

Elevated water temperature and acidity boost growth of key sea star species

June 1 2009

New research by zoologists at the University of British Columbia indicates that elevated water temperatures and heightened concentrations of carbon dioxide can dramatically increase the growth rate of a keystone species of sea star.

The study is one of the first to look at the impact of [ocean acidification](#) on marine invertebrates that don't have a large calcified skeleton or external shell, and challenges current assumptions about the potential impact of [climate change](#) on marine species.

The findings were published online this week in the [Proceedings of the National Academy of Sciences](#).

In the lab, UBC researchers led by Rebecca Gooding manipulated water temperatures and CO₂ levels in sea water tanks containing juvenile Purple Ochre Sea Stars (*Pisaster ochraceus*), a species found along much of North America's Pacific Coast.

An increase in temperature of just three degrees and doubling of CO₂ concentrations enabled the sea stars to grow almost twice as fast as they normally would over a period of 10 weeks.

"This means the sea stars could potentially reach adulthood in about half the time it would typically take -- and consume more mussels, their main diet, at much higher rates," says Gooding, a PhD student in the Department of Zoology working under the supervision of UBC Asst.

Prof. Christopher Harley.

At the end of the period, sea stars reared in warmer, more acidic waters weighed 17 grams, compared to control sea stars that weighed an average of only 11 grams. In contrast, existing studies suggest that an increase in temperature and CO₂ levels hinder growth in most species studied so far—usually more calcified species.

"This complicates current assumptions. It looks like increased CO₂ may not have negative effects on all marine invertebrates, suggesting that predicting the impact of climate change should consider how different organisms respond to changing climatic variables."

The Purple Ochre Sea Star is a coldwater species of sea star that can be found anywhere from Alaska to Baja California. It is most commonly found in the northeastern Pacific. They can actually range in color from purple to orange to brown and have five rays that can range in length from 10 to 25 centimetres.

They are considered a keystone species—a species that exerts a disproportionate effect on their ecosystem by preying on other animals.

Source: University of British Columbia ([news](#) : [web](#))

Citation: Elevated water temperature and acidity boost growth of key sea star species (2009, June 1) retrieved 25 April 2024 from

<https://phys.org/news/2009-06-elevated-temperature-acidity-boost-growth.html>

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