

Lab (7)

Phylum: Echinodermata

1-Class: Asteroidea

Order: Forcipulata

Genus: *Asterias* (Sea star)

2-Class: Ophiuroidea

Order: Ophiuræ

Genus: *Ophiocoma* (Brittle star)

3-Class: Echinoidea

Order: Camarodonta

Genus: *Echinus* (Sea urchin)

General characteristics

- Exclusively marine.
- Adults with radial symmetry.
- Larvae bilateral symmetry.
- No head, body unsegmented.
- Have oral and aboral surfaces, oral surface (have mouth located in the center of the body). aboral surface(have anus).
- Body wall contains an endoskeleton of ossicles , sharp protective spines made of calcium plates covered with thin epidermal layer.

- **With unique water vascular system (network of canals throughout the body) is important for locomotion, feeding, respiration and excretion.**
- **Have a large coelom (fluid-filled cavity between body wall and gut lined by mesoderm) where all the main organs occur.**
- **No brains, central nerve ring surrounds mouth , connect radial nerves run under each arm have ganglia.**
- **Digestive system complete .**
- **Respiration by dermal gills, tube feet or respiratory tree.**
- **Sexes are separate, fertilization is external.**

1- Class:Asteroidea

Order:Forcipulata

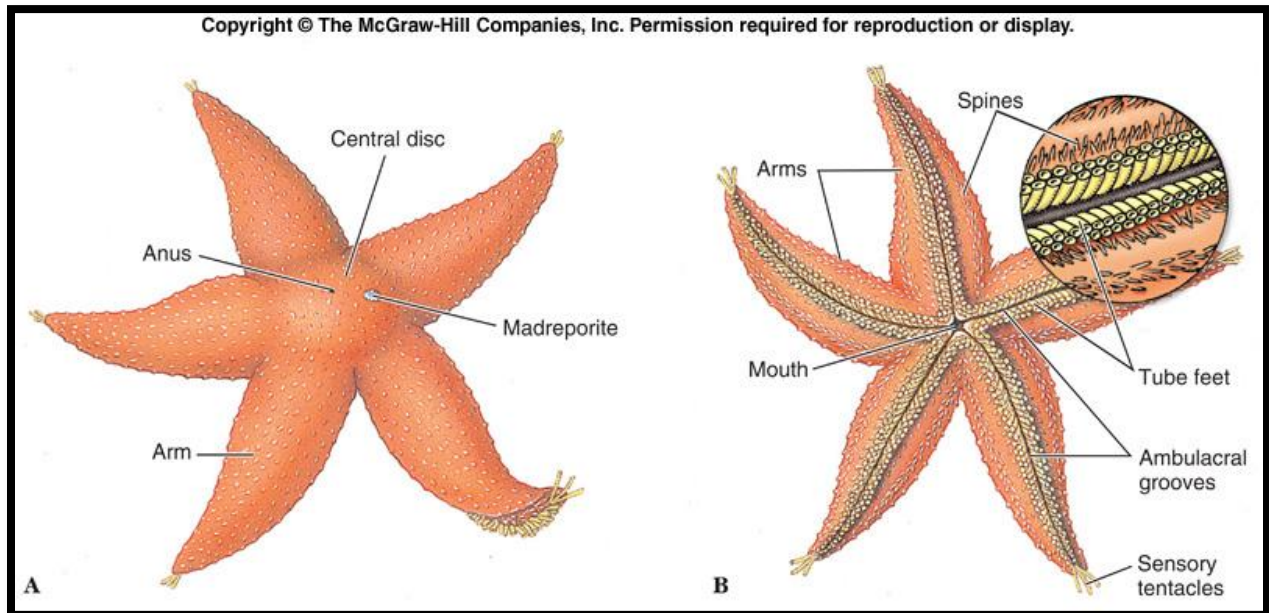
Pedicellariae: Tiny forceps that protect and clean the body surface

Genus: *Asterias* (Sea star)

- **Body is flattened with five or more arms which merge with a central disc.**
- **Mouth is located in the center of oral surface and there is anus in the aboral surface.**
- **Aboral surface with madreporic plate controls water entry for water vascular system.**
- **They breathe through small dermal gills in their skin.**
- **nerve ring surrounds mouth and branches off into nerve cords in each arm, (red eye spots) on the ends of each arm are sensitive to light.**

-Dioecious with sperm or eggs produced in two or more gonads in each arm. Larval stage(bipinnaria) free swimming larva, settles in the bottom and develops into an adult through metamorphosis.

-Star fish can regenerate lost parts by disk division .

