

Water Bears to Travel to Martian Moon, Test Theory of Transpermia

13 October 2009, by Lisa Zyga



(Left) The BioModule will carry 30 samples, and have a mass of 100 grams. Credit: Bruce Betts/The Planetary Society. (Right) Water bears have already shown that they can survive vacuum conditions and intense radiation. Credit: Bob Goldstein.

(PhysOrg.com) -- Tiny microscopic creatures commonly known as water bears (also called Tardigrades), along with a few other life forms, will be sent to the Martian moon Phobos to test whether organisms can survive for long periods of time in deep space. The mission, called the Living Interplanetary Flight Experiment (LIFE), was originally going to be launched earlier this month, but it has been delayed due to safety and technical issues. Currently, the scientists hope to launch the specimens on the Russian Phobos-Grunt spacecraft in 2011, the next time that the orbits of Earth and Mars offer a launch window.

The LIFE experiment is being developed by The Planetary Society, a publicly supported organization founded in part by Carl Sagan that now has 125 member countries. The researchers will send 10 individual organisms (three of each, for a total of 30 samples) from all three domains of life - bacteria, eukaryota, and archaea - along with some native soil samples to Mars' largest moon on the three-year mission. According to the scientists, the experiment will test part of the theory of transpermia, specifically investigating life's ability to move between planets. In an earlier experiment in 2007, water bears flew on a spacecraft and survived the major hardships of radiation and the

vacuum.

In 2011, the life forms will be packed up inside a puck-like container called a BioModule with a total mass of 100 grams, which is designed to resemble a [meteorite](#) that may have carried earlier life forms between planets. After the 10-month journey to Phobos, the specimens will undergo a 4,000-g impact on the moon's surface, spend a few weeks there in their sealed containers, and then return to Earth on board a robotic interplanetary lander that would crash-land in Kazakhstan. Scientists would then open the containers and see what was still alive.

"If no [microbes](#) survive, this does not necessarily rule out the possibility of transpermia, but it certainly calls it into question more," according to The Planetary Society's website. "But if some of the organisms do make it alive to Phobos and back, then at least we would know that some life could indeed survive an interplanetary journey over a three-year period inside a rock."

The experiment would mark the longest time that biological samples have spent in deep space; the Biostack 1 and 2 experiments, flown during the Apollo 16 and 17 missions to the moon, traveled outside the Earth's magnetosphere for about two weeks.

To prepare for the upcoming launch, the scientists had to overcome several challenges. They tested the BioModule's durability by violently vibrating the container while strapped to a shake table, and then shooting the container out of an air cannon to mimic the conditions it would undergo.

More information: [The Planetary Society: LIFE Experiment](#) and [FAQ](#)

via: [Wired](#)

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APA citation: Water Bears to Travel to Martian Moon, Test Theory of Transpermia (2009, October 13)
retrieved 2 December 2021 from <https://phys.org/news/2009-10-martian-moon-theory-transpermia.html>

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