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Climate dynamics from 17 to 7 kyr BP deduced from a new pollen record from Tenaghi Philippon in comparison with marine palynological data from the northern Aegean Sea

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The time interval from 17 to 7 kyr BP is characterized by pronounced climate variability. Among the climatic setbacks during that time, the most prominent are the Younger Dryas (YD) and the 8.2 ka event. The impact of these setbacks on vegetation development is relatively well understood for higher-latitude settings particularly in Central and SW Europe. However, there is still a lack of high-resolution vegetation and climate data for the eastern Mediterranean region, although this region is an ideal natural laboratory for analyzing the effects of short-term climatic change on terrestrial environments due to its intermediate position between the higher-latitude and lower-latitude climate systems. In light of the above, we used a terrestrial core from Tenaghi Philippon, NE Greece, to carry out pollen-based vegetation and climate reconstructions. These indicate that both temperature and precipitation controlled vegetation dynamics until ~15 kyr BP. Between ~15 and ~12.7 kyr BP, temperatures were already comparable to early Holocene circumstances, thus changes in moisture availability appear to have been of major importance. During the interstadials of the Bølling/Allerød interstadial complex (BAC), moisture availability appears higher at Tenaghi Phillipon than during the preceding interval. The following Younger Dryas, although drier and colder than the preceding interstadials of the BAC, appears more humid/warmer than the preceding cold intervals, i.e. the Older and Oldest Dryas and the Pleniglacial. These results are in opposite to findings from a neighbouring marine palynomorph record, where the YD appears to be the coldest/driest interval between 17 and 7 kyr BP, implied by both pollen- and dinocyst-based reconstructions.
The early Holocene was punctuated by several short-term climate events. Among these, the North-Atlantic-related 8.2 ka event is most strongly pronounced at Tenaghi Philippon, with winter temperatures declining by almost 4° C, in opposite to the coastal areas of the Northern Aegean region, where winter temperatures only dropped by ~1.5° C.