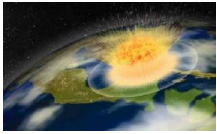


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By: Stefan Anitei, Science Editor



[What Caused Dinosaur Extinction?](#)

New evidence shows that it was not only the Yucatan's meteorite

New evidences suggest that the global mass extinction at the end of the Dinosaur Era might not have been produced by the single Chicxulub meteor impact, found in Yucatan peninsula (Southern Mexico), but by multiple meteor impacts, massive volcanism in India, and climate changes. "The Chicxulub impact may, in fact, have been the lesser and earlier of a series of meteors and volcanic eruptions that pounded life on Earth for more than 500,000 years," say Princeton University paleontologist Gerta Keller. A later much larger impact 65.5 million years ago must have been the last straw, destroying the dinosaurs and with them two thirds of all world species at that time, like giant marine reptiles (plesiosaurs, mosasaurs), pterodactils (flying reptiles), ammonites (shelled squids), many primitive birds and mammals. "It's that impact - not Chicxulub - which left the famous extraterrestrial iridium layer found in rocks worldwide that marks the impact that finally ended the Age of Reptiles," Keller believes. Chicxulub crater is nowadays half on land and half on the sea floor. Analysis of marine sediments from the crater, from a site in Texas along the Brazos River, and from outcrops in northeastern Mexico has showed that Chicxulub meteorite event took place 300,000 years before the mass extinction. "In all these localities we can analyze the marine microfossils in the sediments directly above and below the Chicxulub impact layer and cannot find any significant biotic effect," said Keller. "We cannot attribute any specific extinctions to this impact. No one has ever published this critical survival story before". Chicxulub - though violent - was followed by prolonged and gigantic eruptions of the Deccan Flood Basalts in India, as well as by climate change, and after all, a second large impact pushed the species towards the brink of extinction. The Deccan volcanism released during a period of more than a million years huge amounts of greenhouse gases into the atmosphere. "By the time Chicxulub struck, the oceans were already 3-4 degrees warmer, even at the bottom. On land it must have been 7-8 degrees warmer," says Keller. "This greenhouse warming is well documented. The temperature rise was rapid, over about 20,000 years, and it stayed warm for about 100,000 years, then cooled back to normal well before the mass extinction." "When Chicxulub meteorite hit, most species were suffering from heat stress, proved by dwarfing, growing less than half their normal size and reproducing through r strategy (many offspring to increase the chances for survival). After the heat period, climate cooled back to normal, but most tropical species were already very vulnerable, with reduced populations. When the second large meteorite hit, it pushed them straight to extinction. Dinosaurs themselves can not help to directly elucidate what happened to them because "dinosaur fossils are few and far between," as Keller said. "We can only really study what happened to them by looking at microfossils because these little critters are everywhere at all times. In just a pinch of sediment we can tell you the age, the prevailing climate, the environment in which it was deposited and what happened." "The site of the final impact is still unknown. "There is some evidence that it may have hit in India, where a crater of about 500 kilometers in diameter is estimated and named Shiva by paleontologist Sankar Chatterjee from the Museum of Texas Tech University in Lubbock. The evidence for it, however, is not very compelling at this time." "Chicxulub is one of thousands of impact craters on Earth's surface and in its subsurface," said H. Richard Lane, from the National Science Foundation (NSF) Division of Earth Sciences. "The evidence suggests that there is more to learn about what caused the major extinction event millions of years ago, and the demise of the dinosaurs at the end of the Cretaceous."