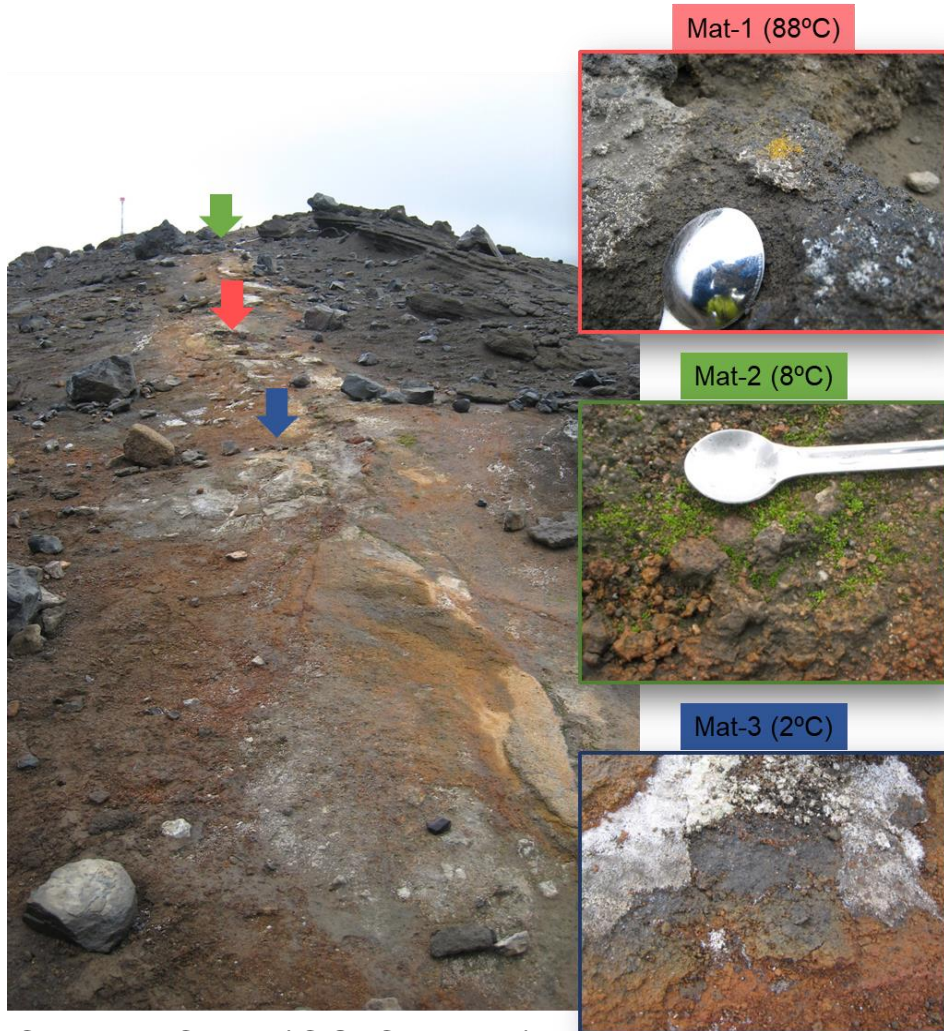


Biomarker profiling of microbial mats in the geothermal band of Cerro Caliente, Deception Island (Antarctica): life at the edge of heat and cold

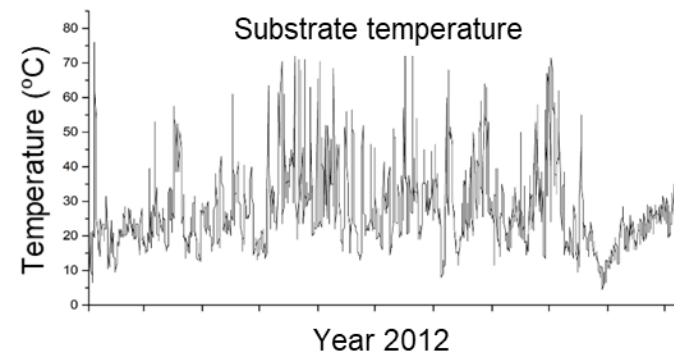


Credit: CAB (CSIC-INTA)

Cerro Caliente is a hill in Deception Island (Antarctica) that combines **snow and geothermal activity**, thus providing steady liquid water over the year and promoting the growth of microbial mats. This geothermal polar site has **counterparts with ancient Mars**, where the interaction of magmatic activity with (sub)surface water ice deposits could have provided liquid water.

We investigated the **composition and metabolisms** of three microbial mats located in Cerro Caliente at temperatures of 2°C, 8°C and 88°C at the time of collection.

Analysis of DNA, lipids and isotopes revealed a **similar** microbial composition in the three mats, possibly explained by the **thermal oscillations** of the ground over a year. Still, the coldest mats showed a higher proportion of cold-tolerant microorganisms and the **Calvin cycle** as the major carbon fixation pathway. The hottest mat showed a higher proportion of thermophiles and the **reductive tricarboxylic acid cycle** as the most likely pathway for carbon fixation.



The coexistence of microorganisms with different thermal tolerances and metabolisms in Cerro Caliente provides **diverse molecular biomarkers** useful to interpret extant or extinct life in current or future planetary missions to Mars.