



Radiocarbon dating with annual-resolution of subfossil trees from the Younger Dryas event in the southern French Alps

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Tree rings are an important archive for the calibration of radiocarbon data. The younger part of the IntCal curve is based essentially on tree-ring chronologies, absolutely dated by dendrochronological analysis. For the Northern Hemisphere (NH), a gap still exists between the absolutely dated sequences and a floating chronology. Based on the Southern Hemisphere (SH) tree-ring chronologies a link has been previously proposed (Reimer et al. 2013, Radiocarbon; see also update in Hogg et al. 2016, Radiocarbon).

By measuring radiocarbon at annual resolution in French subfossil pines (*Pinus sylvestris* L.) we propose to improve the connection between the absolute chronology and the floating chronology. Several subfossil pines have been found in the Southern French Alps; they were buried by flood deposits, allowing their preservation. Some trees discovered in the Barbier riverbed were dated to the Younger Dryas periods by previous decadal radiocarbon measurements, performed in Heidelberg and Mannheim. The trees selected for our new study are Barb12 and Barb17 (analyzed sequences of 163 and 152 rings, respectively). These sequences were sampled at annual resolution when permitted by the ring width. As a first step, every third ring was pretreated for radiocarbon analysis. These samples were sliced in small pieces and pretreated by using the ABA-B method before being combusted, graphitized with the AGE system and measured with AixMICADAS (Bard et al. 2015, Nucl. Instr. Meth. B).

From the comparison with the kauri sequence, the Barb12-17 sequence can be dated from about 12835 to 12606 cal. BP. It can also be used to calculate the interhemispheric gradient (IHG) over the overlapping period. In order to reduce the inter-annual variability, the Barb12-17 record was smoothed, grouped and averaged over the same decades as in the Kauri record. On the basis of twenty values, a mean IHG value of ca. 60 years was calculated. Quantification of the IHG around 50 yr is particularly robust during the two "age plateaux" corresponding to the time intervals 12820-12760 and 12660-12630 cal. BP. Overall, the IHG stayed relatively high throughout the studied period corresponding to the beginning of the Younger Dryas climatic event.