Beta Analytic Inc.
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Consistent Accuracy . . .
. . . Delivered On-time

January 11, 2012

Dr. Loukas Barton
U.S. National Park Service
240 West 5th Avenue
Ste. 236
Anchorage, AK 99501
USA

RE: Radiocarbon Dating Results For Samples CS-001, CS-003, CS-005, CS-009, CS-010, CS-011, CS-012, CS-013, CS-014, CS-015, CS-016, CS-017, CS-019, CS-021, CS-023, CS-024, CS-026, CS-027, CS-028, CS-030

Dear Dr. Barton:

Enclosed are the radiocarbon dating results for 20 samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. As usual, the method of analysis is listed on the report with the results and calibration data is provided where applicable.

As always, no students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

Our invoice has been sent separately. Thank you for your prior efforts in arranging payment. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Loukas Barton

Report Date: 1/11/2012

U.S. National Park Service

Material Received: 12/19/2011

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 312527	3610 +/- 30 BP	-26.3 o/oo	3590 +/- 30 BP
SAMPLE : CS-001			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal BC 2030 to 1880 (Cal BP 3980 to 3830)			
Beta - 312528	1590 +/- 30 BP	-23.4 o/oo	1620 +/- 30 BP
SAMPLE : CS-003			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 390 to 540 (Cal BP 1560 to 1410)			
Beta - 312530	1190 +/- 30 BP	-27.1 o/oo	1160 +/- 30 BP
SAMPLE : CS-005			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 780 to 900 (Cal BP 1170 to 1050) AND Cal AD 910 to 970 (Cal BP 1040 to 980)			
Beta - 312531	1180 +/- 30 BP	-25.3 o/oo	1180 +/- 30 BP
SAMPLE : CS-009			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 770 to 900 (Cal BP 1180 to 1050) AND Cal AD 920 to 940 (Cal BP 1030 to 1010)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

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Dr. Loukas Barton

Report Date: 1/11/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 312532 SAMPLE : CS-010 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 540 to 650 (Cal BP 1410 to 1300)	1490 +/- 30 BP	-26.1 o/oo	1470 +/- 30 BP
Beta - 312533 SAMPLE : CS-011 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 410 to 550 (Cal BP 1540 to 1400)	1600 +/- 30 BP	-26.0 o/oo	1580 +/- 30 BP
Beta - 312534 SAMPLE : CS-012 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 430 to 580 (Cal BP 1520 to 1370)	1550 +/- 30 BP	-25.2 o/oo	1550 +/- 30 BP
Beta - 312535 SAMPLE : CS-013 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 660 to 780 (Cal BP 1290 to 1170)	1280 +/- 30 BP	-25.0 o/oo	1280 +/- 30 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

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Report Date: 1/11/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 312536	1560 +/- 30 BP	-24.5 o/oo	1570 +/- 30 BP
SAMPLE : CS-014			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 420 to 560 (Cal BP 1530 to 1390)			
Beta - 312537	1250 +/- 30 BP	-26.3 o/oo	1230 +/- 30 BP
SAMPLE : CS-015			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 690 to 880 (Cal BP 1260 to 1060)			
Beta - 312538	1220 +/- 30 BP	-25.8 o/oo	1210 +/- 30 BP
SAMPLE : CS-016			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 710 to 750 (Cal BP 1240 to 1200) AND Cal AD 770 to 890 (Cal BP 1180 to 1060)			
Beta - 312539	1560 +/- 30 BP	-25.3 o/oo	1560 +/- 30 BP
SAMPLE : CS-017			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 420 to 570 (Cal BP 1530 to 1380)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

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REPORT OF RADIOCARBON DATING ANALYSES

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Report Date: 1/11/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 312540	1170 +/- 30 BP	-25.6 o/oo	1160 +/- 30 BP
SAMPLE : CS-019			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 780 to 900 (Cal BP 1170 to 1050) AND Cal AD 910 to 970 (Cal BP 1040 to 980)			
Beta - 312541	1540 +/- 30 BP	-24.9 o/oo	1540 +/- 30 BP
SAMPLE : CS-021			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 430 to 600 (Cal BP 1520 to 1360)			
Beta - 312542	1160 +/- 30 BP	-25.5 o/oo	1150 +/- 30 BP
SAMPLE : CS-023			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 780 to 790 (Cal BP 1170 to 1160) AND Cal AD 800 to 970 (Cal BP 1150 to 980)			
Beta - 312543	1490 +/- 30 BP	-23.7 o/oo	1510 +/- 30 BP
SAMPLE : CS-024			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 440 to 450 (Cal BP 1510 to 1500) AND Cal AD 460 to 480 (Cal BP 1490 to 1470) Cal AD 530 to 610 (Cal BP 1420 to 1340)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

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REPORT OF RADIOCARBON DATING ANALYSES

Dr. Loukas Barton

Report Date: 1/11/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 312544	1160 +/- 30 BP	-25.8 o/oo	1150 +/- 30 BP
SAMPLE : CS-026			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 780 to 790 (Cal BP 1170 to 1160) AND Cal AD 800 to 970 (Cal BP 1150 to 980)			
Beta - 312545	1480 +/- 30 BP	-24.2 o/oo	1490 +/- 30 BP
SAMPLE : CS-027			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 540 to 640 (Cal BP 1410 to 1310)			
Beta - 312546	1440 +/- 30 BP	-25.7 o/oo	1430 +/- 30 BP
SAMPLE : CS-028			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 580 to 660 (Cal BP 1370 to 1290)			
Beta - 312547	1180 +/- 30 BP	-25.2 o/oo	1180 +/- 30 BP
SAMPLE : CS-030			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid			
2 SIGMA CALIBRATION : Cal AD 770 to 900 (Cal BP 1180 to 1050) AND Cal AD 920 to 940 (Cal BP 1030 to 1010)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.3:lab. mult=1)

Laboratory number: **Beta-312527**

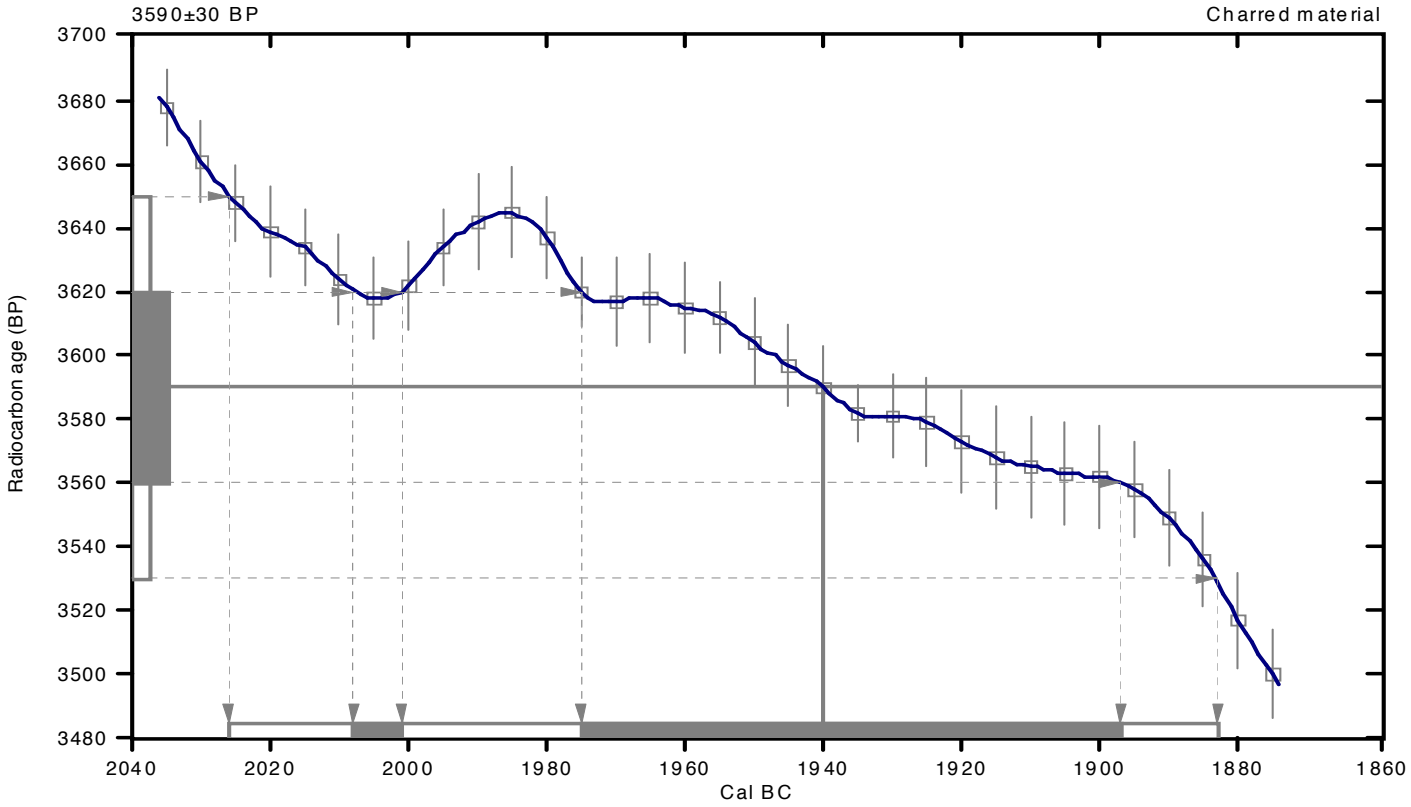
Conventional radiocarbon age: **3590±30 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 2030 to 1880 (Cal BP 3980 to 3830)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 1940 (Cal BP 3890)

1 Sigma calibrated results: (68% probability) Cal BC 2010 to 2000 (Cal BP 3960 to 3950) and Cal BC 1980 to 1900 (Cal BP 3920 to 3850)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.4:lab. mult=1)

