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Paleoclimate of the last glacial-interglacial cycle as recorded in pedogenetic proxies in the central and northeastern Iran

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Although palepedology shifted from a qualitative science to a reliable technique for paleoreconstructions during recent years, there is limited information about soil-derived paleoenvironmental data of Iran. The objective of this study is to synthesize and make a picture for climate of the last glacial-interglacial cycle based on different pedogenetic proxies in central and northeastern Iran. Marine isotope stage (MIS) 5e was characterized by a warm and humid climate, which is recorded in formation of reddish argillic horizons in northeastern Iran. The reddish argillic horizons in arid regions of eastern Isfahan may be the result of warm and humid climate of MIS 5e. There is no information about pedogenic development in the study area during MIS 3 and MIS 4 probably due to dominance of landscape instability and severe erosion in the study area. The Last Glacial Maximum (LGM) was highlighted by loess deposition and aridity and wind erosion in northeastern and central Iran, respectively. Oxygen stable isotopic composition of pedogenic carbonates suggests their formation during glacial stages of Pleistocene in central Iran while soil carbonates in northeastern Iran have precipitated during the Holocene. Southward shifts of westerly track storms in the (mid) Holocene might were responsible in the formation of these carbonates. The Holocene was dominated by aridity, wind erosion and salinization of soils in the eastern Isfahan, central Iran. Overall, more investigations are required to provide a better picture for paleoclimate of Iran and paleopedological studies can play an important role in this way.