

Ocean sampling yields environmental sources of coral symbionts

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By sampling different ocean locations for the presence of an elusive but critical group of algae, researchers have gained new insight into the dwelling places of the symbiotic organisms that reef corals need for survival.

In response to environmental stresses, coral reefs around the world are in a decline due in large part to coral bleaching—loss of the symbiotic photosynthetic algae that live within corals and provide much of their energy. These symbiotic algae are essential to their host's survival, but many corals must acquire their symbionts anew with the emergence of each generation. However, it has remained unclear how newly settled coral polyps acquire their symbionts in the ocean.

Organisms that resemble coral symbionts—dinoflagellates that are similar to those of the *Symbiodinium* genus that grow within corals—have been isolated from both sand and the water column; however, neither the locations of these populations nor their ability to establish symbioses is known. For both our understanding of reef ecosystems and their conservation, it is critical to recognize where these symbionts reside in the ocean environment.

In the new work, the researchers succeeded in identifying *Symbiodinium* in the water column as well as on ocean-bottom substrates. Most importantly, the researchers also demonstrated that a subset of *Symbiodinium* found in the water and on benthic substrates (that is, on algae and sediments) can infect new coral polyps. These isolates are

therefore capable of establishing symbioses with corals and thus point to environmental sources of symbionts that may prove important in the recovery of reef-building corals after bleaching events.

Source: Cell Press

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