Laboratory number: **Beta-312528**

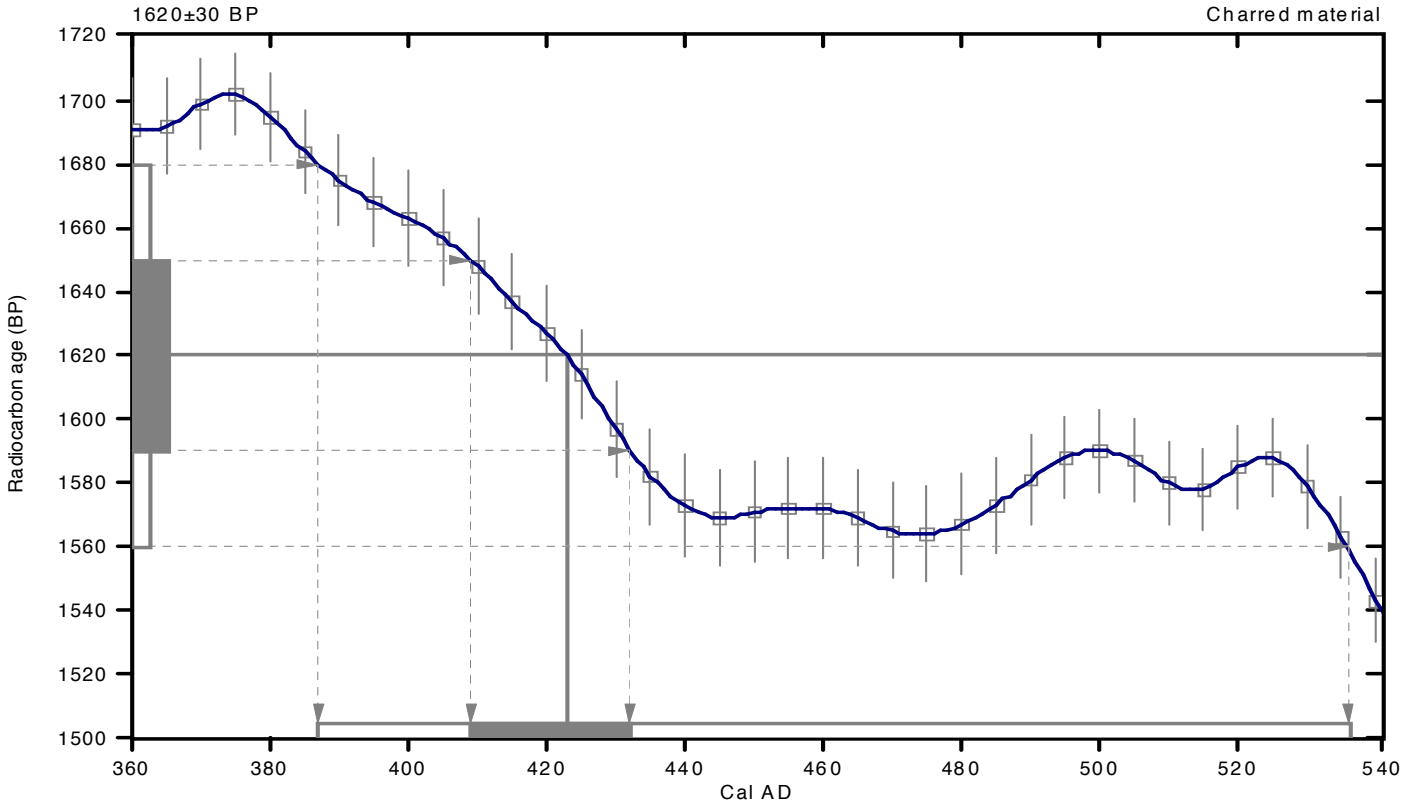
Conventional radiocarbon age: **1620±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 390 to 540 (Cal BP 1560 to 1410)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 420 (Cal BP 1530)

1 Sigma calibrated result: (68% probability) Cal AD 410 to 430 (Cal BP 1540 to 1520)



References:

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Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27.1:lab. mult=1)

Laboratory number: **Beta-312530**

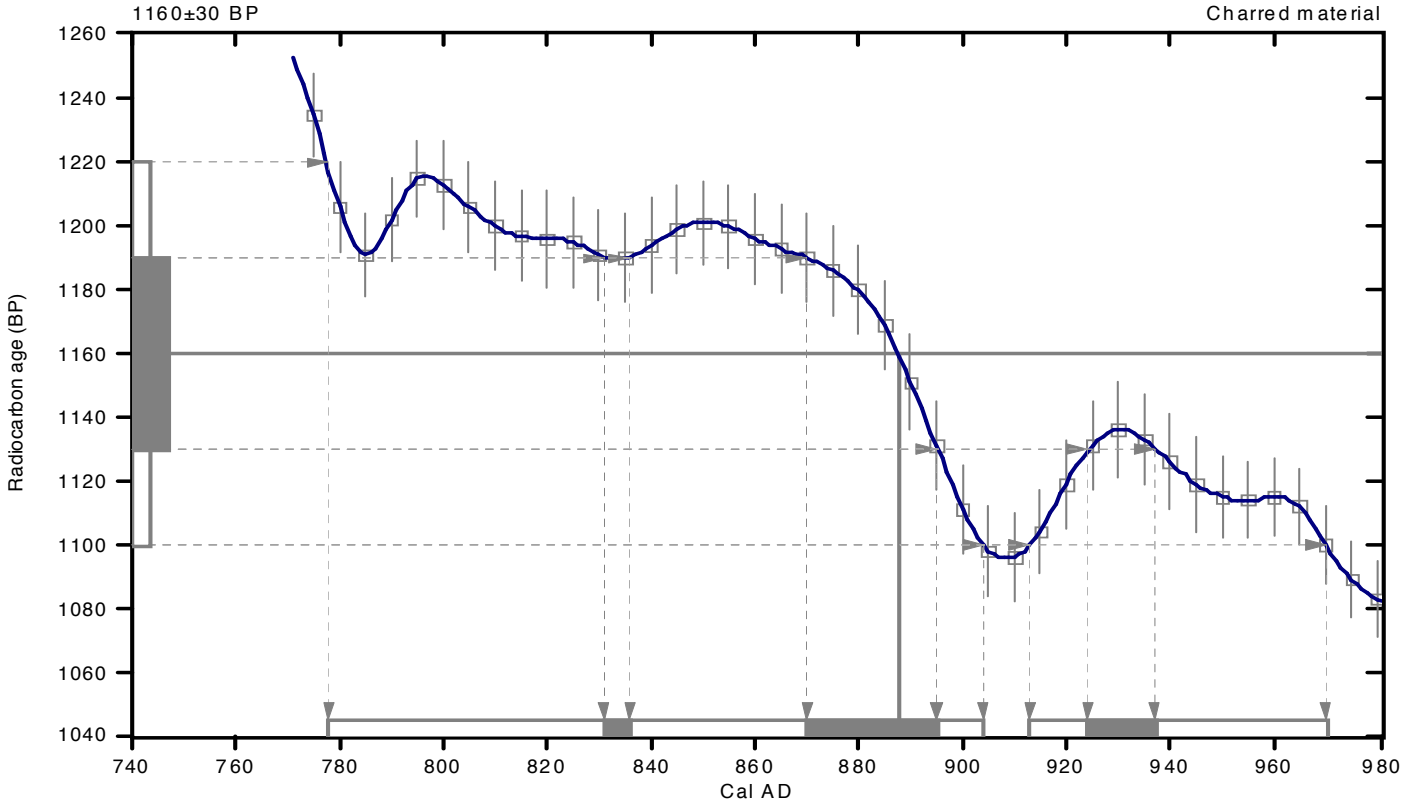
Conventional radiocarbon age: **1160±30 BP**

2 Sigma calibrated results: **Cal AD 780 to 900 (Cal BP 1170 to 1050) and**
(95% probability) **Cal AD 910 to 970 (Cal BP 1040 to 980)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 890 (Cal BP 1060)

1 Sigma calibrated results: Cal AD 830 to 840 (Cal BP 1120 to 1110) and
(68% probability) Cal AD 870 to 900 (Cal BP 1080 to 1060) and
Cal AD 920 to 940 (Cal BP 1030 to 1010)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.3:lab. mult=1)

Laboratory number: **Beta-312531**

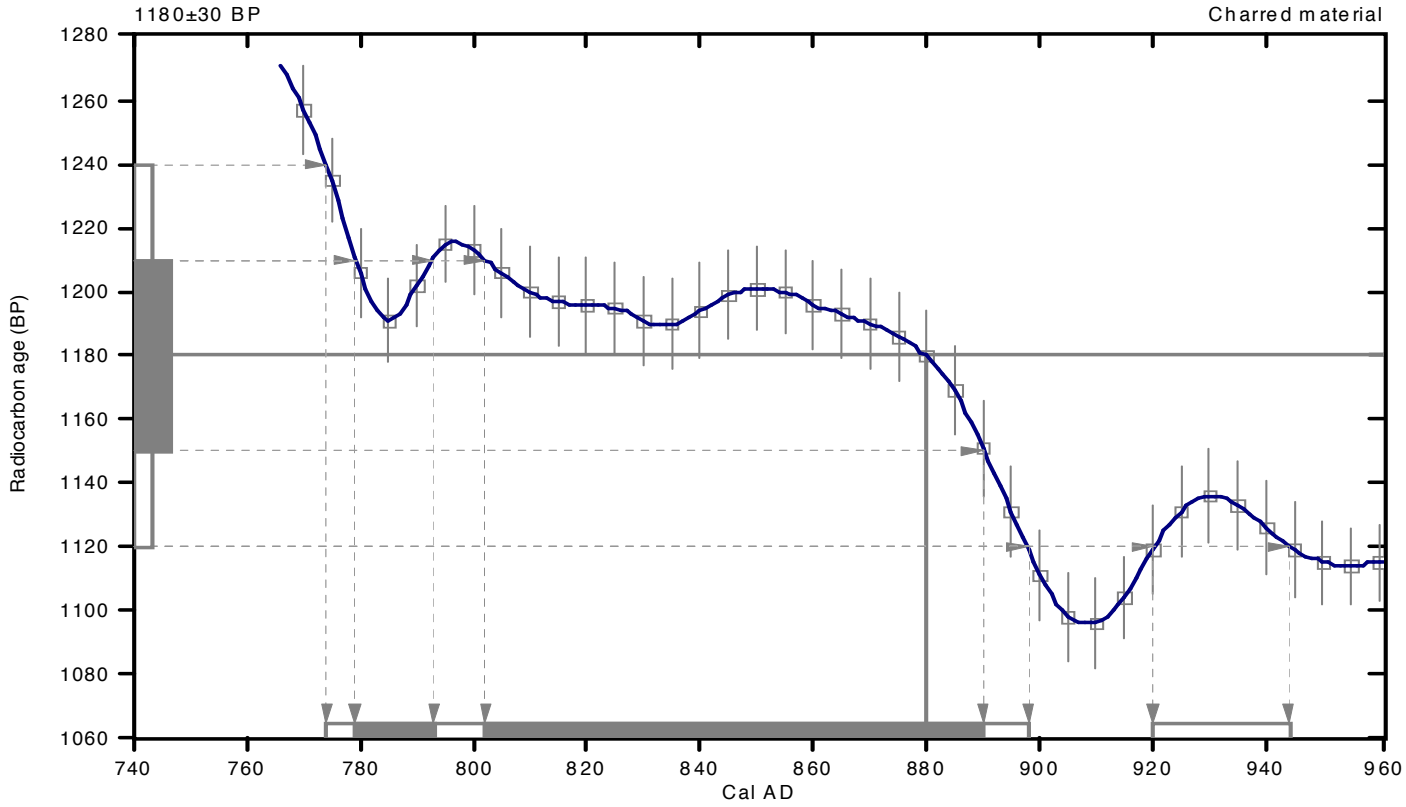
Conventional radiocarbon age: **1180±30 BP**

2 Sigma calibrated results: **Cal AD 770 to 900 (Cal BP 1180 to 1050) and**
(95% probability) **Cal AD 920 to 940 (Cal BP 1030 to 1010)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 880 (Cal BP 1070)

