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DEEP SEA TUBE WORMS SURVIVE IN CAPTIVITY

Twenty-nine bright red tube worms from the bottom of the ocean are alive and thriving in a lab at the University of California, Santa Barbara.

Until now, the giant hydrothermal vent tube worms have never lived for more than a few days once they have been removed from their natural habitat at the edge of hot, boiling vents on the ocean's floor.

The 29 worms are in the lab of James Childress, professor of zoology at UCSB, and an authority on the organisms that live around vents on the ocean bottom. Childress has studied vent tube worms since they were first discovered in 1977.

All but one of the new collection of tube worms, called *riftia pachyptila*, have survived for more than a month in the lab, and are expected to live indefinitely. Water temperature appears to be a key factor in keeping the worms alive.

Previously, scientists kept the worms in cold water, like the icy cold water of the deep ocean. Researchers now believe that the worms require a warmer habitat since the hot water of the vents contributes to a zone of mixed water of moderate temperature.

In fact, the worms appear to be most comfortable at a tepid 80 degrees.

"They like water to be warm like we do; bathtub temperature," said Peter Girguis, a graduate student who has been monitoring the worms since they were collected.

The worms are being kept in ocean water with hydrogen sulphide pumped in to make the environment similar to that of a deep ocean vent. This gas, which is poisonous to most forms of life, provides food to the bacteria that live in the worms. The worms survive by periodically feeding on the bacteria.

So far, the exotic worms appear to be happy in the lab. They are growing new tube, the white casing that they create as housing. The worms are lengthening as well. In the ocean, the worms grow from a few millimeters to more than two feet.

To collect the worms, researchers used Alvin, a small research submarine with robotic arms. They traveled 2.5 miles to the bottom of the ocean to collect the worms which were living under the pressure of two tons per square inch.

They were found at hydrothermal vent sites along a deep ocean rift called the East Pacific Rise. Alvin's robotic arm was used to collect the worms and put them into a thermally insulated box. Back on the ship, the worms were immediately transferred to pressurized containers.

On Christmas day, the worms were transferred to another pressurized container in a lab at UCSB where they have been thriving ever since. According to Childress, they are the only such vent worms to survive away from their natural habitat.

A number of experiments are planned for the worms, as well as for the bacteria that live in symbiosis with them. If the worms continue to live as expected, then scientists from around the world will be able to conduct experiments on the animals at UCSB, rather than having to go on a research cruise to collect them.

About UC Santa Barbara

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