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Mars Soil Resembles Veggie-Garden Dirt, Lander Finds

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Soil near the north pole of Mars is surprisingly Earthlike, with a pH not unlike many vegetable gardens, according to preliminary results from the Phoenix Mars Lander.

"You might be able to grow asparagus in it, but strawberries, probably not very well," said Samuel Kounaves, a chemistry professor at Tufts University, during a NASA press conference this afternoon.

Previous data from the two rovers exploring Mars's equatorial zones had suggested that the geochemistry on the red planet might have been too acidic to support most forms of Earth-type life.

But as little as an inch (2.5 centimeters) beneath the surface, dirt from Mars's arctic plains proved to be very similar to alkaline soils on Earth, with a pH between 8 and 9. The pH scale goes from 0 (acidic) to 14 (alkaline).

The finding is good news in the hunt for signs that Mars was or could now be habitable.

"This means there is a broader range of organisms that can grow [in it]," said Kounaves, who works with the lander's Microscopy, Electrochemistry, and Conductivity Analyzer (MECA).

"But Mars is a huge place, whose soils might differ radically from spot to spot," Kounaves said. "We have to remember that we're looking at tiny areas."

Shake and Bake

The MECA team also found that the soil contains magnesium, sodium, potassium, and chloride.

While these are all key nutrients, the tests don't reveal everything needed for life.

For example, the test looked only at inorganic nutrients, not organic compounds, and it didn't look at all of the dozens of potentially important trace nutrients.

Still, said MECA team leader Michael Hecht of NASA's Jet Propulsion Laboratory, "it's a huge step forward."

Scientists at the briefing also announced the first results from the craft's Thermal and Evolved-Gas Analyzer (TEGA).

This instrument bakes soil samples to temperatures as high as 1,800°F (1,000°C) and "sniffs" the gases they release. (Read more about the Phoenix lander's onboard instruments.)

The team reports that heat caused the sample to emit water vapor, indicating that the soil has water-containing minerals.

"This is what we were hoping to see," said TEGA leader William Boynton of the University of Arizona.

"The soil sample clearly has interacted with water in the past," Boynton said—but how long ago that happened is still an open question.

Getting data at all was a welcome relief for the TEGA team, which has been plagued by technical difficulties.

The researchers were taken by surprise when the soil they collected turned out to be very clumpy and unable to

easily fall through a screen and into the instrument.

Vibrating the screen for extended periods of time eventually sent the soil through, but it also seems to have created a short circuit in some of the instrument's wiring.

Luckily the short was in a part of the instrument that has now completed its test, allowing it to be shut down.

To prevent additional shorts, the team has revised the protocol so that it reduces the amount of shaking.

The arm now sprinkles its samples rather than just dropping them into the instrument, Boynton said.
