Why are microorganisms living 'so tough' on Earth but still hard to survive on Mars

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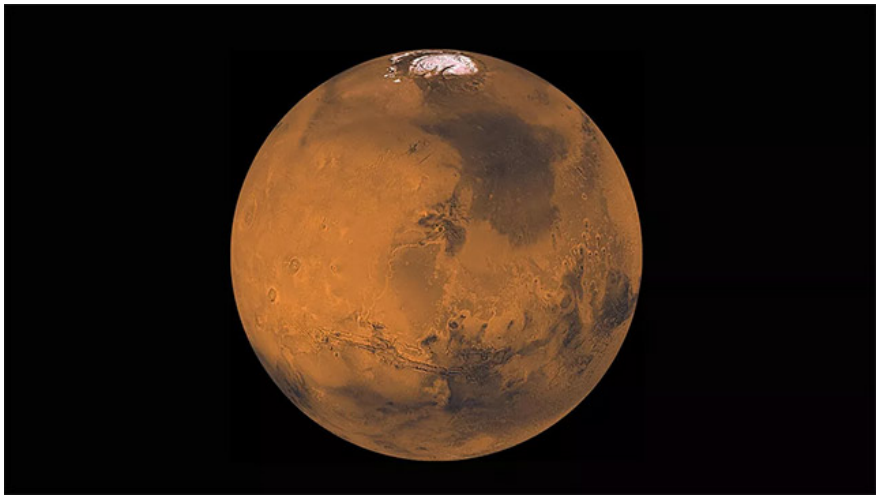
A new study conducted by NASA shows that microorganisms from Earth traveling to Mars through spacecraft are struggling to survive in the water holes on the Red Planet. This may be good news for mankind's expedition, because Mars will be less likely to be infected with Earth-borne bacteria hitchhiking on lander ships, making it difficult to analyze samples. of the scientists. Protecting planets like Mars or the Moon from bacterial invasion from Earth has been the goal of NASA and other aerospace agencies since the first days of human exploration.

So what makes the famous 'long-lived' microorganisms from Earth unable to reproduce on Mars?

Investigators from the United States Southwest Institute of Research (SwRI) have discovered that low temperatures and extremely dry conditions on Mars will cause water to freeze, boil or evaporate instantly. However, liquid water can still exist in deep pits in the ground, but has extremely high salinity. Computer analysis models show that such microscopic salt water pits can be scattered from the equatorial region to high latitude on Mars, for a short period of time every year, up to 6 hours each. day.



Mars

These pits contain water - the essential element needed for every creature to survive. However, their temperatures are still too cold for most of the life forms on Earth to survive and reproduce, not to mention the salinity of the water is also too high. The temperature in these salt water pits, according to calculations by the scientists, will not be higher than -48 degrees C (-55 degrees F). This temperature level is often considered to be the low (not ideal) limit for life.

Back to Earth. We see that life can also exist on the blue planet under a variety of harsh environments. In areas that are too hot, too cold, or too acidic, so that most organisms cannot survive, there will still be some 'transcendent' life forms that can survive. Even without light, extreme drought, or the ocean floor, life can still develop based on available resources.

Thermophiles (thermophilic bacteria) produce enzymes, even at extremely high temperatures. Such is the case with Pyrolobus fumari. The bacterium was discovered in a vents on the ocean floor during an expedition made in 1997, and they can survive temperatures up to 113 degrees C (235 degrees F). Even that harshness has recently been overtaken by a new species of bacteria called Strain 121, which exists at a depth of 2400m below the Pacific Ocean surface, at a vent called Faulty Towers. This species can live - and even breed - at temperatures up to 121 degrees C (nearly 250 degrees F).

At the opposite extreme, some studies have found bacteria that can survive at extremely low temperatures. For example, a bacterium called Colwellia psychrerythraea. They can survive as low as -196 degrees C (-320 F) - the temperature of liquid nitrogen.

Some unicellular organisms can also survive without oxygen. Even recently, researchers claim to have found the first multicellular organism to be able to live without air. Henneguya salminicola, a salmon parasite that can survive without oxygen.

Perhaps the most famous is the tardigrades, a microscopic life form that can survive for decades without food. Even this creature can overcome the distance 384,400km from Earth and land on the Moon by hitchhiking on the spaceship Beresheet.

1. These little creatures have crossed a distance of 384,400km from the earth and are landing on the moon

Water bear

Even in the Dead Sea, where salt contains eight times more salt than other oceans, the bacterium Haloarcula marismortui can survive and reproduce.

All the examples above show the magic of life. Organisms can adapt and mutate to survive in the harshest environments. However, Earth's extreme limits are still nothing compared to Mars.

Data on the Martian surface collected from Opportunity explorers show deposition of magnesium sulfate salts, possibly left over from ancient oceans on the Red Planet. This led researchers to believe that the waters on Mars could be so salty that life could not exist.

In the future, scientists will need more analytical data about the salinity of Mars to come to more concrete conclusions. However, this fact has also shown that the existence of life forms on Mars (including in the past) is very rare and far from life on Earth.