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Caring For Coral Reefs Is Not Rocket Science

Common sense can go a long way to help protect coral reefs. All we really need to do is treat them with the same respect we give our homes and gardens and watch out that we do not degrade their environment.

By **Phil Dustan Ph.D.**

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Tropical coral reefs are the most wondrous expression of life in the sea. They are the oldest, most productive and complex ecosystems known. Long before there were forests or even life on land, there were reefs in the sea that became the vibrant, underwater fantasy worlds introduced to us by *The Undersea World Of Jacques Costeau*. Their vibrant biodiversity holds incredible potential for advancing medical science and understanding life.

In practical terms today, reefs are a major source of food for about a billion people; they protect shorelines, may harbour oil and gas reserves; and tragically, too often become the final resting grounds for hapless ships. Sadly, reefs are deteriorating faster than anyone could have imagined. Since I began studying reefs in 1969, it is now well known that 75 percent of the Earth's coral reefs are currently threatened, especially in coastal areas of the Indo-Pacific and Caribbean.

The degradation is global but the drivers vary; leaving even reefs in the middle of the Pacific Ocean vulnerable. We think of corals as huge rocks and reefs as underwater mountains that grow, but in reality they are simply aggregations of colonies made of tiny animals, plants, and bacteria that grow together in much the same way trees grow together to make a forest.

The animal is a voracious carnivore whose expanded polyps feed on plankton at night turning the reef into a so-called wall of mouths. The animal's three tissue layers are each only one-cell thick, secreting nanometer-scale crystals of calcium carbonate that grow into the white rock we think of as coral. One

tissue layer is populated by millions of symbiotic algae called *zooxanthellae* that accelerate the skeletal growth through photosynthesis, while millions of other microorganisms dwell on the exterior cell surface providing an interface with the sea. In reality, corals are poised like an upside down tree – their tentacles are functional roots and the symbiotic *zooxanthellae* are the leaves, both of which are supported by their mineral skeleton.

Humans impact reefs through destruction, extraction, and pollution. The fragility of corals lies in their delicate surface tissues being exposed to the elements. Unlike higher animals and plants, the coral animal does not have a body, only a surface. Imagine if your body was your skin, with nothing inside except a hard skeleton. Surface cuts would damage your very body, not just your skin. Simple cuts and bruises become life-threatening injuries while sediment falling on the surface or the overgrowth of algae smothers the coral tissue.

Ironically, the very adaptations that made reefs survive hundreds of millions of years now make them vulnerable to the direct and indirect impact of human. For example, corals can withstand oceanic waves and constant swell, but their brittle calcium carbonate skeletons are no match for the sharp mechanical forces of errant ships, small boats, anchors, and even the careless snorkeler.

While scientists are scrambling to better understand the fate of these coral reefs; the truth is we don't need "rocket science", just simple yet effective ways to care for them right now. 🤿

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