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The correlation between the magnetic paleoclimatic record of the Chinese loess-red clay sequences and the marine benthic oxygen isotope record during the past 6 Myr

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Abstract

Global cooling in the Cenozoic, leading to the growth of large continental ice sheets in both hemispheres, may have been caused by the uplift of the Tibetan Plateau and the positive feedbacks initiated by it. However, the details remain to be clarified. An ideal place to study detailed sedimentary and climatic processes associated with Tibetan uplift is the Chinese Loess Plateau (CLP), which is immediately adjacent to northeastern Tibet. Here we review recent progresses in correlating the magnetic susceptibility record of the eolian sequences on the CLP with the benthic oxygen isotope records over the past 6 Myr. Magnetic susceptibility of the eolian sequences on the CLP and the benthic oxygen isotope reflect intensity of the East Asian summer monsoon (EASM) and global ice volume, respectively. We found a good correlation between the magnetic susceptibility record and the benthic oxygen isotope record in the past 6 Myr except during 4.5-2.7 Ma. We attributed this lack of correlation between these two records at the interval to closure of the Panama Seaway and uplift of the Tibetan Plateau. We then present new results about correlation patterns between the magnetic grain size records and the benthic oxygen isotope records over the past 6 Myr. We demonstrate that contrasting/comparing magnetic grain size proxy records from Chinese eolian sediments has the potentials of resolving both the paleo-rainfall and paleo-temperature history of the CLP region.

Biography

Junsheng Nie has completed his Ph.D. from University of Rhode Island in 2008 and postdoctoral studies from University of Texas at Austin in 2010. He is a Professor at Lanzhou University, China. He has published more than 25 papers in reputed journals and serving as an editorial board member of journal Dataset Papers in Geosciences. He is a reviewer for ″Nature", "Nature Geoscience", "Geochimica et Cosmochimica Acta", “Geophysical Research Letters”, “Palaeogeography, Palaeoclimatology, Palaeoecology”, “Global and Planetary Change”, “Geochemistry, Geophysics, and Geosystems”, "Quaternary Research", "Quaternary International", "Sedimentary Geology", “Journal of Asian Earth Sciences”, “Chinese Science Bulletin”, and Chinese and Romanian NSF proposals.