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## Evidence of high effusion Deccan volcanism preceding the KPg boundary at Elles, Tunisia

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Massive volcanic eruptions of the Deccan coincided with the end-Cretaceous mass extinction. Precisely dating when the most intense eruptions occurred is challenging because the resolution of geochronological techniques does not yet resolve events shorter than 20 kiloannum (ka). Volcanic eruptions outgas volatile metals, e.g., Cd, Te and Hg, along with SO<sub>2</sub> and other gases that may have contributed to high-stress environments for planktic foraminifera the 200 ka preceding the end-Cretaceous. Trace metals like Cd accumulate in sediments by deposition of aerosols, where the excess Cd reflects the intensity of volcanic emissions. Models show high frequency, low effusion rate eruptions result in low Cd enrichments, whereas low frequency, high effusion rate eruptions, the type likely to lead to deadly consequences, result in high enrichments of Cd within the sediments. The KPg section at Elles represents a middle neritic depositional environment with an average sedimentation rate of 4.7 cm/1,000 years for the late Maastrichtian. A series of sediment samples (marly limestone to shale) were taken from about 1 meter above the boundary to about 15 meters below the boundary. Elemental compositions of sediments (50 elements) were obtained by solution ICP-MS. Cadmium abundances ranged from values close to upper continental crust (UCC) to values approximately eight times higher. Such high enrichments were found in sediments from the 100 ka period preceding the boundary corresponding to the Poladpur phase of Deccan volcanism. A lack of correlation between Zn, P<sub>2</sub>O<sub>5</sub>, and Mo below the boundary suggest the Cd enrichments are not from an influx of biogenic detritus or TOC burial. Above the boundary, there is a 25 ka period of normal shale Cd values interpreted here to represent the period between the Ambenali and Poladpur phases. We have previously shown from the neighbouring El Kef section, representing ~ 10 ka, that Cd and Re are correlated in proportions similar to those from intraplate volcanoes. The Cd data for Elles complement Te and Hg data, all of which demonstrate the presence of volcanogenic trace metals over most of the period of the Poladpur phase of the Deccan eruption. Cadmium as a tracer enables better correlation between foram-based chronology and intense pulses of the Deccan eruption. The data obtained thus far confirm that the period prior to the extinction was dominated by intense volcanism followed by relative quiescence during the earliest Danian recovery with important implications for the cause of the extinction.