



Phylum Echinodermata



Echinodermata



[End show](#)

- ❑ **Bilateral larvae, radial adults.**
- ❑ Body surface with **five symmetrical radiating areas** (ambulacra).
- ❑ **Water-vascular system.**
- ❑ Often with **pedicellaria** and **Tiedemanns bodies**.
- ❑ Endoskeleton of **calcareous plates**.
- ❑ **“Mutable” connective tissue.** Connective tissue can rapidly polymerize from stiff and hard to soft gel and vise versa.





[End show](#)

Systems

- ❑ Integumentary - thin epidermis
- ❑ Skeletal - Mesodermal endoskeleton of calcareous plates (movable or fixed)
- ❑ Water vascular system- derived from coelomic pouches.
- ❑ Nervous - a diffused **net** typically of three rings centered on mouth region with radiating branches.
- ❑ Excretory - isotonic, some use of amoebocytes from Tiedemann bodies.





[End show](#)

Systems continue

- ❑ **Respiratory**- skin gills (dermal branchiae or papulae from coelom) cloacal respiratory trees in Holothuroidea.
- ❑ **Digestive** - usually **complete** with anus on aboral surface. Some (Echinoidea) with mouth parts. Most use water vascular system to procure food.
- ❑ **Circulatory**- in general no special system, use the water vascular system and the coelom.
- ❑ **Reproductive** - Sexes usually separate, no dimorphism. Fertilization usually in the sea. Larva bilateral and usually free swimming. Many readily regenerate body parts.





[End show](#)

Echinodermata Taxonomy

- Class: Crinoidea
- Class: Holothuroidea
- Class: Echinoidea
- Class: Ophiuroidea
- Class: Asteroidea
 - *Asterias* dissection





Class Crinoidea

- Sea lilies and feather stars
 - Arms branched attached by a stalk or free-moving. The mouth and anus on oral surface. No spines, madreporite or pedicellariae.



fossils





Class Holothuroidea

- Sea cucumbers
 - Elongated body with no arms, spines, or pedicellariae. Skeleton only of microscopic plates mouth ringed by retractile tentacles(modified tube feet). Pedicellariae absent, madreporite internal.





Class Echinoidea

- Sea urchins and sand dollars
 - Skeleton rigid (plates fused), mouth parts present, pedicellariae with 3-jaws. Spines movable. Ambulacral grooves closed.

Sand dollar



Mouth parts
aboral



oral

Sea biscuit



Sea urchin



aboral surface oral surface



endoskeleton



Aristotle's lantern

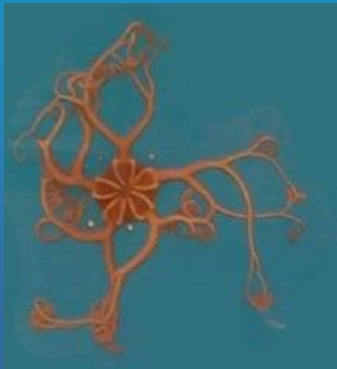




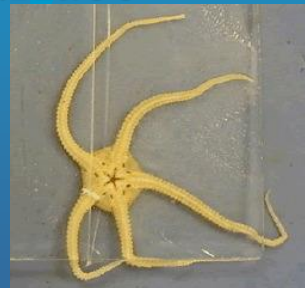
Class Ophiuroidea

- Brittle stars and basket stars
 - Arms distinct from central disc. Ambulacral grooves closed, tube feet without suckers (not used in locomotion). Pedicellariae and anus absent.

Basket star



Aboral surface



Oral surface





Class Asteroidea

- Sea stars and starfish
 - Arms are not sharply distinct from central disc. Ambulacral grooves open, tube feet with suckers, pedicellariae present.



