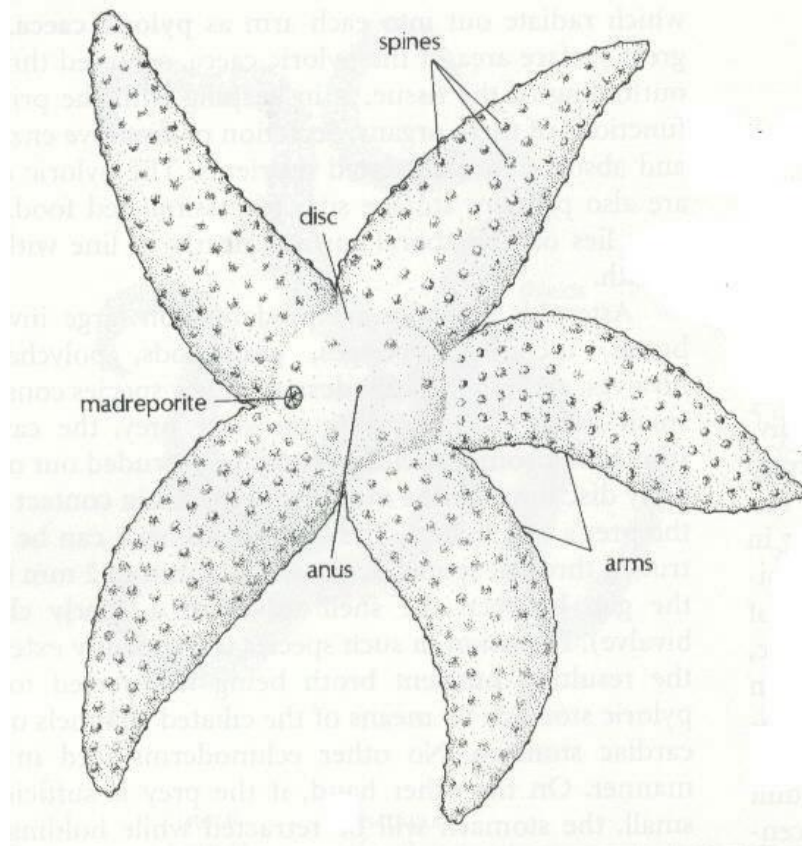


Phylum Echinodermata



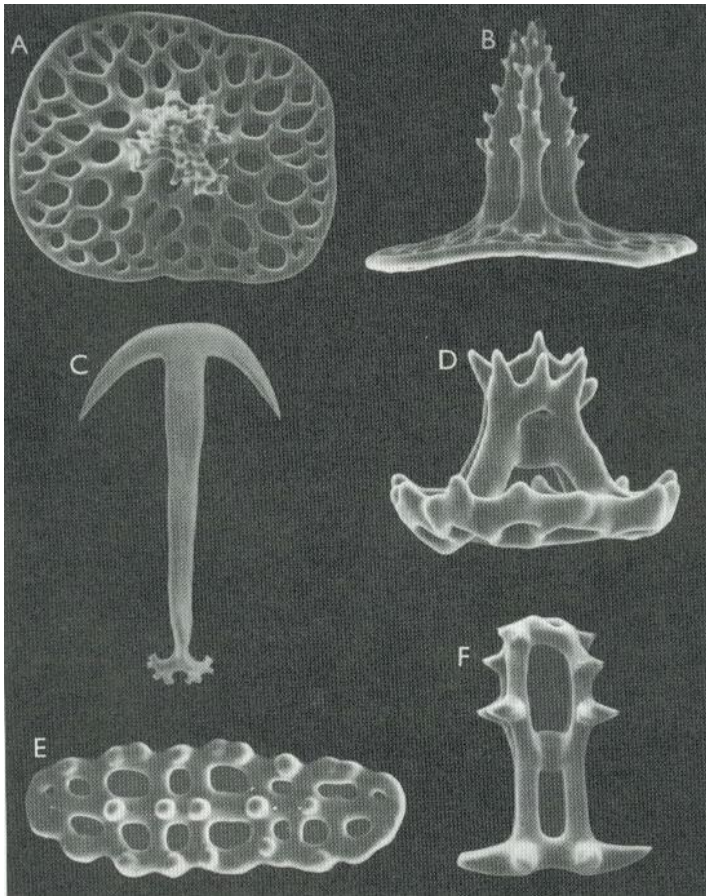
Phylum Echinodermata



CS

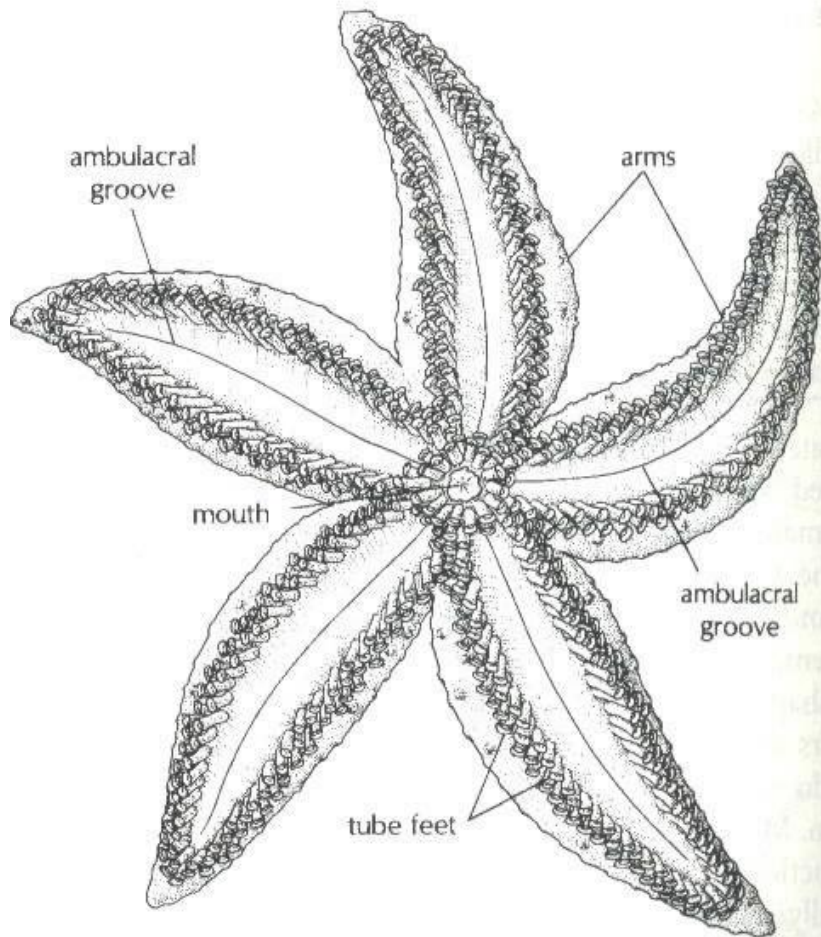
mid filled canals with numerous
omotory appendages
metry in adult

