

NASA study will help stop stowaways to Mars

August 29 2007

NASA clean rooms, where scientists and engineers assemble spacecraft, have joined hot springs, ice caves, and deep mines as unlikely places where scientists have discovered ultra-hardy organisms collectively known as ‘extremophiles’. Some species of bacteria uncovered in a recent NASA study have never been detected anywhere else.

According to Dr. Kasthuri Venkateswaran, who led the study conducted at NASA’s Jet Propulsion Laboratory in Pasadena, California, “These findings will advance the search for life on Mars and other worlds both by sparking improved cleaning and sterilization methods and by preventing false-positive results in future experiments to detect extraterrestrial life.”

NASA builds its spacecraft in rooms designed to minimize contamination by airborne particles because dust and its microbial passengers can foul instruments and invalidate experiments. If scientists someday find microbes on Mars, they will want to be sure they aren’t just hitchhikers from Earth.

Clean rooms used in the space program already undergo extensive cleaning and air filtering procedures, and the detection technology employed in this study will help NASA to develop and monitor improvements. Still, it is extremely difficult to eliminate all dust particles and microbes without damaging the electronic instruments the process is intended to protect.

Identifying and archiving clean-room microbes serves as an effective backup to the cleaning and sterilization efforts. Armed with a list of microbes that could possibly stow away on its spacecraft, NASA can disregard them if they turn up in future Martian samples.

As reported in *FEMS Microbiology Ecology*, a journal of the Federation of European Microbiological Societies, Venkateswaran's team used a technology known as ribosomal RNA gene-sequence analysis to detect bacteria in clean rooms at Kennedy Space Center, Johnson Space Center, and the Jet Propulsion Laboratory. This was the first time that this technology was applied to NASA clean rooms.

They found that both the total number of bacteria and the diversity of bacterial species were much higher than previously detected. This has implications not only for NASA and other space agencies, but also for hospital operating rooms and industries such as semiconductor manufacturing, where cleanliness and sterility are critical.

Clean rooms are considered extreme environments for microbes because water and nutrients are in extremely short supply. Nevertheless, some bacteria are able to survive on what little moisture the low-humidity air provides and on trace elements in the wall paint, residue of cleaning solvents, and in the spacecraft materials, themselves.

Source: Blackwell Publishing

Citation: NASA study will help stop stowaways to Mars (2007, August 29) retrieved 23 April 2024 from <https://phys.org/news/2007-08-nasa-stowaways-mars.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is

provided for information purposes only.