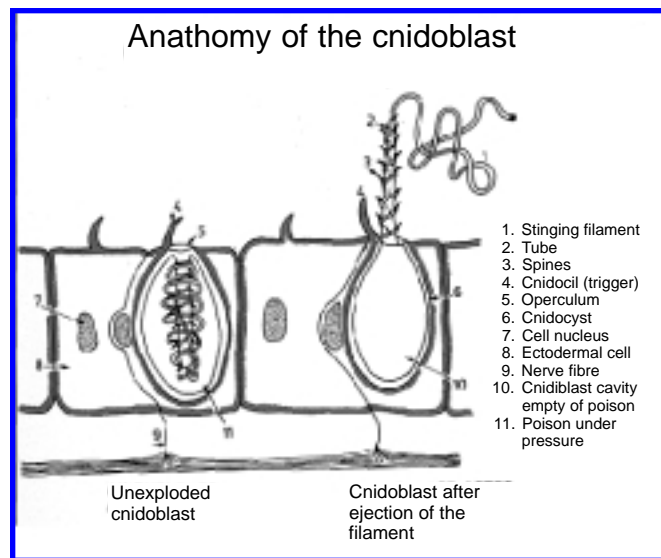


CNIDARIA (Corals, Hydroids, Jellyfish)

This is a large group of over 10,000 species, found on shores, reefs, and oceans of the world. Well-known and easily recognized animals such as jelly fishes, anemones and corals, are included in the phylum as well as a host of totally dissimilar forms, some almost inconspicuous, others delicately fragile, or plant-like in their growth. Whilst many species are attached to the substrate, often forming large or small colonies, others are free swimming in the sea. The basic body form is that of a polyp with a single external opening, the mouth, surrounded by tentacles in which there are stinging cells called **cnidoblasts**, containing coiled threads, the **nematocysts**. These enable the animal to paralyze its prey. The toxicity of these cells varies very considerably, some being extremely potent. Perhaps the species best known to man, from this point of view, is the Portuguese-Man-of-War, *Physalia*, which is found floating on the surface waters of the ocean and in times of strong wind is blown ashore in thousands, causing havoc among bathers.



Class Hydrozoa

Many of the animals in this class, known as hydroids, are sessile, shallow water species, usually occurring as small colonies attached to the substrate, but many of them also have a free-floating sexual stage, the medusa or jellyfish. In most cases microscopic examination is necessary for their identification. Possibly only two groups of hydroids will be frequently observed and out of the many occurring on the reefs, these two unfortunately are the only ones to be avoided by divers who are warned not to brush against them with bare arms or legs.

Concentrate on the following families/species:

Millepora sp.

Distichophora sp.

Aglaeophenia cupressina

Lytocarpus philippinus

Class Scyphozoa

The jelly fish are free swimming medusae with a bell or umbrella beneath which are found the mouth-arms and the fishing tentacles. In the Cubo-medusae, the bell is usually not more than a few cm across whereas the large brownish-pink *Cyanea* has an umbrella over one metre in diameter, surrounded by a massive curtain of fishing tentacles capable of great extension. Large jelly-fish are quite uncommon in your area so don't spend too much time on these creatures.

Class Actinozoa

In this Class, the largest of the Cnidarians, there is no medusa stage and all are attached polyps, with the mouth surrounded by hollow tentacles. There are two clear-cut sections, divided according to the nature of the tentacles and the polyps may be solitary or form large colonies, with or without a skeleton.

Sub-Class Alcyonaria (Octocorallia)

All these animals are easily distinguished in that their polyps have **eight tentacles** which are always **pinnate**, that is, they are "feathered", having small processes along either side of each tentacle. They are usually in the form of large or small colonies which may be tall and multi-branched, elongate, finger-like, or round and flattened, according to the species. The skeletal elements within this group consist of minute spicules of calcium carbonate embedded in the tissues or an axial skeleton of a horny or chitinous nature, and these give firmness to the branches of an Alcyonarian colony. The skeletal elements are of considerable importance in the classification of species, and differ from the skeletons of reef-building corals since they are internal, whereas the polyps of the reef-building corals lie on top of their hard limy cups. Since the requirements of these so-called soft corals are similar to those of the reef-builders, they are usually found occupying the same kinds of habitat on the reef, so that there must always be competition between them for places of settlement. On reefs where areas of corals have been killed as a result of cyclonic activity or some disaster such as large-scale predation by starfish, it may be noted that this section of the reef has been recolonized by Alcyonarians which are capable of much more rapid growth than the reef-building corals.

