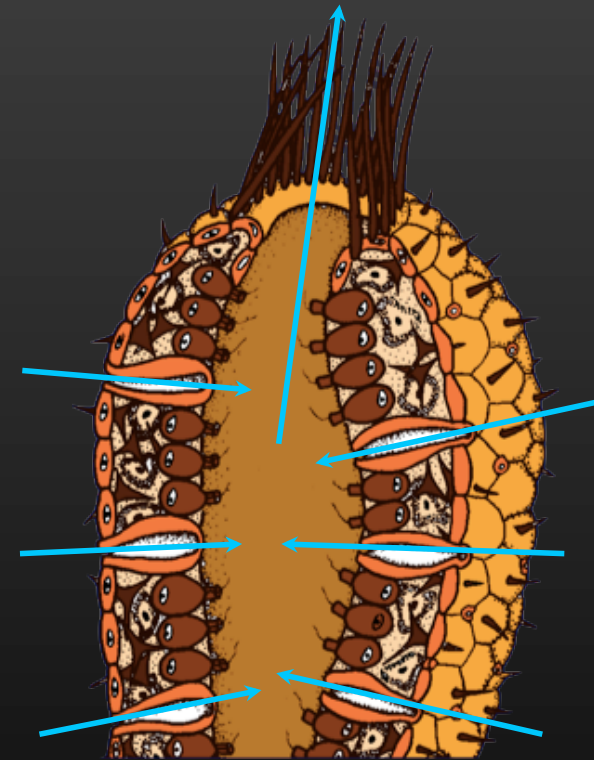
- water flow (syconoid):

- Dermal ostia – incurrent canal – radial canal (with choanocytes) – apopyle – spongocoel – osculum – out of the body

- **feeding**

- suspension feeding

- collars of the choanocytes contain microvilli with cytoplasmic ridges that form a mesh net to capture food particles
- Food ingested at the cellular level using phagocytosis (food vacuole)
- digestion is intracellular



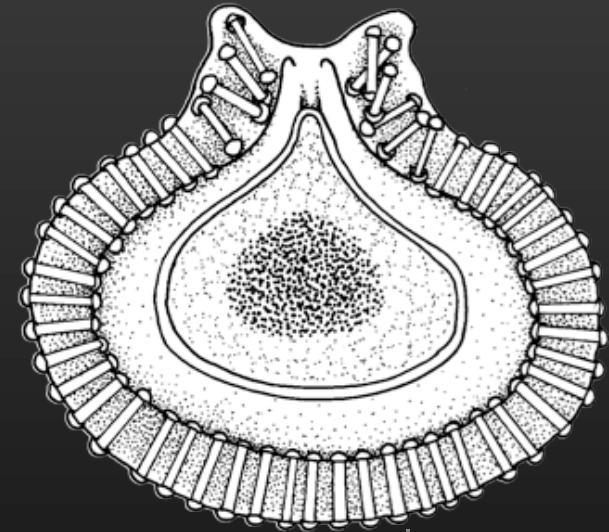
# reproduction

- **Gemmules**

- structure for surviving adverse conditions
- Archaeocytes (amoeboid cells) surrounded by dense layers of spicules to protect from the cold
- This is also a form of asexual reproduction

