

Pleistocene connection and Holocene separation of the Caspian and Black Seas: data from the modern Kura Delta, Azerbaijan

Salomon B. Kroonenberg, E. Aliyeva, M. De Batist, R.M. Hoogendoorn, D. Huseynov, R. Huseynov, N.S. Kasimov, M. Lychagin, T. Missiaen, L. de Mol, S. Popescu, J.-P. Suc

The modern Kura River delta in the Caspian Sea overlies the important Pliocene fluvio-deltaic hydrocarbon reservoirs of the South Caspian Basin, and therefore constitutes a possible modern analogue. Shallow seismic profiles and grainsize, pollen, geochemistry and ^{14}C data from a 50 m offshore core show a subdivision into five sequences.

The deepest reflector at ~ 24 m depth marks the top of a late Pleistocene unit of reddish clays with ^{14}C ages between 23480 and 47070 cal yr BP. Pollen data suggest a large influence of fresh water and pollen influx from the Volga River through coast-hugging marine currents. Overlying peaty sediments dated at 12000 cal BP, have been deposited according to pollen data under salt marsh conditions close to a sea level that at time must have been almost 65 m lower than the present one of -27m below oceanic level, but within the range of published estimates for the Early Holocene Mangyshlak regression. In the overlying greyish marine muds with minor sand intercalations several cycles can be discerned on the basis of TOC contents. They span a large part of the Holocene, and pollen data suggest a rising sea level. They are truncated by a reflector horizon probably corresponding to the 6th century AD Derbent ~48 m lowstand during the Warm Mediaeval Period. This unit is overlain by greyish and green muds between 1,5 and 6 metres depth, with a definite peak in steppe pollen and a dip in the warm temperate pollen, indicating warm semi-arid conditions, probably between the mediaeval lowstands of the 6th and 12th century AD. The uppermost ~ 1,5 m shows a tendency to cooler climatic conditions according to the pollen profiles, and thus may correspond to a period of sealevel rise heralding the start of the Little Ice Age highstand.

Geochemically, the Pleistocene reddish clays differ strongly (high Fe, low Ca) from the overlying Holocene sediments (low Fe, high Ca), and resemble in that respect similar Pleistocene reddish clays recovered from the deepest part from both the Caspian and the Black Sea, as well as to some extent the so-called chocolate clays cropping out in the North Caspian Plain. This might suggest that these clays were deposited when both seas were united during the last major by an overflow from the Caspian during the Last Glacial highstand (Khvalyn) or at least proceeding from drainage basins that underwent similar drastic changes in sediment output characteristics at the Pleistocene-Holocene transition.

This contribution was funded by EU-INTAS grant 05-1000008-8078.