Coral reef

Built up over hundreds or even thousands of years, it is actually composed of the calcareous skeleton of millions of animals. Coral reefs are diverse underwater ecosystem held together by calcium carbonate structures secreted by corals. Corals reefs are built by colonies of tiny animals found in marine waters that contain few nutrients. Most corals reefs are built from stony corals, which in turn consist of polyps that cluster in groups. The polyps belong to a group of animals known as Cnidaria, which also includes sea anemones and jellyfish.

Unlike sea anemones, corals secrete hard carbonate exoskeletons which support and protect the coral polyps. Most reefs grow best in warm, shallow, clear, sunny and agitated waters. Corals require nutrients in order to survive, also require light, without which photosynthesis could not occur and the corals could not survive in these nutrient-poor waters.

Structure and feeding

Corals are simple multi-cellular organisms that belong to the phylum, which also contains the jellyfish and sea anemones (Coelenterata) with which they share their basic form and radial symmetry. They have a hollow body cavity, with a central mouth surrounded by tentacles.

However, there are several types of corals, occurring in a wide range of forms: the millepores, or fire coral, are closely related to jellyfish; the gorgonians or horny corals, such as the sea fans, form flexible plant-like colonies. The black or thorny, deepwater corals, and the true reef builder or hermatypic corals, the madrepores, are also known as stony corals.

Corals are carnivorous like all Cnidarians, and possess stinging cell, or nematocysts on their tentacles, with which to kill or immobilize their prey which consists of the tiny free-floating animals that constitute the zooplankton. However, large corals may also consume large invertebrates or even fish, the food is then passed to the mouth by the tentacles, to be digested in the gastrovascular cavity, and the waste products are discharged back through the same single way (the mouth)

Coral polyps of reef-building or hermatypic corals do not photosynthesize, but have a symbiotic relationship with microscopic algae of the genus Symbiodinium, commonly referred to as zooxanthellae, these organisms live within the tissues of polyps and provide organic nutrients that nourish the polyp. Because of this relationship, coral reefs grow much faster in clear water, which admits more sunlight. Without their symbionts coral growth would be too slow to form significant reef structures. Corals get up to 90% of their nutrients from their symbionts.

Corals reproduce using both sexual and sexual methods. Asexual reproduction typically occurs through a process of division or budding, and some corals exhibited other way of asexual reproduction by fragmentation, whereby a fragment of broken coral that has detached from a colony may survive and if it is carried to a suitable site for attachment, will be able to establish a new colony.

Corals reproduce sexually by either internal or external fertilization. The reproductive cells are found on the mesenteries, membranes that radiate inward from the layer of tissue that lines the stomach cavity. Some corals are

hermaphroditic, others are separate sex (either male or female), and few species change sex as they grow.

Internally fertilized eggs develop in the polyp for a period from days to weeks, the fertilized eggs develops to larva known as planula, that swim for a while and then settle down and develop to new colonies. Externally fertilized eggs develop during synchronized spawning. Polyps release eggs and sperm into the water in masses often in sac which floats to the surface, where fertilization will take place then develop to planula larva and then to the new colonies.