

Holocene variability of the Asian monsoon inferred from a sediment core from Lake Rara, western Nepal

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The Asian monsoon is an important component of the Earth's climate system that influences the societal and economic activity of roughly half the world's population (Yancheva et al., 2007). The main driver of large-scale monsoon change over the past 10,000 years has been a slow decrease in summer-time solar radiation (insolation) at 30N owing to changes in Earth's orbit. Even so, monsoon records show abundant evidence of abrupt, stepwise changes on timescales of a century and shorter. The mechanisms behind this behavior are poorly understood. (Overpeck et al., 2007). The inverse correlation between summer and winter monsoons is obvious during the Bolling-Allerod, the Younger Dryas, and the early Holocene. This indicates a link between the monsoon and the movement of ITCZ (Yancheva et al., 2007). However, it is difficult to evaluate the anticorrelation during the late Holocene.

Here we present a new paleoclimatic record from a sediment core recovered in Lake Rara, western Nepal. Lake Rara today lies 3,000m above sea level and has a maximum water depth of 168m. The age model of the sediment core is based on AMS 14C dating of leaves. Concentrations of major elements were measured by X-ray Fluorescence Analysis (XRF). Intensity of chemical weathering in the catchment area was reconstructed by geochemical indexes such as CIA (chemical index of alteration). Bottom-water redox condition was also reconstructed by Mn/Al ratio. Based on the results, we will discuss evolution and variability of the Asian monsoon during the late Holocene.

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Yancheva, G. et al., Nature 445, 74-77 (2007)

Overpeck, J.T. et al., Nature 445, 270-271 (2007)

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