



Late Pleistocene Terraces in River Valleys of the Central Russian Plain: Morphology, Structure and History of Development

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Morphology and sedimentary composition of low terraces of the Seim (the middle Dnieper catchment) and Khoper (the middle Don catchment) rivers were studied in the field (DGPS topographic profiling, hand and mechanical coring, examination of natural exposures) and in laboratory (grain size analysis, spore-pollen composition, ¹⁴C and OSL dating, microscopic study of quartz grains). Archaeological data have also been taken into account.

It was found that Late Pleistocene river terraces were subject to complex reworking after the alluvial sedimentation had finished. Terraces may therefore contain sediments of different origin and terrace levels may vary according to the post-alluvial reworking. To establish terrace sedimentation mechanisms we supplemented lithological data collected in the field with quartz grains morphoscropy technique – microscopic study of quartz grains surfaces. The results exhibit wide participation of aeolian and slope wash sediments in terrace deposits, deep aeolian reworking of terrace alluvium during LGM that could be possible due to ground water lowering because of deep pre-LGM incision of rivers. The main difficulty in interpretation of morphoscopic results is that aeolian signals are sometimes not clear due to short duration of wind action over alluvial sands.

River incision was detected within the interval since 50-60 to 25-30 ka BP (cal). High runoff increase is proposed as the reason of this incision, which is illustrated by formation of "big meanders" (macromeanders) in river valleys. There were probably several time spans of high runoff divided by low runoff intervals. By the time of LGM rivers had already been incised down to the modern river levels or deeper. The cryoaridic LGM time (20-23 ka BP cal) makes the most pronounced low runoff interval. After LGM, the last high runoff epoch started, which is dated to 13-18(19) ka BP (cal). Numerous now relict macromeanders were formed in river valleys at that time and considerable portions of modern floodplains were established. So the morphology of river valleys indicates contrasting runoff variations being the characteristic feature of the Valdai (Weichselian) cold stage.