

The Chicxulub asteroid impact and mass extinction at the Cretaceous-Paleogene boundary

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The Cretaceous-Paleogene (K-Pg) boundary ~65.5 million years ago marks one of the three largest mass extinctions in the past 500 million years. The extinction event coincided with a large asteroid impact at Chicxulub, Mexico, and occurred within the time of Deccan flood basalt volcanism in India. Here, I review the records of the global stratigraphy across this boundary, revealing that a single ejecta-rich deposit compositionally linked to the Chicxulub impact is globally distributed at the Cretaceous-Paleogene boundary [1,2]. These results are supported by recent studies (i) detailing the exact position of the well-known iridium anomaly in several continental shelf and deep-sea K-Pg sites [3,4], (ii) showing that high-energy deposits from around the Gulf of Mexico correlate stratigraphically with the Chicxulub impact and the K-Pg mass extinction [5], and (iii) providing evidence for dinosaur remains within Chicxulub ejecta-rich beds that were presumably deposited from tsunami backwash currents in northern Mexico [6]. To conclude, the temporal match between the ejecta layer and the onset of the extinctions, and the agreement of ecological patterns in the fossil record [7] with modeled environmental perturbations (for example, darkness and cooling), suggests that the Chicxulub impact triggered the mass extinction.

References:

- [1] Smit, J., 1999, *Earth-Science Reviews*, 27, 75-113
- [2] Schulte, P., et al., 2010, *Science*, 327, 1214-1218
- [3] Miller, K.G., et al., 2010, *Geology*, 38, 867-870
- [4] Berndt, J., et al., 2011, *Geology*, 39, 279-282
- [5] Bralower T., et al., 2010, *Geology*, 38, 199-202
- [6] Schulte, P., et al. 2011, *Sedimentology*, (in review)
- [7] Jiang, S., et al., 2010, *Nature Geoscience*, 3, 280-285