



A K/T boundary climate paradox

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Most models of the environmental consequences of the Cretaceous-Tertiary boundary meteorite impact postulate a sharp temperature fall caused by introduction of large amounts of “dust” and aerosols in the atmosphere (the so-called “impact winter”). This cold spell should have had visible consequences for floras and faunas. However, the vertebrate fossil record across the K/T boundary is not in agreement with a significant temperature drop. Dinosaurs, which apparently were largely endothermic, should not have been as severely affected by cold conditions as ectothermic reptiles such as crocodiles, lizards and turtles. The fossil record shows just the reverse, with all non-avian dinosaurs becoming extinct at the K/T boundary, and ectothermic reptiles surviving with little loss in diversity. The extinction pattern at the K/T boundary is in good agreement with selective collapse of food chains, with major losses among animals (including dinosaurs) immediately or ultimately dependent on living plants, which apparently were highly affected by lowered light levels at the Earth’s surface, and survival of forms with different dietary requirements. How severe filtration of sunlight by impact-generated “dust” and aerosols can be reconciled with the apparent absence of a major temperature drop remains an unsolved problem.