

Uranium-series and Paleomagnetic Dating of Cave Deposits in the Chiquibul System of Belize and Guatemala, Central America

Thomas E. MILLER

Department of Geology, University of Puerto Rico, POB 9017, Mayagüez,
Puerto Rico 00681 e-mail: t_miller@rumac.uprm.edu

Holokarsts of heavily brecciated Cretaceous carbonates of the Maya Mountains of Belize and Guatemala are drained by the Chiquibul Cave System, surveyed to 65 km. Progressive abandonment has formed four or more levels of galleries in these caves. In 1998-99 massive speleothems were sampled with U-series alpha dating. U contents in this area were high (up to 1.5 ppm). Ages ranged upward from 18 KaBP, with one exceeding the alpha method limit (of 350 KaBP). Its U^{234}/U^{238} ratio of 1.16 suggests an age less than 1.25 MaBP, perhaps 780 KaBP based on assumptions of initial U-ratios. As expected, higher levels appeared to be of greater age and longer development. An approximate rate of uplift/stream incision for this interval sampled is about one meter of vertical change per ten thousand years, similar to local regional solutional erosion rates of 100-130 cubic meters/ square kilometers/year.