Echinoderms Skeleton



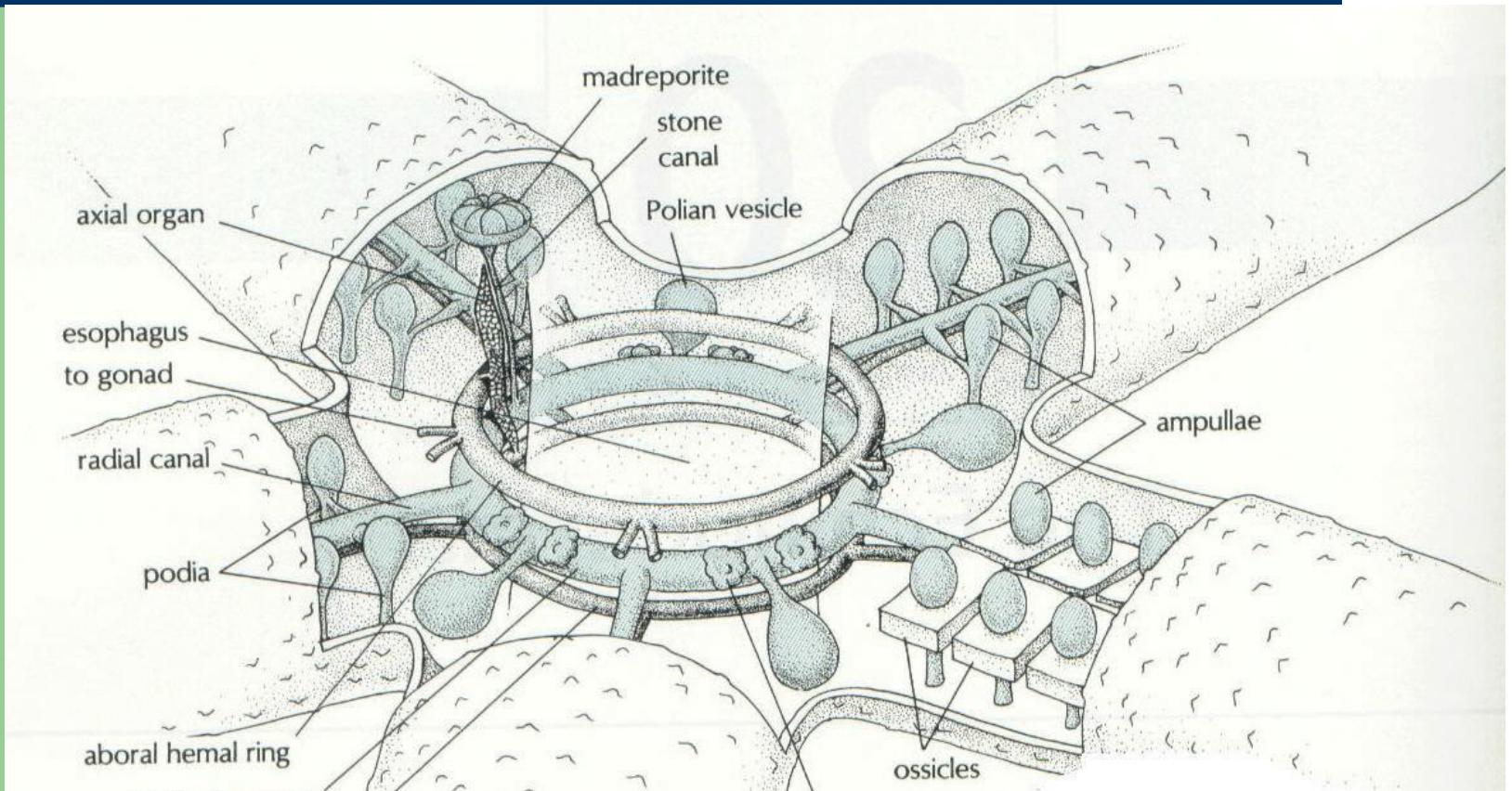
- Have an internal skeleton of calcium carbonate
 - Ossicles vary in size and structure and are manufactured by specialized cells
- Feeding biology?

Water vascular system

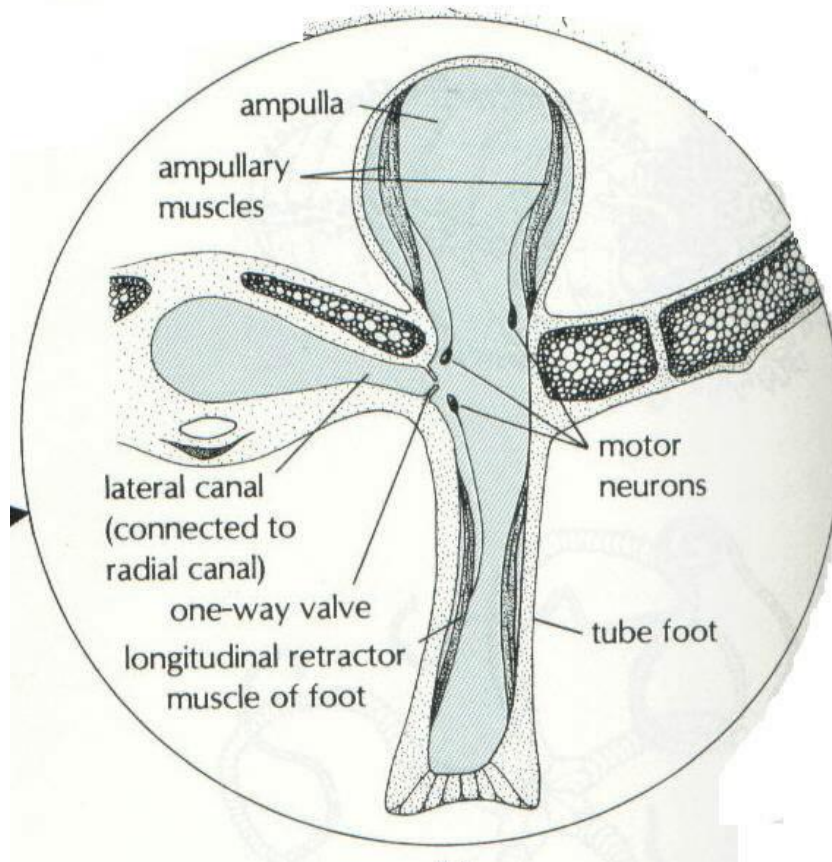


- A separate coelom is used with interconnecting fluid filled tubes and canals
- A ring canal circles the mouth and gives off 5 radial canals
- The radial canal is exposed and runs along the ambulacral groove

Water Vascular System



Tube Feet

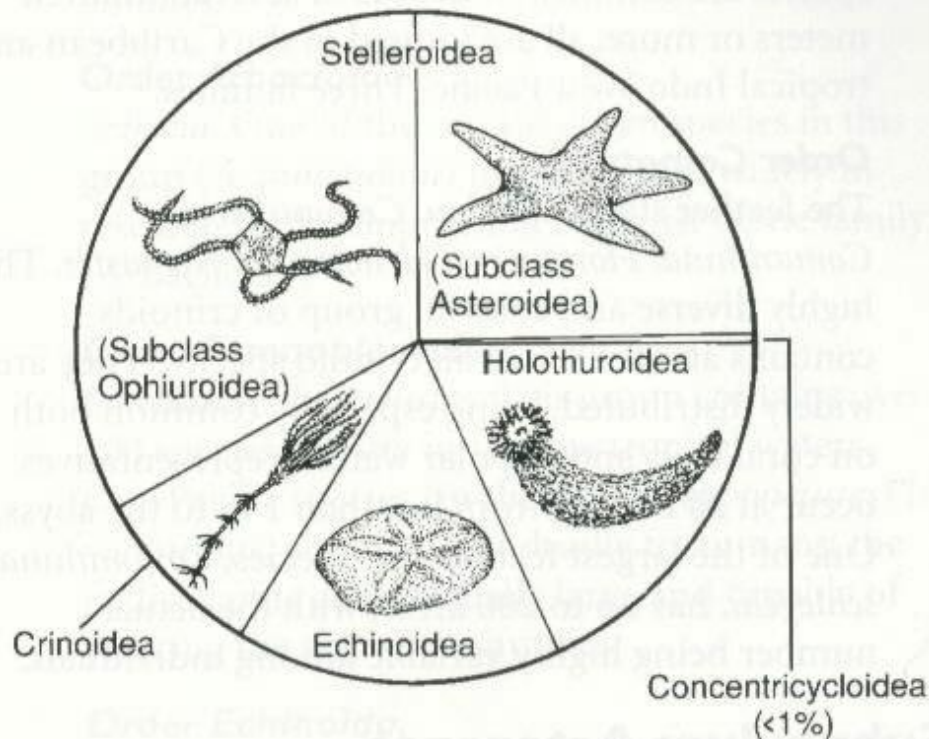


- The ampullae is a small ball that sits above the tube foot
- Contraction and expansion of the ampulla accomplishes movement

