

# BIO 221

## Invertebrate Zoology I

### Spring 2007

Stephen M. Shuster  
Northern Arizona University

<http://www4.nau.edu/isopod>

### Lecture 11

---

---

---

---

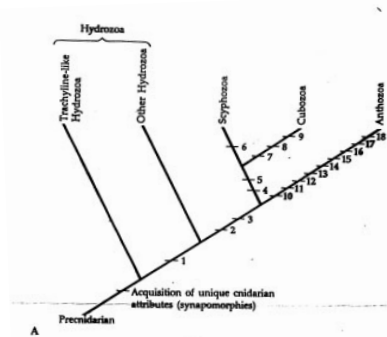
---

---

---

---

## Medusoid Cnidarians



(4) Reduction or loss of polypoid stage.

(5) evolution of rhopalia - balancing organs.

---

---

---

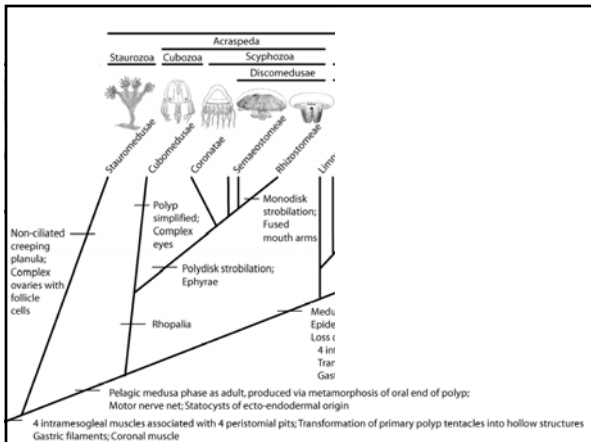
---

---

---

---

---




---

---

---

---

---

---

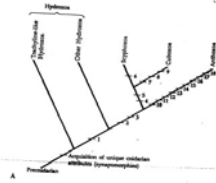
---

---

## Class Scyphozoa



- a. 200 species, all marine
- b. (6) polyps with strobilization




---

---

---

---

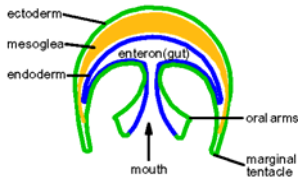
---

---

---

---

## Class Scyphozoa



- Other characters:
- i. 4x radial symmetry with 8 external lobes
  - ii. endodermal gonads (like other cnidaria)
  - iii. medusae without velum
  - iv. 4 gastric septa, with gastric tentacles
  - v. no skeleton; but thick mesoglea
  - vi. no stomadaeum

---

---

---

---

---

---

---

---

## Class Scyphozoa-Body plan



- a. Thick mesoglea with amoebocytes.
  1. Forms bell
  2. Feed by trapping plankton on exumbrellar, subumbrellar surfaces; swept to bell margin and lapped up by oral arms.

---

---

---

---

---

---

---

---

## Class Scyphozoa-Body plan

a. Larger food taken by paralyzing with nematocysts on tentacles.

b. Also nematocysts in GVC; some with gastric tentacles.



---

---

---

---

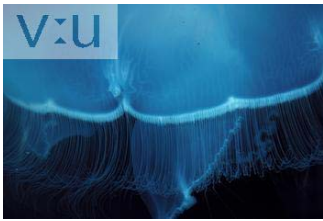
---

---

---

---

## Class Scyphozoa-Body plan



Sensory structures at bell margin.

1. whereas hydromedusae have nerve network at bell margin, scyphozoans have rhopalia.

---

---

---

---

---

---

---

---

## Class Scyphozoa-Body plan



2. Marginal ganglia near rhopalia.

a. act as pacemakers

b. rhopalia contain sensory elements associated with

1. equilibrium - statocysts

2. photoreception - ocelli

---

---

---

---

---

---

---

---

## Class Scyphozoa-Body plan



- Gastric pouches = 4;
1. Gastric filaments
  2. More complex GVC than hydrozoans.
  3. Gastrodermal gonads- usually separate sexes - gonochoristic

---

---

---

---

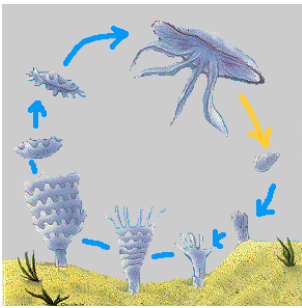
---

---

---

---

## Scyphozoan Life Cycles



Adults (sexual) -> eggs and sperm (into water or sperm swim to eggs);

-> *planula* settles -> grows into feeding; polyp (*scyphistoma*; sometimes with asexual budding)

-> *strobila* -> *ephyra* swim away and grow to *medusae*.