1 Sigma calibrated results: Cal AD 780 to 790 (Cal BP 1170 to 1160) and
(68% probability) Cal AD 800 to 890 (Cal BP 1150 to 1060)



References:

Database used

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Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.1:lab. mult=1)

Laboratory number: **Beta-312532**

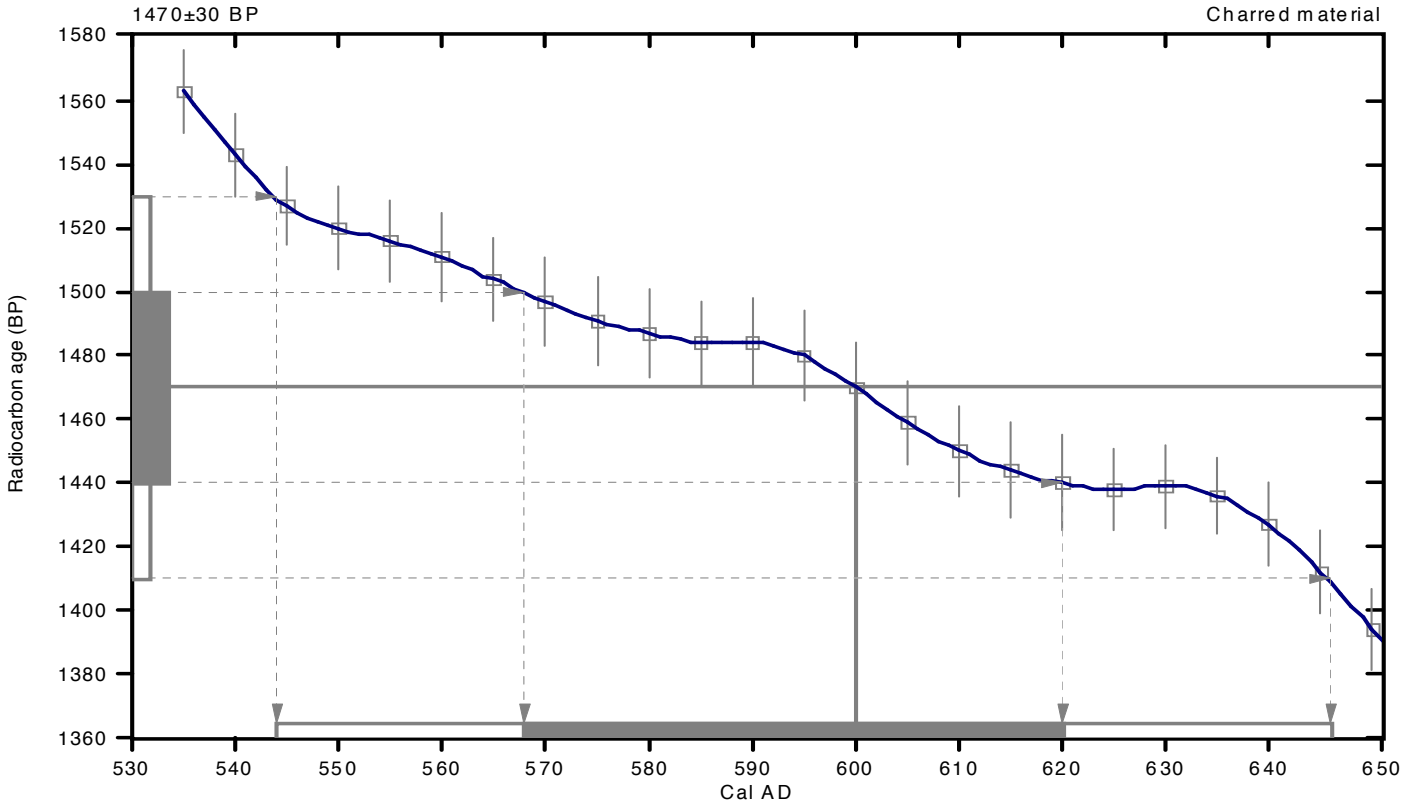
Conventional radiocarbon age: **1470±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 540 to 650 (Cal BP 1410 to 1300)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 600 (Cal BP 1350)

1 Sigma calibrated result: (68% probability) Cal AD 570 to 620 (Cal BP 1380 to 1330)



References:

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Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26:lab. mult=1)

Laboratory number: **Beta-312533**

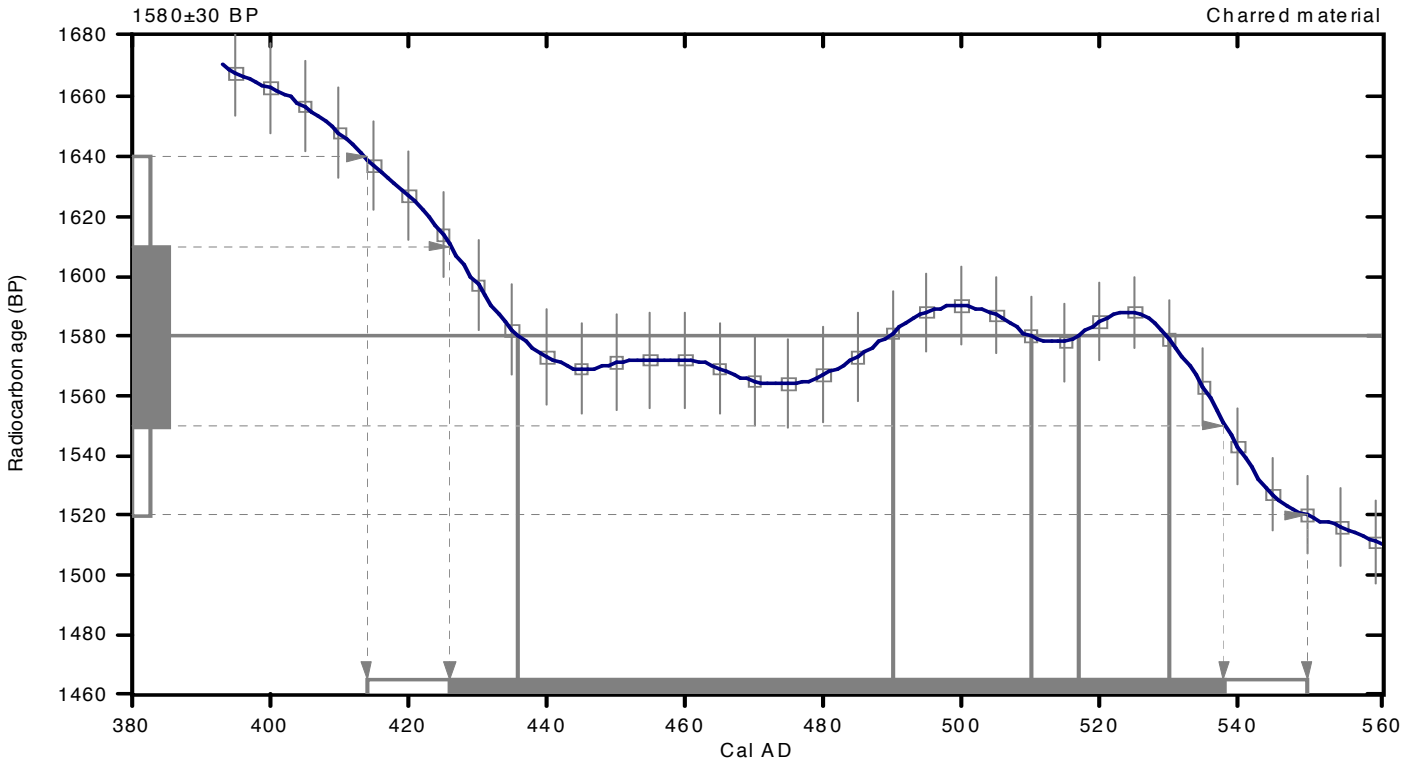
Conventional radiocarbon age: **1580±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 410 to 550 (Cal BP 1540 to 1400)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 440 (Cal BP 1510) and
Cal AD 490 (Cal BP 1460) and
Cal AD 510 (Cal BP 1440) and
Cal AD 520 (Cal BP 1430) and
Cal AD 530 (Cal BP 1420)

1 Sigma calibrated result: (68% probability) Cal AD 430 to 540 (Cal BP 1520 to 1410)



References:

Database used

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References to INTCAL09 database

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Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.2:lab. mult=1)

Laboratory number: **Beta-312534**

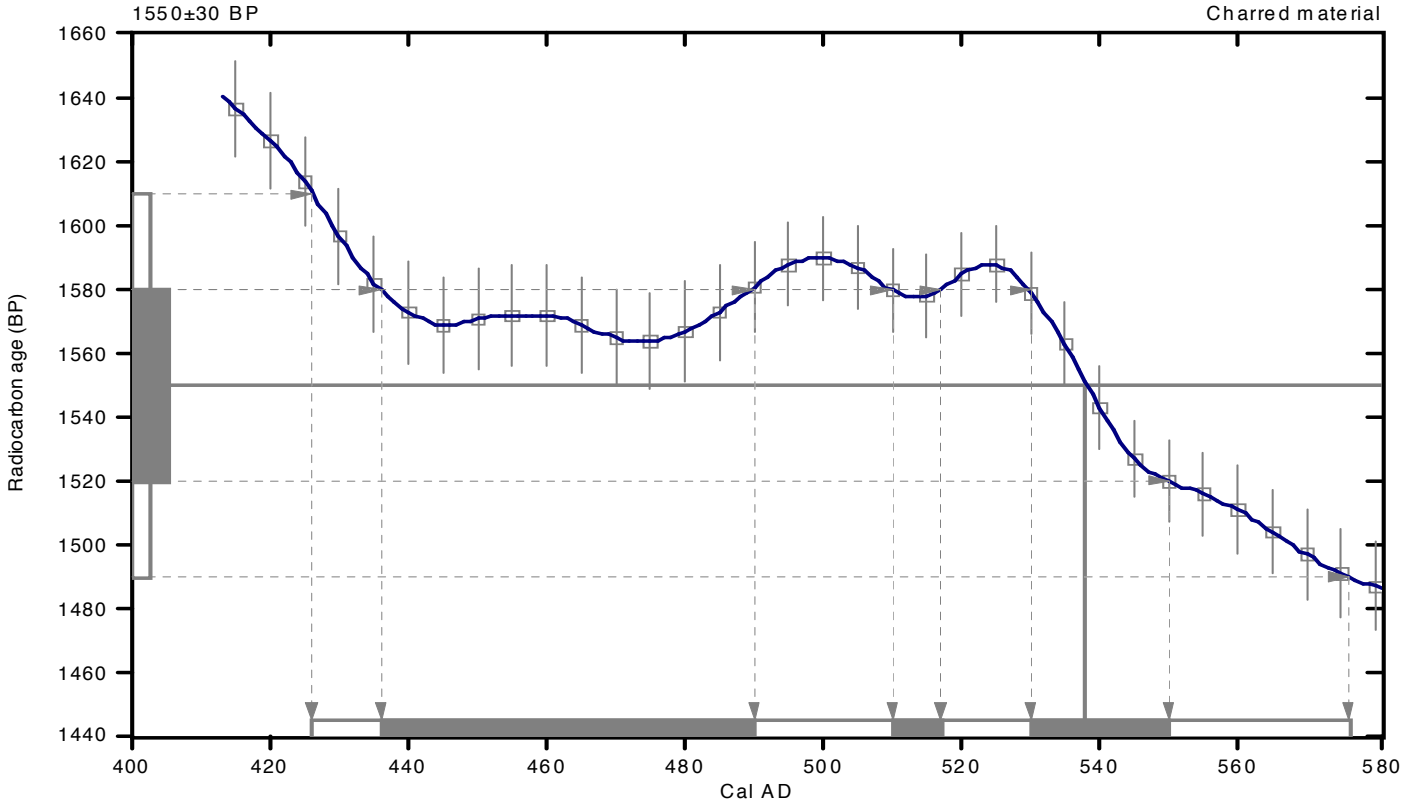
Conventional radiocarbon age: **1550±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 430 to 580 (Cal BP 1520 to 1370)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 540 (Cal BP 1410)