- **Sexual reproduction**

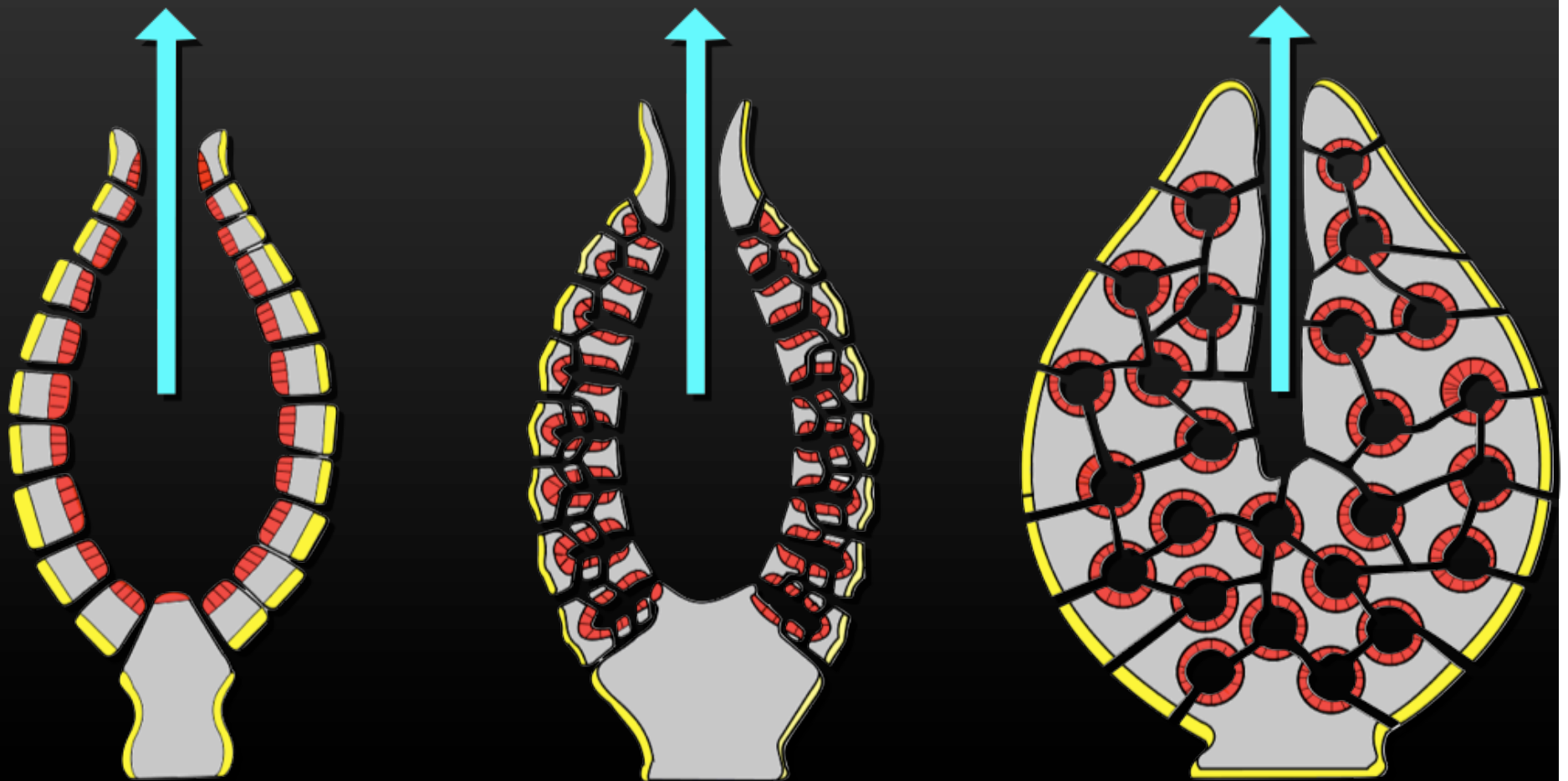
- Modified choanocytes become sperm and leave sponge to mate with originator or a new sponge. Amoeboid cells can become eggs



gemmule

- **body forms**

- Asconoid sponge (Ascon) – simplest, single choanocyte-lined spongocoel
- Siconoid (Sicon) – body wall invaginates into radial canal lined with choanocytes to have more surface area for feeding
- Leuconoid (Leucon) – many chambers and canals, many ostia, 90% of sponges



