



The magnetic and mineralogical signature of the Deccan volcanism in the sedimentary record: a review

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The contribution of the Deccan Traps volcanism in the Cretaceous-Palaeogene (KPg) crisis is still a matter of debate. The main limitation is the lack of mass extinction proxies within the Deccan lava flows, making hard the correlation of the onset of Deccan volcanism in India with the mass extinction recorded in the global marine record. An alternative is to investigate the magnetic and mineral assemblages of remote marine section. Iron oxides are very sensitive to changes in redox conditions, and thus can be possibly used as markers of paleoenvironmental changes driven by Deccan volcanism. This is the case in the Basque-Cantabric basin (Bidart, Zumaya) and the western margin of the Tethys (Gubbio), where an interval of low magnetic susceptibility (MS) containing akaganeite features in the last 50 cm just below the KPg boundary. The low MS interval originated from the loss of detrital and biogenic magnetites, features consistent with reductive iron oxide dissolution possibly linked to environmental acidification (acid rain and acidification of surficial waters). These insights provide new and promising benchmarks of the sedimentary imprint of the Deccan-induced paleoclimatic and paleoenvironmental changes. More importantly, the fact that the hypothesised Deccan perturbations occurred some 50 cm (~30,000 y.r.) before the KPg boundary suggest that Deccan volcanism may have contribute significantly to the KPg mass extinction.

Keywords: Deccan, reductive iron oxide dissolution, akaganeite, KPg boundary, mass extinction

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