

Revisiting the relationship between palaeovegetation and Indian summer monsoon variability in the Central Ganga Plains

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The Central Ganga Plain boasts a rich cultural history and a complex climatic past, shaped mainly by the Indian summer monsoon (ISM). The present study critically assesses current archaeological methodologies for palaeovegetational reconstruction and offers an updated overview of major multi-proxy studies conducted in response to ISM between ~100–2 ka BP. These studies reveal a correlation between high ISM periods and the prevalence of C₃ vegetation, while low ISM periods are associated with C₄ plants. The archaeological record also indicates corresponding adaptations in dietary habits and subsistence strategies. The study emphasizes the need for more localized multi-proxy research to enable inter-site comparisons, aiming for a holistic understanding of the evolution of the Ganga Plains.

Keywords: Archaeology, climate proxies, Indian summer monsoon, palaeovegetation reconstruction, stable isotopes.

the past 120 ka years has further contributed to the development of major foreland basins, duns, and eventually the extensive plains^{3,4}. Singh⁵ discusses in detail the evolution of geomorphological landforms in the Ganga Plains. The CGP is primarily composed of thick layers of alluvial deposits, actively brought down by southeasterly flowing Himalayan rivers and their tributaries. During glacial periods, reduced monsoonal intensity led to decrease in river discharge, causing the rivers to adopt braided patterns. These caused transport of coarse sediments and formation of alluvial fans, river valleys and river terraces, noticeable along the Kosi Megafan and Dun Valley^{5–7}.

In contrast, interglacial periods were characterized by intensified monsoonal activity, which increased river discharge and promoted meandering river patterns. These meandering rivers deposited thick, fine-grained alluvial