1 Sigma calibrated results: (68% probability) Cal AD 440 to 490 (Cal BP 1510 to 1460) and Cal AD 510 to 520 (Cal BP 1440 to 1430) and Cal AD 530 to 550 (Cal BP 1420 to 1400)



References:

Database used

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Mathematics used for calibration scenario

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Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

Beta Analytic Radiocarbon Dating Laboratory

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25:lab. mult=1)

Laboratory number: **Beta-312535**

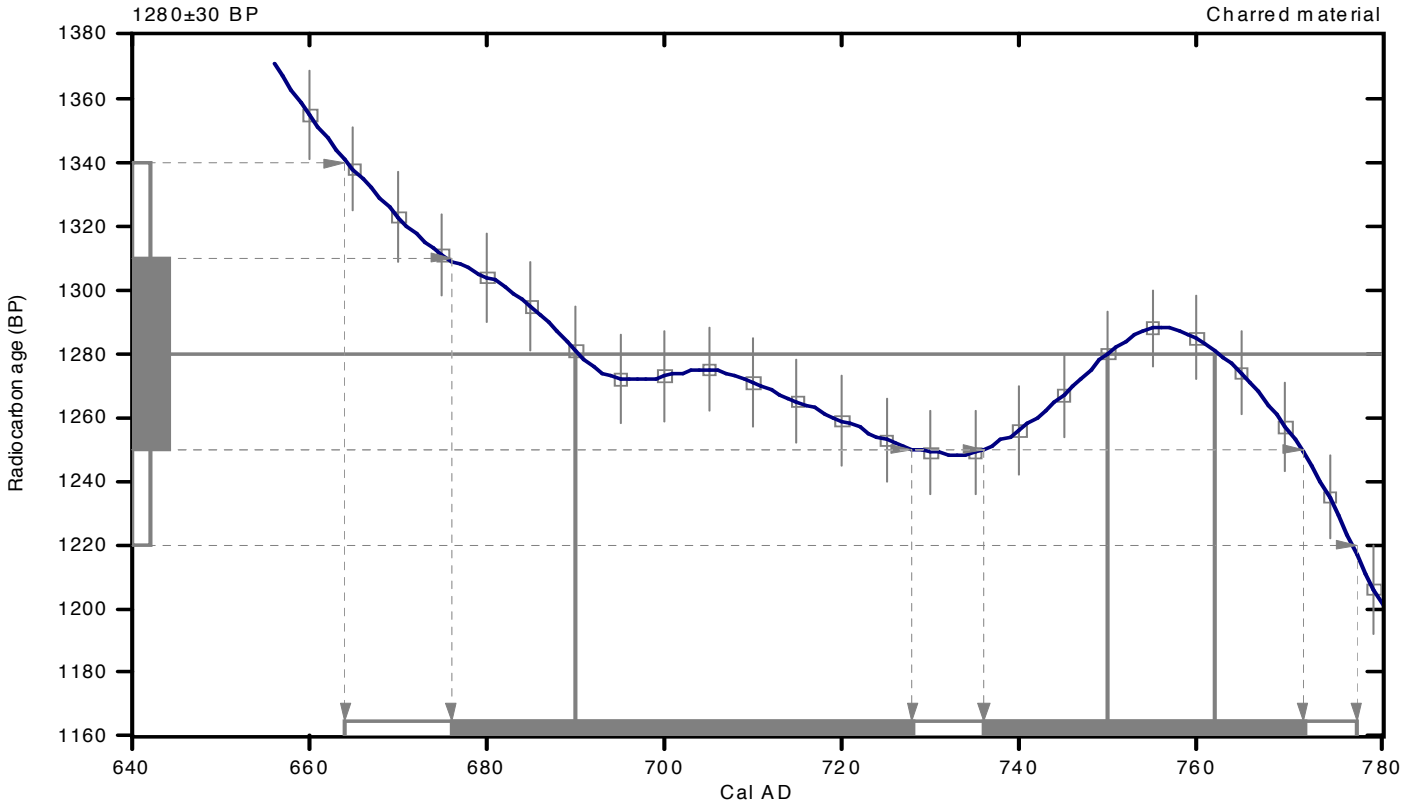
Conventional radiocarbon age: **1280±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 660 to 780 (Cal BP 1290 to 1170)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 690 (Cal BP 1260) and
Cal AD 750 (Cal BP 1200) and
Cal AD 760 (Cal BP 1190)

1 Sigma calibrated results: (68% probability) Cal AD 680 to 730 (Cal BP 1270 to 1220) and
Cal AD 740 to 770 (Cal BP 1210 to 1180)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.5:lab. mult=1)

Laboratory number: **Beta-312536**

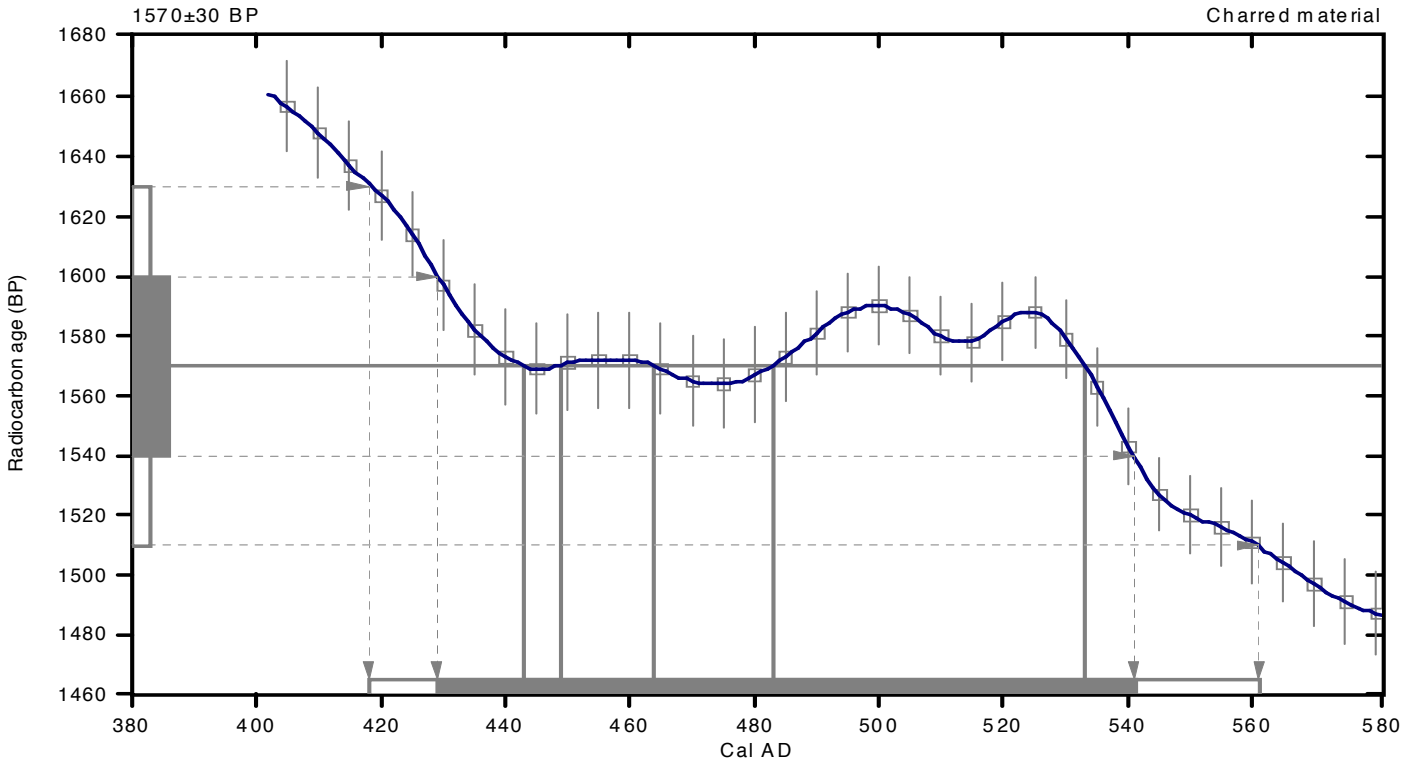
Conventional radiocarbon age: **1570±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 420 to 560 (Cal BP 1530 to 1390)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 440 (Cal BP 1510) and
Cal AD 450 (Cal BP 1500) and
Cal AD 460 (Cal BP 1490) and
Cal AD 480 (Cal BP 1470) and
Cal AD 530 (Cal BP 1420)

1 Sigma calibrated result: (68% probability) Cal AD 430 to 540 (Cal BP 1520 to 1410)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.3:lab. mult=1)

