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Some worms like it really hot

17/04/2006 17:19 - (SA)

Washington - 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, American researchers reported on Thursday.

The worm's 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 findings of researchers Peter Girguis of Harvard University, and Raymond Lee of Washington State University, were published in the journal Science.

The tiny worms, known scientifically as Paralvinella sulfincola, chose water heated to 50 degrees Celcius, and made brief forays into water as hot as 55 degrees.

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

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.

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

'What happened shocked us'

They eat the bacteria that can live in much higher temperatures than more complex animals.

Girguis and Lee conducted an experiment to see what temperatures the worms preferred and what temperatures they could survive in.

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 from 20 degrees to 61 degrees Celcius.

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

"They just picked up and went.

"It was like they were having a little conference."

The worms survived for seven hours at 50 degrees, and spent as long as 15 minutes at 55 degrees Celcius. Water of 60 degrees killed them.

Most animals cannot survive hot

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

Girguis said the experiment 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.

Girguis said 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 said, including heat-tolerant enzymes in their cells.

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