Geophysical Research Abstracts
Vol. 20, EGU2018-12040, 2018
EGU General Assembly 2018


# The Nature of the Palynological Signal of Heinrich Event 1

Irina Delusina
UC Davis, Earth and Planetary Science, Davis, United States (idelusina@ucdavis.edu)

The role of vegetation through intervals of abrupt climate change is one of the most challenging of paleoclimatology problems. The post-glacial transition of vegetation that occurred at the beginning and end of Heinrich event 1 (H1) stretched up to the beginning of the Younger Dryas. This transition is related to the magnitude and timing of H1 and to the non-linear response of the Earth system to the H1 event itself in different geographical locations. The H1 event may stretch over the entire transition interval from 18 to 14.5 Ky.
The main problem that arises is the uncertainty in the interpretation of the pollen assemblage due to its mixed nature, particularly the presence of both "warm" and "cold" pollen and its variable representation in different locations. We have compared the initial and post-H1 event pollen signal for a longitudinal tropic – sub-polar transect, using data from our own studies and the published literature. We find that despite regional peculiarities, most of the pollen assemblages demonstrate a similar sequence of patterns.
One of the most prominent common features at the onset and end of H1, is the appearance of saw-tooth-like shapes in the variables of the pollen diagram, independent of site, vegetation composition and other factors. The most noticeable "saw-tooth" occurs before the H1, at $\sim$ 18-17 Ky and after, between about 14 and 12 Ky, an interval that roughly follows the transition from the Bølling/Allerød interstadial to Younger Dryas. The common features of a "saw-tooth" for both initial and post-H1 event, are: 1) Following the LGM, there is an increase in upland herbs assemblages and/or in ferns, usually coinciding with a general decrease in the percentage of arboreal pollen. 2) A second stage, which extends to the Bø/Al and is similar to the previous one, but with lower saw-tooth amplitude and lasting as long as 2 Ky. 3) Each "saw-tooth", no matter where it occurs, terminates with the beginning of an increase in arboreal taxa. For all of the different sites, the isotopic evidence shows that this period corresponds to warming, but the pollen record tell a more complex story. Thus, despite the local individuality of each pollen data for different geographical locations, they all indicate that these almost chaotic changes in vegetation have something in common. The response to global warming has to be related to the fraction of local plants that were able to adjust fast to climatic change and the growth of $CO_2$ in the atmosphere. In turn these pioneer plants consumed a substantial amount of $CO_2$, changing the situation backward. The "saw-tooth"-like chaos lasts until the stabilization of the system to the "new normal" after the Younger Dryas cooling.