basement of the database information we conduct researches in different areas of water ecology such as estimation of diatom assemblages' diversity (Gorodnichev et al., 2015b) and similarity (Gorodnichev et al., 2015c), evaluation of lakes' saprobity, relationships between biotic and abiotic components (Gorodnichev et al., 2015a) of the ecosystems etc. All our lake investigations are based on the regional morphological classification of lakes' genesis which was founded by Innokentiy Zhirkov in 1977 (Zhirkov, 1977). According with the classification the most part of lakes in Yakutia has thermokarst, fluvial-thermokarst, and fluvial-erosion genesis. Today above then 200 lakes and water ponds are involved in our databases. It is not enough for such big region as Yakutia because recent counting reveals that the territory of the region is covered by more than 800000 lakes (Arzhakova et al., 2007).

For some districts of Yakutia lakes are the only source of fresh drinking water for the people so this is why the researches of modern and future water conditions of lakes are very important. Thus our databases could be used not only for the aims of environmental monitoring and past environmental analogies, but also for the purposes of nature protection. Especially the information about the water objects will be useful after industry development in the Northern part of Yakutia.

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TOWARDS BETTER UNDERSTANDING EUROPEAN ICE AGE POLLEN RECORDS: A LESSON FROM MODERN POLLEN ASSEMBLAGES OBTAINED FROM YAKUTIAN LAKES

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Pollen analysis of lake sediments and peat accumulations has been, over more than a century, the most widely used method to reconstruct past vegetation cover and character of the landscape. Sophisticated models considering pollen–vegetation relationship are often calibrated in current conditions (modern landscapes, climates) and seem to be robust enough to enhance reliability of reconstructions of the Holocene vegetation cover and its changes (e.g. Abraham et al. 2016). However, the same approach can be hardly applied to European records of the coldest (cryocratic) stages of the Pleistocene. In these records, high proportions of non-arboreal pollen (NAP), especially Poaceae and

Artemisia, are often canonically interpreted as the evidence of treeless vegetation. Small proportions of arboreal pollen (AP) are then often considered to be a result of long distance transport. Based on this traditional reconstruction, the glacial vegetation is usually interpreted as a steppe, tundra, or "steppe-tundra", with its closest recent analogy in southern Siberia (Kuneš et al. 2008, Magyari et al. 2014). We asked the following question: Is this traditional reconstruction of European cryocratic vegetation, as being mostly treeless, always valid? To solve this question, we compared fossil pollen data from the Ice Age in central Europe with the modern ones, obtained from treeless regions in southern Siberia, as well as from central Yakutia covered by taiga. We analyzed pollen in 12 surface sediment samples from small *alas* lakes located in a flat landscape in central Yakutia. All the sampled lakes were surrounded by dense northern taiga, dominated by *Larix* with admixture of *Pinus*, *Betula* and (near streams) *Picea*. Nevertheless, the lakes, although similar in size, differed in vegetation characteristics of their proximal surroundings – usually, there was a belt of steppe and/or meadow vegetation near the lakeshore.

We have found that AP:NAP ratio in the modern lake pollen assemblages in central Yakutia was highly variable and ranged from 6:1 to 1:3, while the median was about 1:1. This is a surprising result, considering the dense taiga forest surrounding all the sampled lakes. What is the reason of such a high proportion of non-arboreal pollen in observed pollen spectra? We propose several working hypotheses, which will be discussed below: (1) Larch (*Larix*), despite its dominance in taiga forest, is almost invisible in pollen spectra, due to its low pollen productivity as well as low dispersal ability; (2) Trees, in general, do not produce much pollen under extreme climatic conditions; (3) Local taphonomic processes in central Yakutia (and/or during the Ice Age in Europe) differed from those in current Europe, i.e., the majority of pollen in lacustrine sediments probably originated from their closest surrounding, as a result of both the light wind and low precipitation during the short summer. Naturally, these working hypotheses do not necessarily contradict each other.

To compare fossil pollen assemblages from central Europe and the modern ones from Siberia, we performed a multivariate (DCA) analysis. For this purpose we used several hundred individual pollen assemblages stored in the Czech Quaternary Palynological Database (PALYCZ). We selected samples dated to the Last Glacial Maximum and the Late Glacial, according to radiocarbon chronologies. For the comparison of fossil pollen assemblages with the modern ones, we followed similar method as previously used by Kuneš et al. (2008) and Magyari et al. (2014). While these two studies offered available recent pollen assemblages from vegetation plots (moss pollsters) collected in south Siberia, we included to the data also the 12 pollen samples from the small lakes in Yakutia.

Our results show that most Central European Last Glacial, especially the Late Glacial, pollen spectra show high similarity to pollen spectra from recent Yakutian lakes. This result provides evidence that at least the Late Glacial pollen samples from the Czech Republic shouldn't be interpreted as a reflection of steppe-tundra vegetation, which was considered previously e.g. by Kuneš et al. (2008). On the contrary, our results can support an alternative interpretation (considering a comparable degree of confidence), i.e. the forested landscape (larch-dominated taiga with only small treeless patches) similar to that existing today in Yakutia. The long lasting discussion (as being popularized by Willis & Van Andel, 2004) about the possible nature of LGM climate and the Late Glacial vegetation, as well as about possible existence of northern forest refugia ("microrefugia") in central Europe, must be therefore brought into reconsideration again.

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