

Echinoderms



Chapter 7

Echinoderms: spiny-skinned animals that lack body segmentation but have radial symmetry (usually five part) and an internal skeleton.

Placed in 5 main classes:

- 1. sea stars**
- 2. sea urchins and sand dollars**
- 3. brittle stars**
- 4. sea lillies and feather stars**
- 5. sea cucumbers**

Radial symmetry: all similar body parts are regularly arranged around the central point of an animal's body.



Sea Stars

- Members of the class Asteroidea
- Found from the subtidal zone to the deepest parts of the ocean
- Usually have five (or multiples of five) appendages, or arms.
- Found in clam and/or mussel beds
- Regarded as pests by the seafood industry



West
coast
Sea
Star



Sun Star – prey on other sea stars
or members of their own species

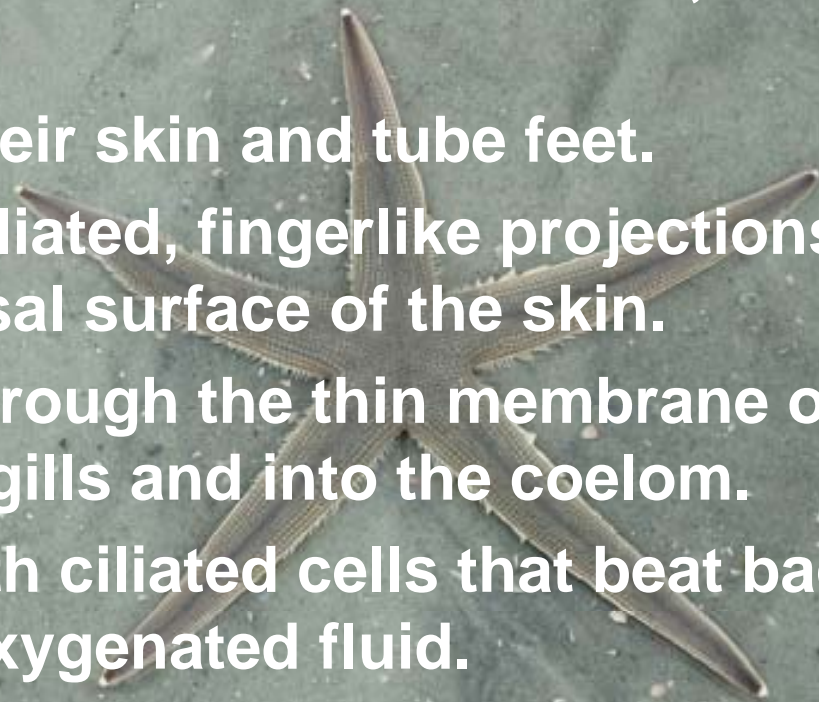


Bat Star

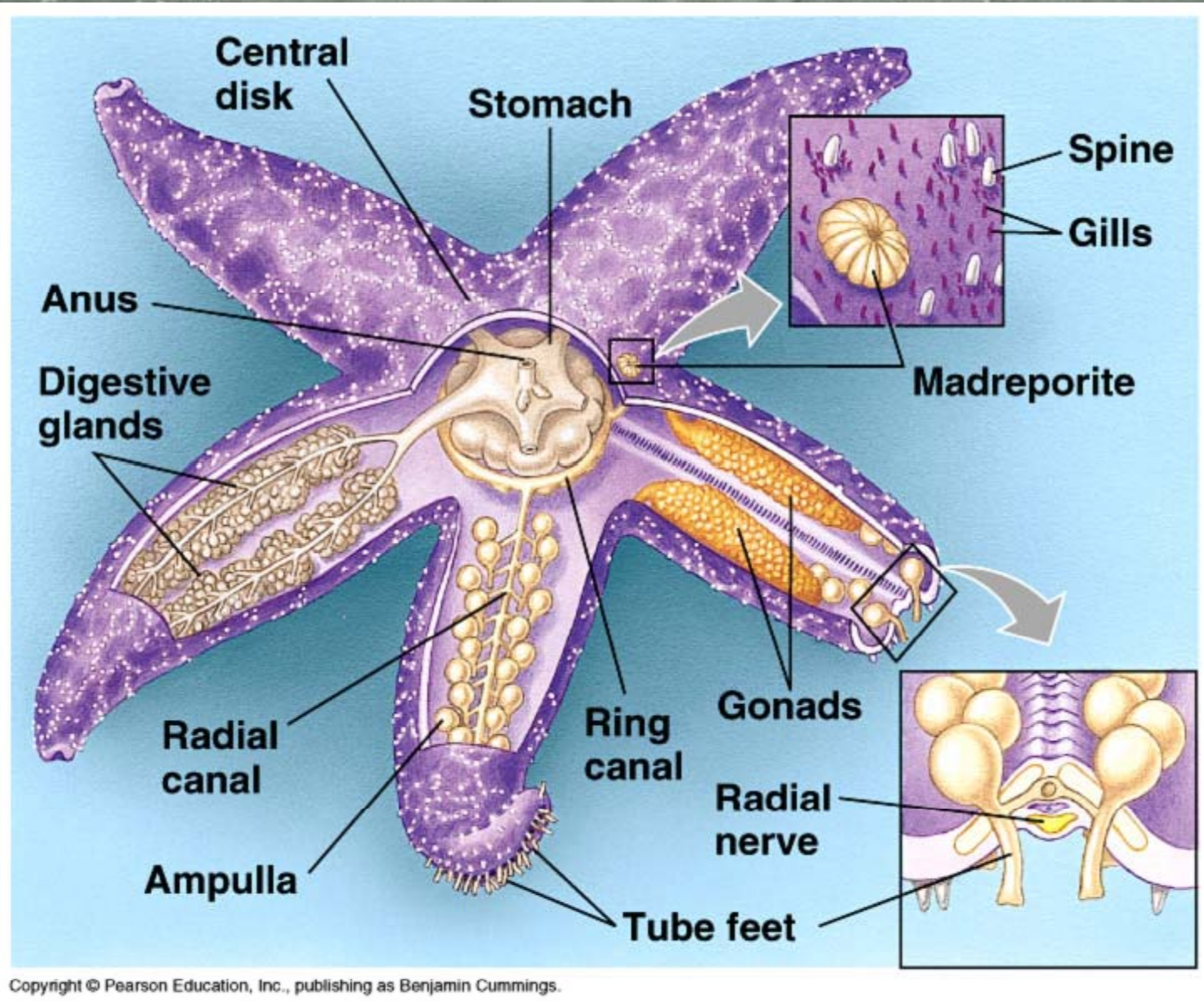
Atlantic
Sea
Star



- When an arm is lost, it can grow a new one but will be noticeably shorter than the others.
