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## Late Maastrichtian global warming triggered by Deccan dykes and sills, evidence from Malwa and Mandla regions, Central India.

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Recent studies indicate that the bulk (80%) of Deccan trap eruptions occurred over a relatively short time interval in magnetic polarity C29r. U-Pb zircon geochronology shows that the main phase began 250 ky before the Cretaceous-Paleogene (KPg) mass extinction and continued into the early Danian suggesting a cause-and-effect relationship. But the potential causal relationship between paleo-environmental change and Deccan volcanism remains debated. New U-Pb zircon geochronology from the Malwa Plateau (~7% of the inferred total volume of the Deccan LIP) located on the northern margin of the Deccan Traps allows to correlate basalts from the periphery of the province with the volcanic stratigraphy of the Western Ghats as well as to global paleoenvironmental records and precise the Deccan eruption rates at larger scale. Main part of the basalts released in northern Deccan area appears to be of latest Maastrichtian age. Moreover recent geophysical and field observations show that the Malwa and Mandla basalt plateaus erupted in the Narmada-Tapti rift, made up of 2-3.5 km of Carboniferous to Cretaceous sedimentary rocks, including up to 60m thick Lower Permian coal interval. Numerous dolerite dykes and sills intersecting these coal beds have been observed in open and underground mines from the Satpura area. The interaction between these dykes and the coal seams may have significantly contributed to the latest Maastrichtian warming by releasing high amounts of CO<sub>2</sub>, SO<sub>2</sub> and halogens into the atmosphere. These observations indicate that Deccan volcanism played a key role in increasing atmospheric CO<sub>2</sub> levels that resulted in global warming and enhanced greenhouse effect during the latest Maastrichtian, which coupled with high SO<sub>2</sub> emissions, increased biotic stress and predisposed faunas to eventual extinction at the KTB.