

Surviving the Tough Life

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University of Arkansas researchers have shown that methane-producing microorganisms can survive for up to 25 days without water, which might make such creatures even more likely candidates for the type of life that could be found on Mars.

Tim Kral, professor of biological sciences in the J. William Fulbright College of Arts and Sciences, and honors student Michael Kendrick will report their findings today, May 23, at the American Society for Microbiology annual meeting in Orlando, Fla.

For years Kral has studied methanogens, ancient microorganisms from the biological kingdom Archaea, as potential candidates for what life might look like on Mars. Methanogens produce methane and live in anaerobic environments, such as the guts of animals, in deep parts of the ocean or in the Earth's crust. Kral has grown the microorganisms on Mars soil simulant under some of the conditions of temperature and pressure found on Mars. His experiments with Kendrick tested yet another parameter for the possible growth of such creatures on the red planet.

"Mars is very dry, at least on the surface," Kral said. "So the question for us was how would methanogens on Earth handle periods of dryness."

Kendrick and Kral grew different methanogen species on Mars soil simulant in anaerobic culture, then transferred the soil simulant containing the microorganisms from these tubes into beakers, which were left in a desiccator in the anaerobic chamber. Every day thereafter,

Kendrick would remove a beaker from the desiccator, transfer the soil to a test tube, add buffer, anaerobically seal the tubes, and incubate them under the organism's ideal growth conditions.

"We were looking to see if anything had survived," Kral said. The researchers tested for methane production, an indicator of the microorganisms' survival.

Two species of methanogens produced methane up to 25 days later, while another species produced methane up to 10 days later, the researchers report.

"What that means is at least two of these organisms could survive almost a month" in extremely arid conditions, Kral said. "This is an important addition to our knowledge base."

The next step would be to look at desiccation at reduced pressure and temperatures to re-create more of the environment found on Mars.

Kral has a new planetary environmental chamber that will be devoted to the methanogen research that will be up and running in the near future through the Arkansas Center for Space and Planetary Sciences.

Source: University of Arkansas

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