Mutable Connective Tissue

- Another unique Echinodermata characteristic is the presence of mutable connective tissue

Taxonomic Summary

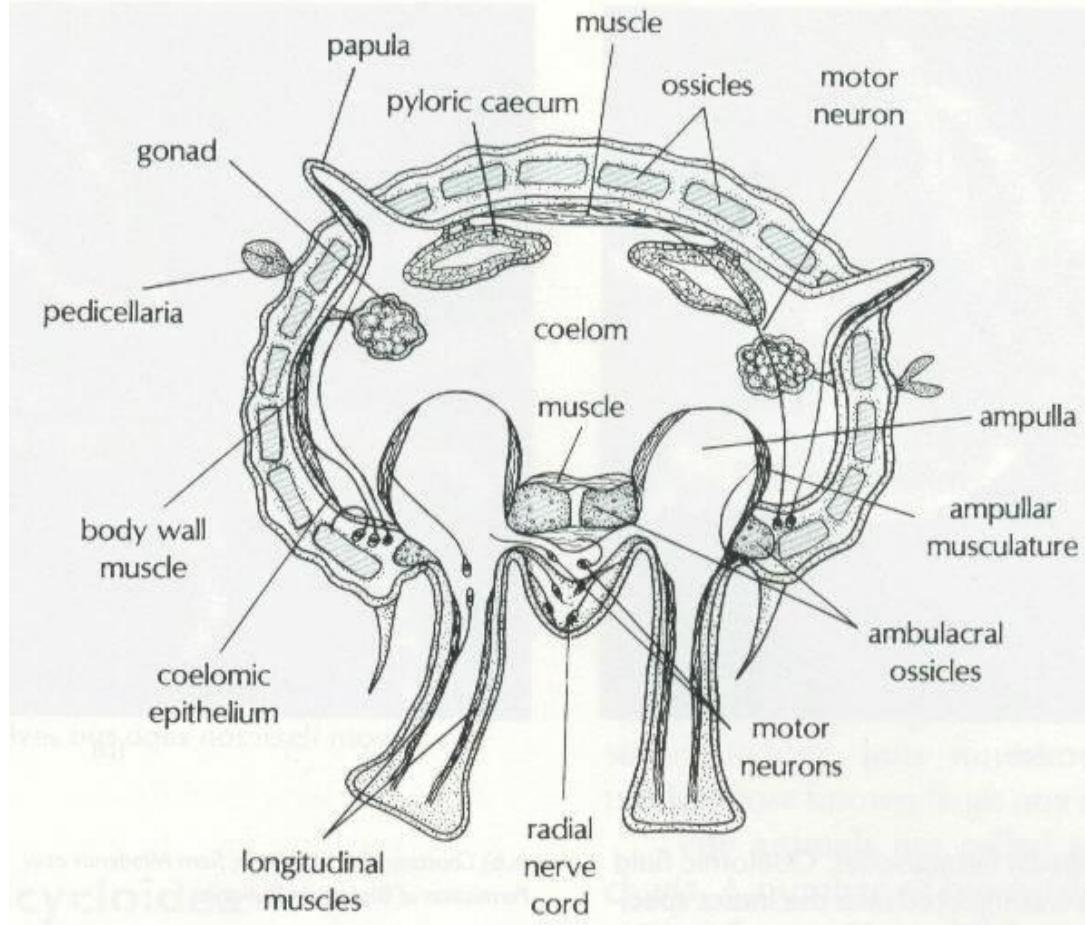


- Phylum Echinodermata
 - Class Crinoidea
 - Class Concentricycloidea
 - Class Stelleroidea
 - Subclass Asterozoidea
 - Subclass Ophiurozoidea
 - Class Echinoidea
 - Class Holothuroidea

