

NASA discovers arsenic-fed life form

Rich Heffern | Dec. 3, 2010 Eco Catholic

NASA has discovered a new life form that can grow by substituting arsenic for phosphorus, redefining the agency's search for different life forms other than the ones known on Earth.

The discovery was made by astrobiologists who performed tests by taking mud from Mono Lake -- a body of water in Northern California three times as salty as the ocean -- which has high arsenic content, said Felisa Wolfe-Simon, a NASA astrobiology research fellow with the U.S. Geological Survey, during a press conference Dec 2.

"(The microbe) is building itself out of arsenic, she said "All life we know is the same biochemically, and this is a little different. It is suggesting there is another way to be alive."

Felisa Wolfe-Simon led researchers from eight federal and university laboratories conducting the experiment. "The researchers conceded that the odd microbes, in and of themselves, don't prove yet that there is a fundamentally different basis for life on Earth. "It is beginning to open the door a crack to possibilities," Wolfe-Simon said.

Researchers created an environment that had everything else a typical life form that exists on earth would need to survive, except for phosphorus - which is one of the building blocks of all existing life forms. Instead, they used arsenic -- normally a toxic element to existing life forms -- to replace phosphorus, she said.

Before the discovery, the six major elements thought essential for life were carbon, hydrogen, nitrogen, oxygen, phosphorus and sulfur -- now add arsenic.



Bill Nye, executive director of the Planetary Society, said: "If you or I

ingest arsenic, well -- it doesn't go so well. So, if we can discover arsenic-loving bacteria right under our noses in such a well-researched place as Mono Lake, who knows what else is out there, on our world or somewhere far, far away?"

"Note that arsenic is immediately below phosphorus on the Periodic Table of the Elements. Perhaps you remember the silicon-based creature called horta in the original Star Trek series. The idea was that silicon is right below carbon in the periodic table; they are in the same chemical period. While swapping silicon for

carbon is probably not a possibility, this is the same concept -- except that it's science, not science fiction. Arsenic is highly toxic to living things like us, but, chemically, it behaves in a similar way to phosphate.?

Not only do these organisms live in an extreme environment, they are an extreme life form.

?Who knows what other organisms are right under our noses that have perhaps taken it yet another step? They might not even use DNA at all. They could be an entirely different type of life. If these arsenic-lovers can be discovered in such a well-researched lake, who knows what else is out there, on our world or somewhere far, far away? This kind of research is an adventure. It helps us appreciate the remarkable nature of life on Earth. It helps us know our place in space. We at the Planetary Society will keep searching and encourage people everywhere to support this kind of research.?

This discovery enhances the probability of life existing elsewhere in the universe, showing how life can exist in many different forms.

Next week on the Eco Catholic blog, we interview Douglas Vakoch of the SETI (Search for Extraterrestrial Intelligence) Institute in Mountain View, Calif. SETI is part of an ongoing search for evidence of life and intelligence elsewhere in the universe.

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