

TAXONOMY: ANIMALIA

Spiny-Skinned Marine Animals

An Anatomical Dossier of
Phylum Echinodermata

Defining the Echinoderm: Armor and Habitat



Endoskeleton

The name Echinodermata translates to spiny-bodied. They are structurally defined by an internal skeleton made of **CALCAREOUS_OSSICLES**.



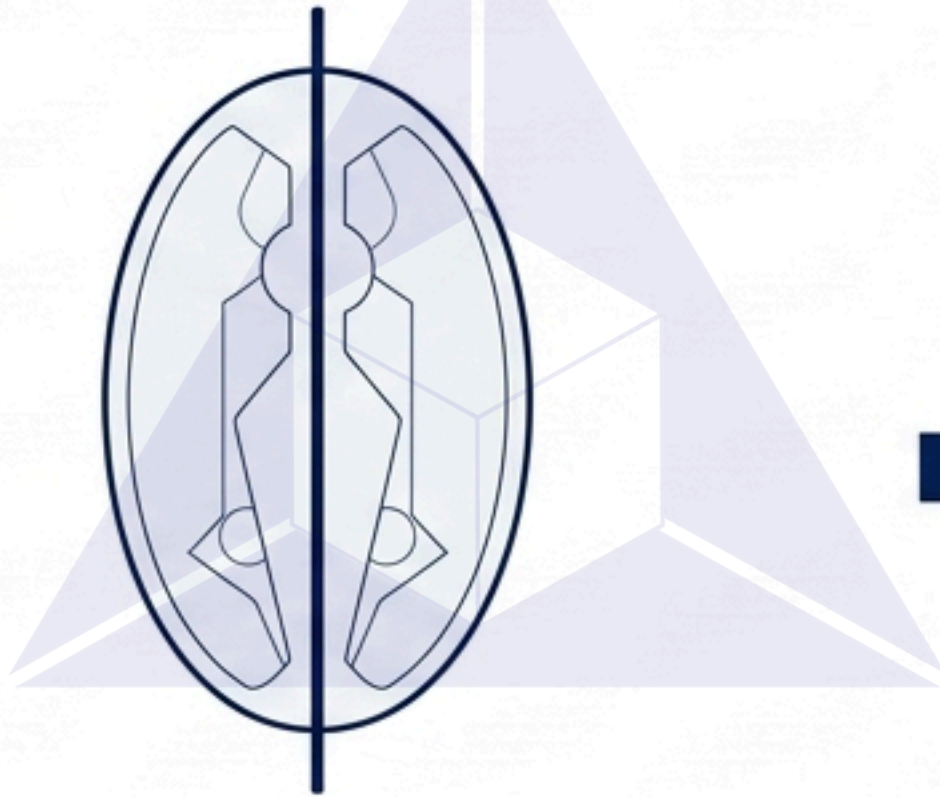
Biological Classification

They operate at an **ORGAN_SYSTEM** level of organisation. They are fundamentally **TRILOBLASTIC** or **COELOMATE** animals.

Exclusive Habitat: Every species in this phylum is exclusively marine; there are no freshwater or terrestrial echinoderms.

The Symmetry Paradox

STAGE: LARVAL



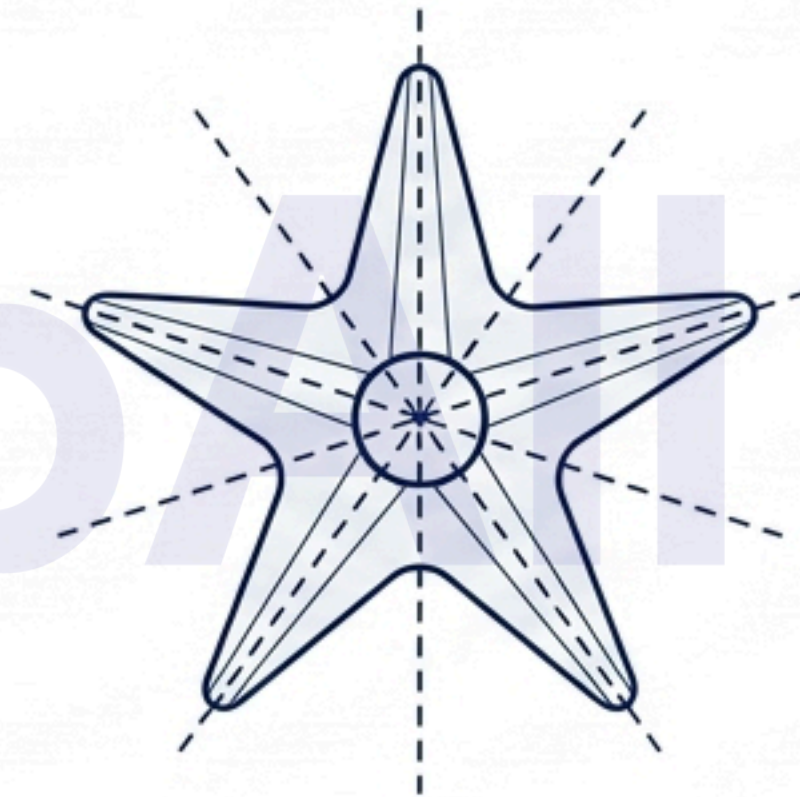
Exhibits Bilateral Symmetry.