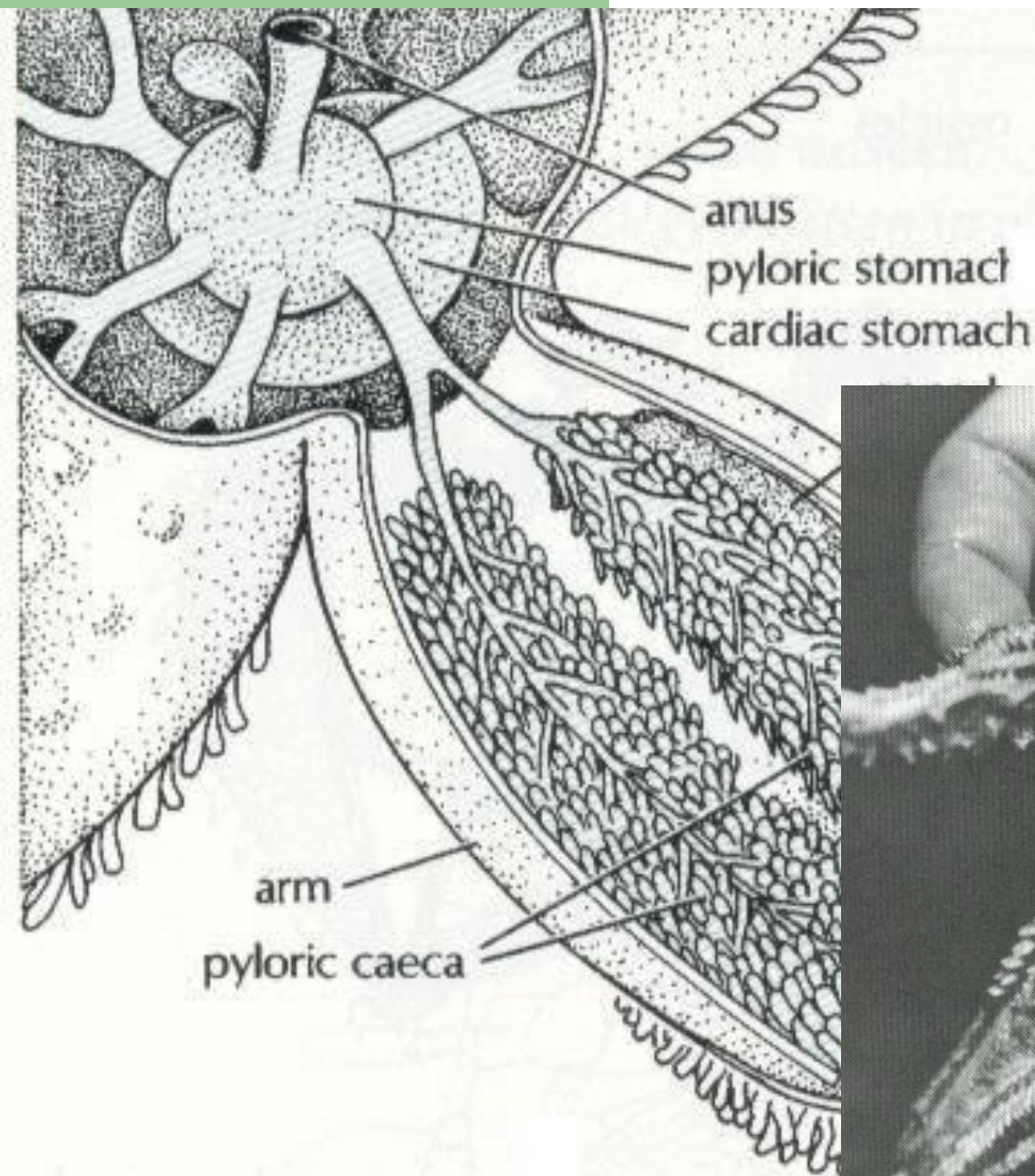
Subclass Asteroidea



Sea Stars

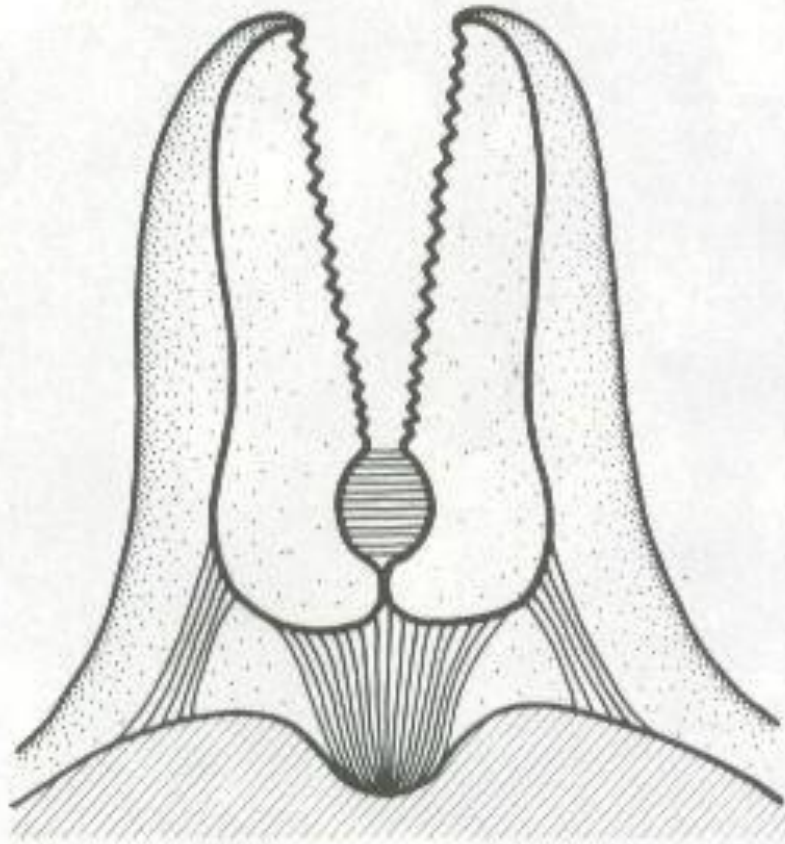


single ambulacral
main organs occur



Phylum Echinodermata

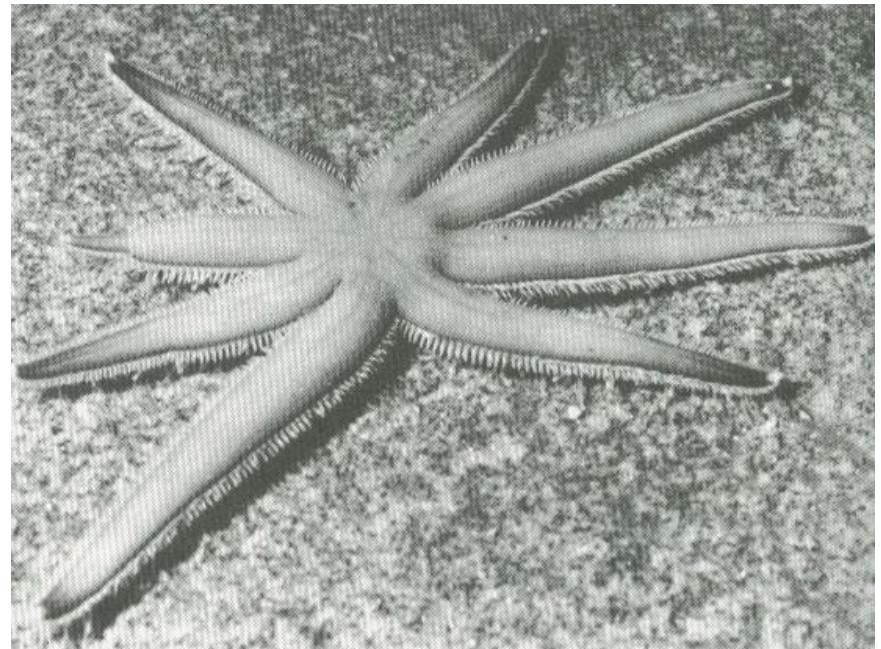
Pedicellariae



- Specialized pinchers found on the aboral surface.

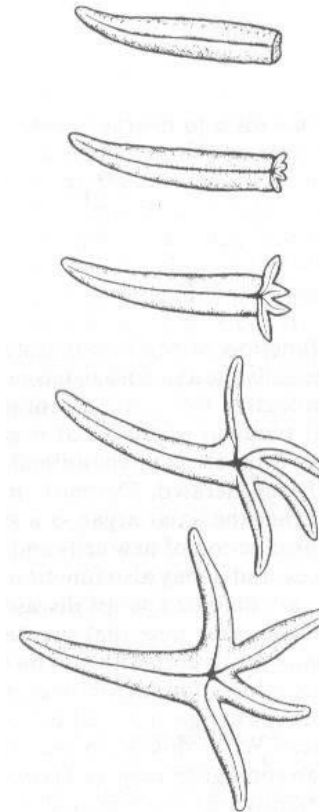
Reproduction

- Can reproduce asexually by disk division
- Sexual Reproduction
 - Dioecious with sperm or eggs produced in 2 or more gonads in each arm
 - Larval stage = **bipinnaria**



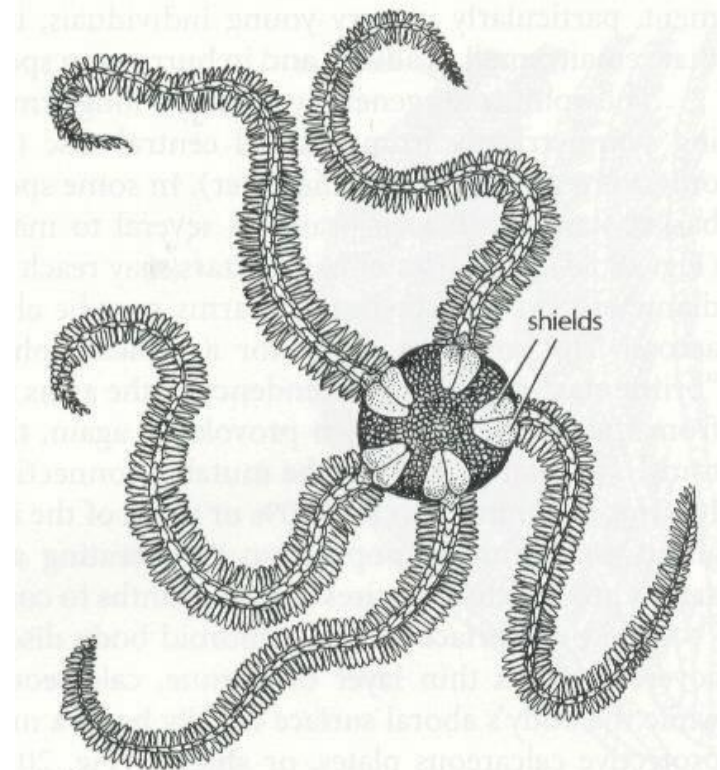
Regeneration

- Many species autotomize, leaving predators with a nutritious souvenir while they escape
- Most spp. can regenerate from fragments that include the disk