---

---

---

---

---

---

---

---

## Important Orders

a. Order Semeostomeae (semeostomes):

1. Larger, most familiar, temperate
2. *Aurelia*, *Cyanea* - flat bell
3. Carnivorous, very large, most oceans, painful sting.



---

---

---

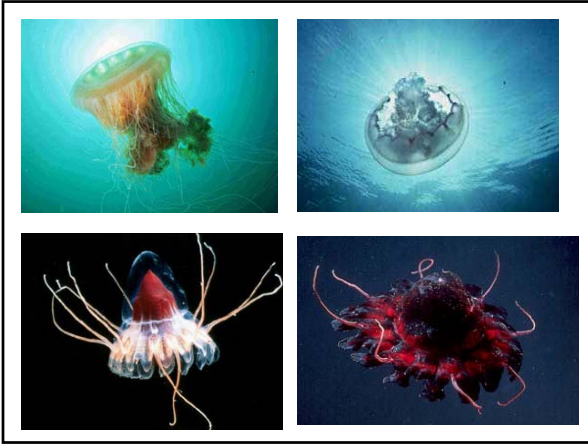
---

---

---

---

---




---

---

---

---

---

---

---

---




---

---

---

---


---

---

---

---

**Important Orders**



Order Rhizostomeae  
(rhizostomes)

1. Tropical, shallow water
2. lack marginal tentacles
3. 8 lobes in GVC; forms mouth lobes often sub-branched
  - a. therefore don't usually feed on large prey

© 2003 www.deepseaindonesia.com, John Easley

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

## Important Orders



Rhizostomes often contain zoochlorellae (zooxanthellae)

1. *Cassiopaea*,

a. Caribbean, get very large.

2. *Stomolophus*

a. Common in Gulf of California.

b. Primary food of sea turtles, especially leatherbacks.

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

## Important Orders



Order Stauromedusae  
(stauromedusae)

1. Look a lot like polyps - 8 clusters of knobbed tentacles.
  - a. Sedentary, hang off of marine vegetation
  - b. Some can move around, some can't.
2. Yet possess scyphozoan GVC, gonads.

---

---

---

---

---

---

---

---

---

---

## Important Orders



*Haliclystus, Manania*

- a. Has a lifestyle almost like a polyp
- b. Good example of convergent evolution?

More recent systematics suggest that these are transitional between Anthozoans and Medusozoans.

---

---

---

---

---

---

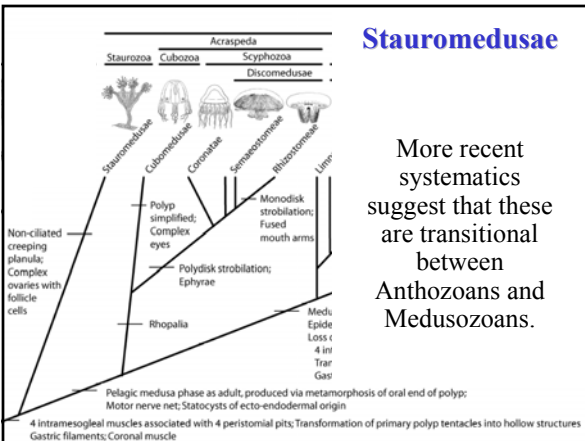
---

---

---

---

## Stauromedusae



More recent systematics suggest that these are transitional between Anthozoans and Medusozoans.

