The University of Georgia

Center for Applied Isotope Studies

RADIOCARBON ANALYSIS REPORT

June 14, 2021

Joshua Reuther
University of Alaska Museum of the North
1962 Yukon Dr.
Fairbanks, AK 99775

Dear Dr. Reuther,

Enclosed please find the results of ^{14}C Radiocarbon analyses and Stable Isotope Ratio $\delta^{13}C$ analyses for the samples received by our laboratory on May 21, 2021.

UGAMS#	Sample ID	Material	$\delta^{13}C$,‰	$\delta^{15}N$,‰	C/N	^{14}C age, years BP	±	pMC	±
52964	UAM-Mamm-63998	collagen	-13.17	11.66	3.26	1260	20	85.45	0.23
[redacted]									

The charcoal sample was treated with 5% HCl at the temperature 80°C for 1 hour, then they was washed and with deionized water on the fiberglass filter and rinsed with diluted NaOH to remove possible contamination by humic acids. After that it was treated with diluted HCL again, washed with deionized water and dried at 60°C. For accelerator mass spectrometry analysis the cleaned sample was combusted at 900°C in evacuated / sealed ampoules in the presence of CuO.
The bone was cleaned by wire brush and washed, using ultrasonic bath. After cleaning, the dried bone was gently crushed to small fragments. The cleaned sample was then reacted under vacuum with 1N HCl to dissolve the bone mineral and release carbon dioxide from bioapatite. The residue was filtered, rinsed with deionized water and under slightly acid condition (pH=3) heated at 80ºC for 6 hours to dissolve collagen and leave humic substances in the precipitate. The collagen solution is then filtered to isolate pure collagen and dried out. The dried collagen was combusted at 575ºC in evacuated/sealed Pyrex ampoule in the present CuO.
The resulting carbon dioxide was cryogenically purified from the other reaction products and catalytically converted to graphite using the method of Vogel *et al*. (1984) Nuclear Instruments and Methods in Physics Research B5, 289-293.
Graphite $^{14}C/^{13}C$ ratios were measured using the CAIS 0.5 MeV accelerator mass spectrometer. The sample ratios were compared to the ratio measured from the Oxalic Acid I (NBS SRM 4990).
The sample $^{13}C/^{12}C$ ratios were measured separately using a stable isotope ratio mass spectrometer and expressed as $\delta^{13}C$ with respect to PDB, with an error of less than 0.1‰.
The quoted uncalibrated dates have been given in radiocarbon years before 1950 (years BP), using the ^{14}C half-life of 5568 years. The error is quoted as one standard deviation and reflects both statistical and experimental errors. The date has been corrected for isotope fractionation.

Sincerely,

Alexander Cherkinsky, Ph.D.
Senior Research Scientist