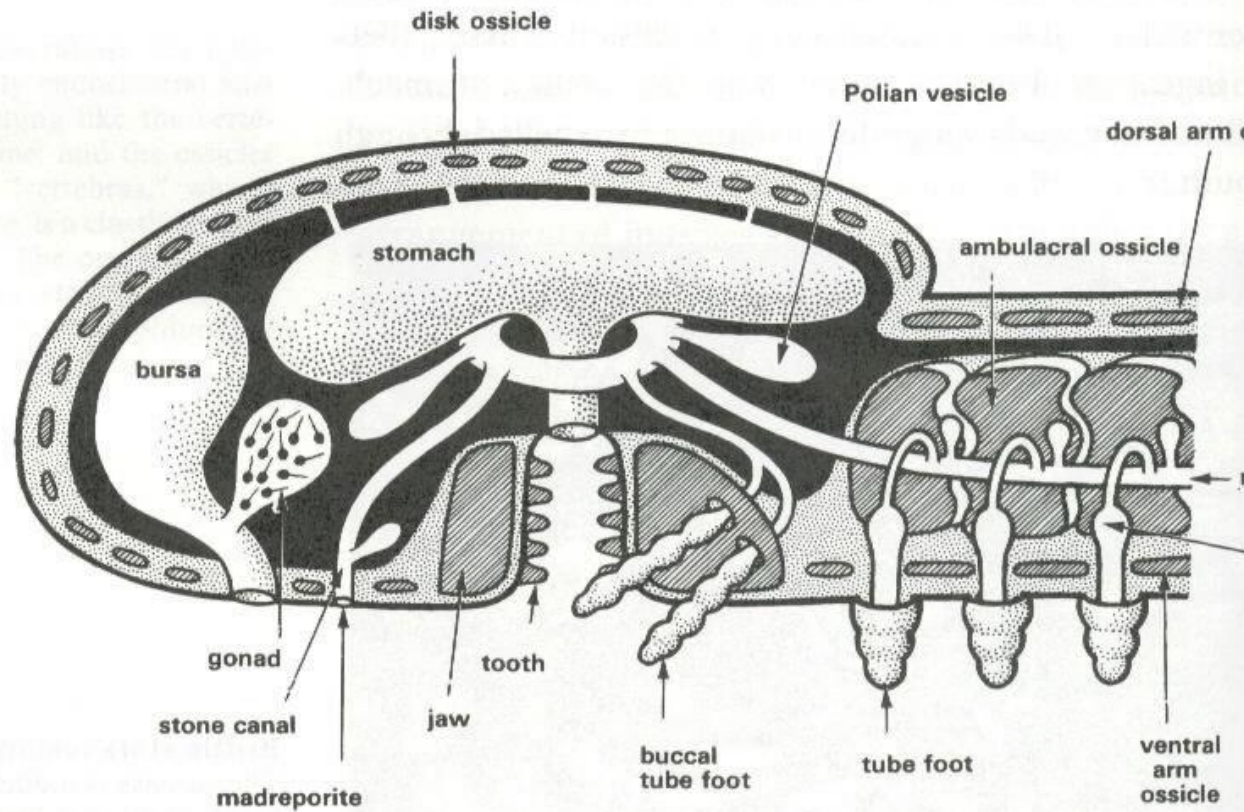


Subclass Ophiuroidea

- Defining Characteristics
 - Well-developed ossicles in the arms forming a system of articulating vertebrae
 - The oral surface bears 5 pair of bursal sacs

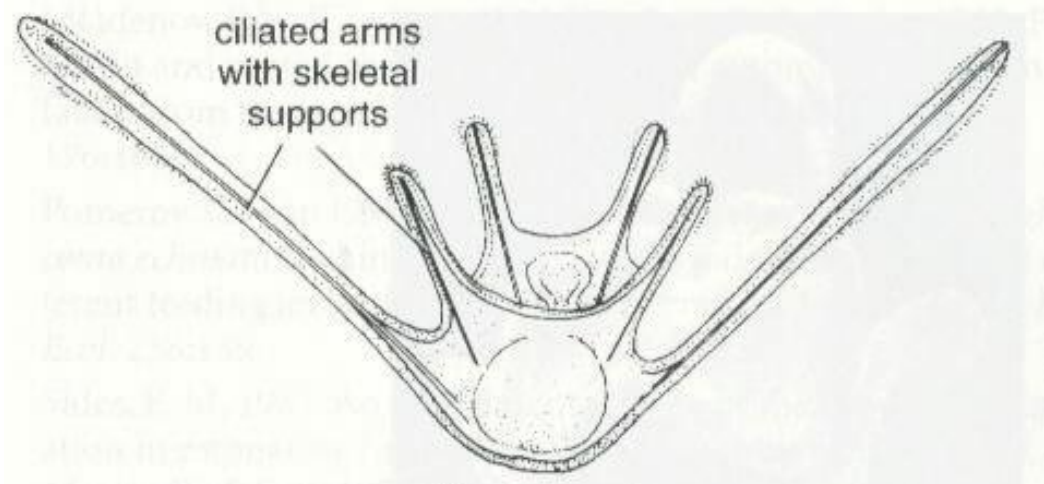


Brittle Star Structure



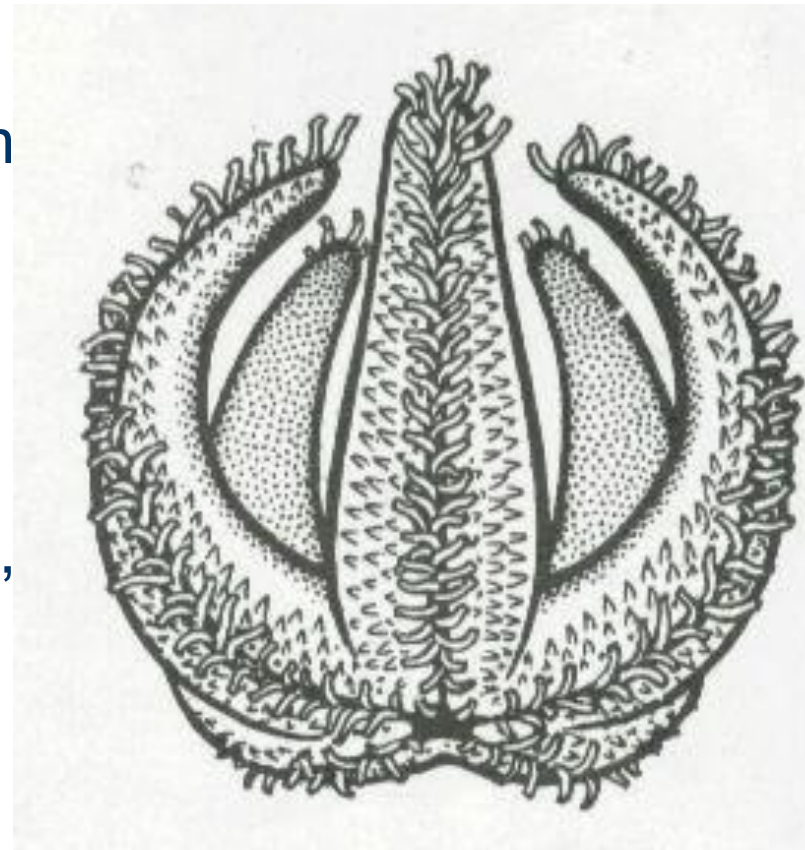
Reproduction

- Similar to Asteroids; yet a **pluteus** larva is formed
- Regenerate well, and one spp., in our area reproduces asexually by disk division

