How do sea level, climate, and structural controls impact Mid-Holocene paleogeography and Late Neolithic population along the Arabian Sea shoreline (Bar Al Hikman Peninsula, Oman)

Thomas Teillet*[1], Perrine Bois , Peter Homewood , Monique Mettraux , Vincent Charpentier , Daniele Spina , Giorgio Melini , Pankaj Khanna , and Volker Vahrenkamp

[1]KAUST - King Abdullah University of Sciences and Technology – Arabie saoudite

Résumé

Climatic and environmental changes over the last 12'000 years have strongly impacted Arabia coastal stratigraphy and human prehistoric populations. The Peninsula of Bar Al Hikman is a storm-dominated carbonate ramp-like system (slope _˜ 0.01◦, 25x35 km) on the Omani shoreline of the Arabian Sea. On the southeastern tip of the region, a Late Neolithic site has been discovered on an N-NE-oriented fault high and suggests humans occupation in the area at least between 5750-5050BP. The main focus of the study is to understand the succession of landscapes that early human populations encountered during the last 6000 years in the area. This is achieved by examining the relationship between the structural framework that shapes the peninsula and the physical factors that control the deposition of Holocene carbonate geomorphologies. A Mid-Holocene to present Relative Sea Level curve and paleogeographic models have been constructed from field-mapping, ground-truthed satellite image analysis, digital elevation model and calibrated 14 C ages of skeletal carbonate components. Our results show that the Mid-Holocene transgression submerged the peninsula around 7000–6500 BP, peaking with a highstand of 3 to 4 m above the current sea level at 6000 BP before falling down to the current level. The transgression caused the flooding of a vast part of the peninsula and consequently the development of intertidal to shallow subtidal over the entire area. Lithic artifacts from three sites attest Neolithic presence after the early flooding of the peninsula, coinciding with the Mid-Holocene Highstand. The period of site occupation overlaps the change from humid to arid climate that commenced at 6100 BP. This period also saw a shift in terms of carbonate factories, moving from intertidal areas dominated by bivalves and gastropods in mangrove habitats to coral reef systems and the development of large complexes of beaches and barrier bar systems. The presence of intertidal and shallow subtidal environments seems to be a crucial factor for human settlement in Bar Al Hikman during the Late Neolithic/Mid-Holocene period, regardless of the prevailing climatic conditions.

Mots-Clés: Carbonate, Geomorphologies, Holocene, Neolithic, Climate, Sea Level, Arabian Sea, Oman

*Intervenant