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Blowing bubbles through oceans may help protect coral reefs

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Coral reefs can be saved by blowing bubbles over them. (photo TOI)

WASHINGTON: Blowing tiny bubbles through seawater may help protect coral reefs and oyster farms from acidified oceans, by transferring excess carbon dioxide from coastal marine environments to the atmosphere, scientists say.

The technique could provide a relatively inexpensive solution

to one of the biggest threats facing coral reefs.

An estimated 30 to 60 per cent of all the coral reefs have died since the industrial revolution as the oceans absorbs more CO2 and become increasingly acidic.

Ocean acidification harms a variety of marine organisms, but especially those that use calcium carbonate to assemble their skeletons and shells, such as coral, mussels and oysters.

"Ocean acidification is particularly troublesome for coral reefs because the entire structure of the ecosystems is built upon the calcium carbonate skeletal remains of dead coral," said lead author David Koweek from Stanford University.

"Ocean acidification makes it difficult for corals to calcify and makes it easier to erode these skeletal remains, threatening the integrity of the entire reef," Koweek said.

A healthy coral reef provides a home to thousands of organisms, which island subsistence communities rely on for the bulk of their diet.

A reef's mere presence can quell the waves whipped up by a surging storm, thereby guarding low-lying coastal towns from flooding.

In the new study, researchers showed that bubbling air through seawater for a few hours in the early morning can enhance the transfer rate of CO2 between the ocean and the air up to 30 times faster than natural processes, resulting in a significant reduction in local marine concentrations of the greenhouse gas.

"The nice thing about the bubble pulse method is that it provides an engineering technique that can help bring us closer to conditions that coral reefs were used to 100 years ago, and to which they've been adapted for many thousands of years," said study coauthor Rob Dunbar, a professor at Stanford University.

The team set up a bubbling experiment in a sensor-laden water tank. Each night, they would fill the tank with bags of giant kelp.

Throughout the night, the kelp would respire, adding CO2 to the water, and thus acting to simulate the CO2 buildup that occurs from respiration in coastal ecosystems at night.

The team would then arrive the following morning, remove the kelp, and begin to bubble the high CO2 seawater in order to test how bubbling lowers the CO2 concentration.

They found that just two hours of bubble-mediated ventilation could increase the transfer of CO2 from the ocean into the air by 10 to 30 times.

The scientists say that if timed correctly, bubble stripping could be an effective means of reducing extreme acidity in coastal ecosystems.

The study was published in the journal Environmental Science and Technology.

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There is a proposal to start night safari for tourists at Ranthambore Tiger Reserve in Rajasthan

J AIPUR: Although it has been widely remarked about, there is little clarity about the proposal to open Ranthambore Tiger Reserve to night safari. The forest department has reportedly sent a proposal in the matter to the state government, seeking tourists be allowed entry into the tiger reserve through the day and even at night, rather than just

three hours each after dawn and before dusk, as at present.

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