Order Stolonifera

Organ-pipe coral (Tubipora)

Order Alcyonacea

Most of the soft corals

Order Coenothecalia

Blue coral (Helipopora)

Order Gorgonacea

The Gorgonians or Sea Fans and Sea Whips have an axial skeleton usually formed of horn-like material and these, dried and bleached, are often seen in displays of corals and shells. The colours are tones of yellows, reds and orange and close inspection will reveal the pores through which, in the living colony, polyps are protruded. These are embedded in the softer tissues surrounding the skeleton and when expanded, appear as tiny fragile flowers scattered along the stalk. The Gorgonians with their intricately interlaced branches provide a sheltered habitat for a host of reef species such as sponges, worms, crustaceans, feather- and brittle-stars. Several families of sea fans and their relatives are represented on the reefs of the Philippines. Unlike the soft corals, they are inhabitants of the deeper, more sheltered waters of the reef and not on the intertidal reef

Sub-Class Zoantharia

This second big sub-division of the Anthozoa includes the sea anemones, the reef-building corals and the Black Coral. Although these animals are extraordinarily dissimilar at a casual glance, there is a basic relationship in the living polyps whose tentacles may be few, or very many. usually in multiples of six, but they are never pinnate.

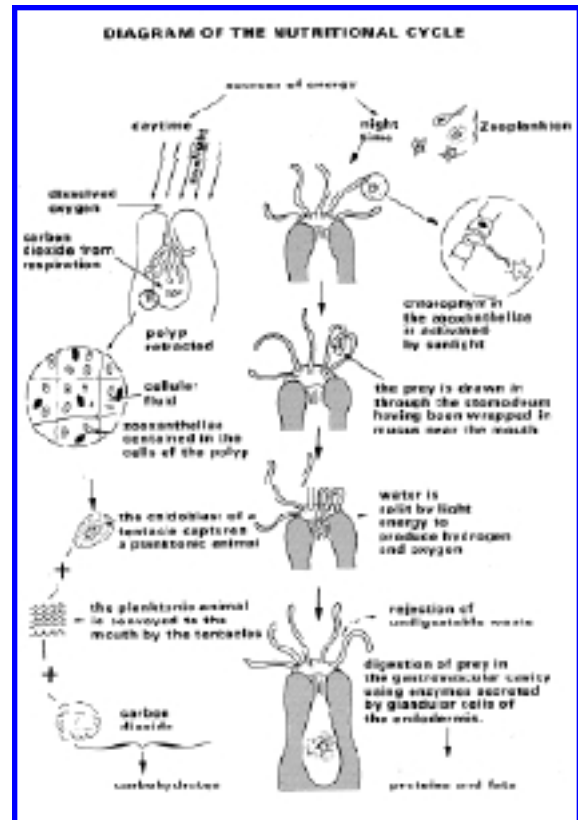
Order Actiniaria

The Sea Anemones, although normally attached animals, are not permanently fixed to a solid substrate and thrive in a variety of habitats on the reef. They may be either solitary individuals or form large colonies and are the largest of the single cnidarian polyps, some

species reaching up to a metre in diameter. Whilst there is no supporting skeleton, the column of the polyp is very muscular, capable of a great deal of expansion and contraction.

