



MAUI OCEAN CENTER MARINE LIFE PROFILE

Corals

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Common Name: Coral
Hawaiian Name: ko'a
Found in Exhibit: Almost every exhibit!



Black Coral

Which marine animal engages in fierce competitions over space, has graphic displays of sexual reproduction, and is possibly the single most important animal in the entire underwater world? Whales? Sharks? The real answer may surprise you: corals! As trees provide food, habitat, and protection for the animals living in the forests, corals provide many of the same things for marine animals that live in the coral reef ecosystem. Like trees, corals come in all different shapes, sizes, and colors. Most corals form hard skeletons, but some are soft-bodied and have no skeleton. They can live within a few feet of the ocean's surface to several hundred feet below it. There are types of coral that thrive in water with turbulent wave action and others which need calm, placid water to survive, and corals that live in every environment in between. Corals have fascinating lives, often engaging in physical competition over valuable space, sunlight, and nutrients and intriguing modes of sexual reproduction.

Corals are tiny, cylindrically shaped animals with tentacles that usually form colonies. These animals, called polyps, can be between 1/25th to 7 inches in diameter, and most live permanently attached to a hard surface. Most stony corals secrete calcium carbonate, which they live upon. Together with limestone-secreting algae, layers upon layers of living and dead coral form the foundation of the reef. Most reef-building corals have a symbiotic relationship with tiny single-celled algae called zooxanthellae. In order for the algae to live and grow the coral must be located in an area that gets enough sunlight for photosynthesis. The algae live inside the coral's tissue and supply nutrients to the polyp as a byproduct of photosynthesis. This extra energy source allows the coral to create the calcium carbonate skeleton. The zooxanthellae can be so numerous that they actually color the coral, ranging from brown to yellow to blue.

Coral polyps are versatile in the reproductive arena and can reproduce both sexually and asexually. Asexual reproduction involves budding a clone from the original polyp, generally resulting in short-range expansion of the colony. For long-range dispersal, up to hundreds of miles, sexual reproduction is most effective. In sexual reproduction, eggs and sperm are broadcast into the water. This spawning is usually triggered by moon and tidal phases and length of daylight to ensure maximum dispersal. After fertilization, eggs become free-swimming larvae called planulae. Though most planulae do not survive this phase, some do settle and start new colonies. Some corals use another type of reproduction to help ensure the survival of their young; they "brood"

the larvae in a modified stomach and release the larvae through the mouth once developed.

Since areas with optimal growing conditions for corals can be very limited, corals often engage in physical competition with neighboring corals. Corals can try to sting each other with their tentacles, or kill them with their digestive filaments, which they can generally extend farther than their tentacles, push dead tissue in front of approaching corals, or shade competing corals, limiting the sunlight needed for photosynthesis.

Rice coral (*Montipora capitata*) is one of about 50 species of shallow-water corals in Hawaii, and is found nowhere else in the world. It can be found in a variety of forms, including finger-like branching, encrusting, and plate-like growth. Rice coral can be identified by the rice-shaped projections surrounding the cup-shaped calyces where the polyps live. It is usually brown to cream colored in appearance. Rice coral reproduction is a predictable and easily observable twice per year. All of the polyps simultaneously release bundles containing both egg and sperm into the water. After twenty to sixty minutes of floating near the surface, the bundles begin to break apart and clouds of sperm are released. The eggs are believed to already contain zooxanthellae, which are thought to provide the planulae with energy. The planulae attach to a hard surface where they eventually turn into a coral polyp and can establish a whole new colony.

Coral reefs are in constant danger of being damaged by other marine life, strong wave action, water pollution, boat anchors, and careless swimmers and divers. Humans can prevent some of this damage by not allowing trash or chemicals to go in the ocean, picking up moorings instead of dropping anchors at dive destinations, and being cautious not to touch the coral or any marine life. By following these simple guidelines, we can all help preserve the health of the entire ocean ecosystem for years to come.



Rice Coral



Antler Coral