Accelerated Mass Spectrometry Radiocarbon Determination of Papyrus Samples

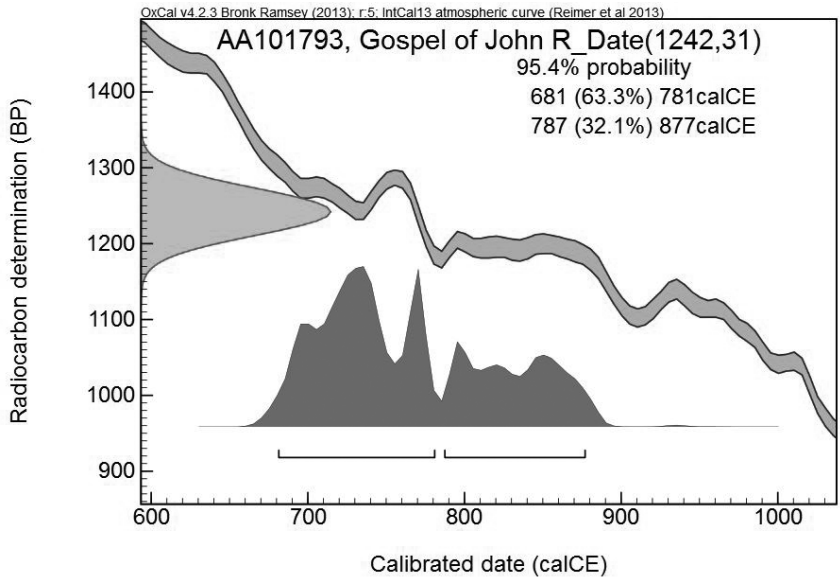
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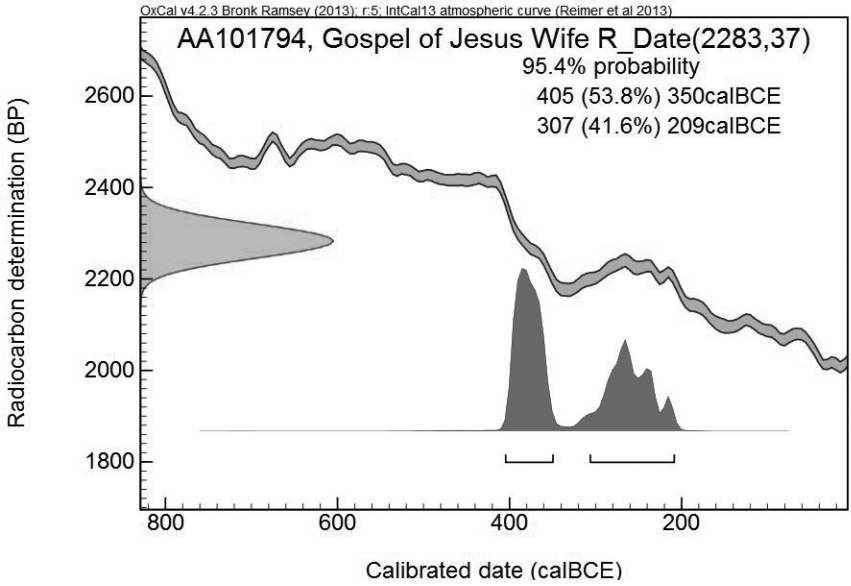
Date no.	AA-101793	AA-101794
Sample	Gospel of John	*Gospel of Jesus's Wife*
$\delta^{13}C$	−9.2‰	−14.3‰
Fraction of modern carbon:	0.8568±0.0033	0.7526±0.0035
Uncalibrated Radiocarbon Age:	1242±31 ^{14}C yrs BP	2283±37 ^{14}C yrs BP
2 sigma, 95.4% Calibrated age ranges:	681 cal C.E. to 877 cal C.E.	405 calB.C.E. to 350 cal B.C.E. 307 cal B.C.E. to 209 cal B.C.E.

The values are quoted for an isotopic correction to –25‰ for $\delta^{13}C$, which indicates the value of the stable-isotope ratio of $^{13}C/^{12}C$ deviation from a known standard, in parts per mil (‰). The calibrated ages are based on cross-referencing the radiocarbon ages with known-age tree ring radiocarbon measurements, using the most recent calibration data set (INTCAL13). The calibration plots are shown on the next page.

The $\delta^{13}C$ value of AA-101794 is lower than is typical for other radiocarbon-dated papyri and requires explanation. It might indicate the presence of a contaminant or have some other explanation. The presence of a contaminant with a different radiocarbon content than the papyrus would alter the bulk radiocarbon content. Consequently the low $\delta^{13}C$ value sheds doubt upon the validity of the radiocarbon date. A discussion of the $\delta^{13}C$ measurement is presented in a separate document.

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Carbon stable isotope measurements on dated papyrus documents and botanical specimens.

