



Understanding Late Quaternary dune accumulation histories in the Thar Desert, India.

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The Thar Desert in north-west India lies at the limit of the region receiving precipitation from the Indian monsoon. It is generally accepted that insolation driven changes in monsoon intensity have affected desert contraction and expansion during the late Quaternary, impacting on the construction and accumulation of aeolian landforms. Observation of dune alignment using remotely sensed imagery has shown that regionally, dunes are closely aligned with the prevailing wind direction of the southwest monsoon system. Previous studies have suggested that aeolian accumulation occurs within limited time windows, when an optimal balance between wind and vegetation is reached and maintained. Therefore, the Thar dune systems potentially provide a rich archive of past climatic and geomorphological change. To investigate this, systematic sampling of dune fields was carried out in different parts of the desert. The field sites were selected considering their locations along the mean rainfall gradient and their relation to the sediment depositional styles for an optimum understanding of the resolution and duration of aridity record. Optically stimulated luminescence (OSL) dating was carried out to these samples to establish chronologies with an aim to infer the sensitivities of dunes to the changes in environment in the past, and different time scales over which they register and preserve the palaeoenvironmental record. Preliminary results have shown that the desert witnessed many phases of dune accumulation post Last Glacial Maximum. The most recent phase is <100 years old, which is attributed to intense human pressure and faulty agricultural practises which have reactivated the dunes.

It is anticipated that the analyses of the entire datasets of luminescence ages from the desert will potentially change the interpretation of dune accumulation histories and permit the assessment of the roles of changing sediment supply and/or monsoon intensity in the late Quaternary development of the Thar Desert.