

Abstract

The Late Quaternary climate in the Arabian Peninsula was influenced by the alternation of humid and arid conditions that effected the evolution of former landscapes and the appearance of today's environment. Phases of high aridity were synchronous with glacials whereas more humid climates dominated during interglacial times. Recent studies on speleothems show evidence of a northward shift of the ITC during the interglacials, thereby transporting monsoonal precipitation towards the central parts of the Peninsula.

The doctoral thesis examines the fluctuations mentioned above for the Late Quaternary (< 35 ka B.P) and proves the existence of three distinct climate phases during this period. From 35 - 20 ka B.P. small lakes were formed between older dune generations in many parts of the Rub' al Khali. Pleistocene or older wadis were reactivated at the same time and transported outflow from the Arabian Shield towards the Arabian Gulf. The Last Glacial Maximum was characterized by extreme aridity and strong glacial winds. Although some uncertainties exist whether the present-day dunes were built during the LGM, there is no doubt that older Pleistocene dune systems were reactivated and new dunes were generated from abundant new sediments in the dry Arabian Gulf during this period. Accumulation of aeolian sediments ceased abruptly after a short transitional phase at the beginning of the Holocene when the ITC shifted northwards and created a wetter climate again. Speleothems that were deposited in many areas of the southern Arabian Peninsula during this time act as an indicator for high rainfall of monsoonal origin. The wetter climate again favoured the development of small lakes in the Arabian Desert, but size and location of the lacustrine deposits suggest that the precipitation during the Holocene was much less than during the Late Pleistocene (35 - 20 ka B.P.). After ca. 5.5 ka B.P. aridity set in and - after some short fluctuations - led to present-day climate conditions.