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## Heat-loving microbe expands limits of life

By MIKE TONER  
The Atlanta Journal-Constitution

A newly discovered microbe thrives at temperatures higher than scientists thought possible -- raising the limits at which life might survive deep inside the Earth, or on other planets.

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The hardy bacterium was recovered from a deep hot-water vent in the Pacific Ocean, and it likes things hot -- so hot that it is undaunted by 10 hours of exposure to the 250-degree heat in autoclaves used by laboratories and hospitals to sterilize equipment.

Even the scientists who discovered the new bug were astonished by its unusual resilience. The research was reported Thursday in the journal *Science*.

"We subjected it to temperatures that are generally expected to kill all life, but these just kept right on going," said University of Massachusetts microbiologist Derek Lovely.

The bugs withstood sustained laboratory temperatures as high as 266 degrees Fahrenheit -- higher than any other known form of life -- and were still able to reproduce. Researchers say some organisms may survive even higher temperatures.

Lovely said the microbes pose no public health concern. They're not infectious, and their ability to adapt to such extreme heat comes at a price. At room temperatures in which common bacteria thrive, they are dormant.

Scientists long assumed that the structure of cells disintegrated at temperatures not too far above the boiling point of water. But the newly discovered bugs are well adapted to the inhospitable world of the black smokers, chimneys formed around deep-sea vents, where water heated to hundreds of degrees emerges from Earth's interior -- and where iron and other minerals serve the life-sustaining functions that oxygen provides in more benign environments.

Some microbiologists believe such organisms may be just a sample of bacteria that thrive, without light or oxygen, deep in Earth's crust. Simple forms of life may extend many miles below the surface, with a mass greater than the total of all organisms on Earth's surface and in the oceans, some biologists say.

Growing interest in what researchers call "extremophiles," life forms that can tolerate extremes of temperature, aridity, salinity or darkness, is shaping current thinking about where life might exist in the solar system -- perhaps buried beneath the surface of Mars, or sealed beneath the icy crust covering some of Jupiter's moons.

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