



## **Micro- and Macrofossils as indicators of Early Holocene palaeoenvironmental changes in the northwestern Saudi Arabia**

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The reconstruction of palaeoclimatic changes is a key to understand landscape change, prehistoric human migration and settlement, in particular within sensitive arid environments. Whereas there are several Late Pleistocene to Holocene climate records from the Sahara, the Levant, and the southern Arabian Peninsula, Northern Arabia is poorly known so far. The continental sabkha of Tayma (27°38'N, 38°33'E) is one of very few North Arabian sites, where landscape changes are recorded in a laminated lacustrine sequence.

The early to mid-Holocene palaeo-lake of Tayma, 250 km away from the Red Sea and about 800 m above sea level, yields a fossil fauna almost completely composed of the euryhaline barnacle *Amphibalanus amphitrite*, two gastropods (*Melanoides tuberculatus*, *Hydrobia* sp.), four foraminifer species (*Ammonia tepida*, *Quinqueloculina seminula*, *Flintinoides labiosa*, *Trichohyalus aguayoi*), and the brackish water ostracod *Cyprideis torosa*, beside very rare freshwater ostracods. Only the smooth shelled morphotype of *Cyprideis torosa* occurs. The association indicates a large athalassic brackish water lake with temporary freshwater inflows. All species documented originate in the marginal marine environment of the Red or Mediterranean Sea within the intertidal zone and hence they are adapted for strong environmental changes. Morphological and taphonomical analyses on *Cyprideis torosa* (i.e. sieve pores, population structure, preservation) and test malformations on the foraminifers reveal habitat types and its changes for sediment cores and sections from the center and the margins of the lake basin. The lake evolution starts immediately with saline conditions. At its maximum, the lake had a perennial regime, brackish to seasonally even hypersaline conditions, a depth of up to 16.7 m and covered a minimum area of c. 22 km<sup>2</sup>. The increasing salinity at the younger part of the sections confirms a climatic shift to drier conditions during the mid-Holocene.