The body can be divided into identical left and right halves in only one plane.

METAMORPHOSIS



STAGE: ADULT



Exhibits Radial Symmetry.

Any plane passing through the central axis divides the organism into identical halves.



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$$E=mc^2$$



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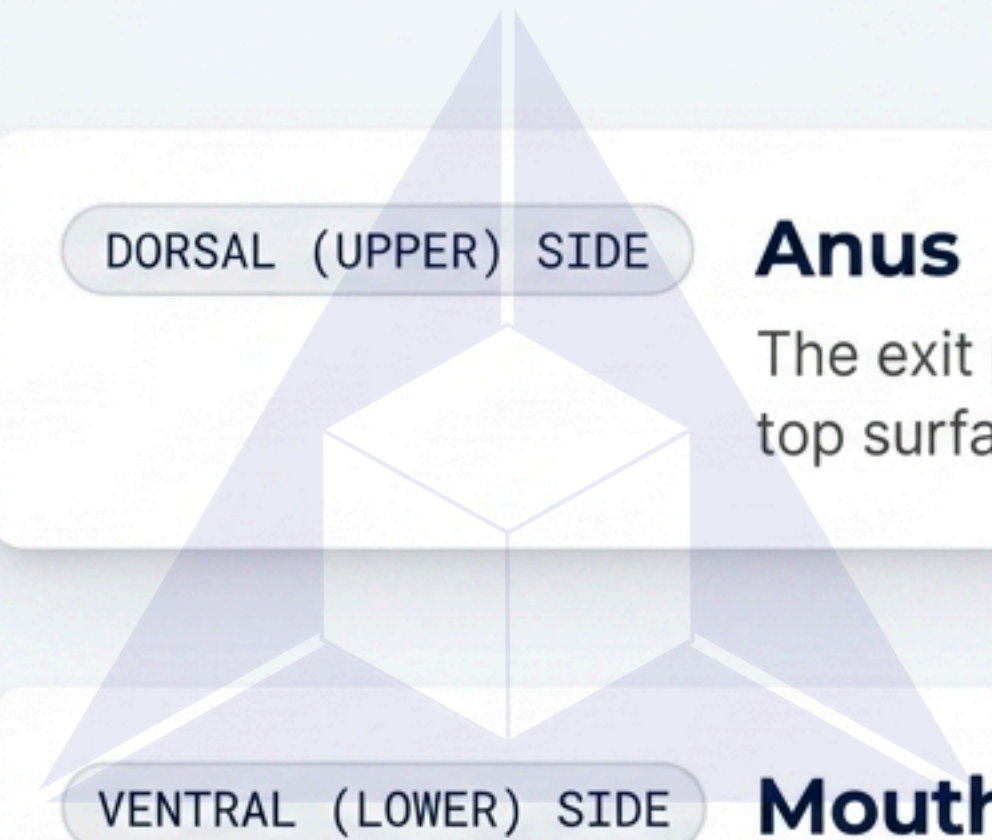
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Internal Architecture: The Digestive Tract



DORSAL (UPPER) SIDE

Anus

The exit point of the complete digestive system is located on the top surface of the organism.

VENTRAL (LOWER) SIDE

Mouth

The intake point is located on the underside, allowing the organism to feed as it moves across the sea floor.

