OFFICE
07 MAR 2019
DISTRICT & MAGISTRATE'S COURT
MANNAR

Beta Analytic
TESTING LABORATORY

Beta Analytic Inc
4985 SW 74 Court
Miami, Florida 33155
Tel: 305-667-5167
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ISO/IEC 17025:2005-Accredited Testing Laboratory

February 21, 2019

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Dr. Saminda Rajapaksha
District General Hospital, Mannar
Mannar, Sri Lanka

RE: Radiocarbon Dating Results

Dear Dr. Saminda Rajapaksha,

Enclosed are the radiocarbon dating results for six samples recently sent to us. The report sheet contains the Conventional Radiocarbon Age (BP), the method used, material type, and applied pretreatments, any sample specific comments and, where applicable, the two-sigma calendar calibration range. The Conventional Radiocarbon ages have been corrected for total isotopic fractionation effects (natural and laboratory induced).

All results (excluding some inappropriate material types) which fall within the range of available calibration data are calibrated to calendar years (cal BC/AD) and calibrated radiocarbon years (cal BP). Calibration was calculated using one of the databases associated with the 2013 INTCAL program (cited in the references on the bottom of the calibration graph page provided for each sample.) Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Looking closely at the calibration graph provided and where the BP sigma limits intercept the calibration curve will help you understand this phenomenon.

Conventional Radiocarbon Ages and sigmas are rounded to the nearest 10 years per the conventions of the 1977 International Radiocarbon Conference. When counting statistics produce sigmas lower than +/- 30 years, a conservative +/- 30 BP is cited for the result.

All work on these samples was performed in our laboratories in Miami under strict chain of custody and quality control under ISO/IEC 17025:2005 Testing Accreditation PJLA #59423 accreditation protocols. Sample, modern and blanks were all analyzed in the same chemistry lines by qualified professional technicians using identical reagents and counting parameters within our own particle accelerators. A quality assurance report is posted to your directory for each result.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact us.

Sincerely,

Beta Analytic Inc. CORPORATE SEAL 1979 Florida

Ronald E. Hatfield Director

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REPORT OF RADIOCARBON DATING ANALYSES

Saminda Rajapaksha

District General Hospital, Mannar

Report Date: February 21, 2019

Material Received: January 25, 2019

Laboratory Number	Sample Code Number	Conventional Radiocarbon Age (BP) or Percent Modern Carbon (pMC) & Stable Isotopes Calendar Calibrated Results: 95.4 % Probability High Probability Density Range Method (HPD)	
Beta - 516828	**B23218ESMP3**	**350 +/- 30 BP**	IRMS δ13C: -16.7 o/oo IRMS δ15N: +17.5 o/oo
(54.2%)	**1538 - 1635 cal AD**	**(412 - 315 cal BP)**	
(41.2%)	**1458 - 1530 cal AD**	**(492 - 420 cal BP)**	

Submitter Material: HUMAN BONE
Pretreatment: (bone collagen) collagen extraction; with alkali
Analyzed Material: Bone collagen
Analysis Service: AMS-Standard delivery
Percent Modern Carbon: 95.74 +/- 0.36 pMC
Fraction Modern Carbon: 0.9574 +/- 0.0036
D14C: -42.64 +/- 3.58 o/oo
Δ14C: -50.59 +/- 3.58 o/oo(1950:2,019.00)
Measured Radiocarbon Age: (without d13C correction): 210 +/- 30 BP
Calibration: BetaCal3.21: HPD method: INTCAL13
Carbon/Nitrogen: CN : 3.2 %C: 41.05 %N: 14.88

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Results are ISO/IEC-17025:2005 accredited. No sub-contracting or student labor was used in the analyses. All work was done at Beta in 4 in-house NEC accelerator mass spectrometers and 4 Thermo IRMSs. The "Conventional Radiocarbon Age" was calculated using the Libby half-life (5568 years), is corrected for total isotopic fraction and was used for calendar calibration where applicable. The Age is rounded to the nearest 10 years and is reported as radiocarbon years before present (BP), "present" = AD 1950. Results greater than the modern reference are reported as percent modern carbon (pMC). The modern reference standard was 95% the 14C signature of NIST SRM-4990C (oxalic acid). Quoted errors are 1 sigma counting statistics. Calculated sigmas less than 30 BP on the Conventional Radiocarbon Age are conservatively rounded up to 30. d13C values are on the material itself (not the AMS d13C). d13C and d15N values are relative to VPDB-1. References for calendar calibrations are cited at the bottom of calibration graph pages.

