



The indicative significance of the tropical Pacific precipitation for the evolution of ITCZ over the last four glacial/interglacial cycles

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Multiple planktonic foraminiferal calcite Mg/Ca and $\delta^{18}\text{O}$ were studied to reconstruct the high-resolution records of sea water $\delta^{18}\text{O}$ in the sediment core KX97322-4, which was recovered from the Ontong-Java Plateau in the western equatorial Pacific (WEP), the core region of the western Pacific warm pool (WPWP). By combining the two proxies together, we obtained the upper water temperature and salinity over the last four glacial/interglacial cycles. We also removed the influence from global ice volume change to salinity to reconstruct the local precipitation history. By comparing SST records of the WEP with the Eastern Equatorial Pacific since MIS 10, we find that the tropical Pacific was more likely in the phase of El Niño-like during Terminations and warming stage in glacial. Meanwhile, the mean position of the intertropical convergence zone (ITCZ) was moving northward and more water vapor and heat were taken to middle and high latitude regions. By comparing precipitation records of multi-position in the WPWP with the East Asian summer monsoon (EASM) records, we find that the tropical Pacific hydrological variation was associated with the ITCZ changes and even could impact EASM precipitation. When the isolation became stronger, the globe was warming and evaporation-precipitation ratio in the WEP enhanced, the ITCZ with more moisture shifted from the tropical areas to the temperate latitude, then East Asia precipitation was strengthened. While the situation would reverse when the solar radiation decreased. During the processes, the zonal thermal state would adjust the extent of the ITCZ variation. Our finding provides further evidence for the relationship between the WPWP hydrological status and the EASM precipitation, the tropical Pacific zonal thermal state and the ITCZ change during the last four glacial/interglacial cycles.