



Stalagmites from the Northwest Yucatan Peninsula, Mexico: Progress and Problems with Resolving the Paleoenvironmental Record of the Last Millennium

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Caves on the Yucatan Peninsula, Mexico, possess stalagmites that may be useful for developing historical, Mayan, and pre-historical records of climate- and human-induced changes to regional hydrology and landscape. However, real challenges to the development of robust absolute chronologies can occur due to large errors on Th-230 age estimates created by low uranium and high detrital Th concentrations. One way to strengthen chronologies for well-laminated stalagmites is to initially develop several Th-230-dated stable isotopic and/or geochemical records from a locality, and to attempt to curve-match the records. Once curve-matched, a more detailed inter-comparison of stalagmite laminations has the potential to reveal similar growth patterns. Such a study is presented using two well-laminated, Th-230-dated stalagmites from the San Eduardo Cave and one from Calcehtok cave, located in the northwestern quadrant of the Yucatan Peninsula. Chronologies that are optimized by curve-matching their stable isotope records indicate that records can shift with respect to each other by several decades, suggesting that the detrital Th estimation developed for a stalagmite may not be constant through time. Ultimately, the key to optimizing such records may rest on lamina-by-lamina inter-comparison, with the underlying assumption that each lamination reflects one year of growth. An additional test of the optimized chronologies is to assess whether or not the trace metal records appear similar.