# taxonomy

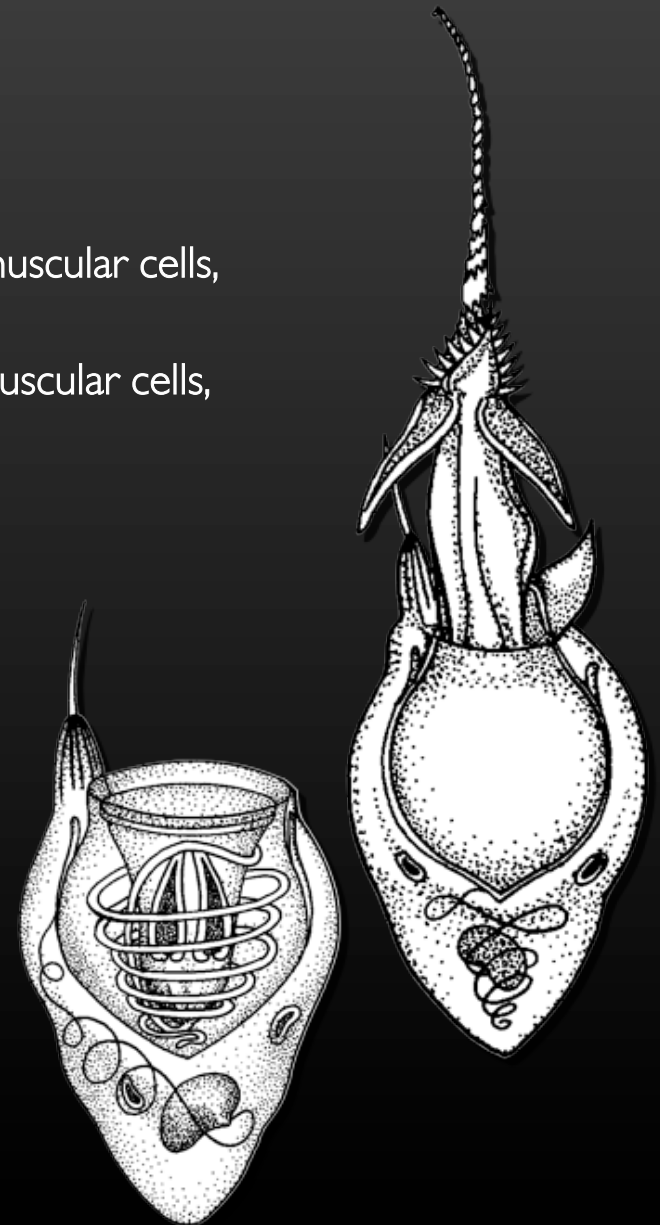
- **Class Calcarea**
  - calcium carbonate spicules; asconoid, siconoid, or leuconoid
- **Class Hexactinellida**
  - Siliceous hexaxon spicules, deep water habitat, siconoid or leuconoid
- **Class Demospongiae**
  - 90% of all sponges, siliceous spicules or can be replaced by squishy spongin fibers, all are leuconoid, many oscula, common bath sponges



# cnidaria

- **Phylum Cnidaria**

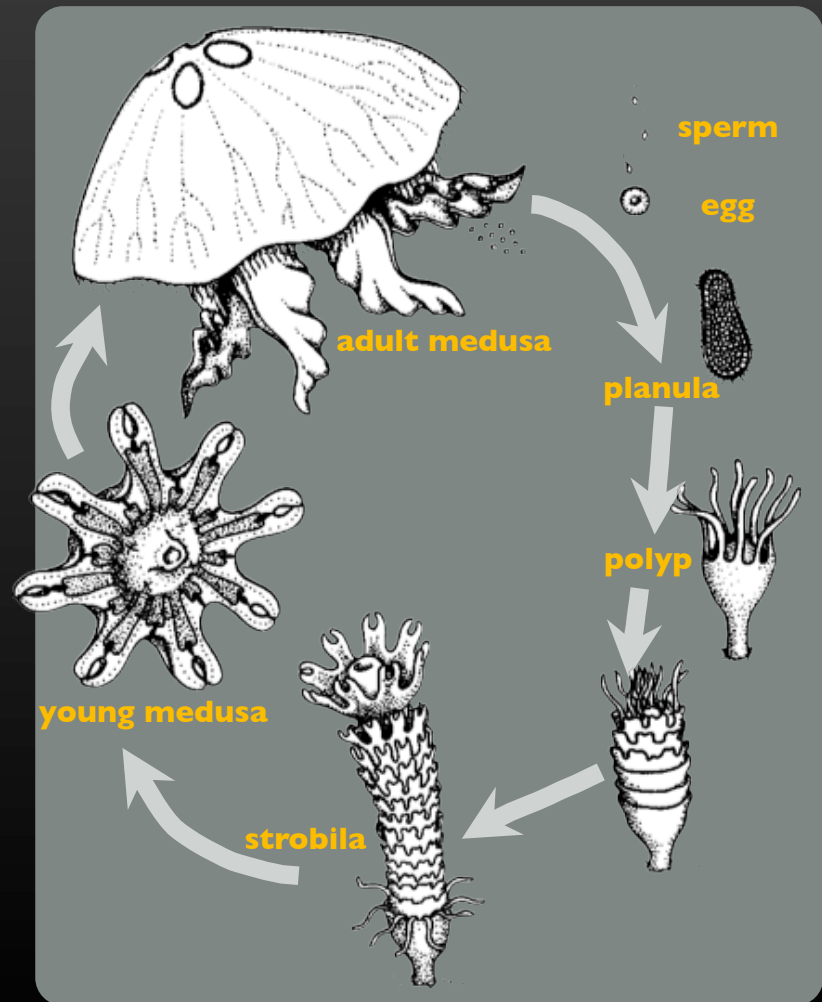
- Tissue level of organization, simple nerve net
- Diploblastic – two tissue layers:
  - Epidermis: outer skin, contains cnidocytes, epitheliomuscular cells, interstitial cells, neurosensory cells
  - Gastrodermis: lines gastrovascular cavity, nutritive muscular cells, interstitial cells, gland cells
  - Mesoglea – nonliving gelatinous layer in middle
- Mouth serves same function as anus
- Circular muscles elongate body
- Longitudinal muscles shorten body



