



ECHINODERMS

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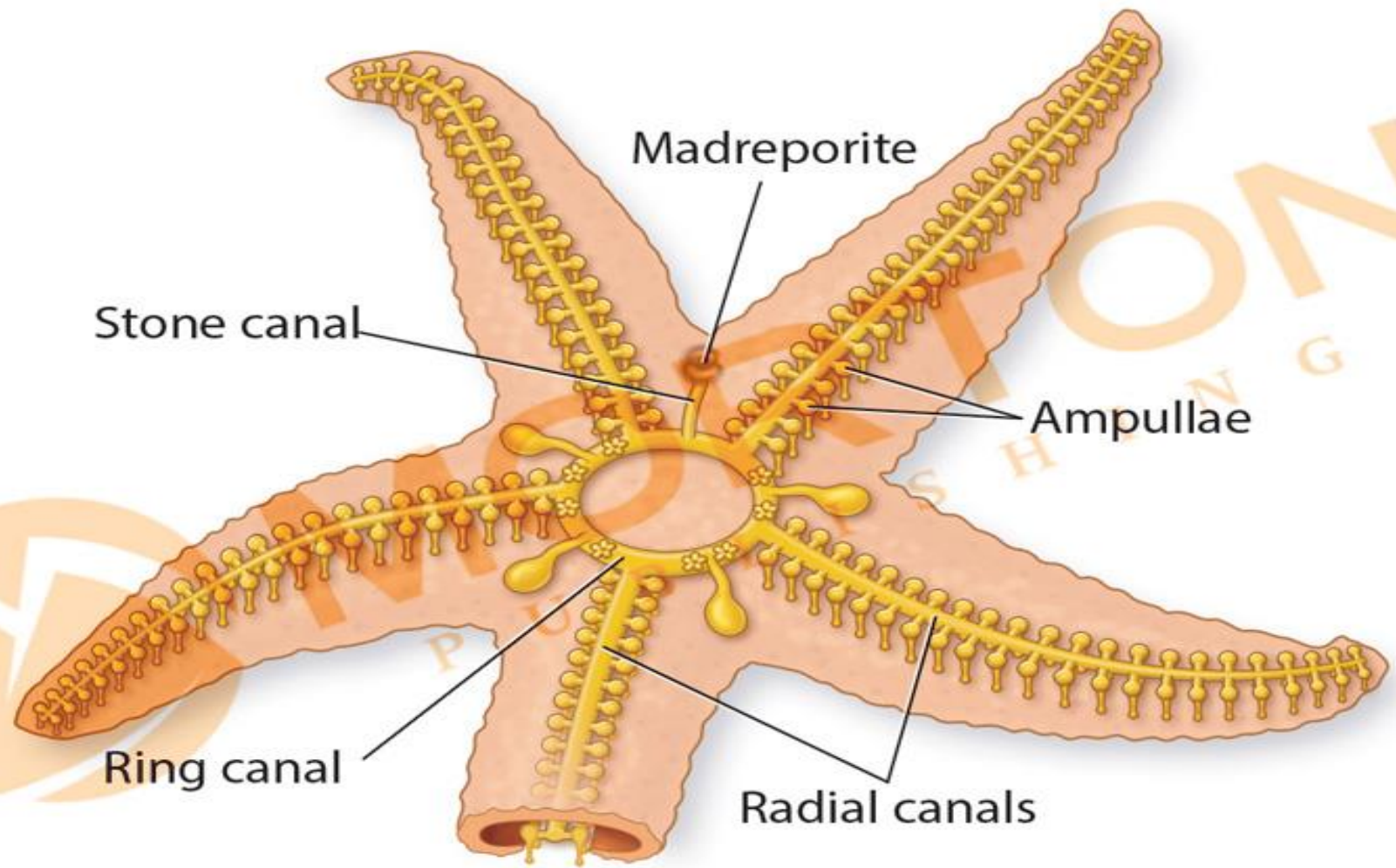
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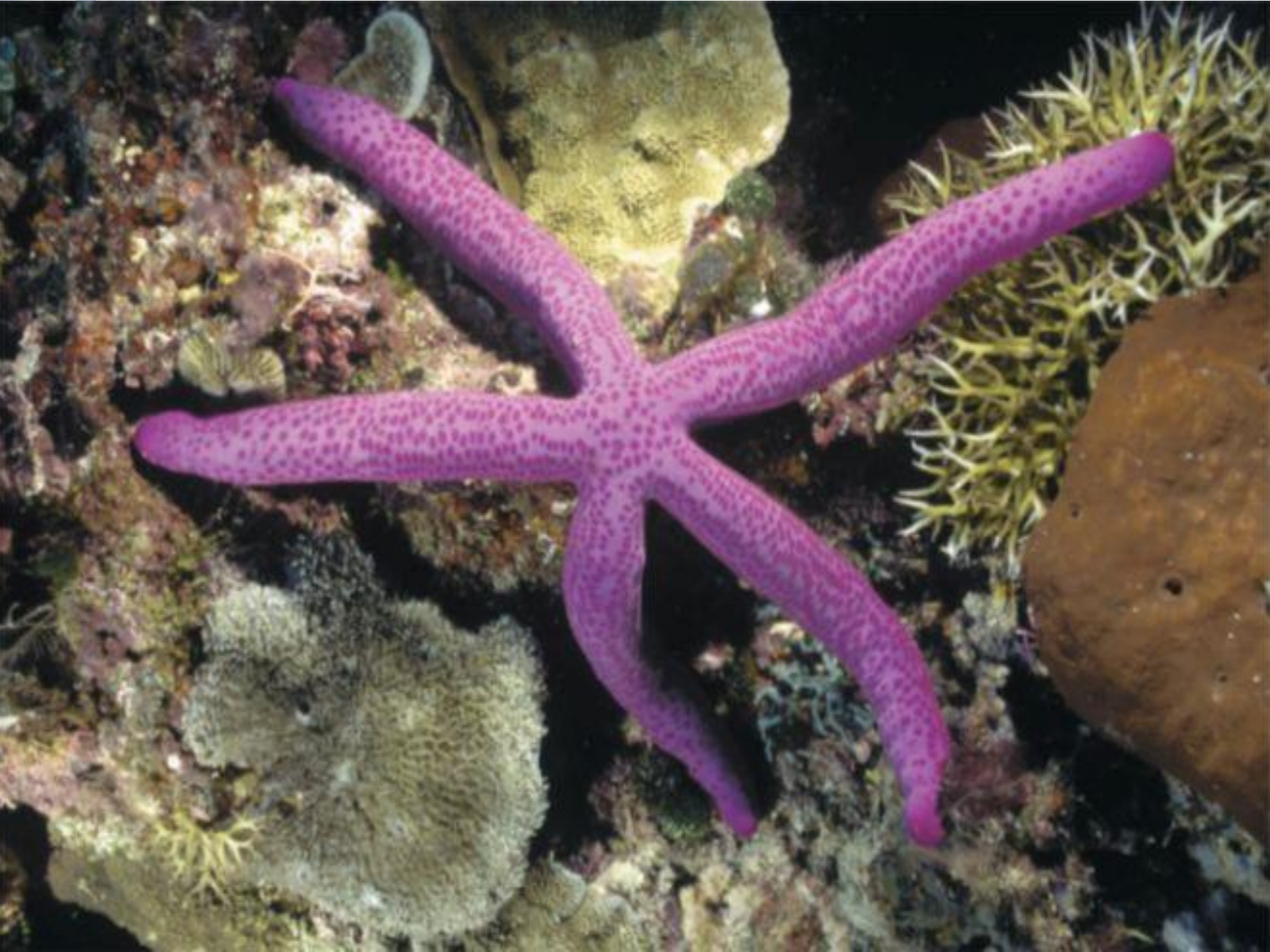
- The echinoderms are a group of animals that includes sea star, sea urchins, feather stars, and sea cucumbers.
- They are simple animals, lacking a brain and complex sensing organs.
- Echinoderms are characterized by their radial symmetry and a central mouth.
- Although a sea urchin looks round, closer inspection reveals that it is nothing more than a sea star with its legs wrapped inwards to form a sphere.
- The echinoderms are found in a spectacular variety of shapes and colors, and are found decorating reefs around the world.
- Some of these animals are carnivorous, feeding on corals and scavenging the ocean floor.





