Paleoecological changes in the Northeastern Iran, signals from carbon isotopic composition of pedogenic carbonates in loess derived soils

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Abstract

Stable isotopes in pedogenic carbonates can provide information for geomorphic evolution of landscapes, past atmospheric CO_2 partial pressure fluctuations, paleotemperatures and local and global vegetation changes. Loess/paleosol sequences and loess derived soils in the north and Northeastern Iran arean excellent archive for Quaternary environmental changes and have been studied by many authors during recent years but there is no information about carbon stable isotopic composition of pedogenic carbonates in the loess derived soils of the north and northeastern Iran. The objective of this study was to determine the carbon isotopic composition of pedogenic carbonates from loess derived soils of southern Mashhad for quantitative reconstruction of paleovegetation. Carbon and oxygen isotopic composition of pedogenic carbonates in Btk horizon of last interglacial period and Bk horizons of Holocene were measured by a mass spectrometer. Results indicated the higher precipitation and environmental moisture during interglacial periods of MIS5 and MIS1 compared with the glacial periods and present time. Carbon isotopic composition of pedogenic carbonates revealed the dominance of C_3 plants during MIS1 and MIS5 periods in northeastern Iran. It seems that changes in partial pressure of atmospheric CO_2 and air temperature were the main factors influencing vegetation type during late Quaternary in the northeastern Iran.

Keywords: Pedogenic carbonate, C Stable Isotope, Loess, Iran

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