# life cycle

- **Life cycle**

- Polyp (sessile form) – asexual reproduction
- Medusa (mobile form) – sexual stage, gonochoristic
- Class Hydrozoa – both stages dominant
- Class Scyphozoa – Medusa stage dominant
- Class Anthozoa – Only Polyp stage
- General life cycle: Sperm and egg meet externally, form zygote, form actinula (or planula) larvae, form polyp stage, asexual buds from polyp form medusa stage and cycle starts over



# taxonomy

- **PHYLUM CNIDARIA**

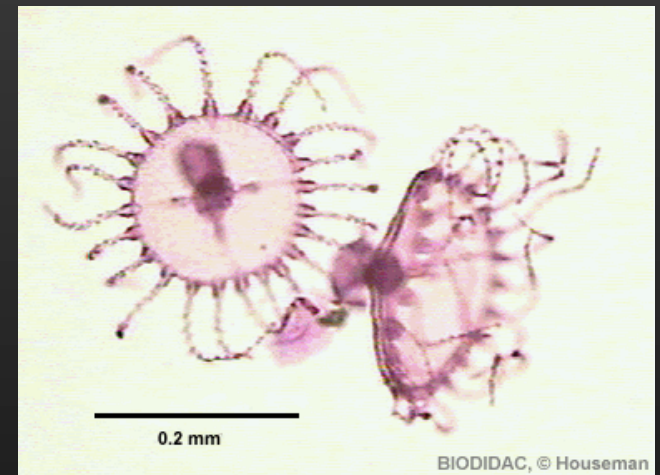
- CLASS HYDROZOA – all medusa have characteristic velum

- ORDER HYDROIDEA

- Hydra – single polyp, no medusa stage
- Obelia – colonial organism
  - feeding polyps called gastrozooids
  - Reproductive polyps called gonozooids
  - Both are connected thru gastrovascular cavity

- Medusa forms:

- Leptomedusa – flattened bell (Obelia)
- Anthomedusa – domed bell (Gonionemus)



