



Contents lists available at ScienceDirect

Quaternary International

journal homepage: [www.elsevier.com/locate/quaint](http://www.elsevier.com/locate/quaint)

## Late Glacial and Holocene environmental history on the eastern slope of the Middle Ural mountains, Russia

N.K. Panova\*, T.G. Antipina

*Institute Botanic Garden, Ural Branch, Russian Academy of Sciences, Russian Federation*

### ARTICLE INFO

*Article history:*  
Available online xxx

*Keywords:*  
Holocene  
Peat bog  
Pollen analysis  
Radiocarbon data  
Archeological site  
Climate changes

### ABSTRACT

The study area is situated on the eastern slope of the Middle Urals, at an elevation of 250–300 m above sea level, in pine forests of the southern taiga subzone. The modern climate is temperate continental. In order to assess the Holocene environmental dynamics, a study of peat bog deposits by means of palynological and paleobotanical analyses, coupled with radiocarbon dating is undertaken. The article presents the results of a multi-proxy study of five sections of Shigirskiy and Gorbunovskiy peat bogs, the former post-glacial lakes changed into peat bogs during the Holocene. The study is coupled with archaeological investigations of the cultural layers in peat and sapropel, which represent the traces of settlements on the banks and islands. A total of 179 samples are subjected to palynological and botanical analyses and the radiocarbon dates are obtained on 29 samples of peat and sapropel. The peat bog stratigraphy, sedimentation processes, environmental dynamics and ancient human activities are characterized for the period from the end of Late Glacial throughout the Holocene. The three periods of the most significant climatic changes are established for the study area. 1) The warming and beginning of the spread of arboreal vegetation at the boundary between the Late Glacial and Early Holocene about 11 thousands calendar years ago, or 11 ka; 2) the substantial warming between 9.3 and 8.6 ka resulted in the wide spread of pine and formation of mixed forests with broad-leaved trees; 3) an abrupt decrease of spruce and broad-leaved arboreal plants in forest communities, indicating a dry cooling at about 4.2–3.8 ka. Those periods are related to the changes of archaeological epochs. The other three periods of climate aridification are established by the decreasing spruce frequencies in the pollen spectra and the transition from sapropel to peat due to lowering water levels in the lakes at about 8.3–7.8, 6.2–5.8, and 5.4 ka. The formation of cultural layers was related to the dry periods and the reduced levels of ground waters, which promoted the human use of the peatlands. The results are presented as a table summarizing the environmental dynamics over the background of the calendar age of deposits and are correlated to the Blytt-Sernander periodization of the Holocene in Northern Eurasia modified by Khotinsky (1977) and the formal tripartite subdivision of the Holocene (Walker et al., 2012).

© 2015 Elsevier Ltd and INQUA. All rights reserved.

