Chironomid-based temperature and environmental reconstructions of the Last Glacial Termination in southern Bohemia, Czech Republic

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Author(s) Kubovcik, Vladimír; Hosek, Jan; Heiri, Oliver; Rojik, Filip; Vaterkova, Simona; Trubac, Jakub; Pokorny, Petr
Author(s) at UniBasel Heiri, Oliver ;
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We present a new chironomid record from sediments of former Lake ÇSvarcenberk in South Bohemia (412 m asl,Czech Republic), located in the oceanic-to-continental macroclimatic transitional zone of eastern Central Europe. We provide estimates of Weichselian Late Glacial and Early Holocene (ca. 15-8 ka BP) mean July air temperatures on the basis of changes in the fossil assemblage using a joint Norwegian-Swiss transfer function. In our study, the climate was found to be relatively cold during the Late Pleniglacial, with July temperatures ranging between 11.2 and 12.3 æC. With the exception of the youngest section of this interval, temperatures during the Bølling-Allerød interstadial were relatively stable and warm, with values around 13.3-14.5 æC. During the Younger Dryas (YD), July temperatures varied between 12.7 and 16 æC, and these particular results are in agreement with other climatic reconstructions from the central to the eastern part of the European continent showing no or moderate summer temperature decrease during the YD, or even a slightly warming trend. A relatively warm and climatically stable early YD phase was followed by a variable and overall cooler younger phase. At the beginning of the Early Holocene, our reconstructed July temperatures increased to 17.7 æC. We demonstrate that general patterns of temperature changes inferred from chironomids during the Last Glacial Termination are similar to various multi-proxy reconstructions in Europe but we observe two unusually strong and abrupt cooling events: one that may be linked with the Gerzensee oscillation at the end of the Bølling-Allerød Interstadial and another that probably corresponds to the Preboreal Oscillation, although the temperature decreases in these intervals were much more pronounced than observed in other chironomid records from Europe, suggesting that local climatic factors and ecosystem responses may have overamplified these cold events in the temperature reconstruction. However, other proxies (geochemistry, pollen) support the interpretation of climatically driven palaeoenvironmental changes such as the development of vegetation cover, changes in lake productivity, pedogenesis and erosion.
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