SEA STAR (*Asteroidea*)

- Disc small, five arms (rarely 4-8).
- Body wall very flexible with numerous groups of papulae in soft areas.
- Major spines on the upper surface often in one or more longitudinal rows, sometimes surrounded by bundles of straight and crossed pedicellariae.
- Vento-lateral spines just outside adambulacrals, in oblique rows.
- Straight pedicellariae on lower surface in ambulacral grooves and attached to furrow spines.









Cushion Star (*Oreaster reticulatus*)

- The cushion star is a thick-bodied species of sea star with short legs.
- It ranges in color from brown to orange, red, and yellow.
- Its hard shell is covered with raised knobby spines.
- This sea star grows to a diameter of 10 inches, and is found on the sandy bottoms in the Atlantic waters from South Carolina to Florida.





Sunflower sea star (*Pycnopodia helianthoides*)

- The sunflower sea star is among the larger of the sea star species. With its 24 arms, it can reach a diameter of over 2 feet.
- The color of this sea star can range from purple to red, pink, brown, orange, and yellow.
- It is common along the Pacific coast and can be found along the rocky sea bottoms from Alaska to southern California.





Pacific Sea star (*Henricia leviuscula*)

- This brightly colored sea star is a common species found along the western coast of the United States and Canada.
- It can range in color from red to orange, yellow, and purple.
- This sea star grows to a diameter of about 8 inches, and is found under rocks.
- It feeds on small sponges and algae.

Henricia leviuscula
Boiler Bay, Oregon
May 2010





Short Spined sea star (*Henricia sanguinolenta*)

- The short spined sea star is a coldwater species found in the northern waters from the Arctic to Cape Hatteras.
- They can be seen in a wide range of colors from orange to red, purple, yellow, and white.
- Dark red varieties are sometimes known as blood stars.
- They can be found scavenging along the rocky sea bottom.





Orange Sea star (*Fromia monolis*)

- This colorful orange and red sea star is one of the most common species.
- Its colorful markings and docile nature make it quite popular among aquarium hobbyists.
- This sea star grows to about 4 inches in diameter, and is commonly found in the Indian Ocean near Indonesia where it feeds on small sponges and algae.





Blue Sea Star (*Linckia laevigata*)

- Is a species of sea star in the shallow waters of tropical Indo-Pacific.
- These sea stars may grow up to 30 cm in diameter, with rounded tips at each of its arms
- Some individuals may bear light or darker spots along each of its arms. It is firm in texture, and possessing slightly tubular, elongated arms.





The crown-of-thorns sea star (*Acanthaster planci*)

- Is a sea star with thorn-like spines sprouting all over its body for protection.
- These grow to a diameter of up to 40 cm across and have 12 to 19 arms extending from their center.
- Crown-of-thorns sea star are found on coral reefs in the tropics ranging from the Red Sea, throughout the Indian and Pacific Oceans, and all the way to the Pacific coast of Panama.





Reticulate Brittle Star (*Ophionerehis reticulata*)

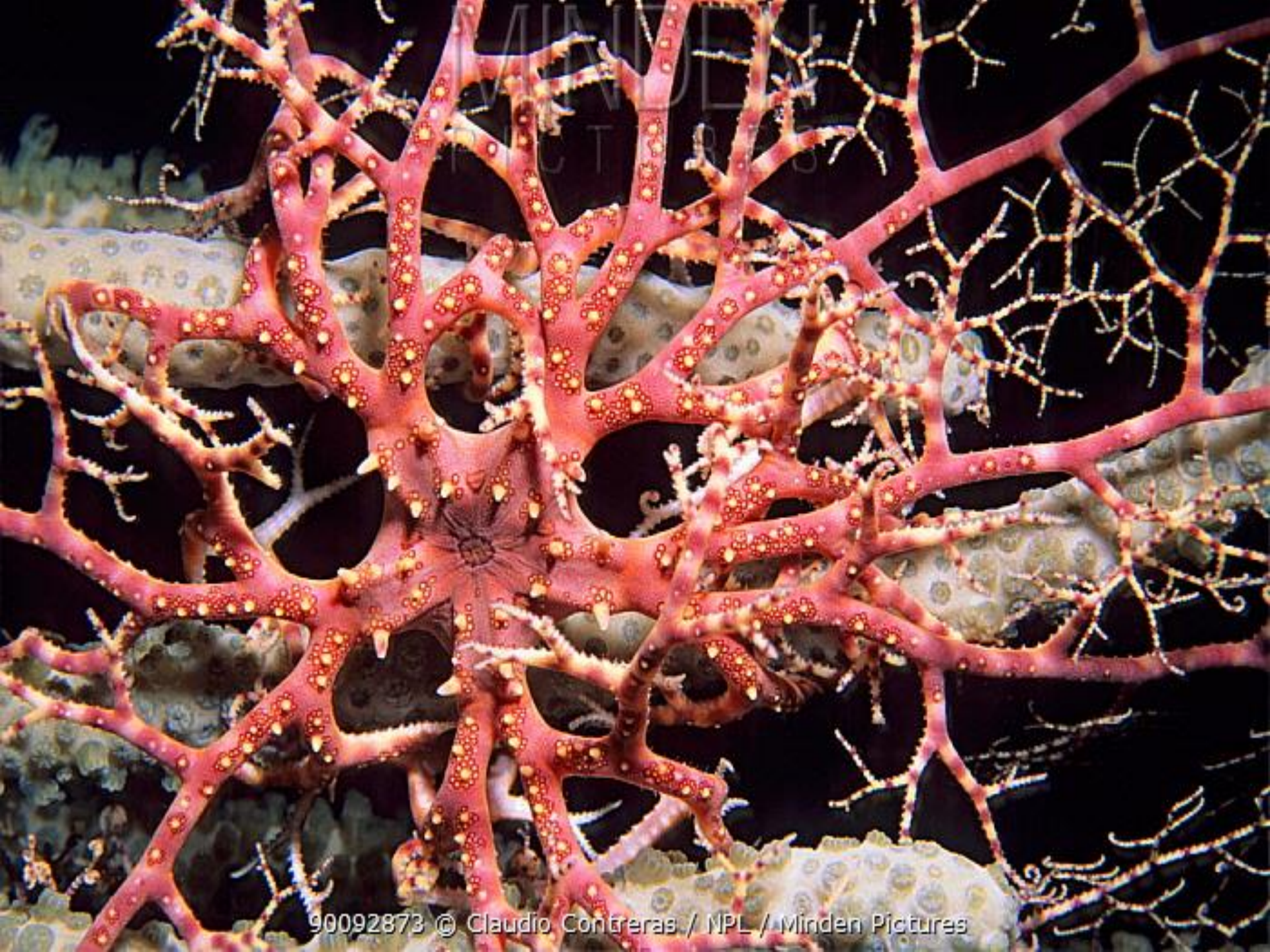
- This small sea star is characterized by five long, thin arms protruding from a central disk.
- The arms grow to a length of 3 inches, and are usually colored with white and brown rings.
- This is a very common species in the waters off the coast of Florida.
- It can be found in sandy areas and under rocks on the reef.