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REPORT OF RADIOCARBON DATING ANALYSES

Saminda Rajapaksha — Report Date: February 21, 2019

District General Hospital, Mannar — Material Received: January 25, 2019

Laboratory Number	Sample Code Number	Conventional Radiocarbon Age (BP) or Percent Modern Carbon (pMC) & Stable Isotopes Calendar Calibrated Results: 95.4 % Probability High Probability Density Range Method (HPD)	
Beta - 516830	**B23218ESMP5(A)**	**420 +/- 30 BP**	IRMS δ13C: -17.9 o/oo IRMS δ15N: +11.1 o/oo
(87.8%)	**1426 - 1516 cal AD**	**(524 - 434 cal BP)**	
(7.6%)	**1597 - 1618 cal AD**	**(353 - 332 cal BP)**	

Submitter Material: HUMAN BONE
Pretreatment: (bone collagen) collagen extraction; with alkali
Analyzed Material: Bone collagen
Analysis Service: AMS-Standard delivery
Percent Modern Carbon: 94.91 +/- 0.35 pMC
Fraction Modern Carbon: 0.9491 +/- 0.0035
D14C: -50.94 +/- 3.54 o/oo
Δ14C: -58.83 +/- 3.54 o/oo(1950:2,019.00)
Measured Radiocarbon Age: (without d13C correction): 300 +/- 30 BP
Calibration: BetaCal3.21: HPD method: INTCAL13
Carbon/Nitrogen: CN : 3.2 %C: 41.79 %N: 15.13

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Results are ISO/IEC-17025:2005 accredited. No sub-contracting or student labor was used in the analyses. All work was done at Beta in 4 in-house NEC accelerator mass spectrometers and 4 Thermo IRMSs. The "Conventional Radiocarbon Age" was calculated using the Libby half-life (5568 years), is corrected for total isotopic fraction and was used for calendar calibration where applicable. The Age is rounded to the nearest 10 years and is reported as radiocarbon years before present (BP), "present" = AD 1950. Results greater than the modern reference are reported as percent modern carbon (pMC). The modern reference standard was 95% the 14C signature of NIST SRM-4990C (oxalic acid). Quoted errors are 1 sigma counting statistics. Calculated sigmas less than 30 BP on the Conventional Radiocarbon Age are conservatively rounded up to 30. d13C values are on the material itself (not the AMS d13C). d13C and d15N values are relative to VPDB-1. References for calendar calibrations are cited at the bottom of calibration graph pages.

(7) BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(highest probability ranges: INTCAL13)

(Variables: d13C = -14.0 o/oo)

