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Radiocarbon dating of sub-fossil pollen grans extracted from terrestrial sediments using flow Cytometry.

Richard Jones (1), Richard Tennant (2), and John Love (2)

(1) Geography, University of Exeter, Exeter, United Kingdom (r.t.jones@ex.ac.uk), (2) Bioscience, University of Exeter, Exeter, United Kingdom

Producing robust high-resolution radiocarbon chronologies for sediment archives is often hampered by a lack of suitable terrestrial plant macrofossils. Pollen is a viable alternative, readily identifiable as terrestrial in origin and often present in sufficient quantitates for AMS 14C dating. Producing reliable samples is challenging because of time-consuming methods of extraction and purification and possible contamination from other organic material. Here we report a new, rapid method using flow cytometry (FCM) to distinguish, sort and collect sufficient quantities of fossil pollen with minimal contamination from lake sediments. Indeed it is now possible to produce datable samples using a single species if that species is sufficiently abundant in a sample. FCM dating of microfossils shows considerable promise in generating robust geochronological frameworks for terrestrial sequences including those that have previously proved problematic.