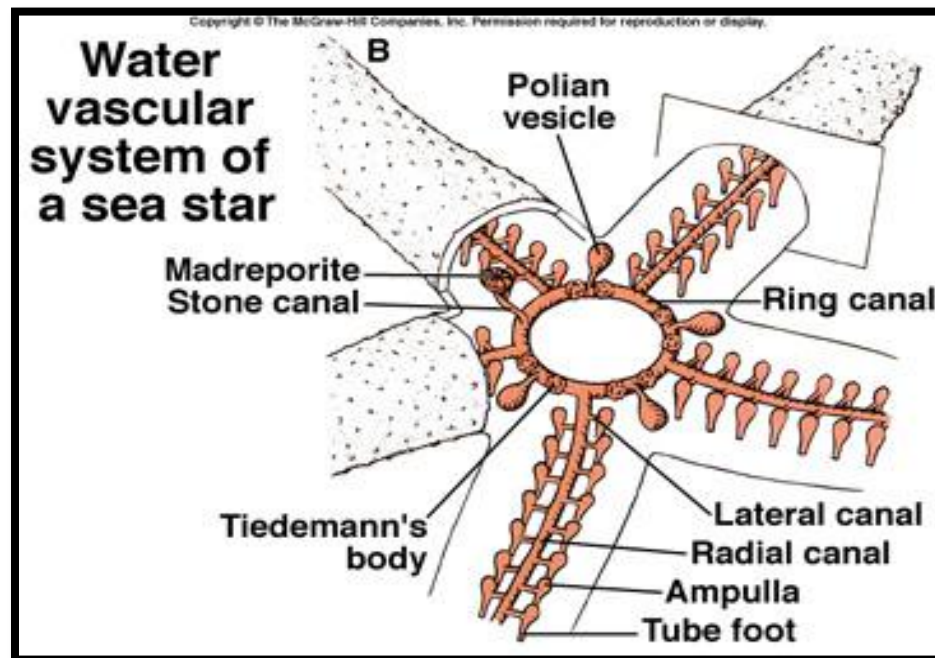


Asterias (Sea star)

Water Vascular System

- **On the aboral surface is the opening of the water vascular system the madreporite (sieve plate) .**
- **Water enters the madreporite and goes through the stone canal canal to the ring canal.**
- **Water then passes through a radial canal extending into each arm.**

- All along the length of these canals are lateral canals that terminate in a bulb-like structures called ampullae equipped with tube feet and sucker.
- There are four lines of tubular feet line the grooves on the oral surface (ambulacral grooves) .

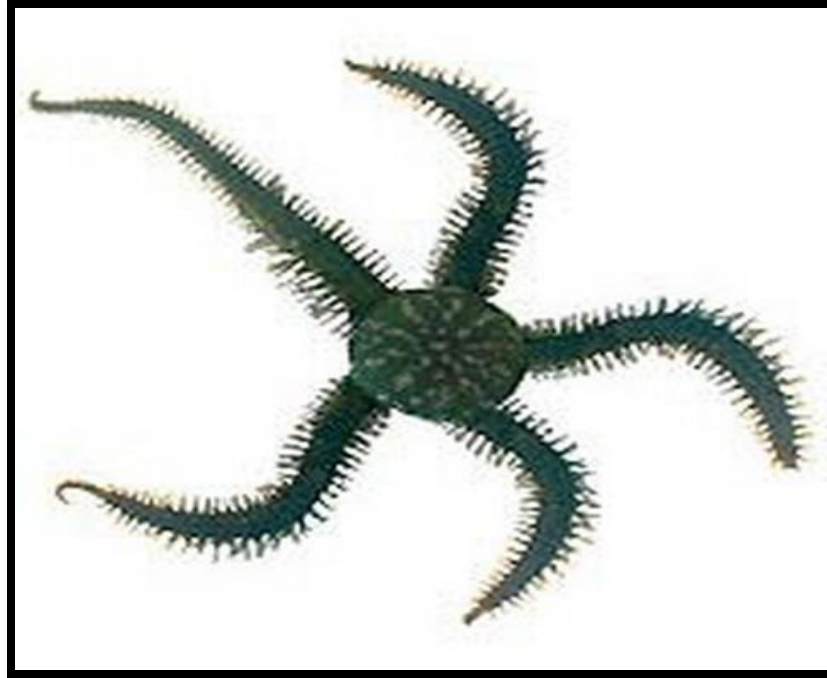


2-Class:Ophiuroidea

Order: Ophiuræ

Genus: *Ophiocoma* (Brittle star)

- Central disc with distinct arms, no pedicellariae.
- Tube feet lack suckers and ampulla .
- Seive plate in oral surface.



Ophiocoma (Brittle star)

3-Class: Echinoidea

Order: Camarodonta

Genus: *Echinus* (Sea urchin)

- **Body is spherical, enclosed in a shell or test (skeleton plates) , lack arms.**
- **Ambulacral plates bearing tube feet that radiate out toward the aboral surface.**
- **Body surface is usually covered with moveable long spines articulate with the calcareous ossicles used for protection against predators.**



Echinus (Sea urchin)