Aboral surface



Oral surface



Aboral surface Oral surface

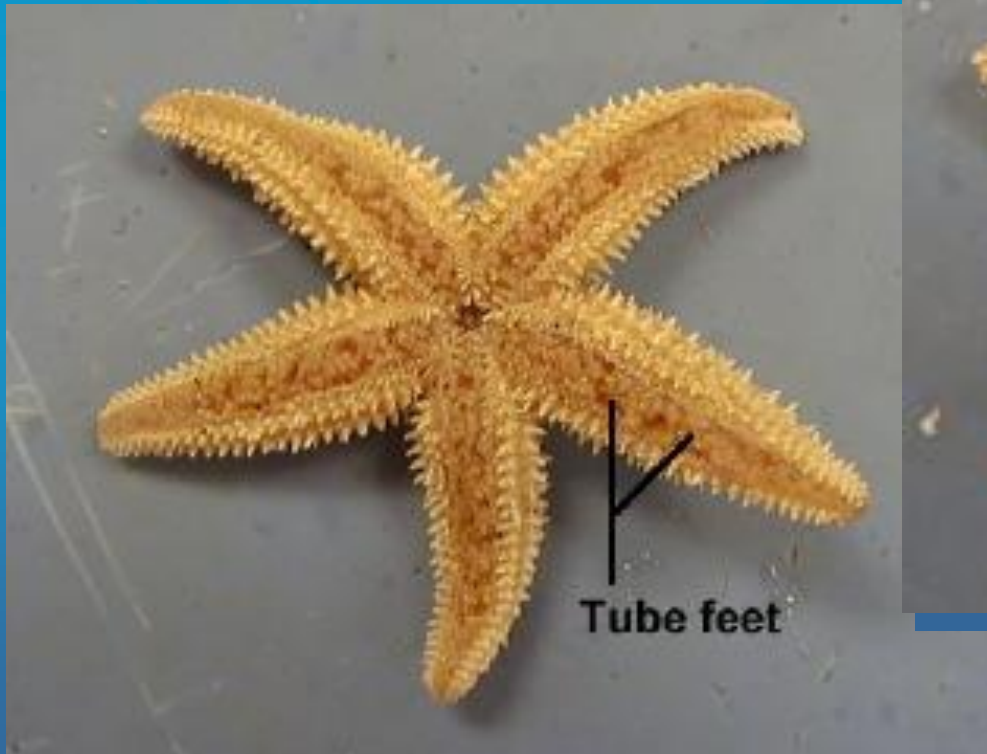
Asterias
dissection





Asterias dissection 1

Oral surface