Basket Star (*Astrophyton muricatum*)

- The basket star is a species with a quite alien look.
- They are common throughout the Caribbean region.
- The arms of the basket star can reach a length of 20 inches, and are used to filter plankton and other small organisms from the water.
- It is a nocturnal animal, feeding at night and wrapping itself into a tight ball during the day.





Feather sea star (*Lamprometra palmata*)

- The feather sea star is an unusual species that looks more like a plant than a sea star.
- It ranges in color from brown to orange, yellow, and black.
- The feather sea star is a filter feeder.
- It is nocturnal, and at night it can be found with its long arms unfurled where it filters plankton from the water.





Purple Sea Urchin (*Strongylocentrotus purpuratus*)

- The purple sea urchin is one of the sharp-spined urchin species.
- The spines are used as a means of defense against would-be predators.
- This urchin is deep purple in color, and grows to a diameter of about 4 inches.
- They are found along the western coast of the United States and Canada where they clink to depressions in the rocks during low tide.





Rock-boring Urchin (*Echinometra lucunter*)

- This species of urchin is common in the waters of the Caribbean and the Gulf of Mexico.
- It grows to a diameter of 2 inches, and ranges in color from red to brown and black.
- It has large, sharp spines about 3/4 inches long.
- This urchin can be found in burrows in the rocks, which are created by the scraping action of its teeth.





Slipper Sea Cucumber (*Psolus chitinoides*)

- The slipper sea cucumber has a flat-bottomed oval shape to its body.
- This differs from most others, which have an elongated shape similar to that of a cucumber.
- Sea cucumbers use their feather-like arms to filter plankton from the water.
- This species is found all along the Pacific coast of North America.





Chocolate chip cucumber (*Isostichopus badionotus*)

- Also known as the or the **cookie dough sea cucumber**, is a sea cucumber common in the western Atlantic Ocean.
- It is a large species that grows to a length of 45 centimeters.
- It has distinctive dark coloured "warts" in three rows on its dorsal surface, the rest of the body may vary from white through to shades of orange to brown.



IMPORTANCE OF ECHINODERMS

- Some varieties of sea cucumber (known as *gamat* in Malaysia or *trepang* in Indonesia) are said to have excellent healing properties.
- There are pharmaceutical companies being built based on this gamat product. Extracts are prepared and made into oil, cream or cosmetics.
- Some products are intended to be taken internally. The effectiveness of sea cucumber extract in tissue repair has been the subject of serious study.



IMPORTANCE OF ECHINODERMS

- It not only helps a wound heal more quickly but is also said to reduce scarring.
- Sea cucumbers are believed to be endowed with aphrodisiac powers in the Far East.
- The reason for this belief is the peculiar reaction of the creature on being kneaded or disturbed slightly with fingers. It swells and stiffens and a jet of water is released from one end.
- This behaviour is similar to the erection of the penis of males. After releasing the jet which is a defensive mechanism and contains irritants the creature loses its stiffness and reverts to its original state.



IMPORTANCE OF ECHINODERMS

- **Uses of Sea Urchin Embryos for Gene Regulation Molecular Biology.**
- **Uses of Sea Urchins for**
- **Cell Biology and Biochemistry of Eggs, Embryos, and the Fertilization Process.**
- **Evolutionary Biology.**
- **Studies Relevant to Human Disease.**
- **Sea urchin roe is edible in some countries.**

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