
# LED2021 Programme and Book of Abstracts

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# Shedding light on the chronology of the largest Late Quaternary transgression of the Caspian Sea

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The Late Quaternary history of the Caspian Basin remains controversial. One of the major disagreements in this debate concerns the stratigraphic correlation of various deposits in the Caspian Basin. Differences in tectonic regime and in preservation of the geological record in different regions have prevented reliable correlation of local stratotype sections across the region. Because of the absence of a reliable chronology, each region is described in terms of its own self-contained stratigraphy. The Lower Volga region is uniquely attractive for its record of palaeogeographic events, and for the opportunity to build a single stratigraphic and palaeogeographic history of the Pleistocene of Central Eurasia. The existing radiocarbon chronology does not allow the resolution of the two largest transgressions of the Late Quaternary (Early and Late Khvalynian). Based on clear palaeontological and geomorphological evidence, these must be very different in age, but shells associated with both transgressions gave very scattered ages of between 8 and 50 ka [1]. The main topic of discussion is existence of the deep regression phase between the two Khalynian transgressions. This Enotaevka regression was recorded in the Lower Volga as a thin subaerial unit between two marine horizons containing Khvalynian marine fauna. Unfortunately the section containing this evidence was destroyed by later river bank erosion and coastal construction. Recently these deposits have been identified at Kosika, on the right valley side of the Volga river.

The top of the Kosika section is represented by the upper Baery knoll strata (deflated sands), that passes through clear erosional boundary to horizon of loess (~95 cm) with clear evidence of soil-formation. A palaeosol has developed within these subaerial sediments, and is represented by a series of genetic horizons with clear evidence of erosion. Lower part of the section is represented by the marine Caspian sea clays with marine shells. Luminescence dating has allowed us to reconstruct the timing of the main evolutionary stages during the second half of the Khvalynian transgression. From the comparison of blue OSL, $IR_{50}$, and $pIRIR_{290}$ ages it appears that quartz OSL signals were probably all sufficiently bleached before deposition, so that any uncertainties in bleaching do not contribute significantly to the reliability of the quartz luminescence ages. 15 OSL ages describe the main stages: re-worked Upper Khvalyanian sands (8.3±0.5 ka; x samples); a palaeosol formed in the Enotaevka regressive horizon (12-13 ka; y samples); Lower Khvalynian sediments (19-22 ka; 3 samples). This research reveals for the first time the evolution of the Enotaevka regressive series of the Lower Volga and provides a numerical age for the main stages of the Late Quaternary environmental evolution of the region. This work was supported by Russian Science Foundation (19-77-10077).

**Keywords:** Caspian sea, marine transgression, Late Quaternary, sea-level change.

**References**

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