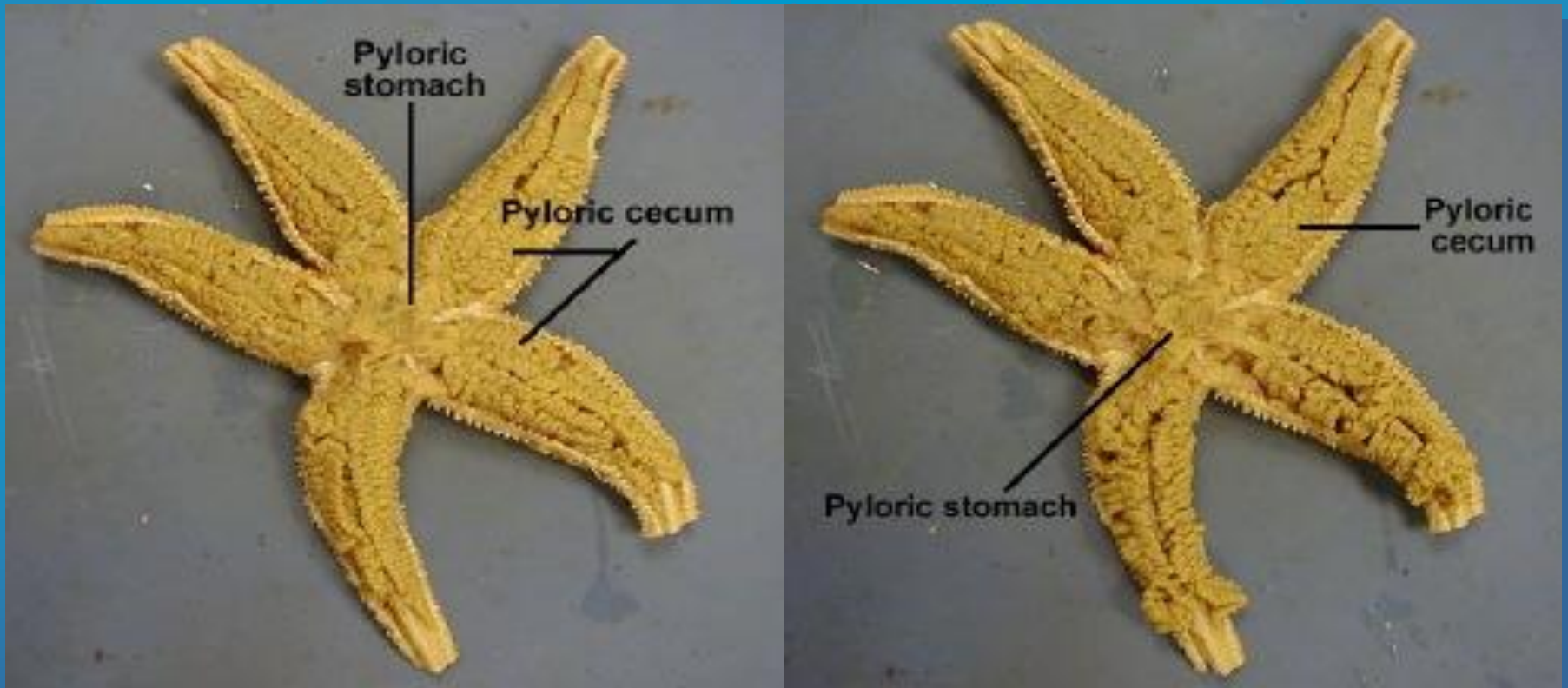
Aboral surface





Asterias dissection 2

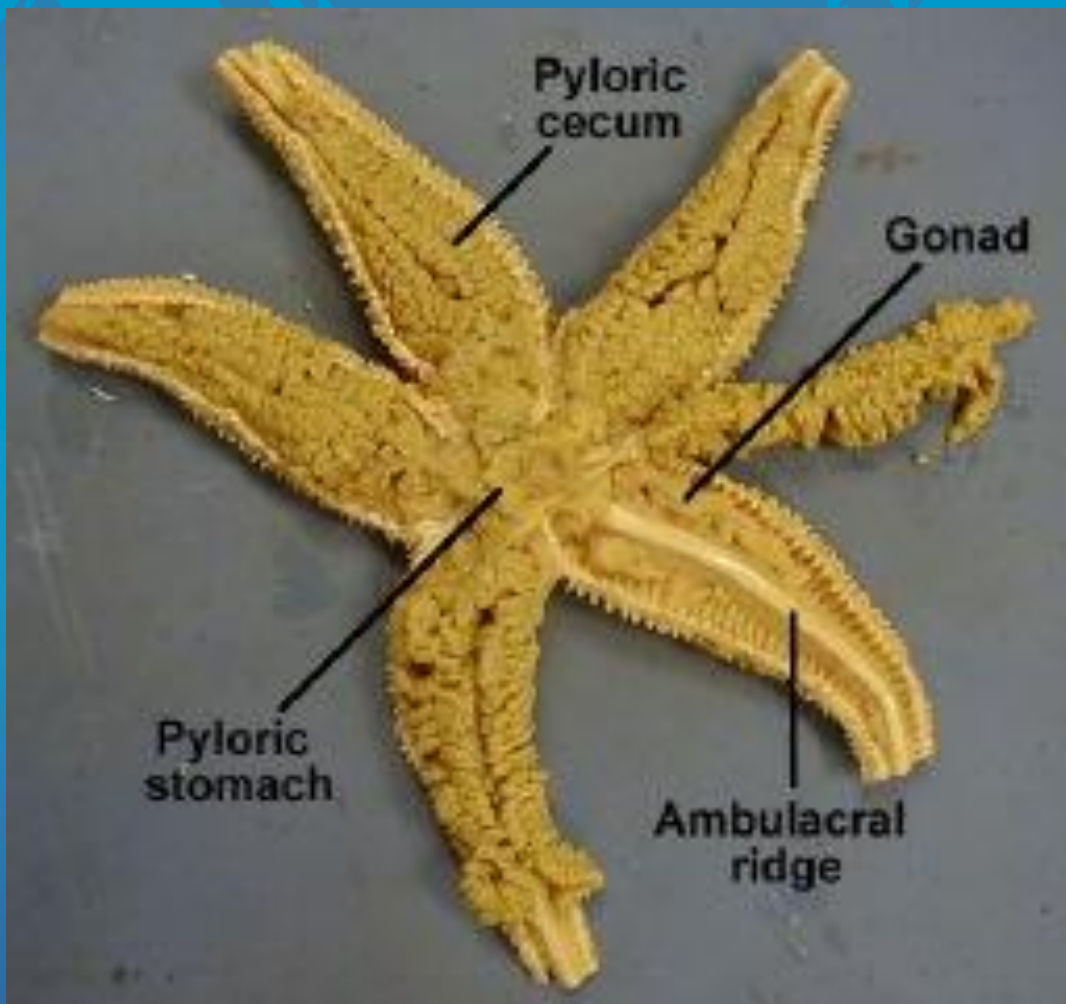
- Aboral surface removed.





