New research suggests Caribbean gorgonian corals are resistant to ocean acidification

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carbon dioxide concentrations. These results suggest that Caribbean gorgonian corals may be more resilient to the ocean acidification levels projected by the end of the 21st century than previously thought.

An international team of scientists, including from the University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science, tested the effects of elevated CO2 concentrations on the growth and calcification rates of the sea rod, *Eunicea fusca*, a type of gorgonian or soft coral found throughout the Bahamas, Bermuda, South Florida and into the Gulf of Mexico.

Researchers collected E. fusca specimens from Big Pine Shoals in the Florida Keys to simulate a range of predicted future ocean acidification conditions - CO2 concentrations from 285-2,568 parts per million (pH range 8.1-7.1) - during a four-week experiment at the UM Rosenstiel School's Coral Reefs and Climate Change Laboratory. *Eunicea fusca* showed a negative response to calcification under elevated CO2 concentrations, but growth and calcification did not stop under any of the CO2 levels used in the study.

"Our results suggest that gorgonian coral may be more resilient than other reef-dwelling species to the ocean acidification changes that are expected to occur in the oceans as a result of climate change," said Chris Langdon, UM Rosenstiel Professor and Director of the Coral Reefs and Climate Change Laboratory. "These findings will allow us to better predict the future composition of coral reef communities under the current "business-as-usual scenario."

The results showed that calcification dramatically declined at extremely high levels of CO2 but not at mid-elevated levels, which led the study's authors to suggest that tropical gorgonian corals may be more resilient to the future levels of ocean acidification expected to occur during this century. Gorgonian corals form complex structures that provide essential

habitat for other important reef-dwelling organisms.

Based upon studies of encrusting coralline algae and echinoderms, scientists have suggested that corals with skeletons formed by high-magnesium calcite may be more susceptible to the impacts of ocean acidification than aragonite-depositing corals. This is the first study to find that not all high-magnesium calcite-secretors, such as soft corals, are more susceptible than aragonite secretors, such as stony reef-building corals.

The absorption of carbon dioxide by seawater, which results in a decline in pH level, is termed ocean acidification. The increased acidity in the seawater is felt throughout the marine food web as calcifying organisms, such as corals, oysters and sea urchins, find it more difficult to build their shells and skeletons making them more susceptible to predation and damage. According to the IPCC 5th Assessment Repot, year 2100 projected changes in surface ocean chemistry compared to preindustrial values are expected to fall by 0.14 to 0.43 units depending on whether there is global effort to sharply curtail emission or if emissions continue to increase each year.

The paper, titled "Reponses of the tropical gorgonian coral Eunicea fusca to ocean acidification conditions," was published in the online first version of the journal *Coral Reef*. link.springer.com/article/10.1 … 07/s00338-014-1241-3

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