**Inner structure and age of development of the Baer knolls in western Volga delta**

The history of the study of Baer knolls (BK) counts more than a century. There are several theories of the origin of BK. In this paper, we provide information about the inner structure of Baer knolls in the western (Mirny, Dolgiy, Troitsky) and central (Yaksatovo, Nartovo) parts of the Volga delta.

The aim of the study is to identify the inner features of the structure of BK and the mechanism of their forming. To achieve this aim, several methods were used (granulometric, geochemical, malacofaunistical and radiocarbon).

BK in the Volga delta, in general, have a similar inner structure. In the basement there are chocolate clays (CC) with lenses of sand. Above there is a lower thickness (LT). The LT consists of cross-bedded dark brown clay and silt with thin layers of detritus. The thickness of LT is about 4–5 m. Above there is an upper thickness (UT) which consists of lighter pale-brown sand and silty clay. The lamination is mainly oblique with monoclinal and wedge-shaped structure. The thickness of UT is 2-3 m.

The grain-size analysis confirms the presence of UT and LT, which are separated by erosion boundaries. Based on grain-size and geochemical data the LT and CC composition are mainly similar. The LT usually contains finer fraction, it has two modes in coarse clay and coarse silt (0.01-0.05 mm). The UT is distinguished by a sand composition with two peaks in clay (0.001-0.005 mm) and fine-grained sand (0.05-0.25 mm).

The radiocarbon dating of the LT in the Yaksatovo BK is 15280±180 cal yr BP.

A malacofaunistical analysis was carried out for two knolls (Mirny and Yaksatovo). On the contact of the LT and CC in the Yaksatovo, shells were found *in situ* *Didacna protracta*, *D. parallella*, *D. parallella borealis, D. praetrigonoides*. In Mirny, on the contact between the LT and UT, *D. praetrigonoides, D. protracta* were found. These species were distributed at the end of the Lower Khvalynian and the beginning of the Upper Khvalynian stages.

The geomorphology of the central part of the delta reveals that the ridges in the lowermost part are absent, and the thickness of alluvial sediments is more than 20 m, which means that there was an active river runoff in this area that destroyed the ridges (Rachkovskaya, 1951). Consequently, BK could have been formed since the end of the Early Khvalynian transgression, and especially during the Late Khvalynian and the Early Holocene. Probably, the LT was formed in the subaquatic conditions, while the subaerial (aeolian) processes, played an important role in the formation of UT.

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