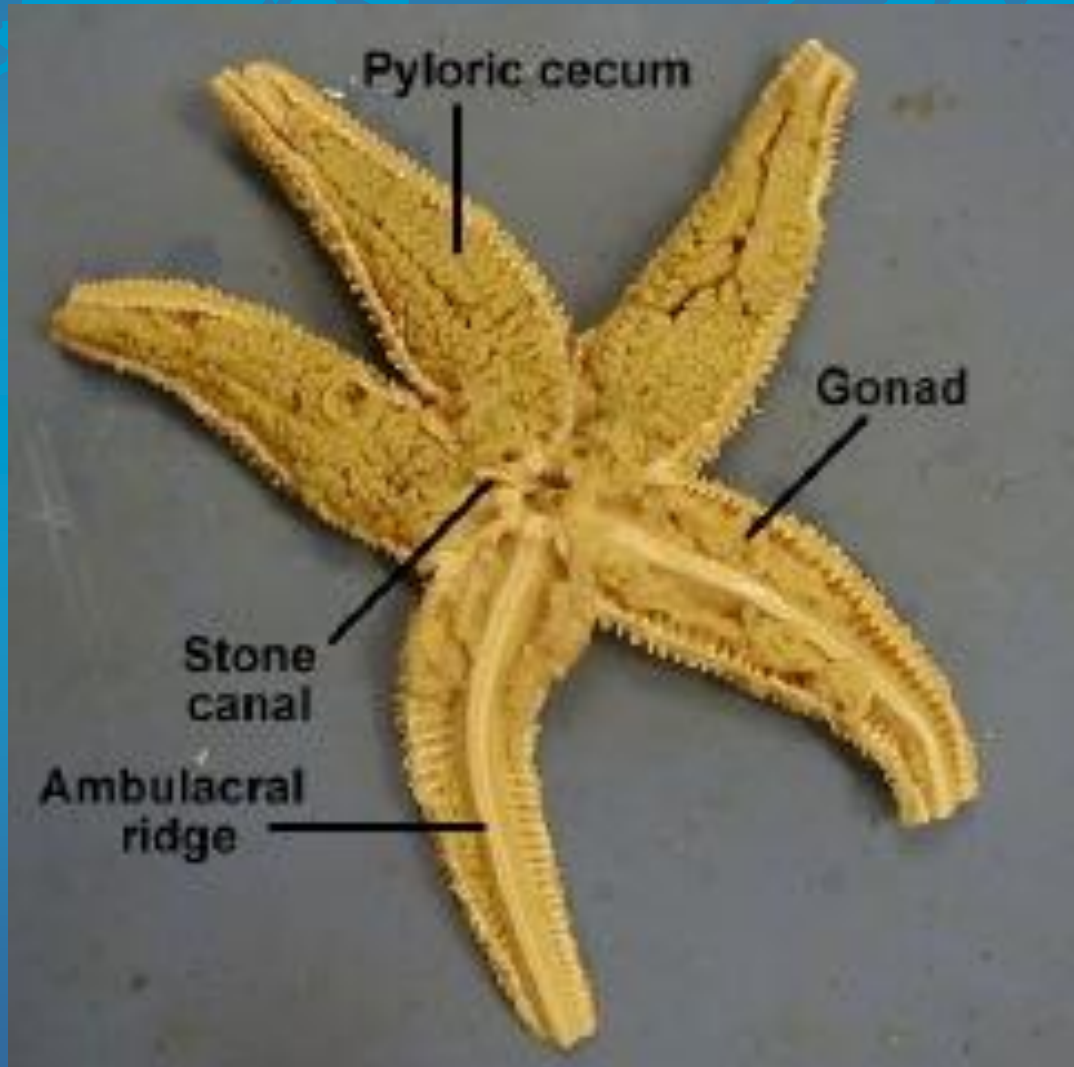
Asterias dissection 3

- Aboral surface removed.





