



Asynchronous 500-year cyclic monsoon rainfall change between north and south of East Asia associated with low latitude climate changes

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A high-resolution pollen record obtained from annually laminated Maar lake provided unambiguous evidence for monsoon rainfall variability in East Asian monsoon region (EAMR) during the past 9260 years. Pollen record reflected the 500-year cyclic vegetation and thermo-hydro change in the north of EAMR. Comparing with cave stalagmite record in the south of EAMR, the pollen proxy show 500-year cyclic monsoon rainfall change in the north of EAMR are nearly antiphase with 500-year periodic monsoonal precipitation change in the south of EAMR from mid-Holocene. "North Drought South Flood" condition prevails in El Niño-liked phase, whereas "South Drought North Flood" stage occurs in La Niña-liked (or normal) phase. Asynchronous climate change between the north and south of EAMR may be influenced mainly by El Niño-Southern Oscillation, linked to the low-latitude oceanic and atmospheric process. The north of EAMR has entered a warm-wet phase for several decades, and thus the next dry condition may have influence on the north of EAMR, whereas the south of EAMR probably prevails wet climate instead.