- Spines are composed of calcium carbonate (CaCO_3). They help support and protect the organism.
- Spines are connected to internal skeleton, endoskeleton.
- Breathe through their skin and tube feet.
- Skin gills: small, ciliated, fingerlike projections located on the dorsal surface of the skin.
- Oxygen diffuses through the thin membrane of the tube feet and skin gills and into the coelom.
- Coelom is lined with ciliated cells that beat back and forth to circulate oxygenated fluid.
- Cell waste and carbon dioxide diffuse from the coelom through tube feet and skin cells.



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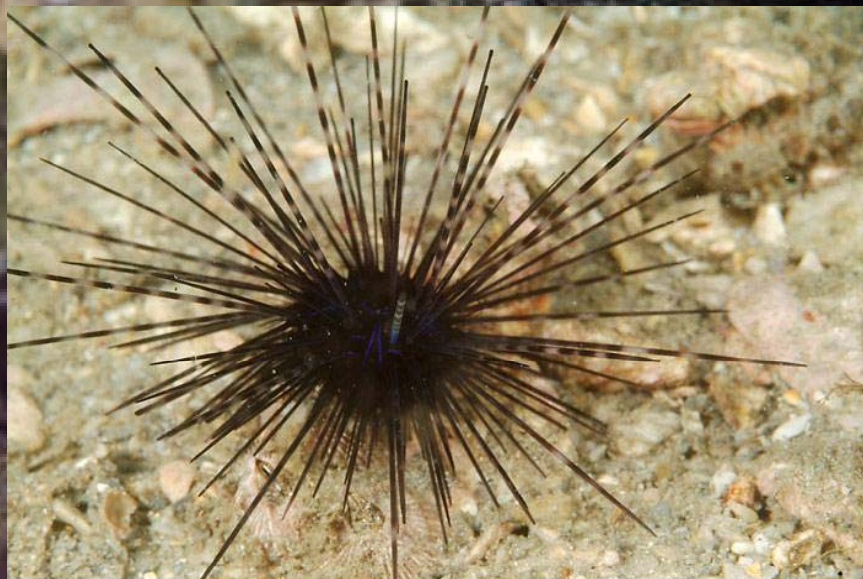
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- Eyespots: tiny light receptors located at the end of each arm. Convert light energy into electrical impulses and coordinate the movements of the arms.
- Have separate sexes and external fertilization. Each arm carries gonads.
- Has the ability to regenerate.