Asterias dissection 4

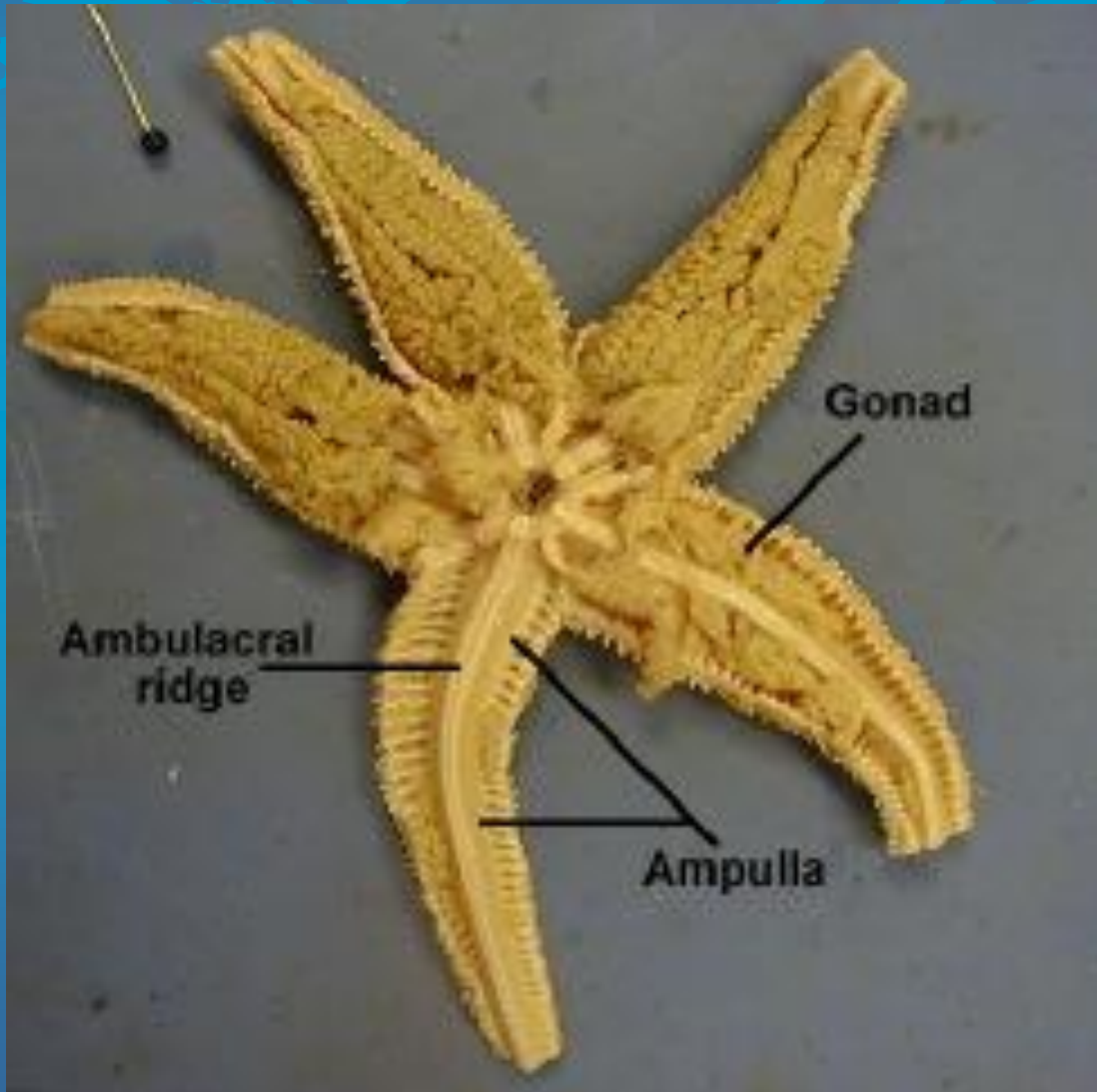


- Aboral surface, stomachs and some pyloric caeca removed





Asterias dissection 5



- Aboral surface, stomachs and some pyloric caeca removed

End of dissection

