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Reconstruction of vegetation in the Northern Hemisphere at the Holocene climatic optimum

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An assessment of vegetation response to global climatic changes, appearing mainly in temperature growth and changes in precipitation regime, is one of very important scientific issue demanding multy-proxy paleo-environmental investigations. According to data of paleogeographic studies, the thermal maximum of the Holocene (Atlantic period, about 6-5.5 ka BP) can be used as good paleoanalogue of future climatic conditions if the global temperature will rise by 1ºC (Velichko et al. 2004). Thus, vegetation during Atlantic phase of the Holocene could be considered as a model of anticipated landscape dynamics. Based on published pollen and plant macrofossil data and materials from the Global pollen database (http://www.ncdc.noaa.gov/paleo/pollen.html) a map (scale 1:90000000) of vegetation of the Northern Hemisphere at the Holocene climatic optimum have been compiled. The reconstruction of vegetation was made on the biome level.

The obtained results show that zonal structure of a plant cover in the Atlantic period was similar to modern one. However some differences are clear identified at the boundaries between the main biomes and in their species composition. For example, the boundaries between forest and tundra zones and northern boundary of broad-leaved forest both in Eurasia and North America were shifted several hundreds kilometers northward. Asian and Northern African arid and semiarid regions were characterized by more humid vegetation than at present. In the mountain areas the Atlantic period was characterized by the highest position of timberline during the whole Holocene.

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