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# Climate signal detected in sub-fossil and living oak trees data. An analysis of signal frequency components

Nechita Constantin (1), Chiriloaei Francisca (2), Radoane Maria (2), Popa Ionel (1), and Radoane Nicoae (2)

(1) National Research and Development Institute for Silviculture "Marin Dracea" (INCDS), Calea Bucovinei 73 bis, 725100 Câmpulung Moldovenesc, Romania, (2) Department of Geography, Stefan cel Mare University of Suceava, Universitatii. No.13, 720229, Suceava, Romania

This study is focused on analysis the frequency components of the signal detected in living and sub-fossil tree ring series from different time periods. The investigation is oriented to analyze signal frequency components (low and high) of the two categories of trees. The interpretation technique of tree ring width is the instrument most often used to elaborate past climatic reconstructions. The annual resolution, but also, the high capacity of trees to accumulate climatic information are attributes which confer to palaeo-environmental reconstructions the biggest credibility.
The main objective of the study refers to the evaluation of climatic signal characteristics, both present day climate and palaeo-climate (last 7000 years BP).
Modern dendrochronological methods were applied on 350 samples of sub-fossil trees and 400 living trees. The subfossil trunks were sampled from different fluvial environments (Siret, Suceava, Moldova). Their age was determined using radiocarbon, varying from under 100 years to almost 7000 years BP. The subfossil tree species investigated were Quercus, Alnus, Ulmus.
Considering living trees, these were identified on eastern part of Romania, in different actual physico-geographical conditions. The studied living tree species consisted in Quercus species (robur and petraea). Each site was investigated regarding stress factors of the sampled tree. The working methods were applied to the total wood series, both late and early, to detect intra-annual level climate information. Each series has been tested to separate individual trees with climatic signal of other trees with different signals (noises determined by competition between individuals or site stress, or anthropic impact).
Comparing dendrochronological series (sub-fossil and living trees) we want to identify what significant causes determined the difference in the signal frequencies. Especially, the human interventions registered in the last 2 centuries will be evaluated by these different types of signal in the tree rings. In order to evaluate this aspect we used time series which were standardized to avoid the non-climatic signal. This type of investigation is the first of its kind to Eastern Europe, an area so large (over 50 000 km2) and a high number of sites and individuals studied (about 1000). The obtained results will help us to understand the palaeo-environment evolution in the last Holocene and when human intervention has been really significant.