Climate change remains a real threat to corals

Featured In: Alternative Energy

By Science Daily Tuesday, October 12, 2010

The research shows, for the first time, that while hard corals can take up from the environment new stress-tolerant algae that provide critical nutrients, the coral may not be able to sustain the relationship with these algae over a long period, a process known as symbiosis.

The findings may mean that certain types of coral will not be able to adapt rapidly enough to survive global warming, says the study's lead author, Mary Alice Coffroth, PhD, UB professor of geological sciences in the College of Arts and Sciences.

"Our findings suggest that not all corals can maintain a long-term symbiosis with these stress-tolerant strains of algae," says Mary Alice Coffroth, PhD, UB professor of geological sciences in the College of Arts and Sciences and lead author.

"That's the problem," she says, "if they can't take up the stress-tolerant symbionts, or if they take them up but can't maintain the symbiosis with them, as we found, then they likely won't be able to adapt rapidly enough to survive global warming."

The demise of coral reefs deprives fish of food and shelter, which reduces reef fish populations and marine diversity.

Co-authors on the paper include Eleni L. Petrou, a recent UB Honors College undergraduate who worked in Coffroth's lab as well as Daniel M. Poland, a recent PhD graduate and Jennie C. Holmberg, a former graduate student, both of whom worked in Coffroth's lab, and Daniel A. Brazeau, research associate professor in UB's Department of Pharmaceutical Sciences.

During the past two decades, Coffroth explains, coral reefs, known as the rain forests of the sea for their incredible biological diversity, have suffered bleaching events due to high water temperatures and light levels that cause them to literally "spit out" their algal symbionts, which provide their sustenance. Severe bleaching can lead to coral death.

In recent years, though, it has been reported that some corals appear to respond to rising sea temperatures by acquiring new stress-tolerant symbionts from the environment, which could allow them to survive the warmer oceans caused by climate change.

Coffroth says that the UB research shows that while the corals they studied were able to acquire new stress-tolerant symbiont strains from the water, they were unable to maintain that symbiosis for very long.

After about five weeks, the proportion of new symbionts within the coral had declined dramatically and after 14 weeks was no longer detectable in the corals.

"While it's true that coral can be flexible in the kinds of symbionts they take up, that will only work within limits," she says. "It's possible that the new symbionts were either unable to multiply in the host or to compete with the existing residual populations of symbionts in the coral.

"Our findings suggest that if a coral that doesn't naturally host this kind of stress-tolerant symbiont, it cannot acquire it from the environment."

She noted that the outlook may be more promising for corals that naturally harbor the stress-resistant symbionts. These symbionts appear to be able to protect corals from sea temperatures that are one-to-two degrees higher than normal; however, Coffroth cautions that most estimates predict that by 2100 global warming will cause sea temperatures to rise by as much as two-to six-degrees above current temperatures.

The UB researchers studied Porites divaricata, a common shallow-water scleractinian coral found throughout the Caribbean.

The coral samples were retrieved from a site within the Florida Keys National Marine Sanctuary; in the laboratory, the scientists induced bleaching by exposing the coral to incremental increases in water temperatures until it reached 33 degrees C, about 91 degrees F.

The research was funded by the National Science Foundation and a grant from the UB Honors College Research and Creative Activities Fund.

SOURCE

JOIN THE DISCUSSION

Rate Article: Â Average 0 out of 5

register or log in to comment on this article!

0 COMMENTS

ADD COMMENT

Text Only 2000 character limit

Add Comment

Page 1 of 1

More LATEST NEWS >>

Subscribe

BLOGS **MULTIMEDIA**

E15 Rules & New Math
4 hours ago
The proposed ethanol label, presumably developed by lunatics, and the problems in developing a biomass supply chain are well worth looking at with fresh eyes.

The Heat Is on Industry
Oct 12
Amongst all of the attention being paid to layoffs and unemployment, often forgotten are those workers who are shouldering the brunt of the work of all those former fellow employees.

The Business Case for Fuel Cells
Oct 21
In an effort to become more energy and cost efficient, companies like Coca-Cola, Michelin and Kimberly-Clark are utilizing fuel cells as part of their daily operations.

More BLOGS >>

The Buzz **Chem Insider Daily** **Digital Edition** **White Papers** **Chem.Info Forums** **Journal Articles**

Solar
Wind
Biofuels
Feedstock Developments
Maintenance
Instrumentation
Safety–Individual

Safety–Facility
Solids
Liquids
Gases
Powders
Systems
Components
Controls
Integration Strategies

RFID
Remote Monitoring
Data Sharing
Purchasing Tips
ERP Software
Simulation Software
Maintenance
Management