Laboratory number: **Beta-312537**

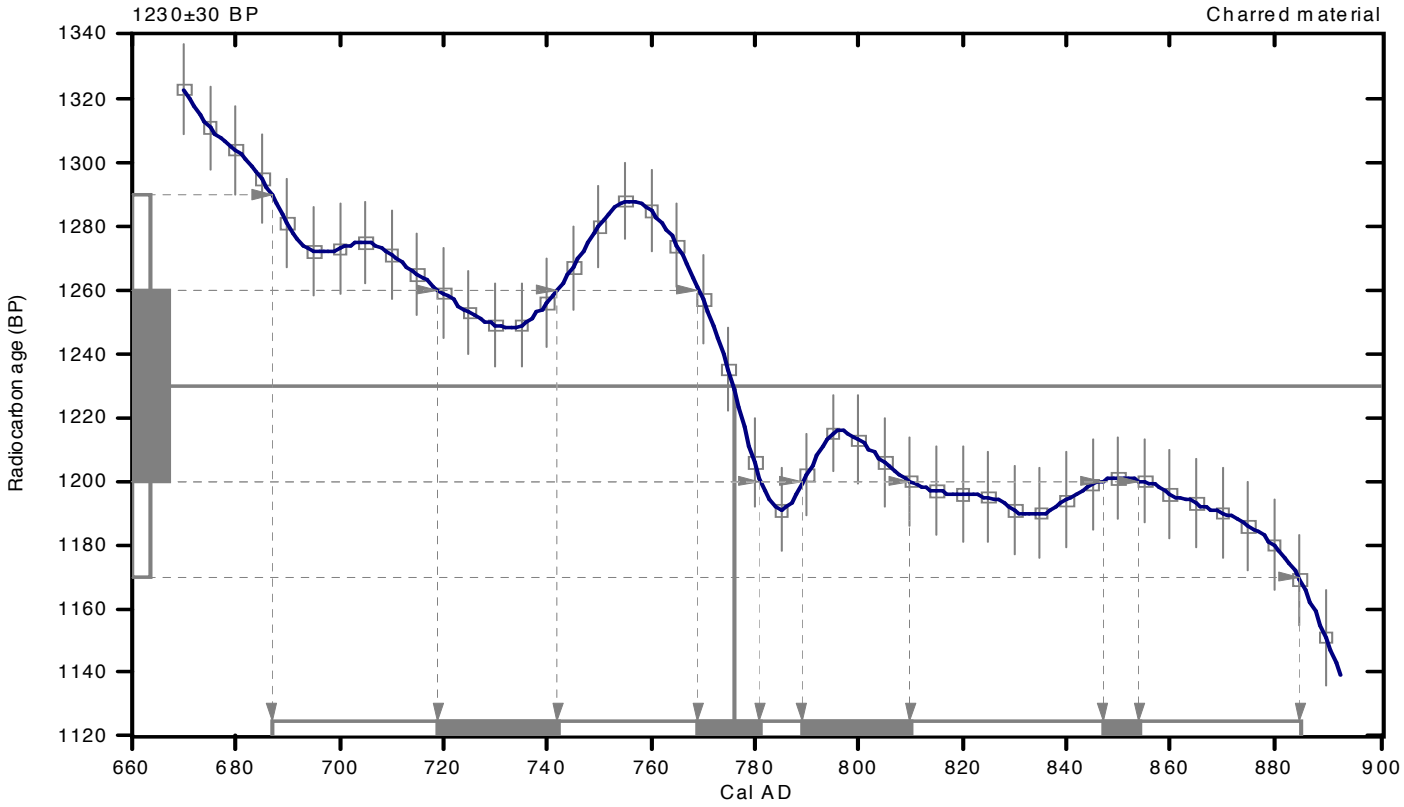
Conventional radiocarbon age: **1230±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 690 to 880 (Cal BP 1260 to 1060)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 780 (Cal BP 1170)

1 Sigma calibrated results: (68% probability) Cal AD 720 to 740 (Cal BP 1230 to 1210) and
Cal AD 770 to 780 (Cal BP 1180 to 1170) and
Cal AD 790 to 810 (Cal BP 1160 to 1140) and
Cal AD 850 to 850 (Cal BP 1100 to 1100)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.8:lab. mult=1)

Laboratory number: **Beta-312538**

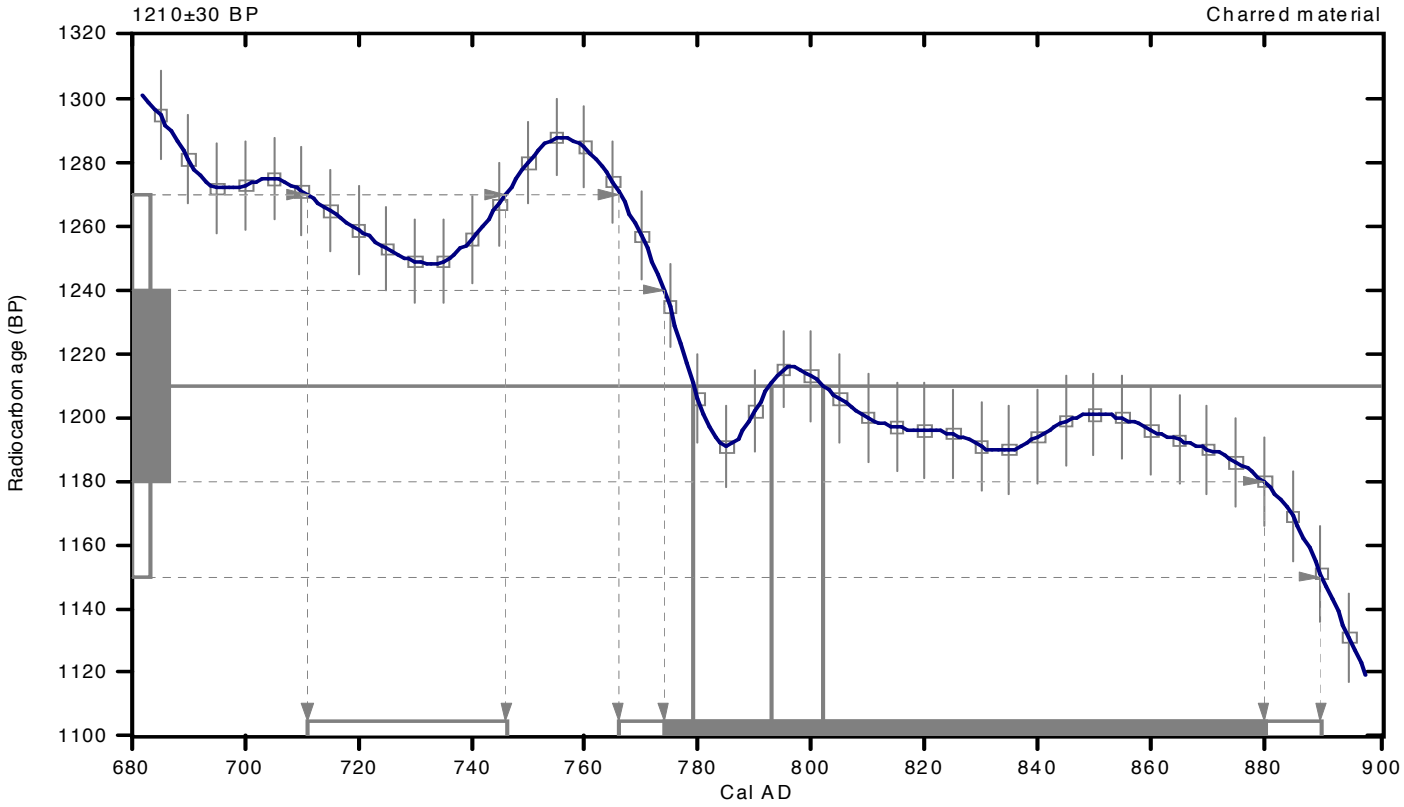
Conventional radiocarbon age: **1210±30 BP**

2 Sigma calibrated results: **Cal AD 710 to 750 (Cal BP 1240 to 1200) and**
(95% probability) **Cal AD 770 to 890 (Cal BP 1180 to 1060)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 780 (Cal BP 1170) and
Cal AD 790 (Cal BP 1160) and
Cal AD 800 (Cal BP 1150)

1 Sigma calibrated result: Cal AD 770 to 880 (Cal BP 1180 to 1070)
(68% probability)



References:

Database used

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References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.3:lab. mult=1)

Laboratory number: **Beta-312539**

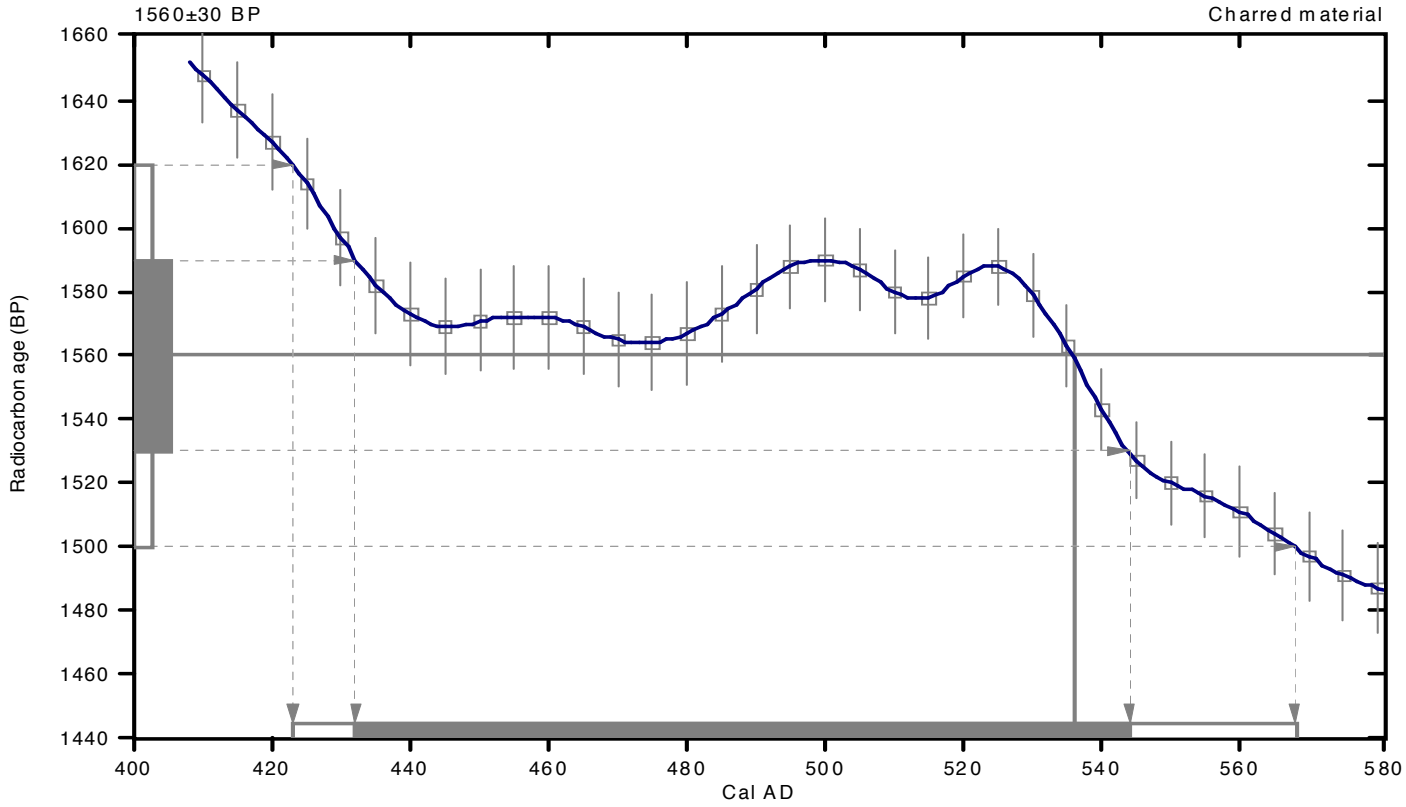
Conventional radiocarbon age: **1560±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 420 to 570 (Cal BP 1530 to 1380)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 540 (Cal BP 1410)

1 Sigma calibrated result: (68% probability) Cal AD 430 to 540 (Cal BP 1520 to 1410)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.6:lab. mult=1)

