

MARINE INVERTEBRATES

THE PHYLUM THEY BELONG TO:

A photo guide to some of the Marine Invertebrates you might discover arranged into the phylum (or group) they belong to, including

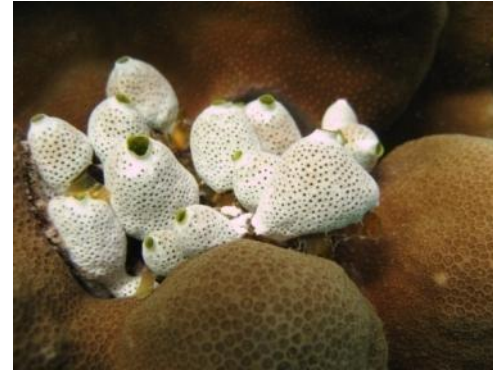
INTERESTING FACTS

about these unusual animals.

ASCIDIANS

PHYLUM: CHORDATA CLASS: ASCIDIACEA

Ascidians belong to this phylum because the larvae are like tadpoles and have a notochord (a rod which supports the bodies of embryonic vertebrates) and holes where the gill-slits are in fish. An adult ascidian has no notochord.



The adult ascidian (or sea squirt) is a sac with two openings, one for water to enter, the other for it to exit after it filters the planktonic food from the water. Its outer covering is surrounded by a fibrous tissue and it may be solitary or in a colony of many.

INTERESTING FACTS

- Ascidian openings close at any disturbance.
- A small ascidian only 30 millimetres long can filter water at the rate of approximately 1 litre an hour.
- Tadpole-like larvae develop in the plankton. After less than 6 hours, they find a suitable spot such as reefs, rocks, sand or mud to attach themselves to, then absorb their tail and change into an adult where it remains for the rest of its life.

SPONGES

PHYLUM: PORIFERA

Sponges are living filters. They take in water, then strain off tiny plants and animals, bacteria and oxygen before pumping it out again. Sponges range from minute encrusting species found under rocks to massive structures ½ metre tall. They come in all shapes and almost every colour.



INTERESTING FACTS

- Sponges filter large volumes of water non-stop throughout both night and day filtering their own volume of water every 4 – 20 seconds. In one day, a teacup size sponge pumps about 5000 litres of water through its body.
- Sponges are the most efficient “vacuum cleaners” in the sea, cleaning the water by filtering out most of the tiny food particles such as bacteria.
- Most sponges produce toxins that are distasteful to many animals, thus giving them protection from predators.

CRABS – HERMIT CRABS – SHRIMPS – LOBSTERS – BARNACLES

PHYLUM: ARTHROPODA CLASS: CRUSTACEA

Crustaceans have a segmented body which is divided into the head, thorax and abdomen. Each segment may bear jointed appendages or limbs that can be specialized for walking, grasping, feeling, digging, swimming, carrying, cutting or feeding. A tough, protective, yet flexible outer coat covers the body. As they grow, they periodically cast off their old skeleton. The new soft body and skeleton then rapidly expand before the new skeleton hardens.



INTERESTING FACTS

- A crustacean's body cannot be flexed or twisted and to make up for this, the eyes are perched on movable stalks.
- Many crustaceans live together with other reef animals such as corals, anemones, molluscs or echinoderms and have colours

to match those of their host. They not only use the host for protection, but in some instances, gain a ready food supply as well.

- If caught, crustaceans are able to quickly break off their appendages (arms, legs and claws) to get away, as they have special breaking-off points near the body. A new appendage is easily grown back.

SEGMENTED WORMS

PHYLUM: ANNELIDA

Marine segmented worms belong to the same phylum as the garden earthworms. There are two types of segmented worms – some have bristle feet and some have feather heads.



Tube worms build a hard tube either alone or in a colony in which they live. Their brightly coloured feathery head tentacles protrude from the tube which filters food and oxygen from the water. This is the only part of the worm you usually see. The most common tube worm is the “Christmas Tree Worm” so named because the feathery tentacles resemble little Christmas trees when extended.



