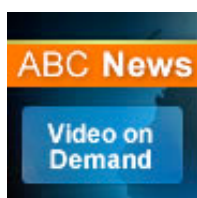


[ABC Home](#)[Radio](#)[Television](#)[News](#)[...More Subjects](#)[News Home](#)[Top Stories](#)[Just In](#)[World](#)[Australia/Local](#)[Business](#)[Politics](#)[Weather](#)[Sport](#)[Health](#)[Arts](#)[Sci-Tech](#)[Environment](#)[Rural](#)[Indigenous](#)[Offbeat](#)[In-Depth](#)[Forums](#)[Services](#)[Help/Site Map](#)



Last Update: Friday, April 14, 2006.
7:09am (AEST)

[Print](#) [Email](#)



Heat seekers: The worms live a temperatures deadly to other animals.

Undersea worms thrive on heat

A species of worm that thrives on undersea hot-water vents prefers the hottest water possible, choosing to live at

temperatures that kill other animals, researchers say.

Their unique abilities to withstand hot water shooting like a geyser from hydrothermal openings may help the stalk-like worms prey on bacteria that other animals cannot reach, the researchers report in the journal *Science*.

Peter Girguis, of Harvard University in Massachusetts, and Raymond Lee, of Washington State University, say the tiny worms, known scientifically as *Paralvinella sulfincola*, chose water heated to 50 degrees Celcius.

The worms sometimes make brief forays into water as hot as 55 degrees Celcius.

"To our knowledge, every other vent organism down there dies at temperatures way below 50 and 55 [degrees]," Mr Girguis said.

The worms live on underwater vents found at depths of 2,200 metres off the Pacific coast of Washington.

They are studied and collected using submarines such as the deep-sea ALVIN submersible, or robots.

They belong to a group known as polychaetes and build tubes made out of mucus but can move around freely.

They resemble tiny red palm trees with frond-like red gills.

Many different animals live on the deep undersea vents, not merely tolerating the sulfur, heat and pressure but thriving in it.

They eat the bacteria that can live in much higher

ABC Top Stories

- [PM stands by Papuan visa decision](#)
- [Firefighters battle Moorabbin factory blaze](#)
- [Qld emergency crews say they're ready for cyclone Monica](#)
- [Labor's family tax benefit plans just the beginning, says PM](#)
- [Israel strikes Palestinian factory](#)
- [Scientists develop motor neurone test](#)
- [Brooks wins Pulitzer prize](#)
- [Cosgrove, Dorey receive one-day call-ups](#)

temperatures than more complex animals.

Thermal test

The water pours out of the vents at temperatures far above the boiling point but it quickly cools in the chilly sea water.

Because of the conditions, it is difficult to know precisely which temperatures the animals can tolerate, but Mr Girguis and Mr Lee set up a unique experiment.

"We wanted to see what temperatures the worms preferred and what temperatures they could survive," Mr Girguis said.

They built a special pressurised aquarium, with a heating element on one end and a cooling element on the other.

This created a thermal gradient, with water ranging in temperature from 20 degrees C to 61 degrees C.

They then threw the worms in.

"What happened really kind of shocked us, which is they all very quickly moved when we imposed the thermal gradient," Mr Girguis said.

"They just picked up and went."

He says it "was like they were having a little conference" in the hotter water.

Fine line

The worms survived for as long as seven hours at 50 degrees C, and would spend as long as 15 minutes at 55 degrees C.

Water of 60 degrees C killed them.

These temperatures are far hotter than anything most animals can survive.

Other researchers have found desert fire ants die at 55 degrees Celcius.

Desert air is often hotter but water conducts heat much more efficiently than air does.

Mr Girguis says the experiment has answered a key question about the physiology of the worms.

The cells of complex animals all rely on structures called mitochondria, which provide power to the cells.

Mr Girguis says mitochondria start to break down at temperatures of 50 to 55 degrees Celcius.

The worms may skate on the borderlines of this limit but do not break it.

They almost certainly have multiple other adaptations, he

says, including heat-tolerant enzymes in their cells.

- **Reuters**

© 2006 ABC | [Privacy Policy](#)

This service may include material from Agence France-Presse (AFP), APTN, Reuters, CNN and the BBC World Service which is copyright and cannot be reproduced.

AEST = Australian Eastern Standard Time which is 10 hours ahead of UTC (Greenwich Mean Time)