



Palaeoenvironmental implications of evaporative Gaylussite crystals from Lonar lake, Central India

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We have undertaken petrographic, mineralogical, geochemical and isotopic investigations on carbonate minerals found within a 10 m long core from Lonar lake, central India, with the aim of evaluating their potential as palaeoenvironmental proxies. The core encompasses the entire Holocene and is the first well dated high resolution record from central India. While calcite and/or aragonite were found throughout the core, the mineral gaylussite was found only in two specific intervals during (4630-3890 and 2040-560 cal. a BP). Hydrochemical and isotope data from inflowing streams and lake waters indicates that evaporitic processes play a dominant role in the precipitation of carbonates within this lake. Isotopic ($\delta^{18}\text{O}$ and $\delta^{13}\text{C}$) studies on the evaporative gaylussite crystals and residual bulk carbonates (calcite) from the long core show that evaporation is the major control on $\delta^{18}\text{O}$ enrichment in both the minerals. However, in case of $\delta^{13}\text{C}$ additional mechanisms e.g., organic recycling in gaylussite and phytoplankton triggered $\delta^{13}\text{C}$ enrichment in calcium carbonate also play an important role in some intervals. We also discuss the relevance of our investigation in palaeoclimate reconstruction and late Holocene monsoon variability.