Bristle-footed marine worms have a fleshy paddle like flap, set with bundles of bristles projecting from the side of each segment.

INTERESTING FACTS

- Segmented worms have a hydrostatic skeleton – the body is full of fluid that helps maintain its shape and enables it to swim. If a segmented worm is punctured, it loses its form and cannot swim until the tear heals.
- The tube worm lives permanently in its tube, with only the brightly coloured feeding tentacles protruding. These are ultra sensitive to light and pressure changes and when disturbed they are quickly withdrawn into the tube.

FLATWORMS

PHYLUM: PLATYHELMINTHES

Marine flatworms have oval flattened bodies exhibiting bright colour patterns. They may be semi-transparent or have frilly margins. They glide slowly, sliding across a mat of mucus they have laid down, powered by the movement of the bristles on their undersides.



INTERESTING FACTS

- At first glance, flatworms can be mistaken for nudibranchs, but unlike nudibranchs they do not have external gills. Many flatworms mimic nudibranchs probably as a defence against predators (if the nudibranch is

poisonous and predators leave them alone, then thinking that the flatworm is a nudibranch, it might also be left alone).

- If a flatworm is broken into small bits, each part may grow into a new flatworm.

RIBBON WORMS

PHYLUM: NEMERTEA

Ribbon worms are long, flatbodied and unsegmented which range in size from several millimetres to several metres in length. They are slippery or sticky to touch and most live beneath rocks or dead coral slabs or among algae or in soft bottom sediments.



INTERESTING FACTS

- Ribbon worms have remarkable powers of extension and contraction.
- Many are nocturnal and are only seen on the sand at night.
- The bright colours of a ribbon worm warn predators not to eat them, but if they do, they won't enjoy the coating of toxic slime.

SEA STARS – BRITTLE STARS – FEATHER STARS – SEA URCHINS – SEA CUCUMBERS

PHYLUM: ECHINODERMATA

Echinoderm means “spiny skin”. The animals in this group have skin that is filled with hard plates or spines and most have a body that is divided into five radial parts, each with duplicate internal organs. Members of this group can regenerate lost body parts and some can grow a fragment into a new individual.



Sea Stars are very common. Most species have the typical five arm design, but others, such as the Crown of Thorns can have up to 13 arms.



INTERESTING FACTS

- Sea Stars have remarkable powers of regeneration. If an arm is broken off it can grow a new arm. The broken off arm can also grow a new Sea Star.
- A sea star feeds by pushing its stomach out of its mouth and then surrounds its prey with its digestive organs. When the meal is eaten, the stomach is pulled back into the body.
- Sea Stars move on hundreds of tiny hollow tubes which are lengthened by pumping sea water into them.

SEA STARS – BRITTLE STARS – FEATHER STARS – SEA URCHINS – SEA CUCUMBERS

PHYLUM: ECHINODERMATA

CONTINUED



Brittle stars have only one set of internal organs. The flexible arms, which fall off easily, are made of limy rings held together with muscle like tissue.

Feather Stars have between 5 and 200 arms, each with many fine feathery branches.



INTERESTING FACTS

- Most brittle stars try to avoid predators by feeding at night. If frightened, they can drop off part, or all, of an arm as a decoy.
- Feather stars are unlike other echinoderms in that its mouth actually faces upwards, rather than downwards.
- A feather star has a ring of small claw like arms called cirri that they use to walk, climb or grip onto surfaces. It can swim by raising and lowering its longer feathery arms in a flapping motion.

SEA STARS – BRITTLE STARS – FEATHER STARS – SEA URCHINS – SEA CUCUMBERS

PHYLUM: ECHINODERMATA

CONTINUED



Sea urchins have a round shell (test) made of interlocking calcareous plates which retains its structure even after the animal has died. This test is covered with a thin skin and movable sharp spines of varying lengths. The spines underneath the sea urchin are short and stout so that its jaws can reach the ground for feeding.



