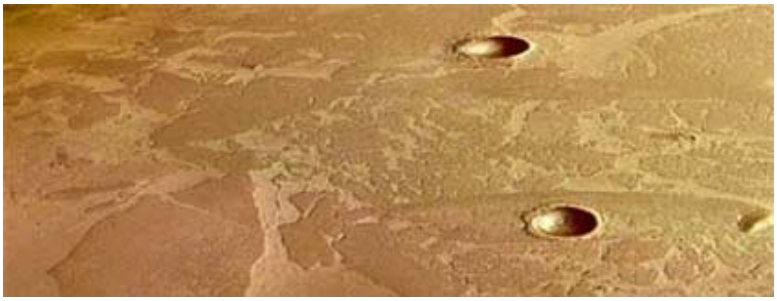
DESERT HOPPING FOR METHANE

Work Bolsters Life on Mars Theories 1.11.2005

A Keck School scientist and his collaborators are the first to find methane-producing bacteria in arid desert soils, providing a springboard for future experiments on the distant planet.
By Lori Oliwenstein



"Methane-producing organisms are the ones most likely to be found on Mars," noted Joseph Miller, associate professor of cell and neurobiology in the Keck School and one of the study's lead researchers. "And, in fact, methane was detected on Mars last year."

Evidence of methane-producing organisms can be found in inhospitable soil environments much like those found on the surface of Mars, according to experiments undertaken by scientists and students from the Keck School of Medicine of USC and the University of Arkansas and published online in the journal Icarus.

The results, they said, provide ample impetus for similar "biodetection experiments" to be considered for future missions to Mars. Methane is considered to be a biological signature for certain living organisms that metabolize organic matter under conditions of low or no oxygen.
Terrestrial methanogens (methane-producers) are typically found in environments largely protected from atmospheric oxygen, such as peat bogs, oceanic methane ices and anoxic levels of the ocean. But they previously had not been detected in an arid desert environment.

To see if methane could be found in Mars-like soil, the investigators collected soil and vapor samples from the arid environment of the Mars Desert Research Station in Utah and

arid	vyprahlý
soils	zeminy
springboard	odrazový můstek
to be found	být nalezeno
inhospitable	nehostinný
environments	životní prostředí
ample	dostatečný
impetus	podnět
considered	považovaný
signature	znamka, podpis
peat bogs	rašeliniště
collected	shromáždili
vapor	pára
sample	vzorek
showed	ukazaly
similarly	podobně
addition	přidání
growth medium	růstové prostředí
give off	vypouštet (páru)
circadian	denní
appeared	zdál se být
nutrient	výživný
proof	důkaz
might	mohly by
warrants	zaručuje
regolith	pokryvná hornina
bode	předvídat

then compared them with vapor samples taken from the Idaho High Desert and soil samples from Death Valley, the Arctic and the Atacama desert in Chile.

Three of five vapor samples from the Utah site showed the presence of methane; there was no methane found in any of the vapor samples from Idaho. Similarly, while five of 40 soil samples from Utah produced methane after the addition of growth medium to the samples – indicating that the methane was being given off by a biological organism, most likely a bacterium – none of the other soil samples showed signs of methane production.

Finding methane in the Utah desert is no guarantee that methane-producers exist on Mars, said Miller, who previously has analyzed data from the Viking Lander missions and found that soil samples taken in the 1970s from the Martian surface exhibited a circadian rhythm in what appeared to be nutrient metabolism, much like that present in terrestrial microbes.

However, Miller said, this recent experiment does provide "proof of principle [in that] it improves the case that such bacteria can and might exist on the Martian surface." And, he added, that surely warrants further investigation during future missions to Mars.

In conclusion, the researchers wrote, "The detection of methane, apparently of biological origin, in terrestrial desert regolith bodes well for future biodetection experiments in at least partially analogous Martian environments."

"I think the ingredients of the [martian] biosphere should be martian. That would be the most interesting situation." -Chris McKay Credit: University of Arizona

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Připravila Tereza Šedivcová
Anglický list vychází jako příloha Bílého trpaslíka, zpravodaje Amatérské prohlídky oblohy