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When it comes to deep-sea worms, some like it hot

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CBC News

Biologists have found deep-sea worms that prefer to live in water at 50 C, the highest temperature preference ever recorded in an animal.

The worms, *Paralvinella sulfincola*, live near deep-sea vents at the bottom of the Pacific Ocean off the coast of Washington state.

The water directly adjacent to the vents is too hot for animal life, but bacteria can grow in lush mats, feeding off sulphurous chemicals coming out of the thermal vents.

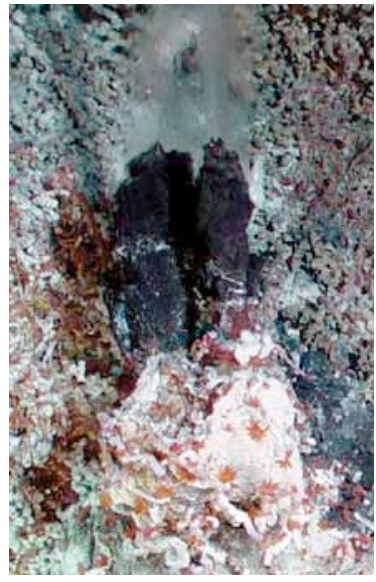
The worms are the only animals found that can feed off these bacterial mats.

The thermal vents jet out liquid water at temperatures up to 350 C. Because the water at the bottom of the Pacific is under such high pressure, the water becomes super-heated and doesn't convert to water vapour.

The water surrounding the vents is just a few degrees above freezing, so the water goes from very hot to very cold in a short distance.

That temperature gradient makes it difficult to measure how hot the water is where the worms live. So Peter Girguis, a Harvard biologist, and Raymond Lee of Washington State University took worm specimens from the ocean and put them into a high-pressure aquarium.

They set up a temperature gradient in the aquarium, from 20 C at one end to 61 C at the other, and let the worms choose where to live.



A thermal vent chimney, about 35 centimetres tall, at the bottom of the Pacific Ocean is surrounded by white bacterial mats and the worms feeding on them. The worms' orange, star-shaped gills can be seen. (Photo courtesy of W. Chadwick/National Undersea Research Program and Monterey Bay Aquarium Research Institute)

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The worms migrated to the section of the tank corresponding to 45 C to 55 C and stayed there for several hours. The researchers reported their findings in this week's issue of Science.

"Unlike many animals found in hot habitats, which merely tolerate extreme temperatures, these worms actually prefer temperatures around 50 C," Girguis said in a statement.

Other animals that live in hot environment have died fairly quickly when put in such an experiment. In a previous study on desert fire ants, all of the specimens died within one minute of exposure to an air temperature of 55 C, although the ants will briefly brave such heat to find food in the wild.

The researchers speculate that the worms evolved to prefer higher temperatures because of their unique diet. They needed to endure as high a temperature as possible to eat the heat-loving bacteria.

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