

ZOOLOGY 101 SECTION 10 LECTURE NOTES

Phylum Echinodermata:

Characteristics:

1. Body of radial, pentamerous symmetry; not metameric
2. No head or brain, few specialized sensory organs
3. Circumoral nerve ring and radial nerves
4. Endoskeleton of dermal calcareous ossicles; stereom structure
5. Water-vascular system
6. Locomotion by tubular feet at the ambulacral groove
7. Complete digestive system, may be axial or coiled
8. Coelom extensive
9. Hemal system
10. Various forms of respiration
11. No excretory organs
12. Sexes separate, external fertilization

Class Asteroidea: Sea Stars (star fish)

External:

1. Five radial arms
2. Ossicles = calcareous plates form endoskeleton
3. Stereom = internal network of spaces
4. Pedicellariae = pincer-like jaws on the upper surface
5. Locomotion:
 - a. Ambulacral groove and tube feet (podia)
 - b. Radial nerve
 - c. Groove open in asteroids, crinoids; closed in others
6. Papulae = (dermal branchiae or skin gills) for respiration
7. Arboreal (upper surface) anus
8. Madreporite = opening leading to water vascular system

Internal:

1. Coelom: perivisceral Coelom + water-vascular system
2. Water-vascular system:
Madreporite > stone canal > ring canal and polian vesicles > radial canals > lateral canals > ampulla (tube feet)
3. Unique to echinoderms
4. Used for locomotion, food, respiration and excretion
5. Digestion:
Mouth > two part stomach (lower *cardiac stomach* > upper *pyloric stomach*) > digestive ceca in arms > intestine > anus

Class Ophiuroidea: Brittle Stars

1. Arms sharply marked off from central disc
2. Ambulacral grooves closed, covered by ossicles
3. Tube feet without suckers
4. Pedicellariae and papulae absent
5. Articulated ossicles called vertebrae
6. Jaws
7. Sac-like stomach, no intestine
8. Bursa for gas exchange

Class Echinoidea: Sea Urchins, Sand Dollars

1. Globular shape, no arms
2. Compact skeleton of closely fitting plates
3. Movable spines
4. Ambulacral grooves closed
5. Pedicellariae present
6. Jaw structure called *Aristotle's Lantern*

Class Holothuroidea: Sea Cucumbers

1. Oral tentacles
2. Ambulacral grooves closed
3. Pedicellariae absent
4. Madreporite internal
5. Eviscerate

Class Crinoidea: Sea lilies and Feather Stars

1. Branched arms, pinnate
2. Sessile, body on stalk

Class Concentricycloidea: Sea Daisies