

First published in:

Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04804, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04804
EGU General Assembly 2008
© Author(s) 2008



Did Volcanism and Climate change cause the K-T mass Extinction?

G. Keller (1), S. Abramovich (2), Z. Berner (3), A. Pardo (4) and T. Adatte (5)

(1) Department of Geosciences, Princeton University, Princeton N.J. 08544 (gkeller@princeton.edu), (2) Department of Geological & Environmental Sciences, Ben-Gurion University of the Negev, Israel 84105, (3) Institute for Mineralogy & Geochemistry, University of Karlsruhe, 76128 Karlsruhe, Germany, (4) Universidad San Jorge, E-50830-Villanueva de Gállego, Zaragoza, Spain, (5) Geological Institute, University of Neuchatel, Neuchatel CH-2007, Switzerland.

Over the past 25 years the Chicxulub impact has become the commonly accepted cause for the end-Cretaceous (K-T) mass extinction whereas other catastrophes, such as volcanism and climate change, are considered at best secondary effects. However, this popular scenario can no longer be supported by the emerging database on the biotic effects of the Chicxulub impact in Mexico and Texas. At these localities the impact spherule ejecta layer is stratigraphically well below the sandstone complex, which has been interpreted as impact-generated mega-tsunami, and in Texas the K-T boundary is also well above. The sandstone complex, which infills submarine canyons formed during the latest Maastrichtian sea level fall and cooling (100-150 ky) that followed the greenhouse warming between 400-150 ky before the K-T boundary. In contrast, the impact spherule layer in undisturbed marls 4 m below was deposited during the global warming near the base of zone CF1, or ~300 ky before the K-T boundary. Evaluations of the biotic effects across the Chicxulub impact layer in Mexico and Texas reveal that out of a total of 52 species not a single species went extinct. No significant changes occurred in species populations, climate, or sedimentary environments as a result of this impact. This suggests that even a second much larger impact at the K-T boundary would likely have been insufficient to cause the K-T mass extinction. If not the Chicxulub impact, what caused the K-T mass extinction? Decan volcanism is the other major catastrophe near the end of the Cretaceous. Recent

studies suggest that the main phase (80%) of Deccan eruptions may have been very rapid and ended near the K-T boundary. These intriguing new data suggest that Deccan volcanism and associated climate changes may have been the major cause for the K-T mass extinction.