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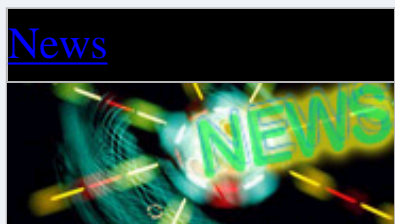
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Press Release 14-011
 New sea anemone species discovered in Antarctica

ANDRILL team finds *Edwardsiella andrillae* sea anemones burrowed in underside of Ross Ice Shelf



A new species of sea anemone living in the underside of the Ross Ice Shelf, Antarctica.

[Credit and Larger Version](#)

January 16, 2014

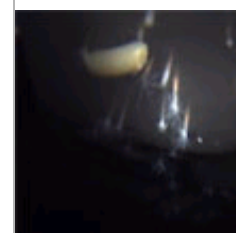
For b-roll of this discovery, please contact Dena Headlee at (703) 292-7739 or dheadlee@nsf.gov.

National Science Foundation (NSF)-funded



The remotely operated vehicle, SCIN (Submersible Capable of under Ice Navigation and Imaging)

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New species sea anemone discovered by NSF scientists in Antarctica

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researchers from the University of Nebraska-Lincoln, while using a camera-equipped robot to survey the area under Antarctica's Ross Ice Shelf, unexpectedly discovered a new species of small sea anemones that were burrowed into the ice, their tentacles protruding into frigid water like flowers from a ceiling.

"The pictures blew my mind, it was really an amazing find," said Marymegan Daly, a specialist in sea anemones at Ohio State University, who studied the specimens retrieved by scientists and engineers with the NSF-funded Antarctic Geological Drilling (ANDRILL) Program's Coulman High project.

The team made the astonishing discovery of thousands upon thousands of the small anemones.

The new species, discovered in late December 2010, was publicly identified for the first time in an article published last month in *PLOS ONE*, an open-access, peer-reviewed journal published by the Public Library of Science.

Though other sea anemones have been found in Antarctica, the newly discovered species is the first reported to live in ice. They also live upside down, hanging from the ice, compared to other sea anemones that live on or in the seafloor.

The white anemones have been named *Edwardsiella andrillae*, in honor of the ANDRILL Program.

Scott Borg, who heads the Antarctic Sciences Section in NSF's Division of Polar Programs, noted that the discovery indicates how much remains both unknown and

unexplored by scientists, even after more than 50 years of active U.S. research on the Southernmost continent

"It is an absolutely astonishing discovery--and just how the sea anemones create and maintain burrows in the bottom of the ice shelf, while that surface is actively melting, remains an intriguing mystery," he said.

"This goes to show how much more we have to learn about the Antarctic and how life there has adapted."

NSF is responsible for managing all scientific research and logistics of the U. S. Antarctic Program on the Antarctic continent and in the Southern ocean.

The discovery was "total serendipity," said Frank Rack, executive director of the ANDRILL Science Management Office at the University of Nebraska-Lincoln. "When we looked up at the bottom of the ice shelf, there they were."

Scientists had lowered the robot--a 4.5-foot cylinder equipped with two cameras, a side-mounted lateral camera and a forward-looking camera with a fish-eye lens--into a hole bored through the 270-meter-thick shelf of ice that extends over 600 miles northward from the grounding zone of the West Antarctic Ice Sheet into the Ross Sea.

Their research mission, funded by NSF with support from the New Zealand Foundation for Research, was to learn more about the ocean currents beneath the ice shelf to provide environmental data for modeling the behavior of the ANDRILL drill string (a length of pipe extending through the water column and into the sea floor through which drilling fluids are circulated and core samples are retrieved), Rack said. They didn't

expect to discover any organisms living in the ice, and surely not an entirely new species.

Rack, who is U.S. principal investigator for the environmental surveys that were conducted as part of the international ANDRILL Coulman High project, had left the site via helicopter just prior to the discovery. He was listening by radio when he heard the report from the robot deployment team, composed of engineers Bob Zook, Paul Mahecek and Dustin Carroll, who began shouting as they saw the anemones, which appeared to glow in the camera's light.

"People were literally jumping up and down with excitement," Rack said. "They had found a whole new ecosystem that no one had ever seen before."

"What started out as an engineering test of the remotely operated vehicle during its first deployment through a thick ice shelf turned into a significant and exciting biological discovery," he said.

In addition to the anemones, the scientists saw fish who routinely swam upside down, the ice shelf serving as the floor of their submarine world, as well as polychaete worms, amphipods and a bizarre little creature they dubbed "the eggroll", a four-inch-long, one-inch-diameter, neutrally-buoyant cylinder, that seemed to swim using appendages at both ends of its body, which was observed bumping along the field of sea anemones under the ice and hanging on to them at times.

The anemones themselves measured less than an inch long in their contracted state-- though they get three to four times longer in their relaxed state, Daly said. Each features

20 to 24 tentacles, an inner ring of eight longer tentacles and an outer ring of 12 to 16 tentacles.

After using hot water to stun the creatures, the team used an improvised suction device to retrieve the animals from their burrows. They were then transported to McMurdo Station for preservation and further study.

Because the team wasn't hunting for biological discoveries, they were not equipped with the proper supplies to preserve the specimens for DNA/RNA analyses, Rack said. The specimens were placed in ethanol at the drilling site and some were later preserved in formalin at McMurdo Station.

Many mysteries remain about the creatures, the scientists report. Though some sea anemones burrow into sand by using their tentacles or by expanding and deflating the base of their body, those strategies don't seem feasible for hard ice. It is also unclear how they survive without freezing and how they reproduce. There is no evidence of what they eat, although they likely feed on plankton in the water flowing beneath the ice shelf, Daly said.

Rack said a proposal is being prepared for further study of this unusual environment, using a robot capable of exploring deeper in the ocean and further from the access hole through the ice. NASA is helping to finance the development of the new underwater robot because the Antarctic discoveries have implications for the possibility of life that may exist on Europa, the ice-covered moon of Jupiter. He said researchers hope to return to Antarctica as early as 2015 to continue studying the sea anemones and other organisms beneath the ice shelf.

-NSF-

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The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering. In fiscal year (FY) 2014, its budget is \$7.2 billion. NSF funds reach all 50 states through grants to nearly 2,000