New radiocarbon measurements from Tasmanian Huon pine: Closing the current gap in tree-ring based calibration data during the early Younger Dryas

Quan Hua,[1]* Mike Barbetti,[2] David Fink,[1] Vladimir A. Levchenko,[1] Ugo Zoppi,[3] Andrew M. Smith,[1] and Fiona Bertuch[1]

[1]Australian Nuclear Science and Technology Organisation, Menai, Australia
[2]Radiogenic Isotope Laboratory, University of Queensland, Brisbane, Australia
[3]Accium BioSciences, Inc., Seattle, USA
*qhx@ansto.gov.au

The European absolute tree-ring chronologies have recently extended back to 12,594 cal BP [1], covering most of the Younger Dryas (YD). Radiocarbon data from these chronologies spanning the past 12,400 cal BP have been used to construct the younger part of the current internationally ratified calibration curve IntCal04 [2]. For the Late Glacial, radiocarbon data from a floating 1382-ring pine chronology are also available [3]. Here we present new high-precision, high-resolution radiocarbon measurements for the early YD chronozone derived from 4 sub-fossil logs of Huon pine with clearly defined annual tree rings. These logs were excavated from alluvial sediments along Stanley River in north-western Tasmania, Australia. A total of 137 samples, mostly decadal, were pretreated to alpha-cellulose, then converted to graphite and measured by AMS using the ANTARES facility at ANSTO [4], with a typical precision of 0.3-0.4%. A floating 617-ring Huon pine chronology has been constructed based on ring width and radiocarbon measurements. Our high-precision decadal ^{14}C record, covering an age range from 10,350 to 10,760 ^{14}C years BP, has been linked to the European absolute tree-ring and floating Late Glacial Pine chronologies, bridging the current gap in the European tree-ring chronologies during the early YD and making a continuous and reliable atmospheric ^{14}C record for the past 14,000 cal BP. Variations in atmospheric ^{14}C during the YD recorded in tree rings and the possible mechanisms are also discussed.

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