



Holocene vegetation and climate variability in North Pre-Baikal region, East Siberia, Russia

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ABSTRACT

The paper presents the first reconstructions of vegetation and climate of the North Pre-Baikal region covering the last 9000 years based on detailed pollen records from peatlands. Recorded major changes in pollen spectra and vegetation are demonstrated to correlate with large-scale climatic events, such as the regional climatic optimum ca. 9000–6800 BP, termination of the optimum ca. 7000–6500 BP, and Neoglacial cooling culminated ca. 3000–2000 BP. The most warm and wet climate existed about 9000–6800 BP, the interval being referred to as the regional Holocene optimum. At that time, vegetation was dominated by dark coniferous forests of *Abies sibirica*, *Picea obovata* with *Pinus sibirica*. Since 6800 BP, the dark coniferous forests gave way to light coniferous ones (*Pinus sylvestris* and *Larix*) in response to gradual decrease of precipitation and summer temperatures to today's values, agreeing well with earlier obtained data. The new records suggest the cold boreal plant communities are highly sensitive to climatic changes. Detailed dating of the sequences would facilitate inter- and intra-regional correlations of the obtained records and reconstructed events.

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1. Introduction

The expected warming, as predicted by global climatic models, would be most pronounced in high latitudes of the Northern Hemisphere (ACIA, 2004). This accounts for the close attention focused on reconstructions of paleo-environments in various regions, and particularly in Siberia, opening the way to more objective forecast of environmental changes in future. The North Pre-Baikal region has particular interest for paleo-ecological and paleo-climatic studies. Due to its position in the central part of the continent, within the zone of cold boreal forests, where Atlantic air masses come into contact with Arctic ones, the region features unique environments. The climate with cold winter and moderately warm summer, as well as the presence of permafrost, favored formation of wetlands, and pollen records preserved in their deposits provide information on the Holocene environments. Climate changes in the Holocene were not so dramatic and did not induce complete restructuring of environments comparable to those in Late Pleistocene. However, the climate changes were

sufficient for local and even regional plant communities to be noticeably changed. No paleo-environmental studies of the Holocene have been yet performed in the North Pre-Baikal region. The present paper gives the first reconstructions of vegetation and climate of this area during the last 9000 years, based on detailed pollen records obtained from peatlands.

The objective of the investigation was to get new information on dynamics of vegetation and wetland ecosystems in the high mountains of the Baikalsky Ridge and Khanda depression (north-east of Lena-Angara Plateau). A comparison between the newly obtained records and other regional data would advance understanding of the evolution of climate and vegetation in this still insufficiently studied continental region.

2. Geography, climate and modern vegetation of the area under study

2.1. Northern part of the Baikalsky Ridge (North Baikal basin)

The high Baikalsky Ridge, with some peaks rising above 2000 m, forms the northwestern slope of the North Baikal basin and extends for about 300 km from north to south. The coasts of the North Baikal basin have a temperate continental climate, partly

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