Lab Reference	Origin	Dynastic Period or Name	Sample # or Name	Date	Error	$\delta^{13}C$
OxA-15313	Illahun	Senusret III	10009	3503	30	–9.4
VERA-3726	Illahun	Senusret III	10009	3543	29	–11.0
OxA-15315	Illahun	Senusret III	10041	3513	31	–8.9
VERA-3728	Illahun	Senusret III	10041	3565	29	–11.3
VERA-3735	Illahun	Amenemhet III	10044	3550	29	–10.8
OxA-15316	Illahun	Amenemhet III	10053	3542	30	–9.3
VERA-3729	Illahun	Amenemhet III	10053	3563	29	–10.8
VERA-3732	Illahun	Senusret III	10077	3563	29	–9.6
VERA-3733	Illahun	Amenemhet III	10091	3568	28	–7.8
OxA-15317	Illahun	Senusret III	10092	3532	31	–8.7
VERA-3730	Illahun	Senusret III	10092	3529	29	–10.2
OxA-15311	Illahun	Senusret III	10248	3532	31	–9.4
OxA-15310	Illahun	Amenemhet III	10018Bd	3560	33	–8.9
OxA-15314	Illahun	Amenemhet III	10038 b+c	3755	33	–10.1
VERA-3727	Illahun	Amenemhet III	10038 b+c	3522	29	–10.0
VERA-3734	Illahun	Amenemhet III	10038a	3512	29	–9.0
OxA-15309	Illahun	Amenemhet III	10081c	3626	33	–9.7
OxA-15318	Illahun	Senusret III	10345d	3518	31	–9.2
VERA-3731	Illahun	Senusret III	10345d	3513	29	–11.5
OxA-15312	Illahun	Amenemhet III	10419a	3485	31	–8.8
OxA-14993	Illahun	Senusret II	Fragment B2	3551	32	–9.4
OxA-14994	Illahun	Senusret II	Fragment B2	3483	32	–9.0
OxA-18052	Saqqara	Djoser	MMA 30948	2421	28	–8.1

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OxA-20212	Abusir	Djedkare	BM10735/10	3911	31	–9.1
OxA-16838	Thebes	Amenemhat I or Senusret I	MMA 22.3.5239	3620	32	–9.8
VERA-4075	Thebes	Amenemhat I or Senusret I	MMA 22.3.5239	3679	29	–11
OxA-20189	Thebes	Ramesses IV	BM9999/97	2972	27	–9.1
OxA-20213	Thebes	Ramesses IX-XI	BM10326	2771	28	–10.8
OxA-20214	Thebes	Ramesses IX-XI	BM75018	2946	29	–9.2
LABEC/CIRCE	Alexandria?	Artimedorus Papyrus	Arte 1	1974	80	–11.5
LABEC/CIRCE	Alexandria?	Artimedorus Papyrus	Arte 2	1906	67	–11.5
LABEC/CIRCE	Alexandria?	Artimedorus Papyrus	Arte 3	1958	33	–11.5
OxA-16346	Nile River Bank	C. alopucuroides Rottb.	2a[1]	141	27	–9.0
OxA-16342	Alexandria	C. dives Del.	25a[1]	112	26	–8.3
OxA-16344	Alexandria	C. longus L.	27[1]	126	27	–8.2
AA-62452	unknown	Codex Chaco	page 9	1739	48	–10.0
AA-62453	unknown	Codex Chaco	page 39	1726	47	–9.9
AA85363	Memphis	Early 18th Dyn., Book of the Dead	#371777E	3249	42	–9.3
AA99528	Medinet Madi	Manichaean Codex	cartonnage	1572	38	–10.0
AA101793	unknown	Gospel of John Coptic	fragment	1242	31	–9.2
AA101794	unknown	Gospel of Jesus Wife	fragment			–14.3

1. botanical specimen

OxA and VERA data graciously provided by Michael Dee, University of Oxford, and Ezra Marcus, University of Haifa, previously published in Christopher Bronk Ramsey et al., "Radiocarbon-Based Chronology for Dynastic Egypt," *Science* 328 (2010) 1554–57; and Michael Dee et al., "Investigating the Likelihood of a Reservoir Offset in the Radiocarbon Record for Ancient Egypt," *Journal of Archaeological Science* 37 (2010) 687–93.

LABEC/CIRCE data courtesy Marialena Fedi, dates previously published in Marialena Fedi et al., "The Artemidorus Papyrus: Solving an Ancient Puzzle with Radiocarbon and Ion Beam Analysis Measurements," *Radiocarbon* 52 (2010) 356–63.

AA85363 data courtesy Paul O'Rourke and Edward Bleiberg, Brooklyn Museum. AA99528 data courtesy Jason BeDuhn, Northern Arizona University. Other AA data courtesy Greg Hodgins and Tim Jull, University of Arizona.