Laboratory number: **Beta-312540**

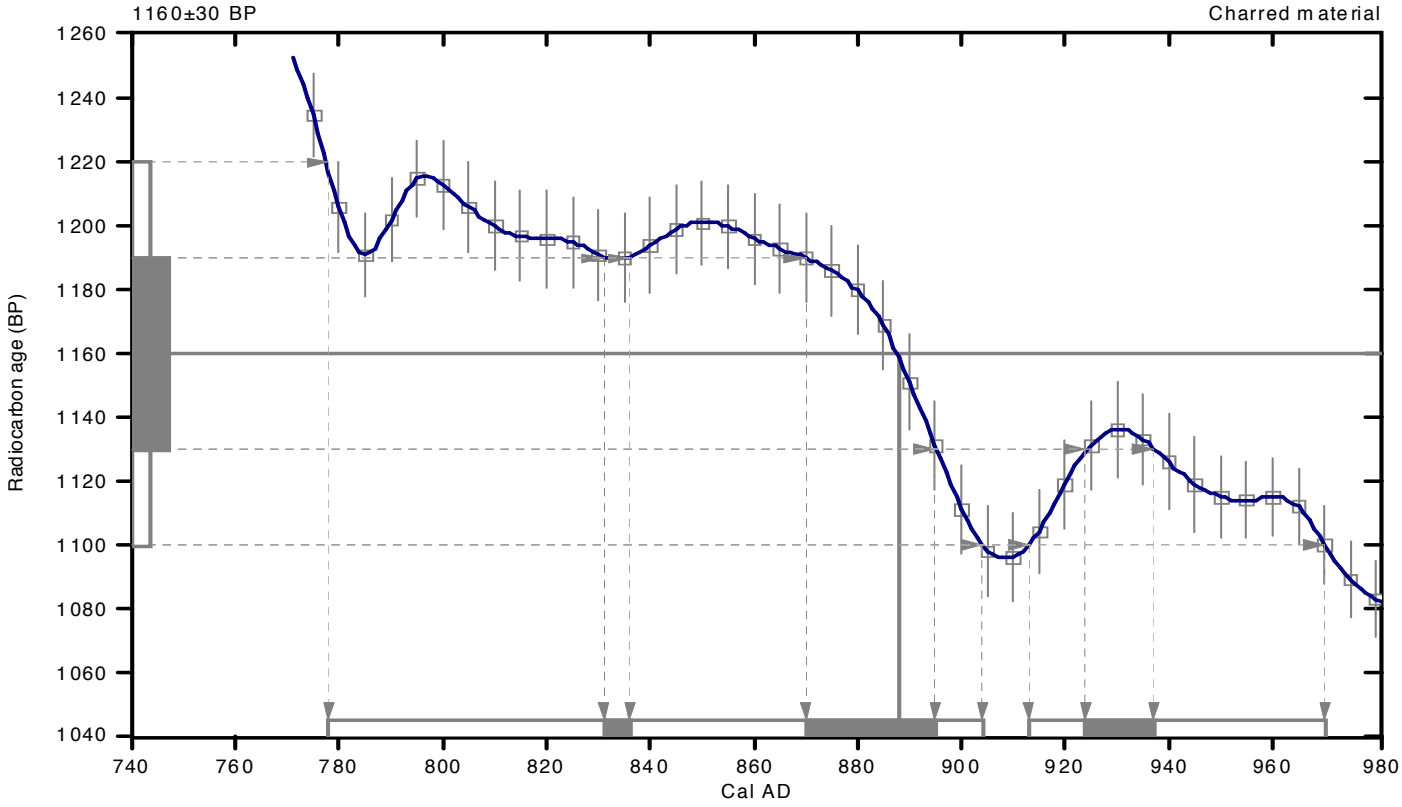
Conventional radiocarbon age: **1160±30 BP**

2 Sigma calibrated results: **Cal AD 780 to 900 (Cal BP 1170 to 1050) and**
(95% probability) **Cal AD 910 to 970 (Cal BP 1040 to 980)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 890 (Cal BP 1060)

1 Sigma calibrated results: Cal AD 830 to 840 (Cal BP 1120 to 1110) and
(68% probability) Cal AD 870 to 900 (Cal BP 1080 to 1060) and
Cal AD 920 to 940 (Cal BP 1030 to 1010)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.9:lab. mult=1)

Laboratory number: **Beta-312541**

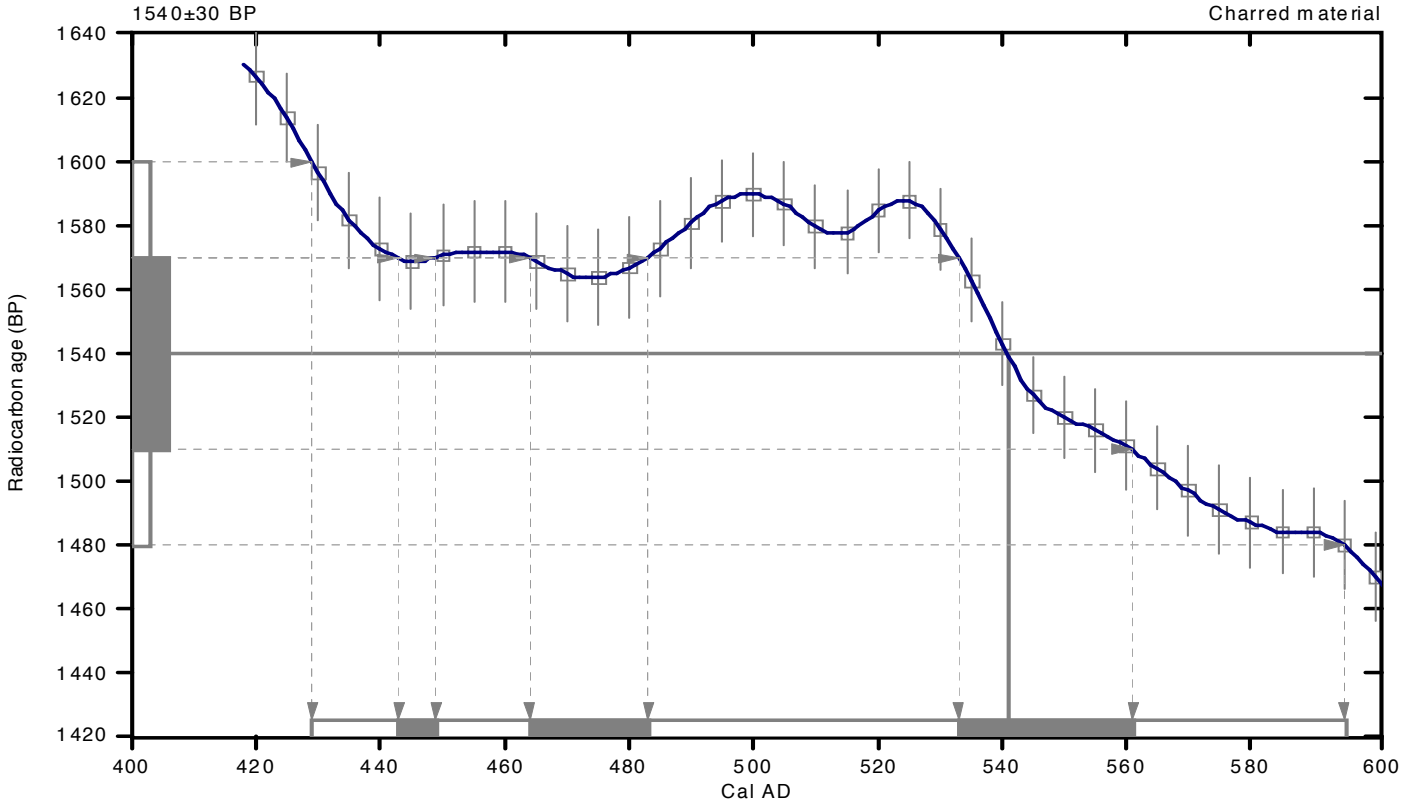
Conventional radiocarbon age: **1540±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 430 to 600 (Cal BP 1520 to 1360)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 540 (Cal BP 1410)

1 Sigma calibrated results: (68% probability) Cal AD 440 to 450 (Cal BP 1510 to 1500) and Cal AD 460 to 480 (Cal BP 1490 to 1470) and Cal AD 530 to 560 (Cal BP 1420 to 1390)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.5:lab. mult=1)

Laboratory number: **Beta-312542**

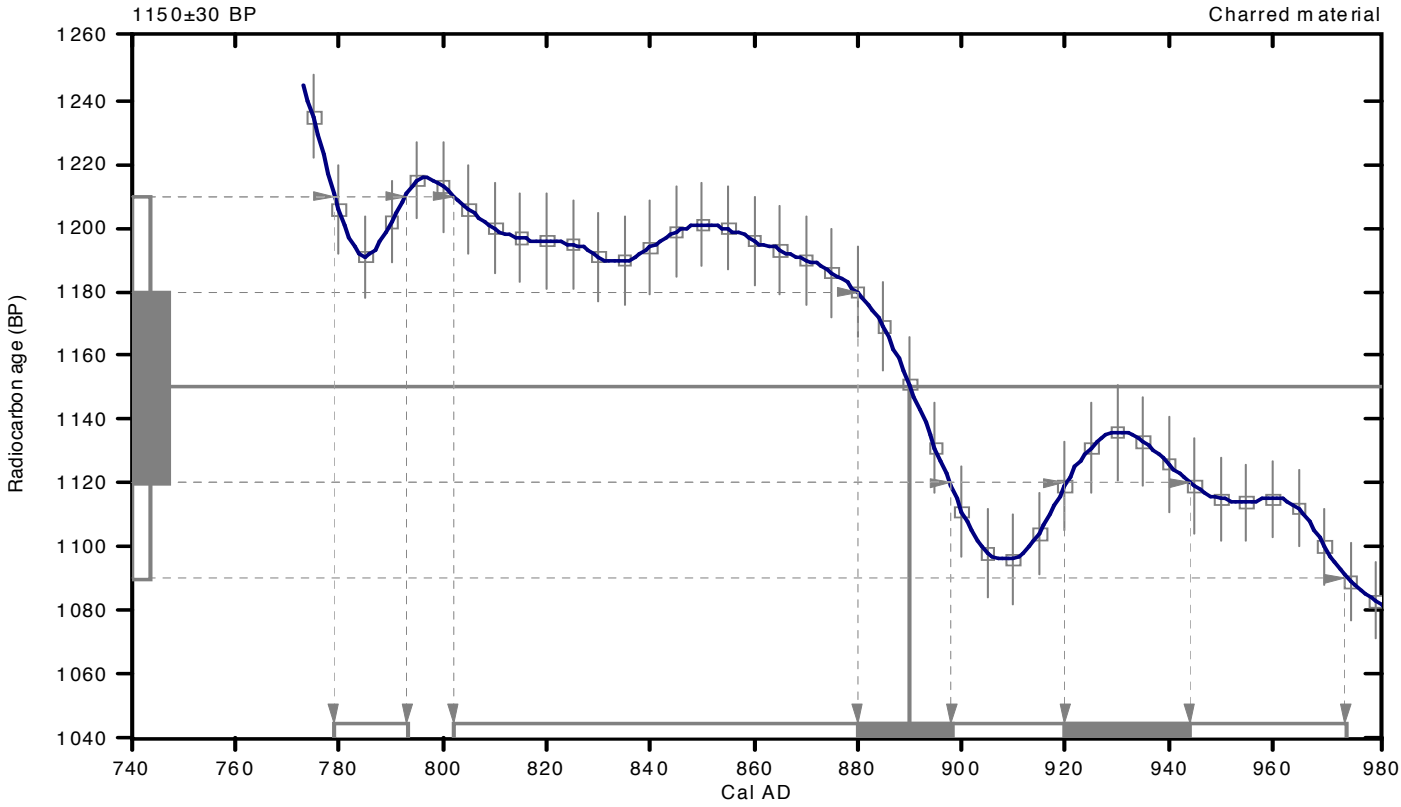
Conventional radiocarbon age: **1150±30 BP**