Laboratory number **Beta-516826**

Conventional radiocarbon age **490 ± 30 BP**

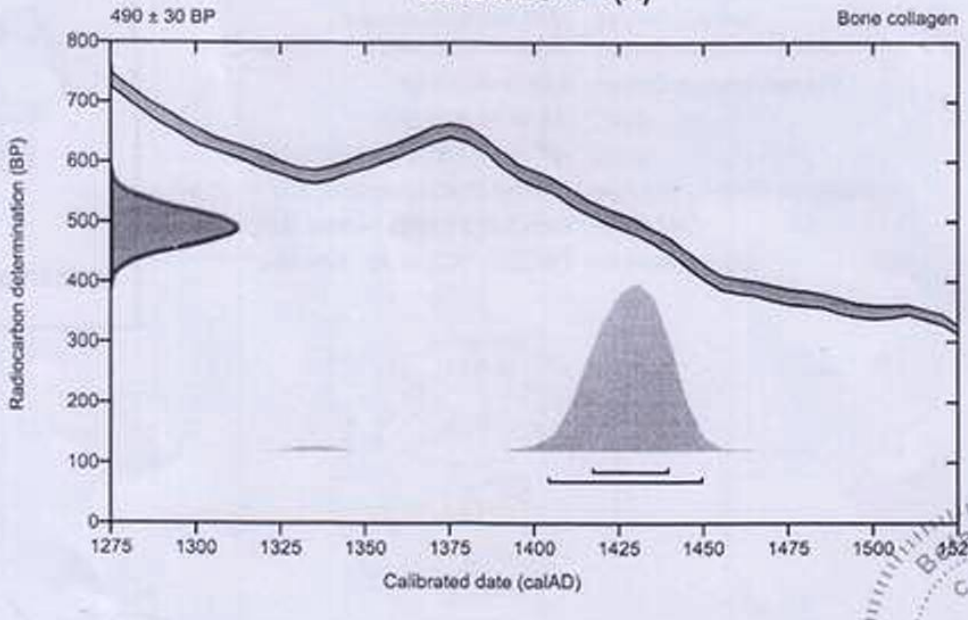
95.4% probability

(95.4%) 1404 - 1450 cal AD (546 - 500 cal BP)

68.2% probability

(68.2%) 1417 - 1440 cal AD (533 - 510 cal BP)

B23218ESMP1(A)



Database used

INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et al., 2013, Radiocarbon55(4).

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BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(highest probability ranges: INTCAL13)

(Variables: d13C = -18.1 o/oo)

Laboratory number **Beta-516829**

Conventional radiocarbon age **330 ± 30 BP**

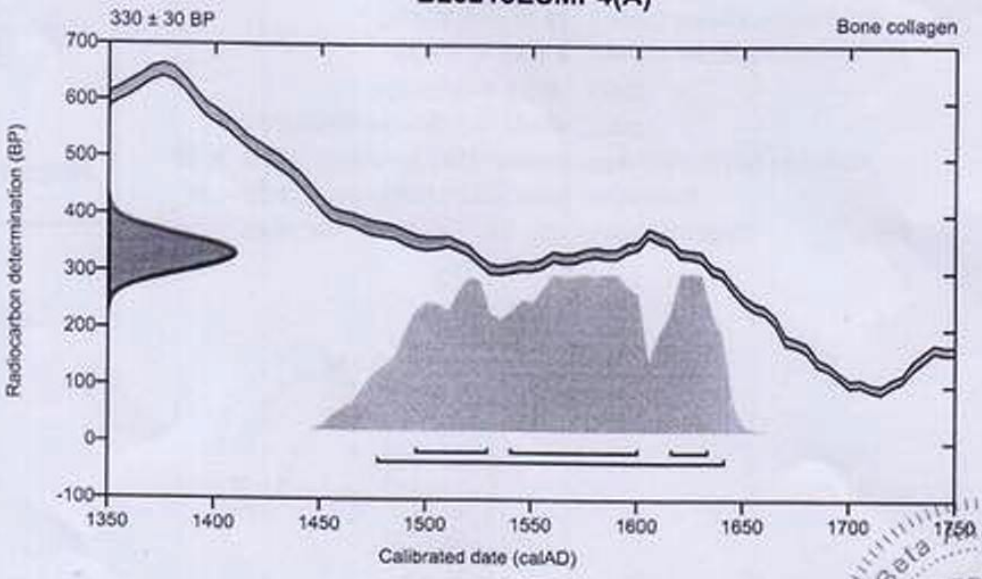
95.4% probability

(95.4%)	1477 - 1642 cal AD	(473 - 308 cal BP)

68.2% probability

(37.4%)	1540 - 1601 cal AD	(410 - 349 cal BP)
(19%)	1495 - 1530 cal AD	(455 - 420 cal BP)
(11.8%)	1616 - 1634 cal AD	(334 - 316 cal BP)

B23218ESMP4(A)



Database used

INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et.al., 2013, Radiocarbon55(4).

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(highest probability ranges: INTCAL13)

(Variables: d13C = -16.7 o/oo)

