



Hydrographic development of the Aral Sea during the past 1900 years: results based on a dinoflagellate cyst quantitative analysis.

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The Aral Sea is an excellent site for studying the influence of climate, tectonics and anthropogenic impact on the development of hydrographic conditions and on land-form evolution in an endorheic basin. From a core retrieved at Chernyshov Bay in the NW Large Aral Sea (Kazakhstan) we present dinoflagellate cyst analyses with a sampling resolution of 15 to 20 years. At most core levels samples are rich in cysts but species richness is low (total diversity: 16 species). The dominant morphotypes are *Lingulodinium machaerophorum* with large variation in process length and *Impagidinium caspiense*, a species recently described from the Caspian Sea. The aquatic palynomorphs *Pediastrum* and cysts of *Radiosperma corbiferum* represent freshwater inflow into the lake. The data are used to reconstruct salinity as expressed in lake level changes during the last 1900 years. We report and quantify for the first time prominent salinity variations from the northern part of the Great Aral Sea Basin. During sea-level highstands, *Impagidinium caspiense*, representing brackish conditions with salinities of about 10–15 psu, prevail. The assemblages with *L. machaerophorum*, document lake lowstands from approximately AD 100-500, AD 950-1300, possibly between AD 1500-1600, and since the 1960ties. Significant erosion of marine Palaeogene deposits, including those of Eocene age, in the hinterland was also evidenced.

We propose that the recorded environmental changes are related to climate conditions and human-controlled irrigation activities.