Sea Cucumbers lie on their sides, using their tentacles to pick up sand and pass it to their mouths like a vacuum cleaner.

INTERESTING FACTS

- Some sea urchins use their tube feet to hold pieces of shell, seaweed and pebbles over their bodies for camouflage, protection and shade.
- Certain types of sea urchin use their strong spines and jaws to dig hollows in soft rock and coral so they are protected from rough weather and predators.
- When threatened a sea cucumber throws out white threads that stick all over the predator. Other times, it vomits up its intestines which are full of food for the predator to eat. The sea cucumber escapes and its intestines grow back within a week or so.
- Small animals often live on sea cucumbers and tiny fish sometimes live inside them.

SHELLS – NUDIBRANCHS – SEA HARES – OCTOPUS – CUTTLEFISH – SQUID

PHYLUM: MOLLUSCA

The bodies of molluscs are unsegmented and soft and they do not have an internal skeleton. Most molluscs have a hard shell that protects the body; though some have a shell on the inside, while others have no shell at all.



The most common shells are the gastropods and bivalves. When the animal dies, the hard shell remains. These are the shells we find washed up on the beach, most of them damaged and broken after being carried and tossed about by the ocean. Many people think of these as just being “shells” and do not realise that a soft bodied animal formed it and used to live in it.



INTERESTING FACTS

- A mollusc has a thin skin-like membrane, called a mantle, covering its body. By soaking up minerals from its food and the water, it uses the mantle to build a colourful shell, layer

by layer. As the animal grows, new layers are added to the shell, making a bigger home for itself.

SHELLS – NUDIBRANCHS – SEA HARES – OCTOPUS – CUTTLEFISH – SQUID

PHYLUM: MOLLUSCA

CONTINUED

Nudibranchs and Sea Hares are molluscs and belong to the gastropod group, but unlike most gastropods, they do not have a shell.



Nudibranchs, misappropriately named sea-slugs, are among the most spectacular and strikingly coloured animals living on the reef.

INTERESTING FACTS

Sea Hares have small, flattened internal shells. Many are camouflaged in dull browns and greens and may be overlooked as they feed on algae.



- The striking colours of a nudibranch mean to a would-be predator that they are probably nasty tasting and possibly toxic to eat. Once a fish nibbles a nasty-tasting nudibranch, it is not likely to taste other creatures which resemble it.
- One group of nudibranchs feeds on coral polyps, hydroids and other stinging animals. They take the stinging cells of

their prey and store them in the tips of their feathery projections on their back. Any animal trying to eat them then get stung with these weapons.

- The colour of a sea hare may range from green and brown to pink and comes from the colouring materials in the algae it eats.
- If disturbed a sea hare may jet out purple ink.

SHELLS – NUDIBRANCHS – SEA HARES – OCTOPUS – CUTTLEFISH – SQUID

PHYLUM: MOLLUSCA

CONTINUED

Octopus, cuttlefish and squid are molluscs and belong to a group known as cephalopods. The Octopus has no shell at all. Squid have a thin internal “pen” while the cuttlefish’s internal shell is a much heavier structure. Cuttlebones from dead cuttlefish are very familiar objects found washed up along beaches.



INTERESTING FACTS

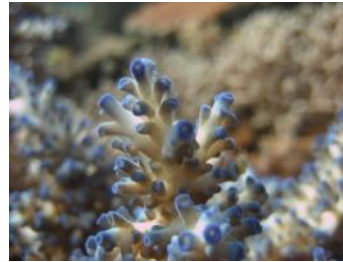
- Cephalopods have the most advanced nervous system of all invertebrates. Their eyes are remarkably human-like and accurately register shapes, textures and colours – they see us much the same as we perceive them.
- These cephalopods can change their skin colours rapidly and dramatically to escape enemies, hide when hunting or show emotion. The skin contains small elastic bags of colour which shrink and expand to pale or colour the animal.
- These cephalopods have an ink sac opening off the end of the gut. Ink is discharged to confuse enemies.

