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North-Eastern Federal University

**2nd International Conference and
Young Scientists School**

**PALEOLIMNOLOGY OF NORTHERN EURASIA
EXPERIENCE, METHODOLOGY, CURRENT STATUS**

Proceedings of the International Conference



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ОПЫТ, МЕТОДОЛОГИЯ, СОВРЕМЕННОЕ СОСТОЯНИЕ**

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(Лаврова, 2004) и современных малых озер из его бассейна (Филимонова, Лаврова, 2015).

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RECONSTRUCTION OF HOLOCENE PALAEOCLIMATE AND PALAEOENVIRONMENT ON THE KOLA PENINSULA (NW RUSSIA) FROM LAKE SEDIMENT RECORD

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Studying effects of changes of climatic parameters, influencing first of all highly sensitive Arctic regions of the Earth, is very important for understanding of present and past climate trends. The Kola Peninsula lies almost entirely above the Arctic Circle and is a perspective area for the paleoclimatic and paleoecological studies.

Aquatic organisms, including chironomids, are recognized as the best indicators for quantifying past changes in air temperature or lake chemistry and are widely used in palaeoecology (Letter et al., 1997; Brooks and Birks, 2000; Battarbee, 2000; Massaferrero and Brooks, 2002; Solovieva et al., 2005). The larval head capsules preserve well in lake sediment deposits and the microfossils are readily identifiable in most cases at least to species morphotype. The abundance and distribution of most chironomid taxa are temperature-dependent, and they respond rapidly to climate change.

We investigated Lake Antyukh-Lambina (Kola Peninsula, N 67.07; E 33.31). The lake is connected by a narrow strait with the Lake Kolvitskoye. We studied a 3 m long lake sediments core and surface samples and performed a lithological, Loss of Ignition and micropalaeontological (in particular chironomid) analyses. Mean July air T was reconstructed using North-Russian chironomid-based inference model (Nazarova et al., 2015). Analyses of lithological sequences and radiocarbon dating of sediments present a clear outline of the development of the lake ecosystem and studied region from 13000 cal years BP to the present day.

Cluster analysis identified four main stratigraphic zones. There was a shift in taxonomic composition of chironomids during the lake development. Zone 1 (13000 – 11000 cal years BP): Lowermost zone is marked by dominance of chironomid taxa associated with macrophytes. In the upper part of the zone *Chironomus plumosus*-type is dominant, a taxon that is tolerant to low oxygen concentrations and sometimes to acidification. We assume that during this initial stage of the lake formation the lake was surrounded by wetlands, and the lake water was eutrophic. Zone 2 (11000 – 8700 cal years BP): The chironomid communities include many taxa associated with aquatic vegetation, and the taxa indicators of the moderate or cool temperature conditions. Species composition of chironomid communities indicates some cooling. Zone 3 (8700 – 4400 cal years BP): The dominant taxon *Sergentia coracina*-type (cold-water and acidophilic) is decreasing in the upper part of the zone, and *Heterotrissocladius marcidus*-type, and then *Heterotrissocladius maeueri*-type 1 become dominant. Across the zone *Microtendipes pedellus*-type (medium temperature) is frequently met. Reconstructed air temperatures are higher than in the previous zone. Zone 4 (4400 cal years BP to present): Cold-water taxa dominate. Reconstructed conditions are close to modern.

The reported study was supported by RFBR, research project № 16-35-50036 mol_nr, №13-05-41457 RGO_a

Section 4.

Reconstructions of the natural-climatic events by paleolimnological data

Направление 4.

Реконструкции природно-климатических обстановок по палеолимонологическим данным.

Oral section

Устные доклады

INTERPRETATION OF PALYNOLOGICAL DATA ON SEDIMENTS OF SMALL LAKES IN DIFFERENT LANDSCAPE AND CLIMATIC CONDITIONS

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Comparison of changes in pollen percentages, concentrations, and accumulation rates of four tree species (*Picea abies*, *Larix* sp., *Pinus sylvestris*, and *Betula* sect. *Albae*) in the sediments of two small lakes, located near the southern and northern boundaries of the boreal forest zone, allow detailed reconstructions of the development of forest communities near the studied sections in the Late Glacial and Holocene. The reconstructions are confirmed by finds of conifer stomata in the lake deposits, which indicate the local presence of larch and spruce beyond the present-day northern tree line until approximately 4.5 thousand years ago.

К ИНТЕРПРЕТАЦИИ ПАЛИНОЛОГИЧЕСКИХ ДАННЫХ ПО ОСАДКАМ МАЛЫХ ОЗЕР В РАЗНЫХ ЛАНДШАФТНО-КЛИМАТИЧЕСКИХ УСЛОВИЯХ

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Отложения малых озер (МО), чаши которых образованы слабо размываемыми породами, обладают рядом преимуществ по сравнению с другими традиционными объектами палинологических исследований (торфяниками, с одной стороны, и иными флювиальными отложениями, с другой стороны). Стабильные условия