



The Paleocene Hyperthermal Events, Links with Global Volcanism: New Insights from Egypt

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The Paleocene is a critical period, which started and ended with the two of the most dramatic events in earth's history; the Cretaceous-Paleogene (KPg) Mass Extinction event and the Paleocene-Eocene Thermal Maximum (PETM) and in between those two events several hyperthermia and climatic changes took place such as Danian C2 event (Dan-C2), Late Danian Event (LDE), Danian-Selandian boundary (DSB), Early Latest Paleocene Event (ELPE), Selandian/Thanetian boundary (S/ThB). Each of these events is characterized by paleo-environmental changes and perturbations in the carbon cycle. The El Beida section located in the Quseir area, Red Sea, Egypt is an expanded succession covering the late Cretaceous to early Eocene interval and represents a excellent record of the Paleocene succession. The stage boundaries and associated bioevents were detected using calcareous nannofossils, planktic foraminifera biozonations and organic carbon stable isotopes. During Paleocene, climate experienced several short warm-cold cycles, which led to significant paleoceanographic changes. Based on mercury anomalies and its relation with the organic matter contents; the observed biotic and environmental changes appears to be linked to the Large Igneous Provinces (LIPs) erupting during Paleocene (Deccan volcanic, phase 1 and 2 of the North Atlantic Igneous provinces, NAIP). Hg anomalies are a good tool to highlight the role of volcanism during the KPg Mass Extinction events and the PETM and allow a direct correlation with the main phase of Deccan volcanism and NAIP phase-2 respectively. The other recorded event needs more investigation to clarify their link to the latest phase of Deccan phase-3 (Early Danian) and the NAIP phase-2 (Late Danian to Selandian).