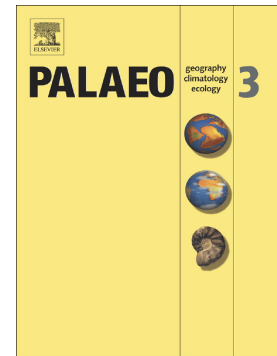


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Indian summer monsoon variability in southern India during the last deglaciation:**Evidence from a high resolution stalagmite $\delta^{18}\text{O}$ record**

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Abstract

We present a high resolution record of Indian summer monsoon (ISM) variability during the last deglacial period. The record is based on high precision measurements of oxygen isotopes ($\delta^{18}\text{O}$) in 263 sub-samples from a ~18 cm long stalagmite (VSPM1) sample collected from the Valmiki cave in the southern India. The chronological framework is based on high precision U-Th dating in 8 sub-samples at regular intervals. The stalagmite exhibits a variable growth rate ranging from ~0.03 to 0.80 mm/yr with 9 years as an average sampling resolution for $\delta^{18}\text{O}$. X-ray diffraction analysis shows that the sample is composed of aragonite mineral. The $\delta^{18}\text{O}$ record provides a strong evidence of abrupt changes in ISM activity between approximately 15,610 and 13,160 yr BP (before 1950 AD). Highly negative $\delta^{18}\text{O}$ values at ~15,610 and 15,250 yr BP are suggestive of a wet climate followed by less negative $\delta^{18}\text{O}$ at ~15,240 to 14,750 yr BP indicating relatively dry climate. These dry and arid conditions are punctuated by two wet events at 15,030 and 14,910 yr BP. A marked increase in $\delta^{18}\text{O}$ between approximately 14,660 and 14,370 yr BP suggests weakening in ISM activity, followed by a gradual decrease in $\delta^{18}\text{O}$ between 14,370 and 13,560 yr BP indicating strengthening of ISM. Spectral analysis of $\delta^{18}\text{O}$ time series suggests

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