



Holocene climate dynamics in the central part of the East European plain (Russia)

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The Holocene climate and vegetation dynamics in the broad-leaved forest zone of the central part of the East European plain have been reconstructed on the base of pollen, plant macrofossil, testate amoebae and radiocarbon data from the mire Klukva (N 53.834812, E 36.252488), located in the kast depression in the Upper Oka River basin (Tula region, European Russia). The reconstruction of main parameters of past climate (the mean annual temperature precipitation) was carried out by the “Best Modern Analog” approach.

Reconstructions of vegetation show that in the early Holocene the territory was occupied mainly by birch and pine-birch forests. Significant changes in the plant cover of the Upper Oka River basin are attributed to the 7.5 cal kyr BP). The climatic conditions were favorable for development of the broad-leaved forests those persisted in this area up to industrial period. In the 17th century, when the population density greatly increased and watersheds were ploughed, natural vegetation communities were gradually destroyed and transformed into agricultural landscapes. According to obtained climatic reconstructions the period 10-8.5 cal kyr BP was relatively cold and wet, when the mean annual temperature was in 3°C lower and precipitation was in 50-100 mm higher then nowadays. The significant climate warming occurred in about 7.0-5.0 cal kyr BP (The Holocene thermal maximum): the mean annual temperature in 2°C exceeded the modern value and precipitation was close to that. The environment conditions were drier due to decrease of effective moisture. In the second part of the Holocene the sequence of second-, and even third-order climatic oscillations expressed against the background of the overall slight trend towards cooling have been determined. The most pronounced cool and wet intervals were reconstructed in 2.5-2.0 cal kyr BP and 1.5-1.3 cal kyr BP. The mean annual temperature decreased in 1.5-2 °C and precipitation rose in 200 mm in compare to modern ones. During the last millennium the warming of the Medieval Climatic Anomaly and cooling of the Little Ice Age were clearly determined.

This work was supported by RFBR grant 11-05-00557.