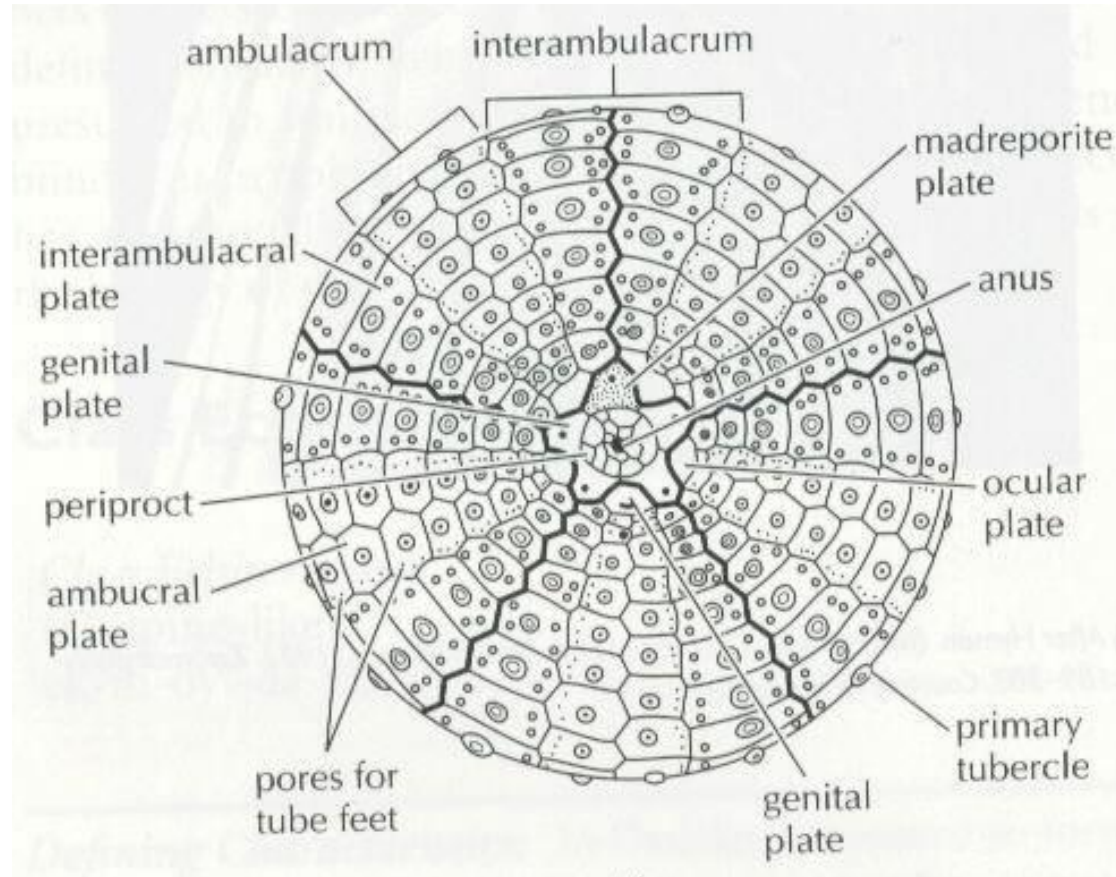


Class Echinoidea

- Defining characteristics
 - Ossicles are joined to form a rigid test
 - Adults possess a feeding structure called Aristotle's lantern
- Two attributes: mobile spines, and hollow skeleton or test

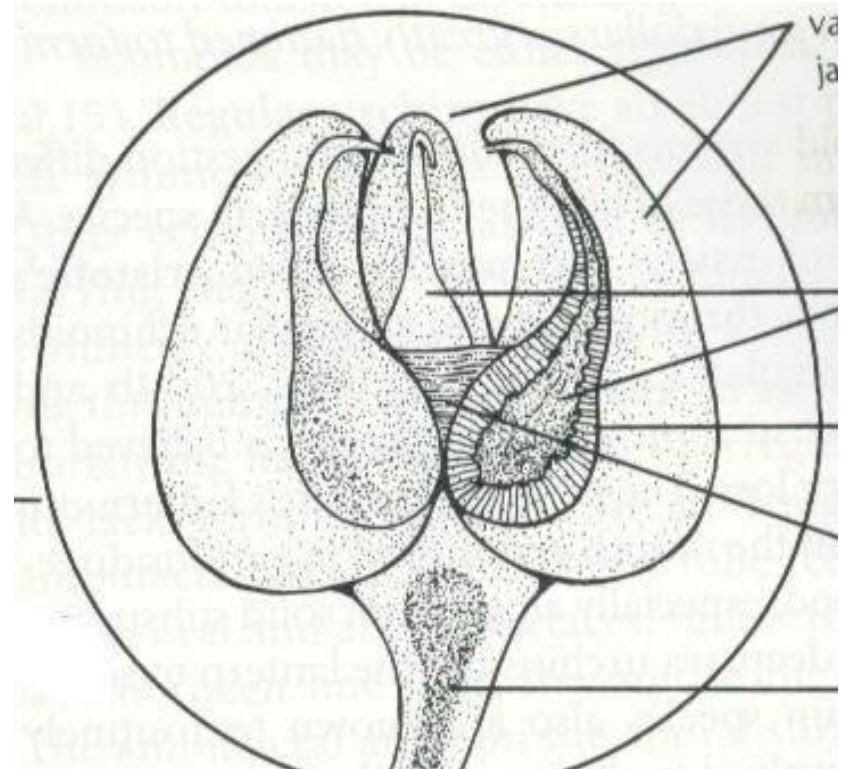


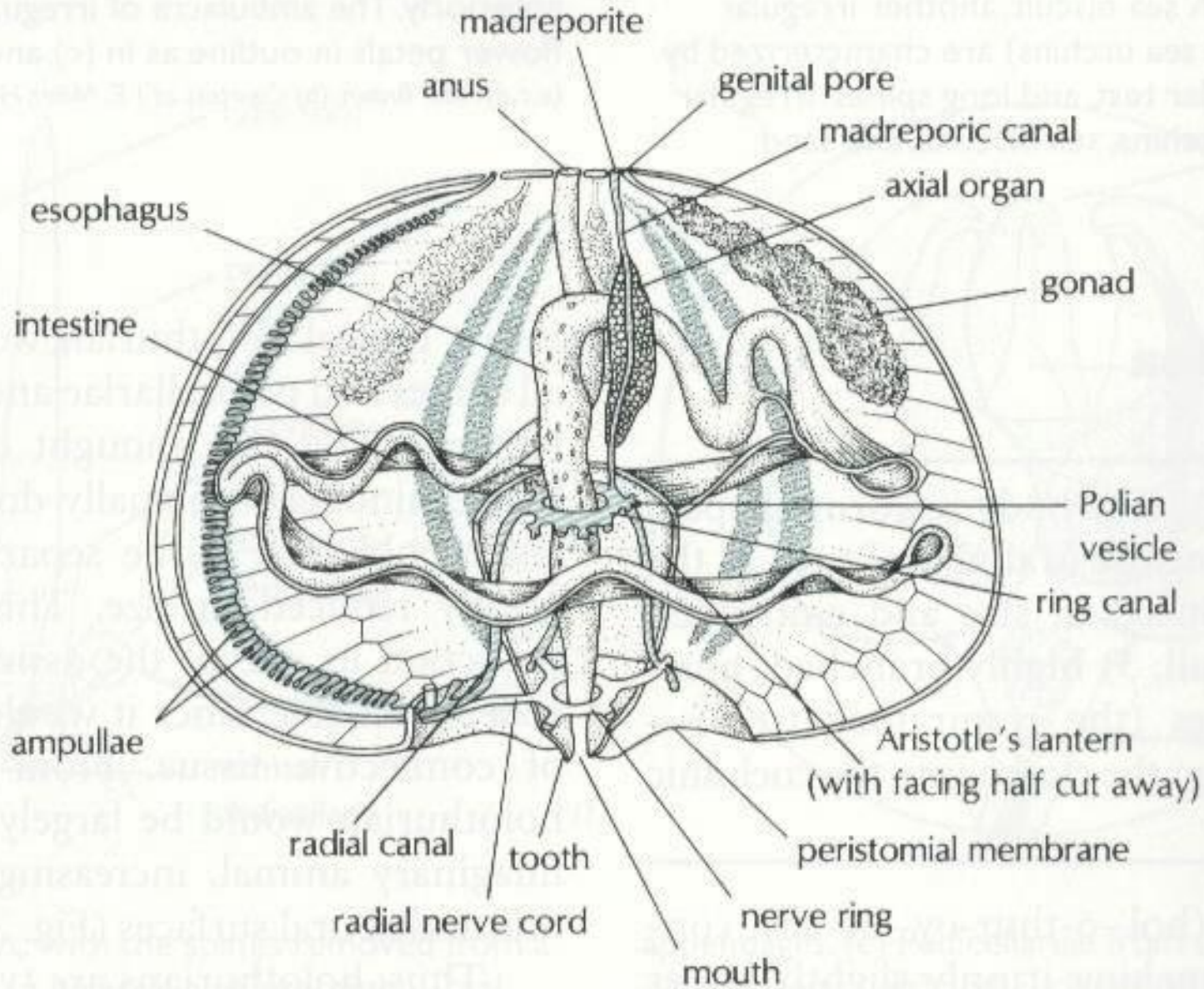
Sea Urchin Structure



Pedicellariae

- Pedicellariae prevent fouling of test and are used in defense
- More complex than sea stars and are located on tall moveable stalks