Anatomical Anomaly:
Despite having a complete digestive system, echinoderms completely lack an excretory system.

The Master Engine: Water Vascular System



Respiration

Facilitates the exchange of gases without a traditional respiratory system.

WATER VASCULAR SYSTEM



Locomotion

Enables movement across the marine floor via hydraulic pressure.



Feeding

Crucial for the capture and internal transport of food.

Life Cycle and Development

01

Separate Sexes

Reproduction is strictly sexual, with distinct male and female organisms.

02

External Fertilisation

Gametes are released into the water column where fertilisation occurs outside the body.

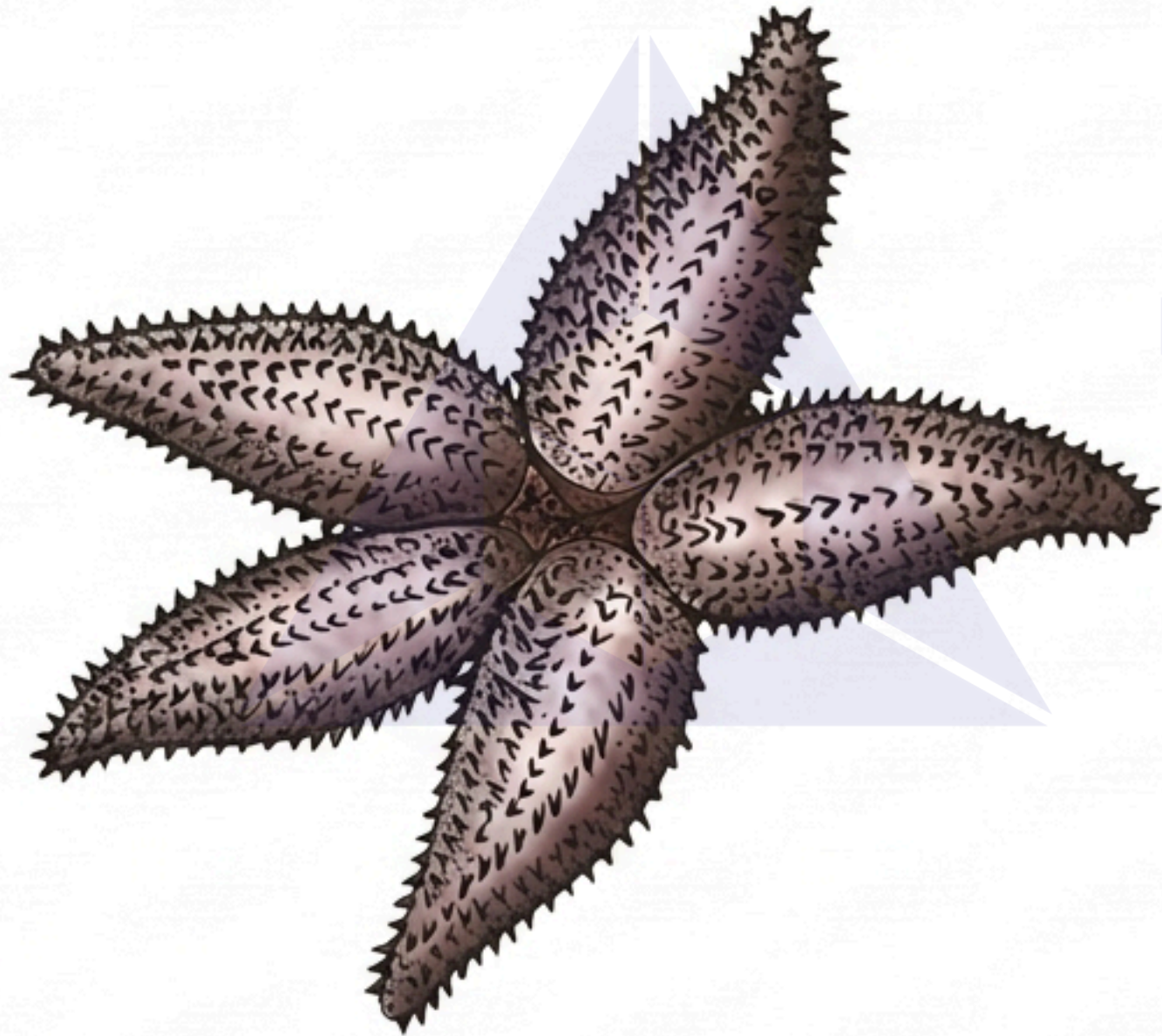
03

Free-Swimming Larva

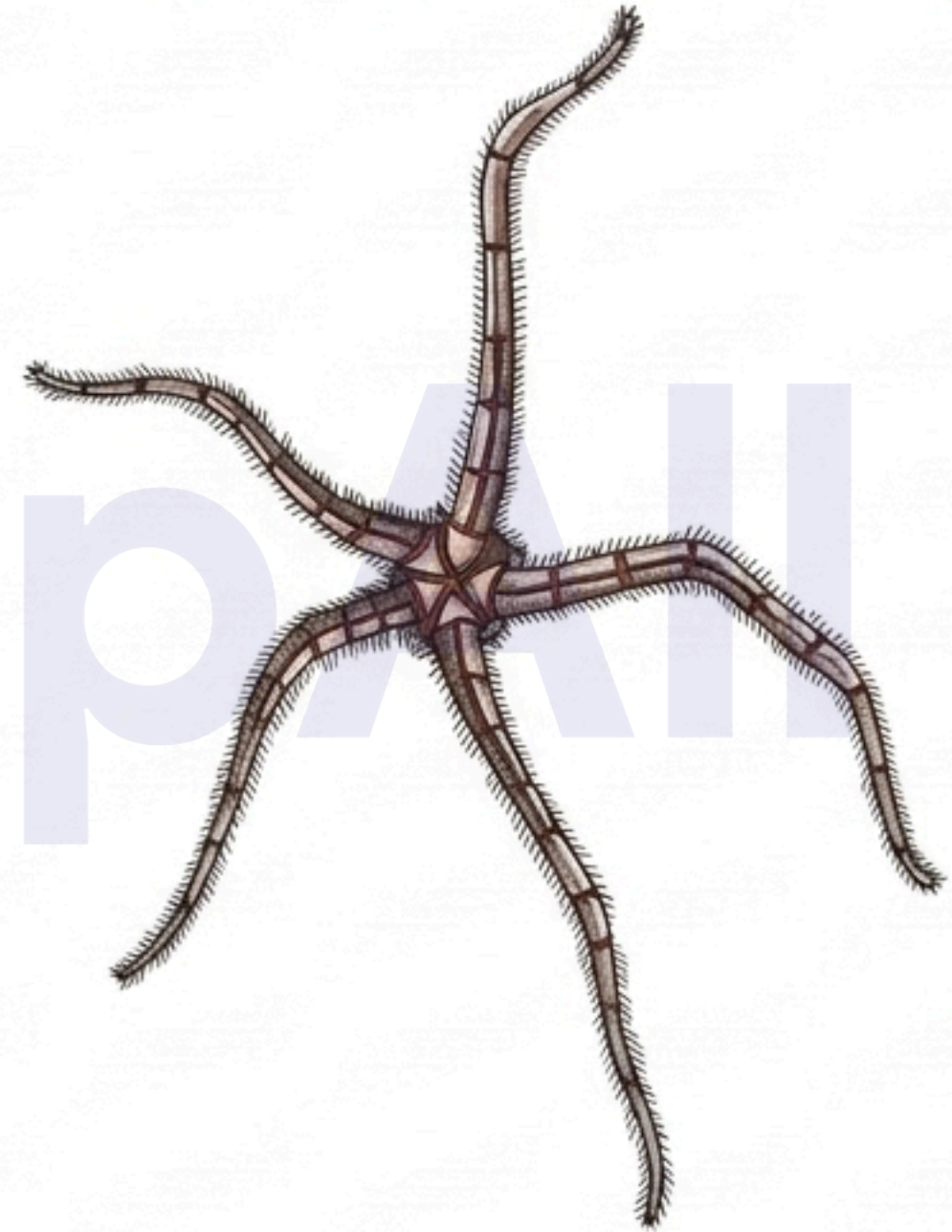
The zygote develops into an independent, motile larval form before settling.

Indirect Development: The life cycle features a morphologically distinct free-swimming larval stage before metamorphosis into the adult form.

Morphological Spotlight



(a) Asterias



(b) Ophiura

Key Species Compendium



Asterias

STAR FISH

Echinus

SEA URCHIN

Ophiura

BRITTLE STAR



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