

The 9.2 ka event in Asian summer monsoon area: The strongest millennial scale collapse of the monsoon during the Holocene

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Numerous Holocene paleo-proxy records exhibit a series of centennial-millennial scale rapid climatic events. Unlike the widely acknowledged 8.2 ka climate anomaly, the likelihood of a significant climate excursion at around 9.2 cal ka BP, which has been notably recognized in some studies, remains to be fully clarified in terms of its magnitude and intensity, as well as its characteristics and spatial distributions in a range of paleoclimatic records. In this study, several geochemical proxies, including total organic carbon, total nitrogen, Aluminum, Titanium, Rubidium/Strontium and $\delta^{13}\text{C}$ from a peat sediment profile in the Dajiuhu Basin, central China, were carried out to help improve understanding of the climate changes around 9.2 cal ka BP. The results show that the peat development was interrupted abruptly at around 9.2 cal ka BP, when the chemical weathering strength decreased and the tree-pollen declined. This suggests that a strong drier regional climatic event occurred at around 9.2 cal ka BP in central China, which was, in turn, probably connected to the rapid 9.2 ka climate event co-developing worldwide. In addition, based on the synthesis of Holocene hydrological records from Asian summer monsoon region, we further found that the 9.2 ka event probably constituted the strongest abrupt collapse of the Asian monsoon system during the full Holocene interval. And it could be interpreted by the co-influence of external and internal factors, related to the changes of the solar activity and the Atlantic Meridional Overturning Circulation.