2 Sigma calibrated results: **Cal AD 780 to 790 (Cal BP 1170 to 1160) and**
(95% probability) **Cal AD 800 to 970 (Cal BP 1150 to 980)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 890 (Cal BP 1060)

1 Sigma calibrated results: Cal AD 880 to 900 (Cal BP 1070 to 1050) and
(68% probability) Cal AD 920 to 940 (Cal BP 1030 to 1010)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.7:lab. mult=1)

Laboratory number: **Beta-312543**

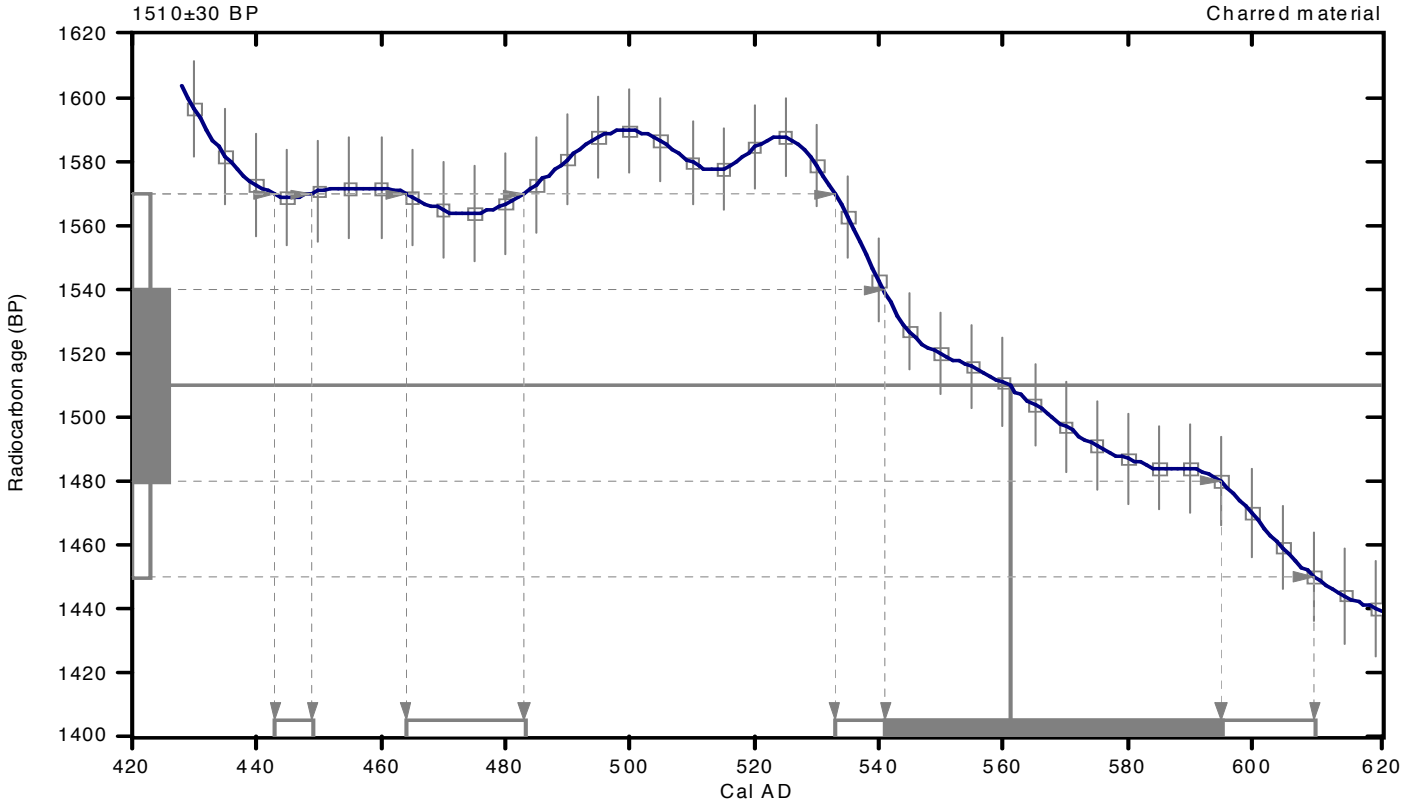
Conventional radiocarbon age: **1510±30 BP**

2 Sigma calibrated results: **Cal AD 440 to 450 (Cal BP 1510 to 1500) and**
(95% probability) **Cal AD 460 to 480 (Cal BP 1490 to 1470) and**
Cal AD 530 to 610 (Cal BP 1420 to 1340)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 560 (Cal BP 1390)

1 Sigma calibrated result: Cal AD 540 to 600 (Cal BP 1410 to 1360)
(68% probability)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.8:lab. mult=1)

Laboratory number: **Beta-312544**

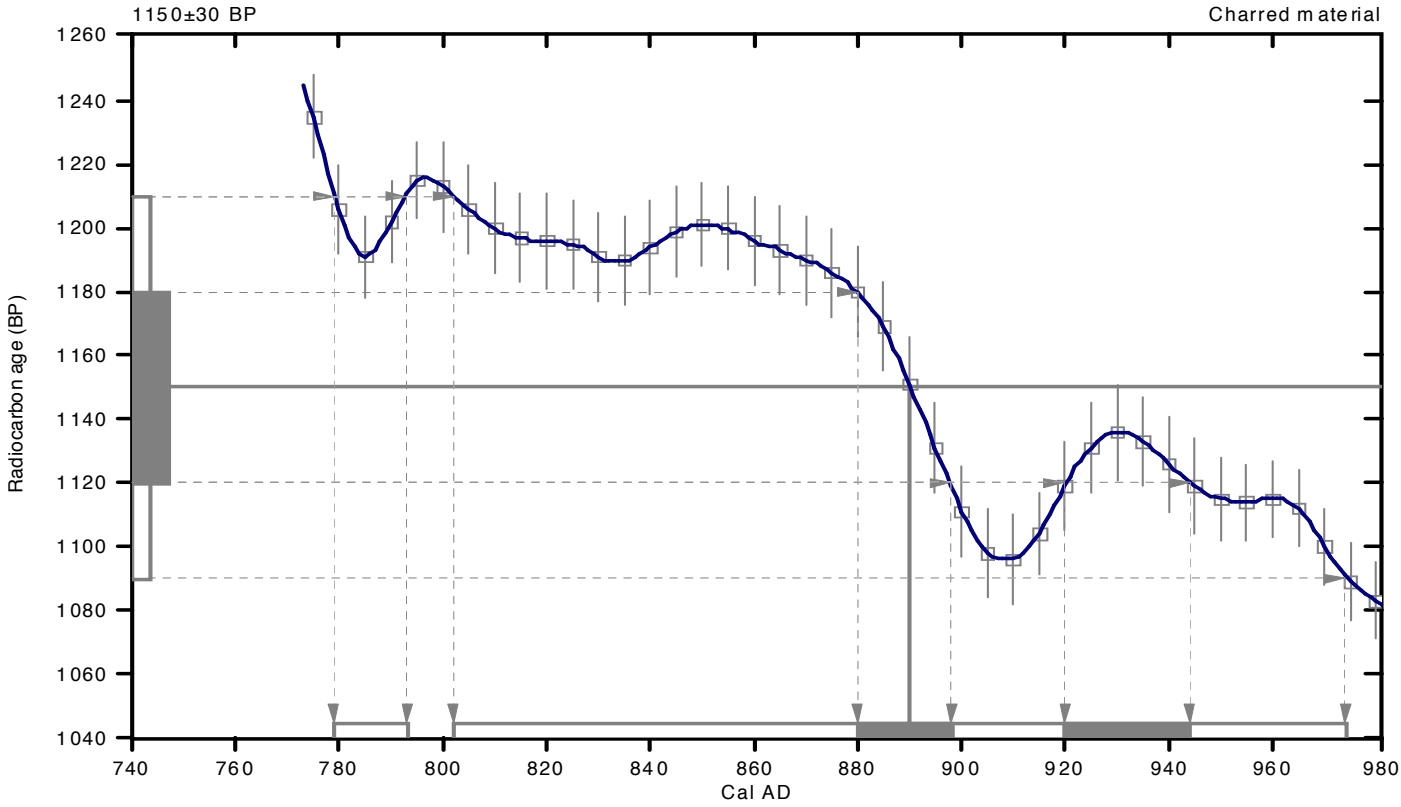
Conventional radiocarbon age: **1150±30 BP**

2 Sigma calibrated results: **Cal AD 780 to 790 (Cal BP 1170 to 1160) and**
(95% probability) **Cal AD 800 to 970 (Cal BP 1150 to 980)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 890 (Cal BP 1060)

1 Sigma calibrated results: Cal AD 880 to 900 (Cal BP 1070 to 1050) and
(68% probability) Cal AD 920 to 940 (Cal BP 1030 to 1010)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.2:lab. mult=1)

