

SPELEOGENESIS IN A HYDROGEN SULFIDE-RICH CAVE

Louise D. HOSE¹, Arthur N. PALMER², Margaret V. PALMER²

¹Department of Environmental and Chemical Sciences, Chapman University,
Orange, CA 92866-1005 USA

²Department of Earth Sciences, State University, Oneota, NY 13820-4015

Cueva de Villa Luz (a.k.a. Cueva de las Sardinas), a hypogenic cave in Tabasco, Mexico, displays remarkably rapid, speleogenetic processes apparently facilitated by chemotrophic microbial interactions with a mostly micritic limestone bedrock. At least 26 water inlets feed the ~290 L/sec cave stream. The inlets release hydrogen sulfide, carbon dioxide, and other biologically attractive chemicals into the cave atmosphere. Microbial activity enhances three speleogenic processes: 1) Sulfuric acid converts subaerial limestone surfaces to gypsum, which the stream readily removes as blocks fall from the ceiling and walls. 2) Drops of strongly acidic water dissolve the limestone floor. 3) Occasional increases in surface water infiltration, accompanied by increased presence of acidic microbial colonies, accelerate acid production and may cause the stream to become aggressive with respect to calcite.