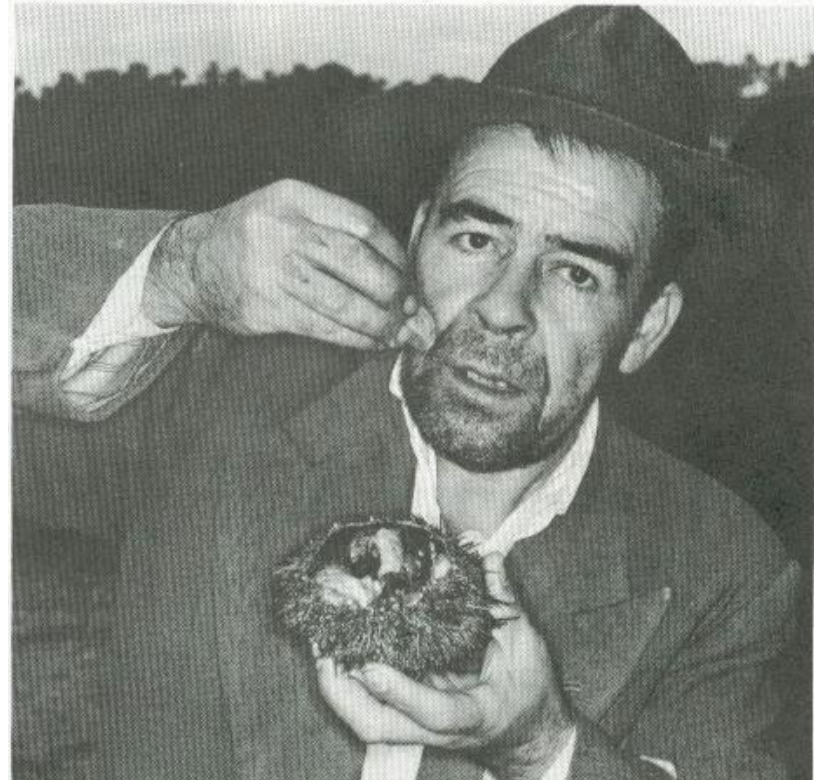


zoans or

vegetable

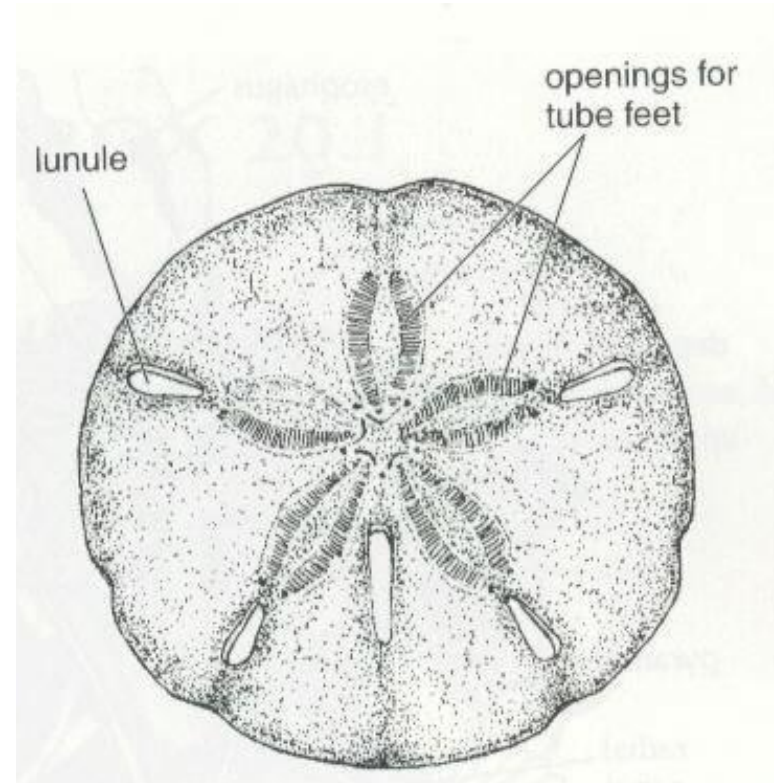
Reproduction

- Most conspicuous organs are those responsible for reproduction
- At spawning the entire coelom will fill with sperm or eggs
- **Pluteus** larva is formed



Sand Dollars

- Irregular: non-spherical variously depressed
 - Anus is shifted to the oral surface posterior to the mouth creating bilateral symmetry

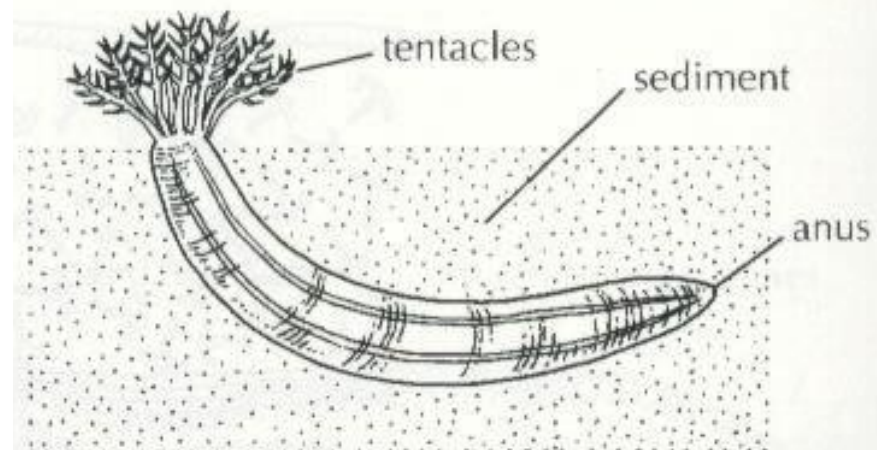


Class Holothuroidea

- Defining characteristics
 - Worm shaped body, greatly elongated along the aboral and oral axis
 - The calcareous ossicles are reduced in size and embedded individually in the body wall
 - Highly branched muscular respiratory structures

