



Past rainfall reconstruction using speleothem from Nakarallu cave, kadapa, Andhra Pradesh, India

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Isotopic analysis of a speleothem sample from the Nakarallu cave Kapdapa, Andhra Pradesh, INDIA has been carried out aimed at high resolution rainfall reconstruction for the peninsular India. Micromill was used to extract carbonate samples with a spatial resolution of 150 μm corresponding to about one year resolution. 1134 samples have been extracted for isotopic measurements. Samples were analysed on a delta V plus IRMS for $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ with precision better than 0.1‰. A precise chronology of the samples was established using U-Th dating. A 1600 Yr record of $\delta^{18}\text{O}$ was produced spanning between 1700 to 3300 Yr BP with annual to sub-annual resolution. The $\delta^{18}\text{O}$ record showed a linear declining trend ca, -4‰ which corresponded to an increase in rainfall approximately 200 mm during the above mentioned study period. Spectral analysis of oxygen isotopic record reveals multi-decadal variability which may represent a 50 year periodicity in the monsoon rainfall of the peninsular India; this kind of variability may arise due to amplitude modulation of El-Niño Southern Oscillation (ENSO). Atlantic Multi-decadal Oscillation (AMO) as well as the Pacific Decadal Oscillation (PDO) is also characterized by 50–80 year multi-decadal variability. An understanding and mechanism of multi-decadal variability could be established using such a long term high resolution past record of rainfall variability. To assess their paleoclimatic significance elemental analysis were also carried out in this speleothem sample. Reconstructed time series and its comparisons with speleothem records from nearby region will be presented.