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# Climate variability in the Siberian Arctic over the past millennium: midge-based inferences from lakes of the Sakha (Yakutia) Republic

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Our study aims at reconstructing climatic variability and climate impact on lakes over the past millennium in the Siberian Arctic, the coldest region of Eurasia. Here we present climate inferences based on the stratigraphic analysis of fossil chironomid assemblages (non-biting midges) from sediments of three arctic lakes (one millennial and two centennial records) located in the northeastern part of the Sakha (Yakutia) Republic (70°N, 147°E). Changes in chironomid assemblages in the millennial record clearly show the most significant climatic events of the past millennium, namely the Medieval Warm Period, the Little Ice Age, and the recent warming of 20th century. During relatively warm phases chironomid assemblages are dominated by the warm-adapted Chironomus anthracinus-type, whereas cooler phases are characterized by taxa such as Micropsectra insignilobus-type and Sergentia coracina-type. The pattern of chironomid-inferred climate changes in this Asian part of the Arctic, as represented by chironomid sample scores in a Principal Components Analysis (PCA), is comparable to that recorded in a tree-ring based summer air temperature reconstruction from this region, and broadly similar to those found in other high-resolution millennial records across the European and Western Hemisphere Arctic (e.g., Svalbard, Greenland, the Canadian Arctic). The recent warming of the 20th century is also well visible in both centennial chironomid records. PCA scores for the chironomid samples of recent decades fall outside the range of variability during the first half of the 20th century but are within the range of the millennial-scale variability. Our reconstructions suggest that the recent warming is unusual in the context of the variability of the past centuries but is, within the millennial climate variability, comparable to the Medieval Climate Anomaly.