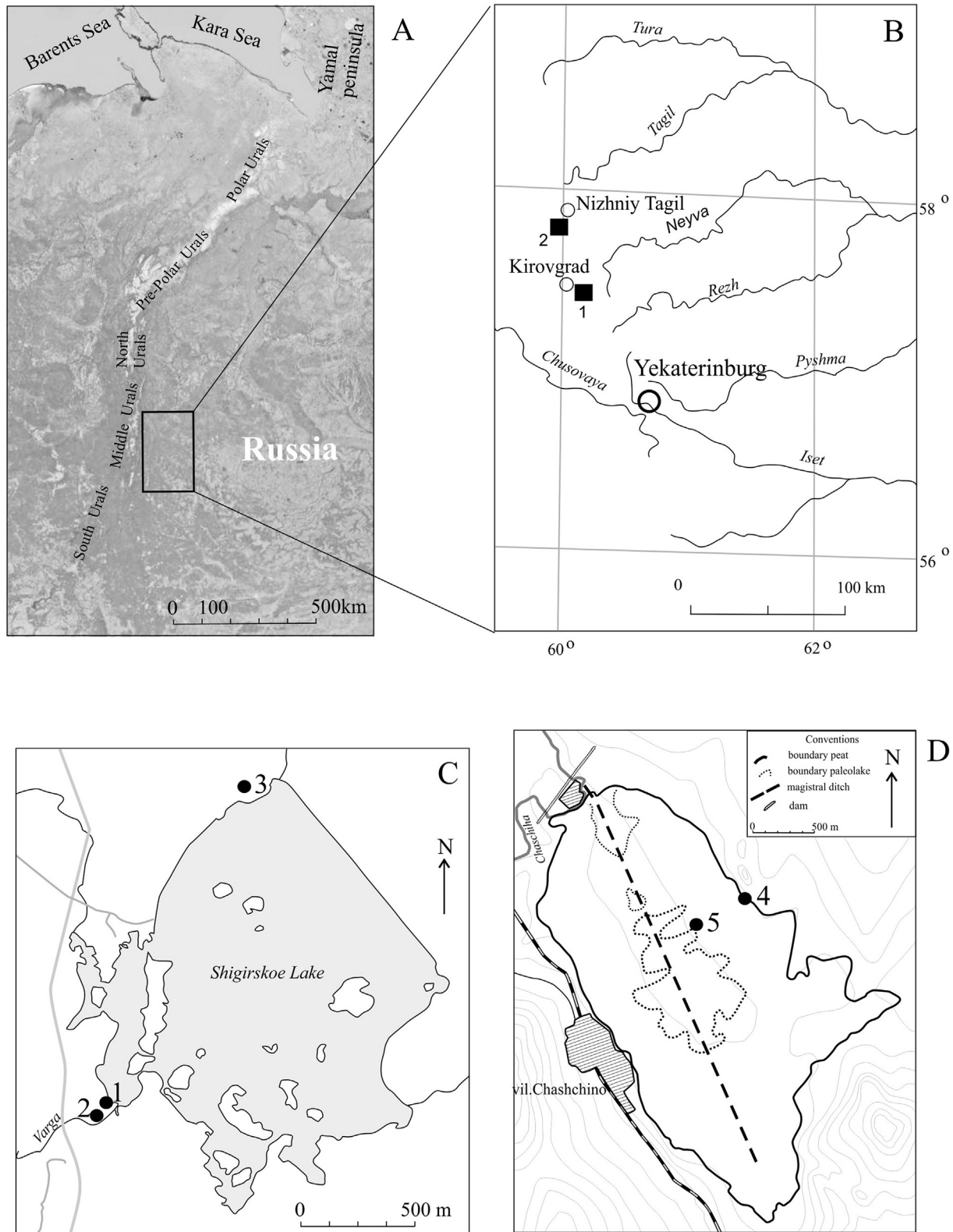
### 1. Introduction

Modern natural ecosystems of the Urals, as well as those throughout North Eurasia, have been developed during the Holocene. Plant fossils obtained from peat-bogs present an optimal

source to draw information about the Holocene dynamics of vegetation and the environments.

Peat-bogs formed after the last glacial gradually deposited layers, thus chronicling the actual sequence of events developed during the late-glacial and Holocene intervals. Acidity and anaerobic conditions within peat work to preserve different organic remains, including pollen and spores, as well as other remains derived from plants grown on the bog and around it. Thus, peat deposits are good objects to examine processes of

\* Corresponding author.  
E-mail address: [natapanova@mail.ru](mailto:natapanova@mail.ru) (N.K. Panova).



**Fig. 1.** Maps and schemes of studied region with locations of coring peat and archaeological sites: A – Map of studied region location in Russia; B – map of coring peat location, 1 – Shigirskiy peat bog, 2 – Gorbunovskiy peat bog; C – scheme of Shigirskiy peat bog, 1 – section of the Varga (borehole), 2 – site Varga 2 (pit), 3 – site Shigirskiy A; D – scheme of Gorbunovskiy peat bog, 4 – site Beregovaya 2, 5 – site VI Razrez.

Download English Version:

<https://daneshyari.com/en/article/5113953>

Download Persian Version:

<https://daneshyari.com/article/5113953>

[Daneshyari.com](https://daneshyari.com)