---

---

---

---

---

---

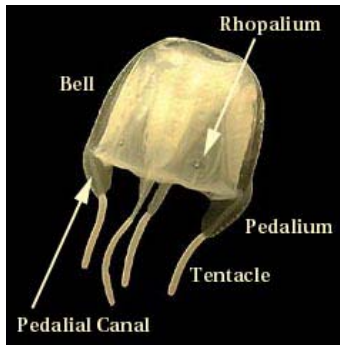
---

---

---

---

## Class Cubozoa



- a. Single order, used to be in Scyphozoa.
- b. (7) box like body shape
- c. (8) complex rhopalia with eyes
- d. (9) velarium (like a velum, but more elaborate)

---

---

---

---

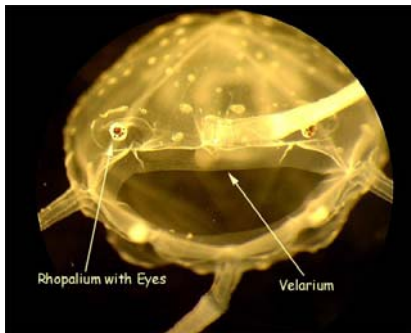
---

---

---

---

## Cubozoan Velarium



---

---

---

---

---

---

---

---

## Cnidarian Rhopalium



---

---

---

---

---

---

---

---





## Class Cubozoa

### Other Characters

- i. extremely powerful venom



---

---

---

---

---

---

---

---

## Class Cubozoa



### Other Characters

- ii. loss of strobillate polyps - polyplanulation

---

---

---

---

---

---

---

---

## Class Cubozoa



---

---

---

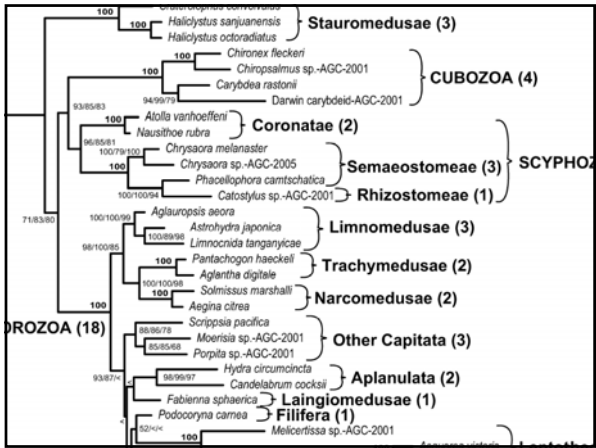
---

---

---

---

---




---

---

---

---

---

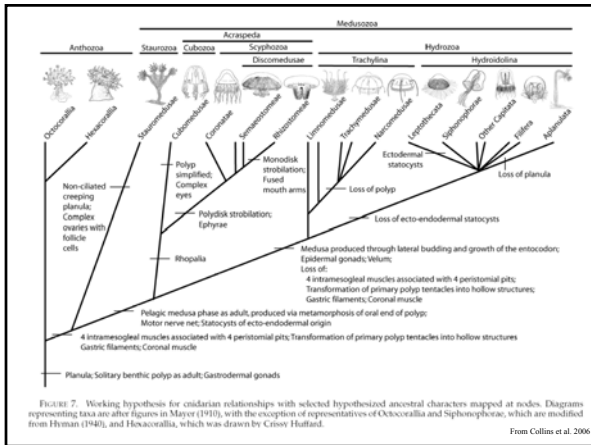
---

---

---

---

---




---

---

---

---

---

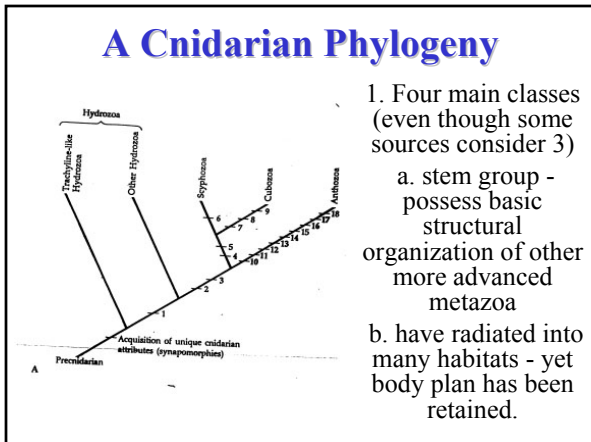
---

---

---

---

---



1. Four main classes (even though some sources consider 3)
  - a. stem group - possess basic structural organization of other more advanced metazoa
  - b. have radiated into many habitats - yet body plan has been retained.

---

---

---

---

---

---

---

---

---

---