



Geochemical signatures of climatic changes in the lake deposits of Holocene in the Southern Siberia area

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The reconstruction of climate during Holocene in the Southern Siberia and Central Asia is the difficult task. It is a region with strong climatic differences, especially concerning effective moisture. The Tibetan Plateau, north-western and north-central China, Mongolia and the Southern Siberia is situated in the triangle of the Indian Monsoon, the SE Asian Monsoon and

the Westerlies. The reconstruction of climatic changes during Holocene in the Southern Siberia has important meaning not only for assessment and prediction climate as a whole but for characteristics of the prehistory people life. The Eastern part of Southern Siberia is located on latitude 53° N in the Eurasian steppe belt, where the steppe areas lie in the Sayan-Altai intermountain depressions. The lake deposits from Kutuzhekovo, Big Kizikul and Shushenskoe Lakes were investigated by geochemical, radiocarbon dating and pollen methods. The mineral-geochemical researches of lake deposits involve the determination of mineral composition of sediments by IR-spectroscopy, the chemical composition by XRF analysis, chromatographic analysis and LOI determination. The data of chemical composition was processed by mathematic statistic method for the determination of the most significant factors influencing on the variability of sediment composition. The correlation with the pollen analysis gave the possibility to establish the indicated ratios of elements ($\text{Na}_2\text{O}/\text{K}_2\text{O}$; $\text{K}_2\text{O}/\text{Al}_2\text{O}_3$; CIA; LOI; CaO , $\text{CO}_2/\text{C}_{org}$, N), which mark most precisely such factors as the temperature changes and the moisture variations.

These data allows us to form the detailed scheme of climatic changes during Holocene in the study area. The Younger Dryas event (11 300-11 000 cal BP) yields dry and

cold climate conditions in South Siberia. The beginning of Holocene is characterized by rise in temperature. The climate in the Southern Siberia was warm and dry. The cold climate at 8200 cal BP was accompanied by humid conditions in study area. The Holocene optimum is registered about 8000-6000 cal BP in the most of Central Asian regions and this period characterized by increasing of insolation. In the Southern Siberia it was a dry and warm period. The decreasing of temperature in the Middle Holocene at 4500 cal BP coincided with the increasing of humidity on this territory. Further rise of temperature was during 3500-3000 cal BP. In the Southern Siberia it was a dry conditions. At 2800 cal BP the climate became the cold and humid in this area. This data allows us to suppose that the Westerlies, which carries the dry atmospheric flow, influenced the climate in the Southern Siberia. This fact has important meaning for the assessment of migration processes of the prehistoric people. The opportunity of the nomadic cultures spreading throughout the Southern Siberia depended on the climatic conditions of this area and neighbor regions.

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