Cnidaria (Jellyfish & Corals)

[10,000 living species; 9300 fossil forms]

Biol 1413 General Zoology Lab
(Ziser, 2008)

[Exercise 8]

Identifying Characteristics of Phylum:
- two true tissue layers (=germ layers (tissue level of organization)
- alternation of generations: polyp and medusa; asexual and sexual reproduction
- many colonial species
- gastrovascular cavity with mouth, no anus
- hydrostatic skeleton
- nerve net and simple receptors
- cnidoocytes with nematocysts for capturing prey

Cell & Tissue Types and Characteristic Structures:
- epitheliomuscular cells - form epidermis
- nutritive-muscular cells - form gastrodermis which lines GVC
- mesoglea - is a gelatinous layer between the two tissue layers above
- cnidocytes (stinging cells) - contain harpoon-like nematocysts

Body Organization:
- polyp - saclike with tentacles
- medusa - umbrella-like with tentacles around edge
- colonial forms - may have polyps specialized for feeding or reproduction

Major Classes:
- Class: Hydrozoa - most with polyp and medusa stage with polyp dominant; many colonial; *Hydra, Obelia, Pennaria*
- Class: Scyphozoa - jellyfish - most with polyp and medusa stage with medusa dominant; *Aurelia, Stomolophus*
- Class: Anthozoa - sea anemones, corals - polyp stage only; many colonial; calcium carbonate exoskeleton; *Metridium*, hard and soft corals

Activities:

1. Read introductory descriptions and discussions of cnidarians in lab manual beginning p121

2. Hydra, a solitary hydroid, live: *Hydra*
   - Habitat & Behavior (p123):
     - observe movements and startled reactions
   - Cnidocytes and nematocysts (p123)
     - recognize nematocysts after staining; and discharge after treatment with acetic acid
   - Feeding Behavior (p123):
     - if possible, observe how the hydra feeds on zooplankton

3. External structure (123)
   - slide: *Hydra budding*, wm or *Hydra budding adult* wm
   - know: basal disc, tentacles, body, hypostome, mouth, buds, gastrovascular cavity
4. Cross Section (p124): slide: Hydra cs
   • know: epidermis, gastrodermis, mesoglea, gastrovascular cavity

5. Reproduction (p125):
   Asexual: Budding slide: Hydra adult w bud, wm
   • know: bud

   Sexual: slides: Hydra spermaries, wm
   Hydra ovaries, wm
   Hydra spermaries & ovaries, cs
   Planula, wm
   • Be able to visually recognize and distinguish between male and female specimens in both whole mount and cross section
   • Be able to visually recognize the planula as the characteristic larval form of this phylum

6. Obelia, A colonial Hydrozoan (p125 & Fig 8-3):
   • A preserved hydroid colony (p 126) slide: Obelia hydroid, wm
   • know: hydranths, gonangia, hydrotheca, gonotheca, hydrocaulus, coenosarc, perisarc, mouth, tentacles, gonopore
   • Life History (see Fig 8-3) slide: Obelia medusa, wm
   • know: medusa as sexual stage and how it is produced on the gonangium

7. Class Scyphozoa (Ex 8B, p132) preserved: misc jellyfish
   • know: oral arms, mouth, stomach, gonads, rhopalium

   slide: Metridium cs (=xs)
   • know: oral disc, basal disc, tentacles, mouth, pharynx, septum, septal filament, acontia, gastrovascular cavity

Demonstrations:

• Nematocysts

• Preserved hydrozoa:
  a. Gonionemus: compare the appearance of the preserved animal with the illustrations in your lab manual (Fig 8-4, p 128)
  b. Physalia: a colonial hydroid, note the different kinds of specialized individuals that make up the colony
  c. Other Hydrozoa: can you distinguish between medusae of hydrozoa and those of the class Scyphozoa?

• Preserved Scyphozoa including Aurelia and "cabbageheads" to recognize forms in the class

• Life cycle of Aurelia: to recognize the stages in the production of medusae; the scyphistoma, strobila and ephyra (see lab manual Fig 8-6, p 133)

• Preserved Anthozoa to recognize hard and soft corals as colonial members of this class
EC. Phylum **Ctenophora (Comb Jellies)** to distinguish this closely related phylum from the Cnidaria

**Notebook Suggestions:**

→ Are there any organ systems in these animals?
→ What evolutionary advances do they have over the sponges?
→ How easily can you distinguish between polyps and medusae? in solitary animals? in colonial animals?
→ What type of symmetry is evident? Do all members of the phylum show the same type of symmetry?
→ Are all the examples of the phylum easily recognized as belonging to the Cnidaria?
→ Observations on living specimens