

# Poster: Cnidarians

## Region

North Coast, Gascoyne Coast, West Coast, South Coast, Indian Ocean Territories

## Summary

The name cnidarians comes from the greek word 'cnidos', meaning stinging nettle. A key feature of these animals is the presence of 'nematocysts' or stinging cells, found mainly in the tentacles.

# Cnidarians

## tingly tentacles

### SEA STINGERS

The name **cnidarians** (pronounced high-dee-ee-ee) comes from the Greek word 'cnidos', meaning stinging nettle. A key feature of these animals is the presence of 'nematocysts', or stinging cells, found mainly in the tentacles.

Cnidarians have a relatively basic body form consisting of a cup-shaped body with tentacles. They all possess radial symmetry, which means that their body parts extend outward from the centre. Ectodermis, such as sea stars and sea urchins, are other examples of animals that possess radial symmetry.

Cnidarians have a central mouth that also functions as the anus and leads into the stomach called the gastrovascular cavity. The entire classification that cnidarians came under 'coelenterata', originated from this organ. The coelenterates, however, also included the ctenophores (comb jellies and sea gooseberries), that are without stinging cells. Hence ctenophores and cnidarians are two separate phyla.

There are four classes of cnidarians:

- **Hydrozoans** (obolarians and hydroids). More than 3,000 species of hydrozoans are known worldwide and about 500 of these have been recorded in Australia.
- **Anthozoans** (anemones and corals). Anthozoans are the most recorded of all cnidarians with over 6,500 species known worldwide, mostly occurring in the tropics. Over 1,000 species of anthozoans have been recorded in Australia.
- **Scyphozoans** (sea jellies). Scyphozoans are widespread in the ocean, however their species diversity is not overly large. There are 51 species of scyphozoans found in Australian waters.
- **Cubozoans** (box jellies). There are only four species of cubozoans recorded in Australian waters, although that may be a good thing as they are deadly!

Sea jellies have sensory organs located around the edge of the bell.

Nomophanes jellies are a delicacy in China and Japan - they are eaten both fresh and pickled.

### BEWARE! BLUEBOTTLES

The name 'hydrocol' means water animal but is also associated with the 'hydra' or many-headed serpent. This makes sense when you realise that whilst they may look like a single animal, they are actually made up of a hydrozoan colony (individuals living together and interacting in advantageous ways).

Most hydrozoans have two stages in their life cycle. A free-swimming medusa reproduces sexually whilst polyps reproduce asexually (a new animal is created from the parent animal).

Within a colony, different polyps have different specialisations, such as feeding, defence and reproduction - and in the case of the bluebottle, one polyp produces the gas-filled float.

Also known as the Portuguese man o' war, bluebottles are found all around Australia. The long tentacles are designed for fishing and have the stinging cells that overwinter usually come into contact with.

### STING IN A BOX

'Cubozoans' or box jellies are so named due to their square shape when viewed from above. They do not have an alternation of generations, only a medusa stage. Single tentacles or clusters of tentacles are found on each corner at the base of the cube-shaped bell.

Box jellies are unusually strong swimmers and therefore active hunters. If a fish touches the tentacles, the other tentacles around it shorten so that there are many surrounding the prey.

The main tentacle of a blue bottle can be up to 10 metres long in a large individual.

There may be up to 1,500 stinging cells in a square millimetre of a deadly box jelly.

### NEMATOCYSTS

Cnidarians have specialised stinging cells called 'nematocysts', which aid in the capture of prey and in defence. Inside the stinging cell is a tiny harpoon-like structure that has coiled up like a spring. When something comes in contact with the stinging cell, the harpoon is released and venom is injected into the animal.

### CROSS SECTION - SEA ANEMONE

mouth, tentacles with nematocysts, outer layer, inner layer, basal disc, body cavity.

### FLOWERS OF THE SEA

Anthozoans (meaning 'flower animals') include corals, sea pinks, sea fans and anemones. Anthozoans do not have an alternation of generations, existing only as polyps - solitary as with anemones or as colonies in the case of corals. The mouth is surrounded by one or more rows of tentacles - hence they may look like flowers.

Sea anemones appear to be fixed in one place, but most can move about on their basal disc. Anemones have special 'lighting' tentacles used to repel nearby anemones.

The stinging cells of anemones can kill small fish on contact and the tentacles pass the fish into the mouth. Anemones' life is anemones to gain protection from predators. In order to live in the anemone however, they must become desensitised. Anemones do this by presenting their pink fins and tail to the anemone's tentacles, making light contacts and retracting until they find they have become immune to the anemone's sting.

Hard corals have a hard limestone skeleton. A characteristic of this group (that they share with sea anemones) is that they have unbranched tentacles, usually arranged in groups of six. Most of these corals extend their tentacles at night to feed, when zooplankton are most active.

Soft corals lack the solid skeleton found in hard corals. These mostly colonial animals have eight branched feathery tentacles, and can be found in a range of colours.

Brightly coloured gorgonian corals, which include sea fans, are quite common in south-west WA. Like soft corals, gorgonians also have eight tentacles but have rigid external skeletons. They usually grow in a fan, tree shape with many branches, which can reach well over a metre across.

### SCYPHOZOANS 'BOWL ANIMALS'

Sea jellies have a bowl- or bell-shaped body with three layers - the middle layer comprising mostly of a jelly-like substance that gives these animals their common name. The body is fringed with tentacles and oral arms, which are often mistaken for large tentacles. The oral arms join the underside of the bell at the mouth, which then leads directly to the stomach. Some sea jellies feed on tiny plankton, while others prefer small fish and crustaceans. Sunfish, tuna and turtles all enjoy sea jellies as part of their diet.

Scyphozoans include the true sea jellies and, unlike bluebottles, are single individuals instead of colonial beings. They have separate sexes, meaning a sea jelly is either male or female. They have an alternation of generations with a fixed polyp stage and a free-swimming medusa stage, which is generally the dominant phase and that with which we are most familiar.

Most sea jellies drift with the currents. A pumping action that is often observed merely changes their position up or down in the water column.

### UPSIDE DOWN!

Cnidarians have two distinct body forms - polyps and medusae - that are typically specific down versions of each other.

Polyps have a tubular body, attached at the base to the substrate or each other (in a colony) and their tentacles point upwards - as in corals and anemones.

Medusae are generally free-swimming, bell-shaped animals with tentacles that dangle below the main body, such as in sea jellies.

Some species have both body forms during their life cycle. This is called an alternation of generations.

Coral reefs have been present on Earth for over 240 million years.

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