

The microbiome in desert lagoons may reflect early life on Mars

Microbiota in lagoons in the Puna de Atacama desert, Argentina, may reveal early life on Earth and Mars.

The crystal-clear lagoons and vast salt flats of the Puna de Atacama desert form an unusual ecosystem, researchers say, unlike anything they've ever seen.

Puna de Atacama is a large plateau located at an altitude of more than 3,660m above sea level, on the Argentine border with Chile. Here, the high altitude combined with dry conditions and bright sunlight combine to create a harsh environment where few animals or plants can survive.



Mounds of green stromatolites bloom at the bottom of the lagoon at Puna de Atacama, Argentina. Photo: Brian Hynek

This strange ecosystem was discovered through satellite images. It spans 10 hectares of desert and includes 12 shallow lagoons, surrounded by mountains. Under the surface of the lagoon, there are mounds about 4.6 meters wide, dozens of centimeters high and covered with green microorganisms.

According to researchers, these mounds reveal to us the early stages of life on Earth and possibly ancient life on Mars. Preliminary observations suggest these may be stromatolites – complex microbial communities whose secretions harden into layers of rock. Similar microbial communities were present during a period of Earth's history, the Archean, when the atmosphere did not have oxygen (4 billion to 2.5 billion years ago).

Today, stromatolites still form in marine and freshwater habitats, but in much smaller forms than ancient stromatolites. The mounds in Atacama Lagoon are similar in size to fossils found in Archean stromatolites, which were up to 6 meters tall. The Atacama stromatolites mainly contain gypsum, a mineral commonly found

in fossil stromatolites but not present in present-day stromatolites.

The researchers used rock hammers to crack the stromatolite structure, revealing the pink core. Photo: Brian Hynek

Researchers think these mounds grew from microorganisms. The structures are submerged in the lagoon's acidic, salty water and are heated by high radiation from the sun. They contain two types of bacteria, with layers of photosynthetic bacteria called cyanobacteria covering the outside, and a community of single-celled organisms called archaea growing at the core.

According to researchers, if life evolved on Mars to the fossil level, it would look like this. Understanding existing microbial communities on Earth will help us know what to look for when probing similar features of rocks on Mars. However, scientists need to quickly confirm these initial observations, as the site has been leased for lithium mining and the entire ecosystem will likely be completely gone within a few years.

You finished reading the article "**The microbiome in desert lagoons may reflect early life on Mars**" edited by the [TipsMake](#) team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.