
Comparison of Bacterial Communities Found in Villa Luz Caves of five different underground sites

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Abstract

Villa Luz caves (VLC), in the southern Mexican state of Tabasco, which are interconnected by an aquifer network that spans hundreds of kilometers in a region lying North of the Sierra de Chiapas, with by at least 26 groundwater inlets and the Chichonal volcano, containing 300-500 mg L⁻¹ H₂S and < 0.1 mg L⁻¹ O₂.

We extracted environmental DNA for metagenomic analysis of collected samples in five selected Villa Luz caves sites, with pH values of 2.5 to 7. Foreign organisms found in this underground ecosystem that oxidize H₂S to H₂SO₄ include the following bacterial associations: biovermiculites, which grow on the rock walls; snottites, which are whitish, viscous biofilms hanging from the rock walls; and sacks or bags of phlegm, which live within the aquatic environment of the springs. Amplification products in V1 and V3 hypervariable regions of 16S rRNA bacterial gene generated 20,901 readings, by TEFAP pyrosequencing. Seven bacterial phyla were identified, Proteobacteria was more frequent than Acidobacteria. Finally, acidophilic Proteobacteria was detected in UJAT5 sample.

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