CORAL – ANEMONES – SEA FANS – HYDROIDS – JELLYFISH

PHYLUM: CNIDARIA

The term “Cnidaria” refers to the power to sting, a feature of these animals which all have special stinging cells in their bodies. The basic structure of these animals is a flower-like polyp. It is a sac like organism with an opening at one end, surrounded by one or more circlets of tentacles. The tentacles are hollow containing a space which connects to the gut and are armed with stinging cells. These tentacles subdue the prey and then manoeuvre it to the mouth.

Hard corals are the reef builders. They have a limestone skeleton and can form giant colonies. They vary in size and shape from delicate branches and plates to huge brain-like structures.



Soft corals have no true skeleton. Their soft tissue-like bodies are generally flexible and some are soft and squelchy while others are firm and leathery.



INTERESTING FACTS

- Mass spawning or release of eggs and sperm takes place on the Great Barrier Reef one or two nights after the full moon in November. For several nights millions of eggs and sperm are released

from coral polyps and float to the surface. Those fertilized eggs which escape predators hatch into larvae and drift with the plankton. Finally a tiny percentage manages to settle on the reef and begin a new coral colony.

CORAL – ANEMONES – SEA FANS – HYDROIDS – JELLYFISH

PHYLUM: CNIDARIA

CONTINUED

A sea anemone consists of a single polyp and could be described as an overgrown coral polyp that lacks a hard skeleton. They vary in



size and may reach one metre across while some small anemones may only be 12mm across. The tentacles surround the mouth and each one contains hundreds of stinging cells which are used to capture the plankton and small creatures on which it feeds.

Gorgonian Sea Fans exhibit extremely brilliant colours and intricate growth patterns. They flourish on the steep outer slopes of a reef and may grow up to 3 metres across. The intricate net formed by the sea fan spreads across the current at an angle which gives it the best exposure to trap drifting plankton.



INTERESTING FACTS

- The tentacles of many species of sea anemone are home for the beautiful clown fish. Most fish would be stung by the anemone, but clownfish have a special mucus coating which prevent the anemone from stinging them.
- Gorgonian Sea Fans have many forms and shapes, including twisting whips, spreading fans and delicate shapes that look like large, branched candle-holders.
- The Sea Fans polyps usually feed at night and pull back into the safety of the hard skeleton during the day making them look like a tree that has lost its leaves.

CORAL – ANEMONES – SEA FANS – HYDROIDS – JELLYFISH

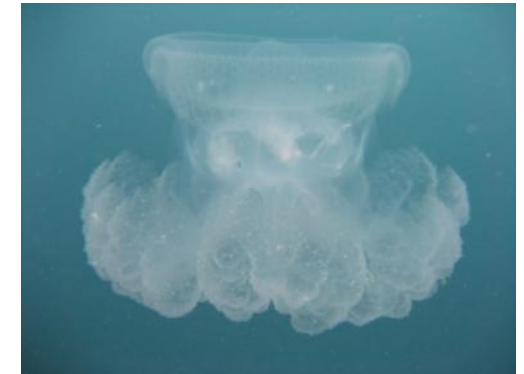
PHYLUM: CNIDARIA

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Hydroids are generally fine, fernlike structures, many of them very small.

A sea jelly's mouth is on its underside, in the middle of hanging tentacles which carry stinging cells.



INTERESTING FACTS

- Hydroids use stinging cells to paralyze prey. Some, like the feather-like hydroid and the bluebottle, can cause very painful stings to humans.
- Within a hydroid colony, certain polyps have special jobs such as catching food, others digest it and others reproduce or defend the colony.
- Some young fish can live among a sea jelly's tentacles without being stung or eaten. The jelly's stings protect the fish from predators.
- Sea jelly's drift with the currents, catching any prey that swims too close to their tentacles. By pumping water through their umbrella-like dome, they can move upwards during the day to feed near the surface and downwards at night or to escape rough weather.