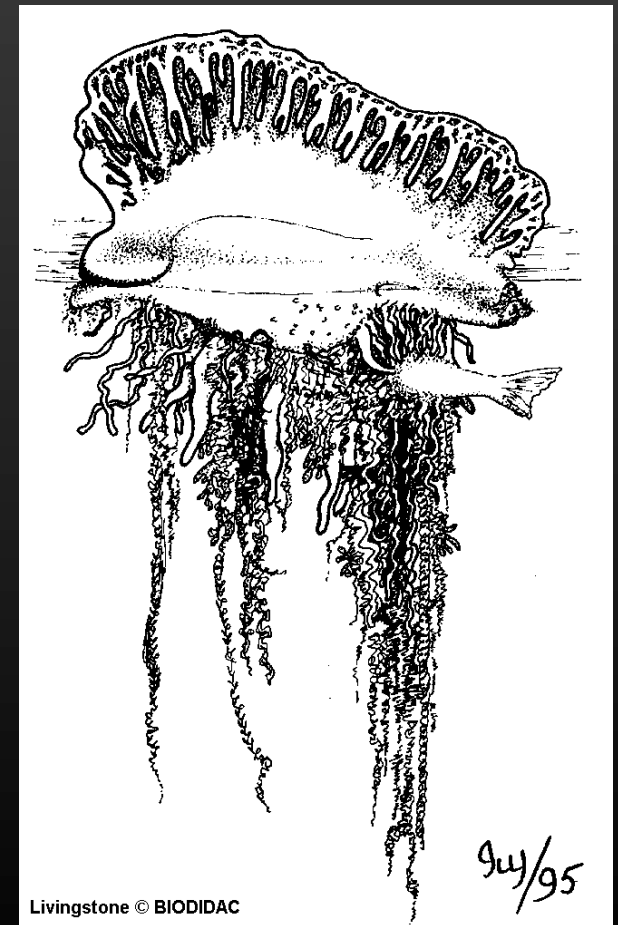
leptomedusa



anthomedusa

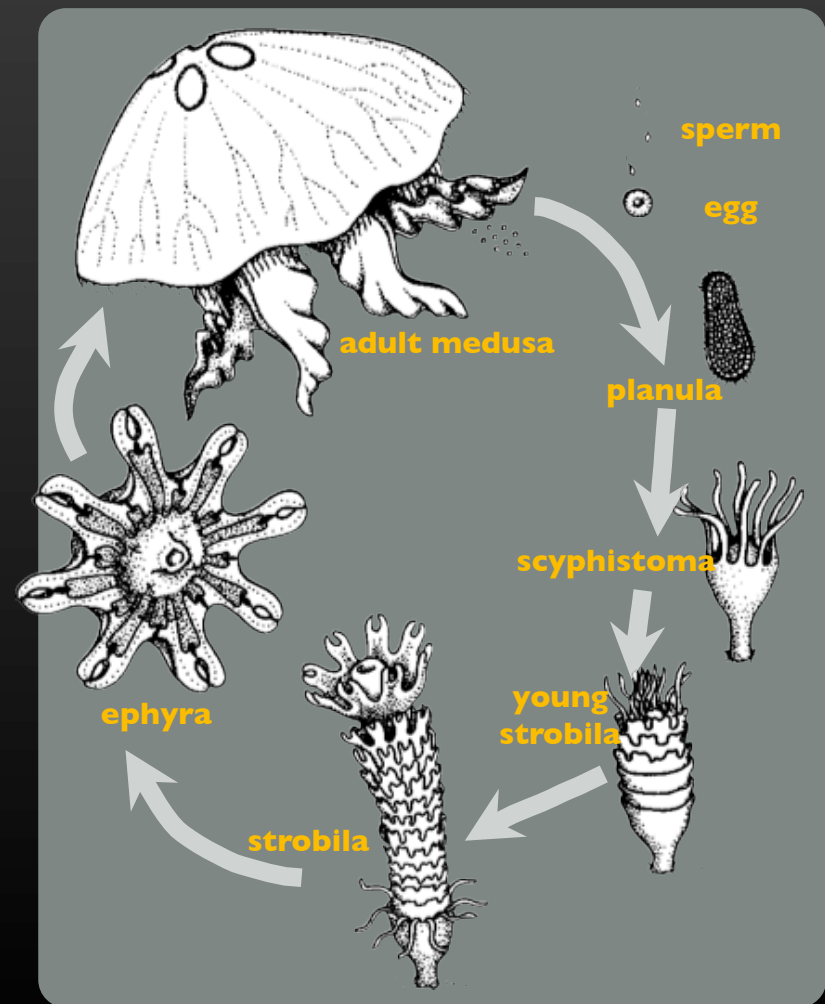
# taxonomy

- ORDER SIPHONOPHORA
  - Portugese Man-O-War (colonial organism)
  - Pneumatophore = “sail”
  - Hanging morphs called cormidia
    - gastrozooids - feeding tentacles
    - dactylozooids with cnidocytes
  - Budding medusae form sexual gonophores, stay in colony
- ORDER HYDROCORALLINAE
  - Hydrozoan corals (colonial organisms)
  - Calcium carbonate exoskeleton (fire corals – covered in cnidocytes)
  - Tiny pits in exoskeleton where polyps reside



# taxonomy

- CLASS SCHYPHOZOA
  - ORDER SEMOSTOMAE
    - Typical jellyfish
    - Life Cycle:
      - Sperm and egg unite to form zygote
      - planula larvae
      - polyp form called scyphistoma
      - forms strobila
      - forms ephyra (baby medusa)
      - forms adult medusa



# taxonomy

- CLASS ANTHOZOA (NO MEDUSA STAGE IN THIS CLASS)
  - SUBCLASS ZOANTHERIA
    - ORDER ACTINARIA
      - Sea Anemones, solitary polyps with no exoskeleton
    - ORDER SCLERACTINIA
      - True corals, also called hard coral
      - Calcium carbonate exoskeleton, very few cnidocytes



9/14/94