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Acid lover.
E. huxleyi seems to be weathering dropping pH levels in the world's oceans.

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Surviving the Ocean Acid Test

By Phil Berardelli
*Science*NOW Daily News
17 April 2008

Despite dire warnings about the dangers of carbon dioxide ($C0_2$) buildup in Earth's atmosphere, the phenomenon may harm some residents of the ocean less than others. Researchers have found that one species of plankton seems to thrive on ocean changes due to increased CO_2 content. The study serves as a reminder that nature can be more adaptive and resilient than expected when facing environmental challenges--although what those adaptations will mean for marine ecosystems remains an open question.

The buildup of CO_2 in Earth's atmosphere, which leads to global warming, has marine scientists just as worried as terrestrial specialists. That's because the seas eventually will absorb up to one-third of that CO_2, resulting in a drop in pH levels and ocean acidification. An increase in the acidity interferes with the ability of certain marine creatures to synthesize calcium carbonate, which they need to form shells (*Science*NOW, 18 February).

Some ocean creatures fare better than others in an increasingly acidic bath. An international team of biologists has found a species of microscopic plankton that seems to have shrugged off acidification and whose population has been thriving through the entire industrial age. The phytoplankton, *Emiliania huxleyi*, is one of the foundations of the ocean food chain.

E. huxleyi just can't seem to get enough CO_2. In lab experiments, the team, led by biological oceanographer M. Debora Iglesias-Rodriguez of the University of Southampton in the U.K., piped in bubbles of CO_2. Starting with pre-industrial levels, they ramped up the concentrations to double the current average for seawater. The researchers had expected that the increased acidity would put a damper on *E. huxleyi*, but the tiny creatures took it in stride. They actually boosted their rate of reproduction, the team reports in the 18 April issue of *Science*. "I was surprised," Iglesias-Rodriguez says. In fact, the *E. huxleyi* cells in the wild have probably increased their mass by 40% over the past 200 years, the team estimates.

The remaining question, Iglesias-Rodriguez says, is whether *E. huxleyi* could act as a

sink for excess carbon in the oceans. On the one hand, the plankton engage in photosynthesis, consuming CO_2 in the process. On the other, when they make their shells of calcium carbonate, they also release CO_2. Based on the team's experiments that replicate CO_2 conditions, she doubts the plankton will tip the balance.

Other experiments with *E. huxleyi* have not seen increased calcification, notes chemical oceanographer Richard Feely of the U.S. National Oceanic and Atmospheric Administration's Pacific Marine Environmental Laboratory in Seattle, Washington, so it might be that the plankton species has varieties that react differently to increased acidity. Or perhaps factors such as the nutrient or iron content of the water play a part, he says. Marine biogeographer John Guinotte of the Marine Conservation Biology Institute in Bellevue, Washington, says that the study represents "good news and a rarity in the often sobering discussions" about the challenges to marine organisms by ocean acidification. "Nature is full of surprises," he adds.

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