



Concurrent Asian monsoon strengthening and early modern human dispersal to East Asia during the last interglacial

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The relationship between initial *Homo sapiens* dispersal from Africa to East Asia and the orbitally paced evolution of the Asian summer monsoon (ASM)—currently the largest monsoon system—remains underexplored due to lack of coordinated synthesis of both Asian paleoanthropological and paleoclimatic data. Here, we investigate orbital-scale ASM dynamics during the last 280 thousand years (kyr) and their likely influences on early *H. sapiens* dispersal to East Asia, through a unique integration of i) new centennial-resolution ASM records from the Chinese Loess Plateau, ii) model-based East Asian hydroclimatic reconstructions, iii) paleoanthropological data compilations, and iv) global *H. sapiens* habitat suitability simulations. Our combined proxy- and model-based reconstructions suggest that ASM precipitation responded to a combination of Northern Hemisphere ice volume, greenhouse gas, and regional summer insolation forcing, with cooccurring primary orbital cycles of ~100-kyr, 41-kyr, and ~20-kyr. Between ~125 and 70 kyr ago, summer monsoon rains and temperatures increased in vast areas across Asia. This episode coincides with the earliest *H. sapiens* fossil occurrence at multiple localities in East Asia. Following the transcontinental increase in simulated habitat suitability, we suggest that ASM strengthening together with Southeast African climate deterioration may have promoted the initial *H. sapiens* dispersal from their African homeland to remote East Asia during the last interglacial.