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Chronology of geomorphological evolution of Iranian coast of Caspian sea during last 15 ka (Golestan province)

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Iranian coasts of Caspian sea is a unique region for understanding the history of the Caspian Sea in the Pleistocene, its correlation with the global and regional climate changes. The reason is representativeness of Quaternary sections, presence of both marine and subaerial sediments, paleontological richness of the materials and available for study.

At present, large-scale studies of the subaerial deposits of the region - first of all - the so-called Iranian loess plateau are being carried out. Works on the paleoclimatic reconstructions of the region in Holocene were performed by S.A.G. Leroy (2016). However, the Iranian coast remains one of the few sections of the Caspian where sea level reconstructions based on geomorphological evidence have not been performed. In our work, we tried to reconstruct the history of the development of the last and largest transgression of the Caspian Sea – Early Khvalynian, and to reveal the stages of its development in the territory of Northeast Iran. The object of research was the valley of the Gorgan River, in the sides of which a series of sections with marine, alluvial and aeolian deposits is revealed. We have described more than 30 sections throughout the valley, within the bounds of the possible influence of the Khvalynian transgression (up to a height of +70 m abs).

For the first time, deposits of mixed alluvial-marine genesis, reflecting the early Khvalynian transgression of the Caspian Sea, were found in the sections. Completed OSL-dating of sediments allowed to reconstruct the stages of development of the natural environment of the region after the LGM. Thus, 14-15 thousand years ago the middle part of the valley of the Gorgan River was covered by the waters of the Caspian Sea. In sections of the middle part of the Valley (altitude of +30 m), this stage is represented by rhythmic clays and loams of mixed marine and alluvial genesis. The transition to purely alluvial floodplain deposits. The upper part of the section is represented by subaerial loess deposits, with thickness of 7-8 m. The subaerial phase of sedimentation began about 11 thousand years ago with a high rate of formation of loesslike deposits.

Obtained new data allow us to reconstruct the history of the development of the region's geomorphology in the final stages of the Early Khvalynian transgression of the Caspian Sea (14-12 thousand years ago) and the subsequent continental stage, during which a deep cutting of the Gorgan River channel is noted with a synchronous accumulation of a thick layer of loess.

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