Order Scleractinia

Perhaps the most important members of the whole reef fauna are the reef builders themselves -- the true or stony corals. Whilst the polyps are basically similar to those of the sea anemones, they have special cells in the basal disc which secrete a skeleton of calcium carbonate. Although some corals are solitary forms in which the single polyp may reach quite a large size (as in the Mushroom Corals), most form colonies and in these, the polyps are rarely much more than a few mm in diameter. Each polyp lies fixed within its limy cup, the **corallite**, which has been secreted by its lower outer layer of cells and, in all colonial species, is interconnected with the polyps adjacent to it. Thus the walls of the column of each polyp lie above the cup skeleton and since they connect with those surrounding it, the entire colony is connected horizontally and the living polyps are, in reality, layers of animal tissue lying above and completely covering the calcareous skeleton. It is this outer layer of tissue which gives the brilliant colour to the reef-building corals, but it is the skeleton which gives form and shape to the colonies. In themselves, the white dead skeletons of the corals are things of great beauty, minutely sculptured with intricate designs. And they are the important structure used in the classification of corals. Microscopic examination in most cases is essential for the correct determination of the various species. Reef-building corals flourish in shallow tropical waters, rarely being found below depths of 60 metres, and with water temperatures ranging between 20°C and 30°C. Minute symbiotic algae, known as **zooxanthellae**, are present within the tissues of the reef-building corals and play an extremely important role in both nutrition and skeleton formation. Since like all plants they require sunlight, it is considered that their presence is the determining factor for the depths at which reef-building corals flourish. About 350 species of corals have been described for the Philippine waters, belonging to some 80 genera of reef-building corals. But intensive collecting by specialists has not until very recently been carried out, and it is certain that with modern techniques and the intensive work of the last decade or so by coral reef workers round the world, many species will be found to be merely differing growth forms from different habitats, thus reducing the total number of valid species. Some of the more important genera are briefly described.



Order Zoanthidea

The Zoanthids differ from the corals since they have no skeleton, and from the anemones by the fact that the basal portion is not formed into a pedal disc, and they usually form colonies, the polyps being united by a common basal stolon. Many are found living as commensals on other reef species.

Order Antipatharia

The Antipatharians are the so-called Black Coral, the basal parts of whose branching skeletons are often polished and used for making semi-precious jewellery. The colonies are

usually long, slender whip-like or finely branching forms growing up to a metre and more in height. The axial skeleton is horn-like and often thorny, and the tiny polyps borne along the branches have 6 tentacles, and are either creamy white or yellow in colour. Although once considered to occur only in deeper waters, in recent years shallow-water species have been discovered on various reefs throughout the Pacific area.

Preparation

To prepare for this lesson, read the corresponding section in *The Encyclopedia of Recreational Diving*, and the following pages in *Indo-Pacific Coral Reef Field Guide* (Allen and Steene): 1 - 6, 45, 49, 55 - 56, 65 - 66, 101 - 102.

Field Handbooks

Use *Indo-Pacific Coral Reef Field Guide* (Allen and Steene) and *Guide to Philippine Flora and Fauna, volume V*. They will both be of great help, but sometimes they will give conflicting ideas. *Indo-Pacific Coral Reef Field Guide* is a more modern publication, so use this one as reference, even though the descriptions in *Guide to Philippine Flora and Fauna, volume V* are far better.

Questions/Assignments

1. Identify slides #16 - 40, and state to what class and order they belong.
2. What types of reefs do you have outside Pahagsama Beach and at Pescador?
3. Do you have any atolls in the Philippines? If not where is the closest atoll?
4. Drilling in the Great Barrier reef has shown coral lime down to about 2000 metres. How is this possible?
5. To what class does the Portuguese-Man-of-War belong?
6. Describe the different growth forms of *Acropora*. Where can you find them?
7. List some unique features of:
 - a) *Porites* sp.
 - b) *Gonipora* sp.
 - c) *Montipora* sp.
 - d) *Fungia* sp.
8. Take the same section of the reef as for your assignment on plants and do a similar investigation. This is also a group assignment and you write the report together in a similar form as for plants. However, try not to pick up too many specimens for closer examination.
9. How does blue coral (*Heliopora*) and organ-pipe coral (*Tubipora*) differ from other soft corals?