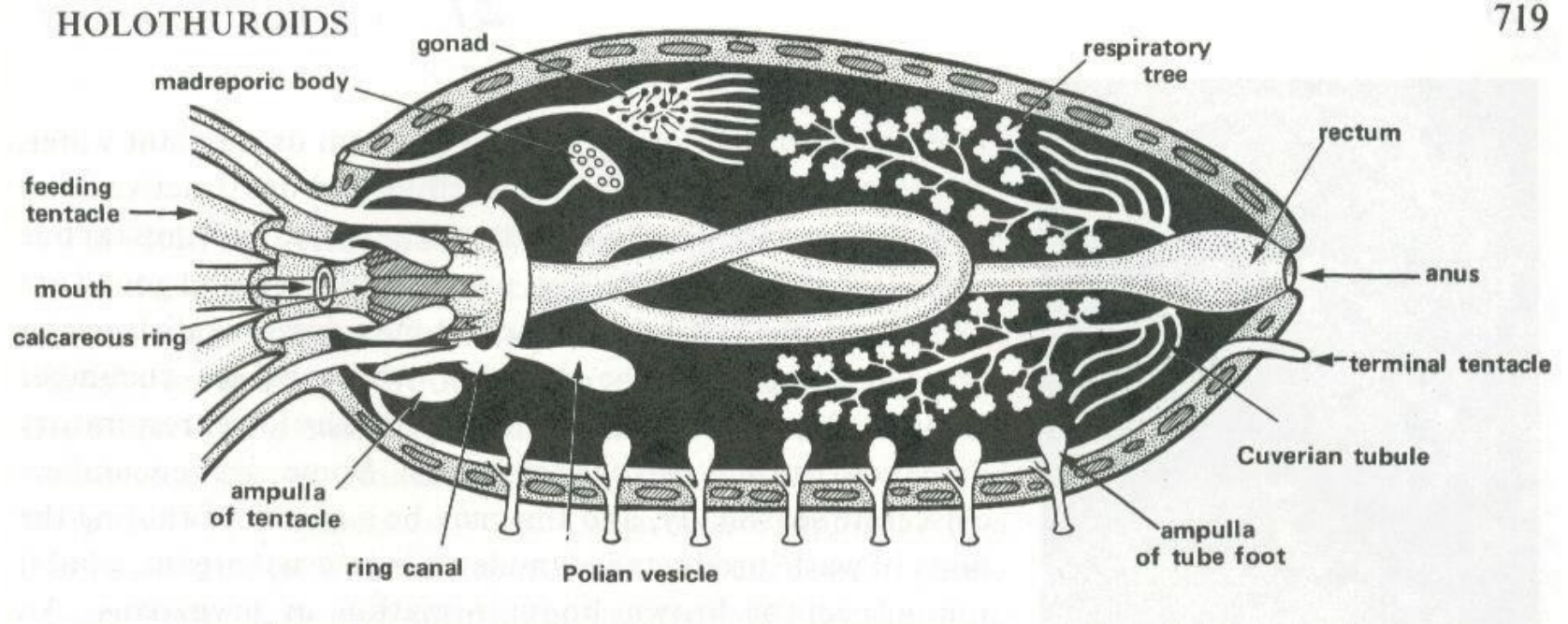
Holothuroidea Feeding

- Possess retractile feeding tentacle that surrounds the mouth
- While suspension or deposit feeding each tentacle is cleaned in the mouth



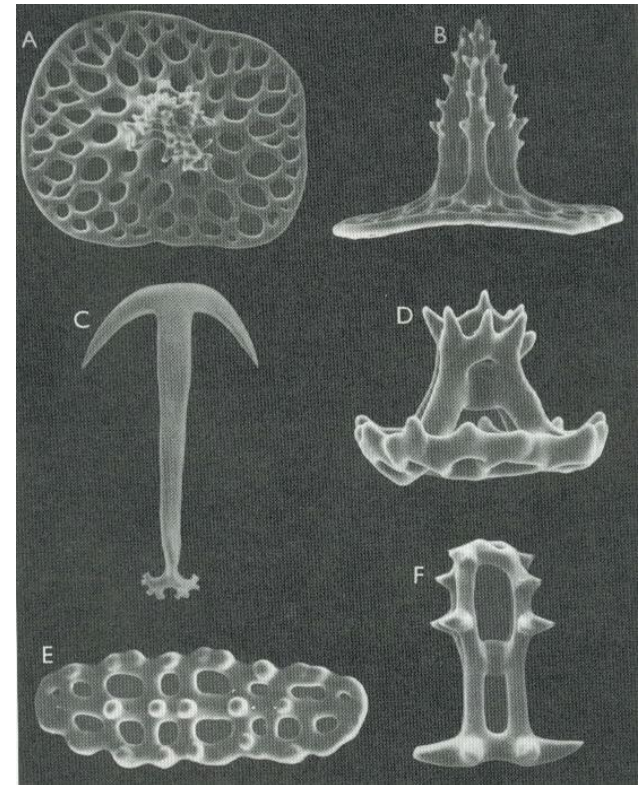
Holothuroidea Structure

719



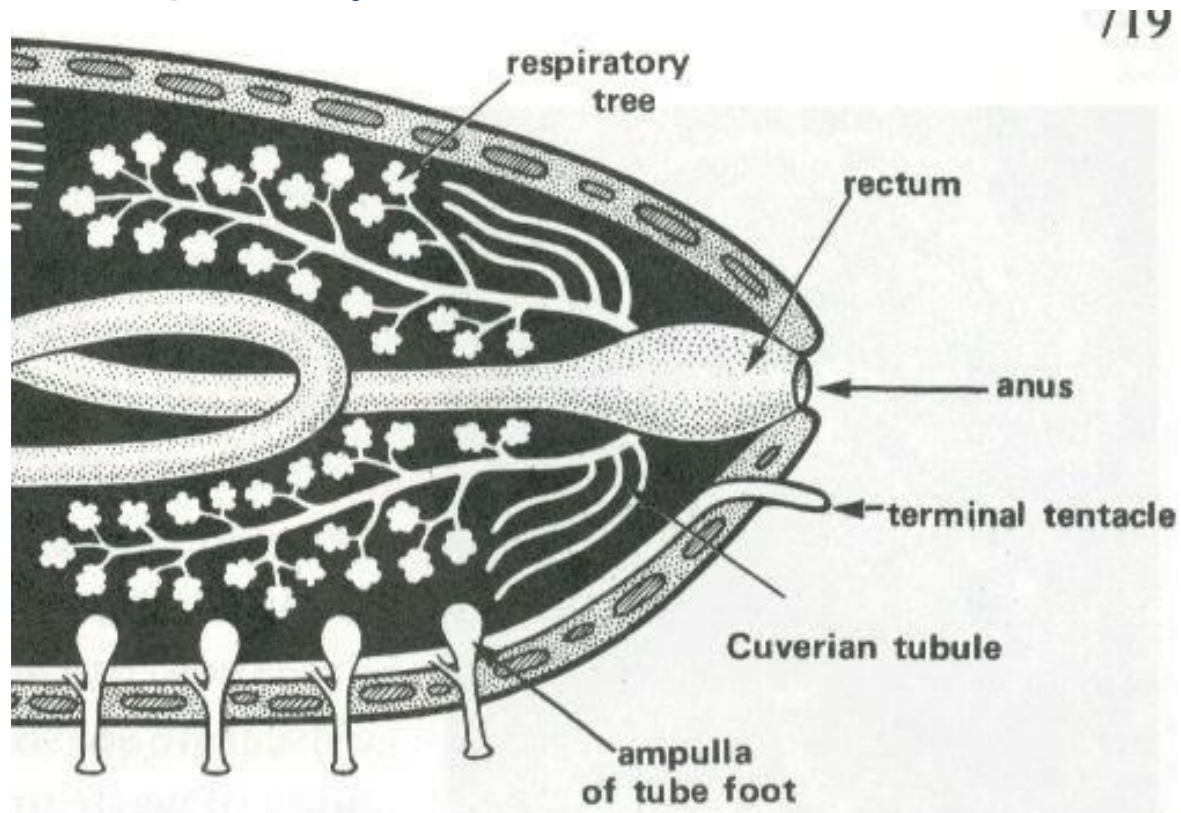
Ossicles

- Although somewhat soft they do have an internal skeleton
 - The skeletal elements (ossicles) are microscopic with complex shapes
 - May compose up to 80% of the dry body weight



Respiration

- Respiratory trees



Defense

- Many spp. have powerful toxins in the body wall
- Cuvierian tubules
 - Sticky and toxic tentacles which are shot out the anus
- Also eviscerates to avoid predation
 - Internal organs regenerate after a period of time