Laboratory number **Beta-516828**

Conventional radiocarbon age **350 ± 30 BP**

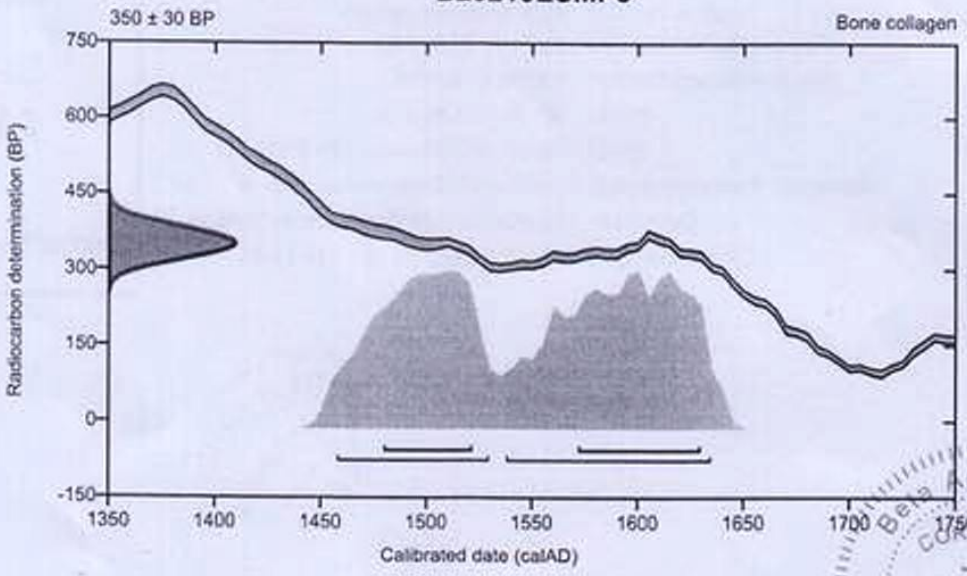
95.4% probability

(54.2%)	1538 - 1635 cal AD	(412 - 315 cal BP)
(41.2%)	1458 - 1530 cal AD	(492 - 420 cal BP)

68.2% probability

(38.8%)	1572 - 1630 cal AD	(378 - 320 cal BP)
(29.4%)	1480 - 1522 cal AD	(470 - 428 cal BP)

B23218ESMP3



Database used

INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et.al., 2013, Radiocarbon55(4).

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(highest probability ranges: INTCAL13)

(Variables: d13C = -15.7 o/oo)

Laboratory number **Beta-516831**

Conventional radiocarbon age **490 ± 30 BP**

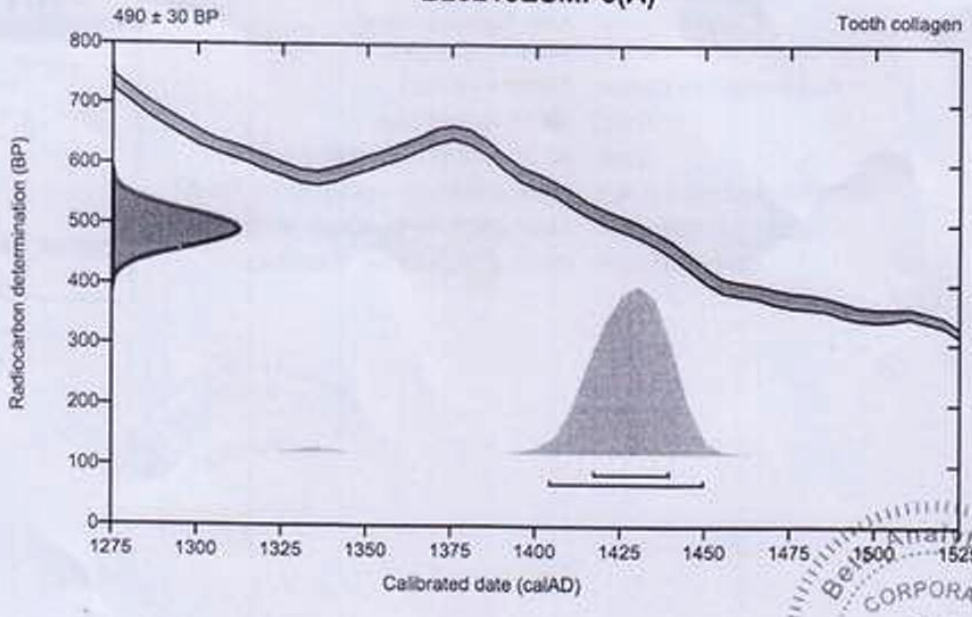
95.4% probability

(95.4%) 1404 - 1450 cal AD (546 - 500 cal BP)

68.2% probability

(68.2%) 1417 - 1440 cal AD (533 - 510 cal BP)

B23218ESMP6(A)



Database used

INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et.al., 2013, Radiocarbon55(4).

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