Sea Urchins and Sand Dollars

- Members of class Echinoidea.
- Movable spines are attached to its internal skeleton, which is formed by bony plates that are fused.
- Members are characterized by oval or round bodies that lack arms.
- Inhabit the intertidal and subtidal zones.
- Have a unique five-toothed mouth structure called an Aristotle's lantern (because of its resemblance to an ancient Greek lantern).
- Sharp spines can inflict a painful wound and in some species contain toxins.
- Separate sexes and external fertilization.



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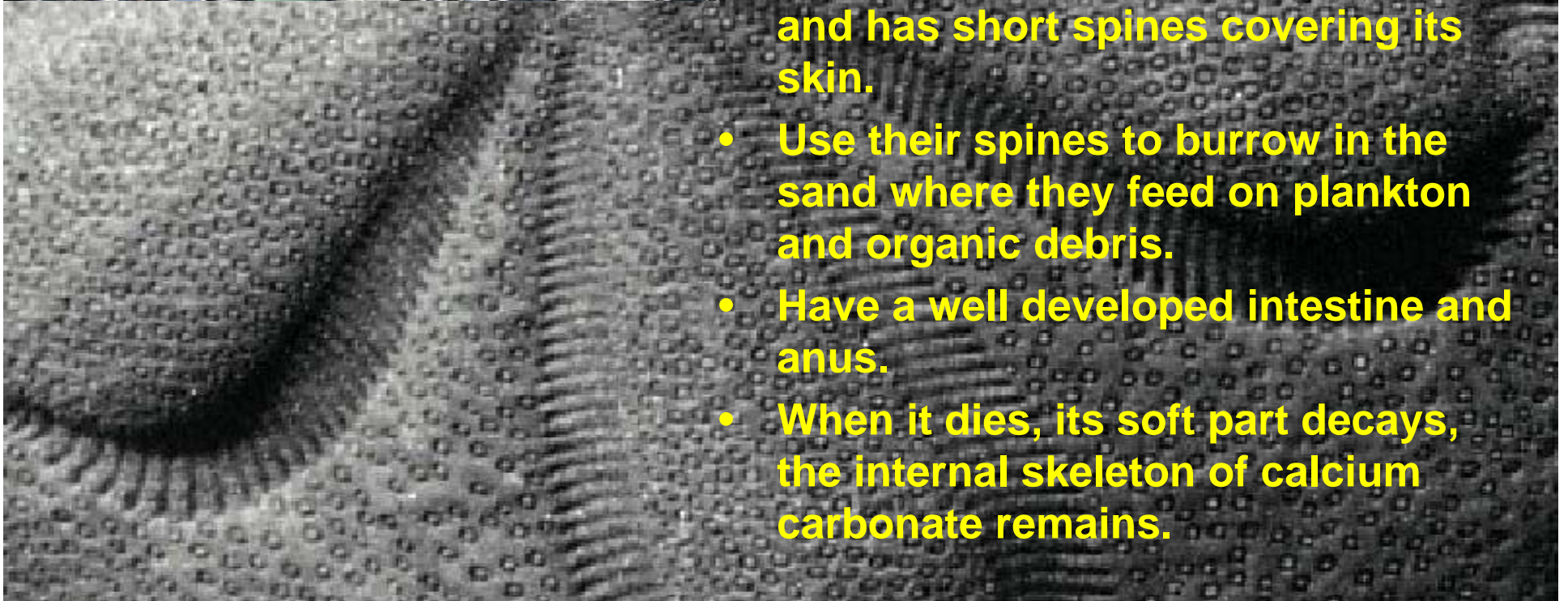


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Sand dollar: resembles a large coin and has short spines covering its skin.

- Use their spines to burrow in the sand where they feed on plankton and organic debris.
- Have a well developed intestine and anus.
- When it dies, its soft part decays, the internal skeleton of calcium carbonate remains.



Eccentric Echinoderms

Brittle stars

- Class Op
- Nocturnal
- Found in
- Do not u
- They eat



le under

to the

muscles in

or organic

r-feed, or

be feet.

Sea Lilies and Feather Stars



- Do not use their tube feet for locomotion

Sea cucumbers:

- Class Holothuroidea
- Soft, oblong body which lack arms but has five rows of tube feet
- Live on sandy and rocky seafloors in intertidal and subtidal zones
- Use sticky, branching tentacles to trap microscopic organisms
- It can release its digestive organs when disturbed by a predator.

It later regenerates lost organs

