1B-05 Size matters: new frontiers in dating archaeological bone

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For Palaeolithic bone samples, starting weights of around 500 mg bone material are necessary to produce enough high-quality collagen for AMS dating with graphite targets. However some rare archaeological samples are much too precious for the destruction of so much material, and are therefore unavailable for direct dating using standard methods. The improved gas ion source of the MICADAS (MIni CArbon DAting System) [1] now offers a way to measure gaseous samples of < 100 µg carbon. The direct coupling of an elemental analyser to the gas-interface system of the MICADAS cuts out the graphitisation step, reducing the risk of contamination and speeding up the dating procedure [2]. We present the results of the first comparison between 'routine' graphite dates (2 mg bone collagen) and dates of gaseous samples of < 100 µg carbon (<0.3 mg bone collagen), undertaken with the highest possible precision in mind [3]. The experiment demonstrates the performance of the AixMICADAS [4] in achieving reliable radiocarbon measurements from gaseous collagen samples back to 35,000 BP. The technique has great implications for resolving chronological questions relating to precious archaeological artefacts and fossils.

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