



The Cretaceous-Paleogene boundary in the shallow northeastern Mexican foreland basins: Evidence for paleoseismic liquefaction, tsunami deposition, and Chicxulub ejecta

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Understanding the depositional sequence and composition of impact ejecta is critical for the interpretation of timing and effects of the Chicxulub impact regarding the mass extinction at the Cretaceous-Paleogene (K-Pg) boundary. Preliminary investigations have shown that the shallow La Popa and Parras foreland basins in northeastern Mexico both feature outstanding and continuous 3D exposures of the Chicxulub ejecta-rich, K-Pg boundary event deposit (Lawton et al., 2005).

The m-thick sand-siltstone interval directly underlying the ejecta-rich mass flows shows evidence of slumping and liquefaction, locally leading to complete disorganization and disruption of the pre-impact late Cretaceous sedimentary sequence. The subsequent ejecta-rich sequence consists of an up to one m-thick basal carbonate-rich bed that discontinuously fills a valley-like topography. Besides abundant silicic and carbonate ejecta spherules (up to 50%) that are excellently preserved, this bed includes abundant mollusks and gastropod shells, as well as vertebrate bones and teeth. The conglomeratic bed is overlain by a series of alternating fine- to medium grained calcareous sandstones with shell debris and ejecta that were deposited by repeated currents / mass flow events incorporating varying source areas. Hummocky-cross-stratified strata that mark the return to a normal out-shelf depositional regime conformably overly these sandstones.

We interpret this sequence as evidence for presumably seismic-induced sediment liquefaction followed by a series of impact-related tsunami deposits. The specific depositional sequence and Fe-Mg-rich ejecta composition as well as the petrography of the sandstones all closely link the K-Pg boundary sequence in the La Popa and Parras basin to the well-known deep-water K-Pg sites in the Gulf of Mexico (e.g. El Mimbral; Smit et al., 1996; Schulte and Kontny, 2005).

Lawton, T.F., et al., 2005, *Geology*, v. 33, p. 81-84.

Smit, J. et al., 1996, *GSA Special Paper* v. 307, p. 151-182.

Schulte, P. and Kontny, A., *GSA Special Paper* v. 384, p. 191-221.