Laboratory number: **Beta-312545**

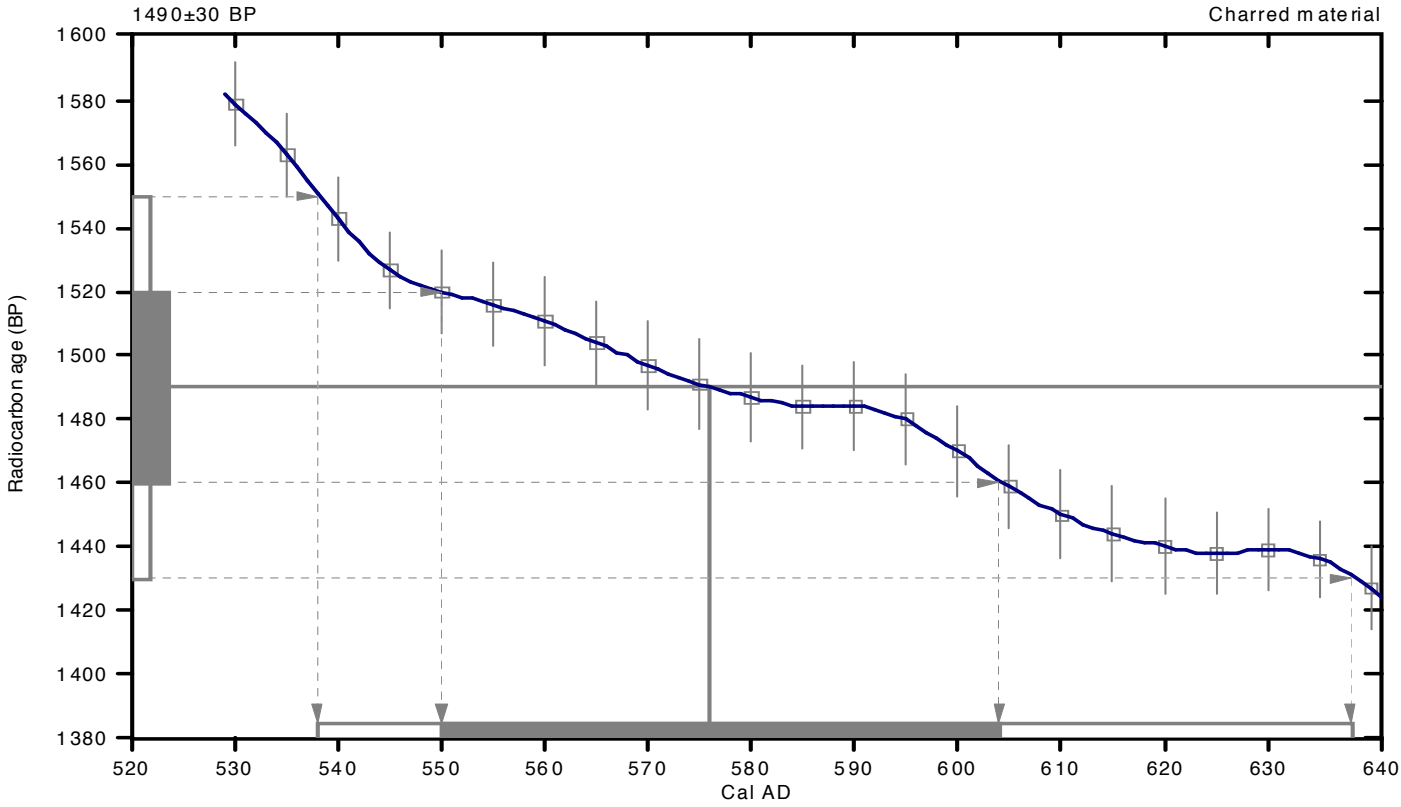
Conventional radiocarbon age: **1490±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 540 to 640 (Cal BP 1410 to 1310)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 580 (Cal BP 1370)

1 Sigma calibrated result: (68% probability) Cal AD 550 to 600 (Cal BP 1400 to 1350)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.7:lab. mult=1)

Laboratory number: **Beta-312546**

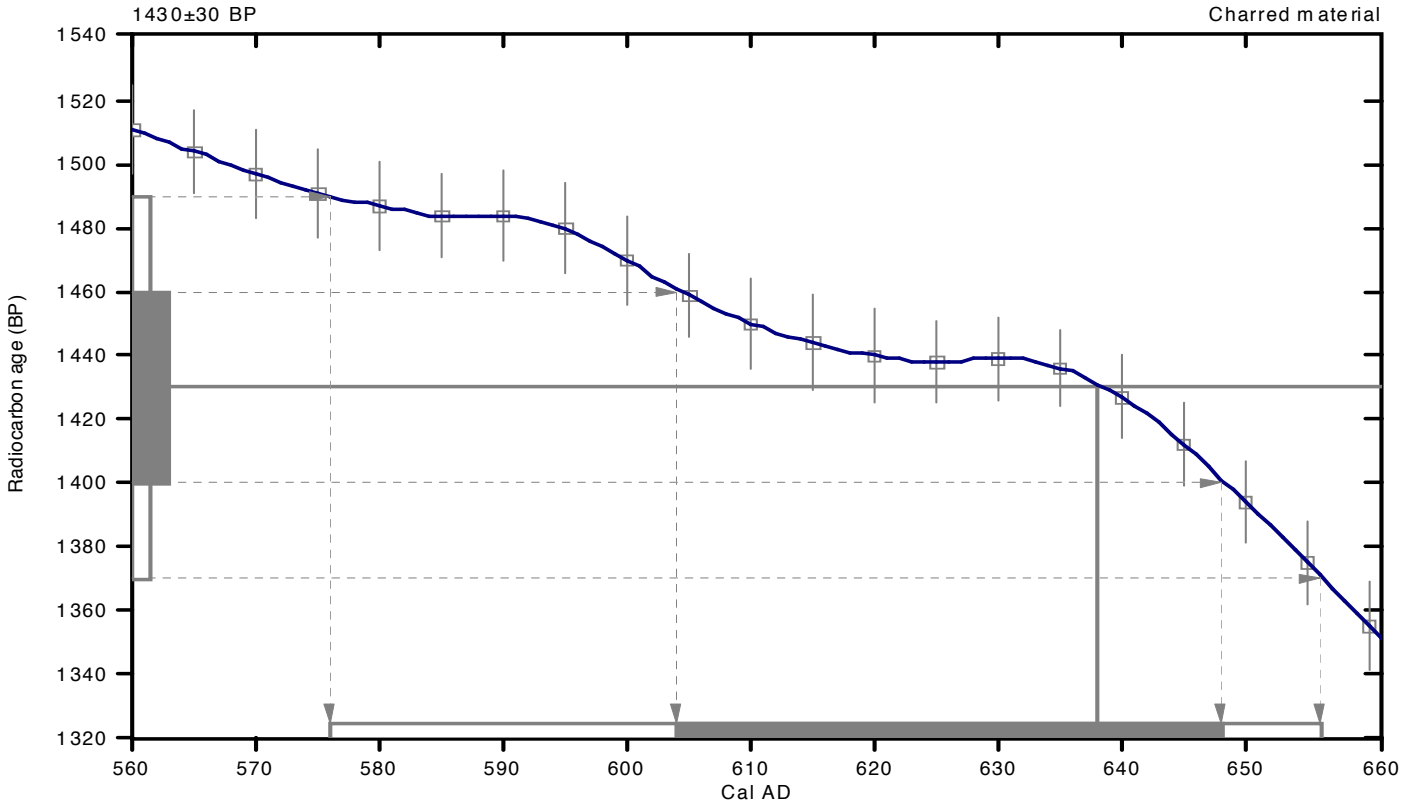
Conventional radiocarbon age: **1430±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 580 to 660 (Cal BP 1370 to 1290)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 640 (Cal BP 1310)

1 Sigma calibrated result: (68% probability) Cal AD 600 to 650 (Cal BP 1350 to 1300)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.2:lab. mult=1)

Laboratory number: **Beta-312547**

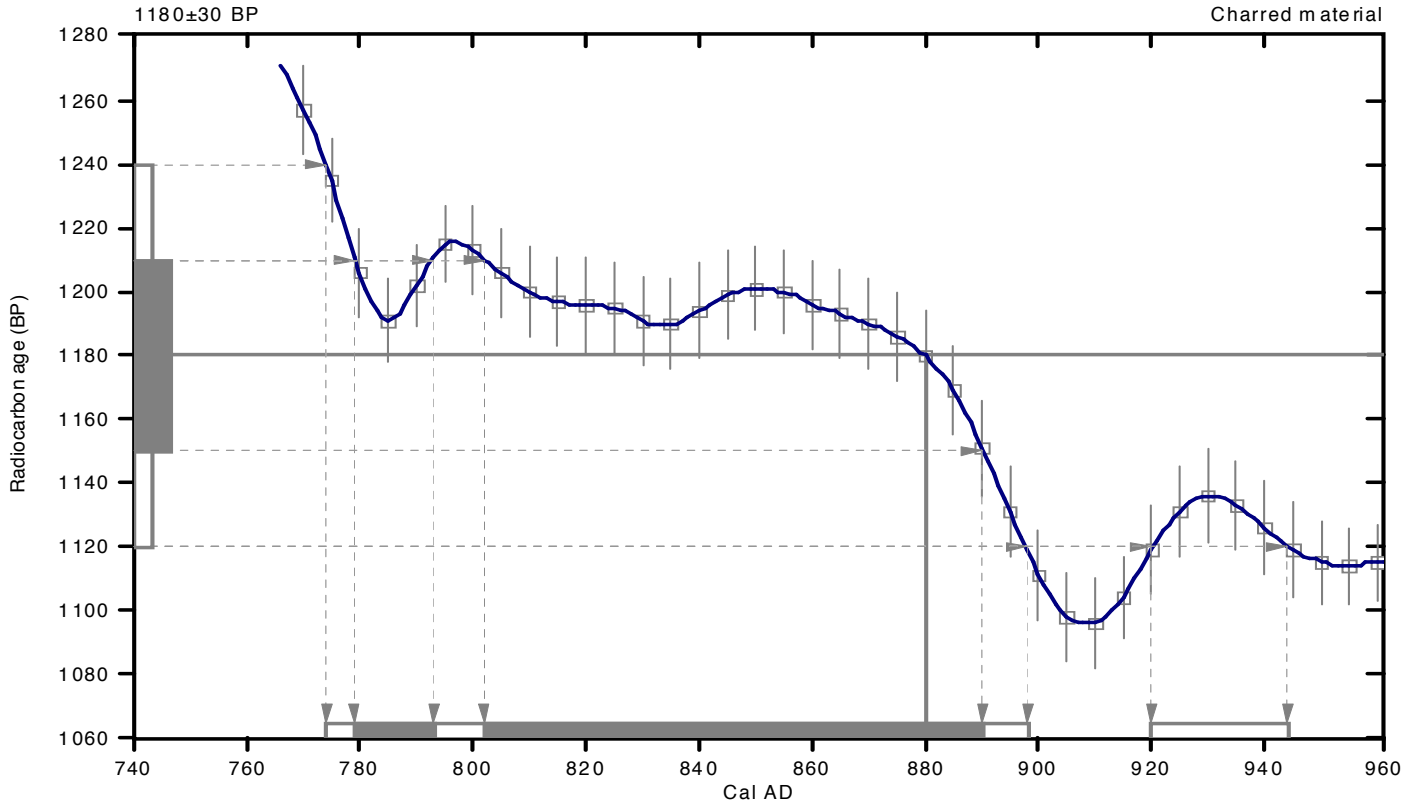
Conventional radiocarbon age: **1180±30 BP**

2 Sigma calibrated results: **Cal AD 770 to 900 (Cal BP 1180 to 1050) and**
(95% probability) **Cal AD 920 to 940 (Cal BP 1030 to 1010)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 880 (Cal BP 1070)

1 Sigma calibrated results: Cal AD 780 to 790 (Cal BP 1170 to 1160) and
(68% probability) Cal AD 800 to 890 (Cal BP 1150 to 1060)



References:

Database used

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References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

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