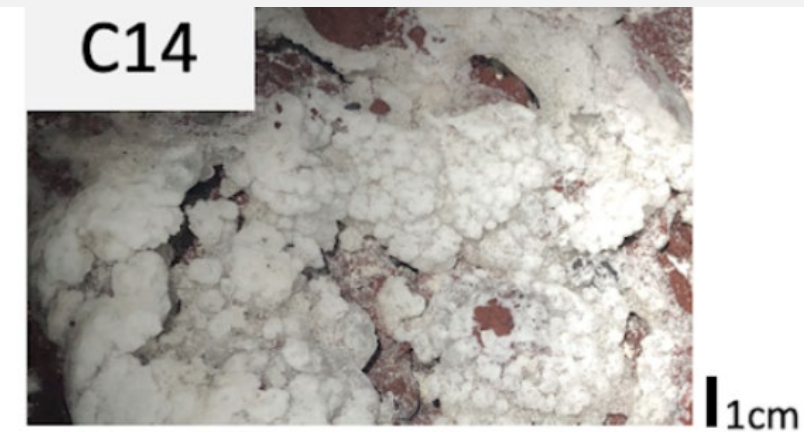
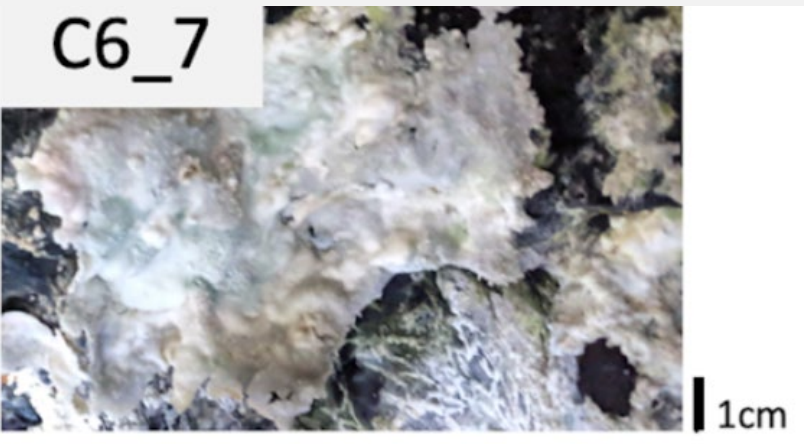


# Novel Microbes Found in Hawaiian Lava Tube with Significant Community Variations Across Small Scales



Two representative samples illustrate the differences in colors and morphology of the minerals in which microbial communities thrive.

- Lava tubes, which provide an underground shelter for life, are key targets for astrobiology.
- We investigated a lava tube at the Mauna Loa volcano in Hawaii, a Mars analog site, where we collected mineral samples from the walls of the tube.
- We characterized the taxonomy and potential metabolisms of microbial life thriving in these minerals. This was the first ever characterization of this site and the deepest level of sequencing used to study any Hawaiian lava tube.
- We found that over 80% of microbes living there are unclassified in taxonomic databases. We assembled the genomes of several of these novel species (this work<sup>1,2</sup>). Of the classified microbes, we found temperature and radiation extremophiles.
- We found significant differences in the microbial makeup of samples, even though some were taken within 10 cm of each other.
- To find biosignatures in lava tubes on Mars, careful sampling of distinct and specific mineralogical features must be conducted to adequately assess the possibility of life.

Fishman, C. B. et al. (2022), Extreme Niche Partitioning and Microbial Dark Matter in a Mauna Loa Lava Tube. *Journal of Geophysical Research: Planets* (In Revision).

<sup>1</sup>Fishman, C. B. et al. (2022), Basaltic Lava Tube Hosts a Putative Novel Genus in the Family *Solirubrobacteraceae*. *Microbiology Resource Announcements*, <https://doi.org/10.1128/mra.00499-22>

<sup>2</sup>Gadson, O. et al. (2022), Metagenome-Assembled Genome of a Putative Chemoheterotroph from Volcanic Terrain in Hawaii. *Microbiology Resource Announcements*, <https://doi.org/10.1128/mra.00556-22>