

**Dating Report on Basilica San Marco (BS 4) peach pits and a wood sample from 3.90 m depth\***

**\*With an Addendum on the Microscopic Analysis of Contemporary Sediments.**

Samples Dated:

**BSM2015 FS -1.** Core S4. Fruit stone 1 (peach) at 4.18 m depth (AA107037-X29596). Half sample used for analysis, other half with seed retained for further work.

<i>Results</i>	
$\delta^{13}\text{C}$ ( $\pm 0.1\text{‰}$ ):	-24.7 ‰
Fraction of modern carbon:	0.8495 +- 0.0026
Uncalibrated $^{14}\text{C}$ Age:	1,311 +- 25 years BP
Calibration Program / Dataset:	OxCal 4.2 / IntCal13 atmospheric
Calendar Age Range (68%):	662 CE to 764 CE
Calendar Age Range (95%):	658 CE to 768 CE

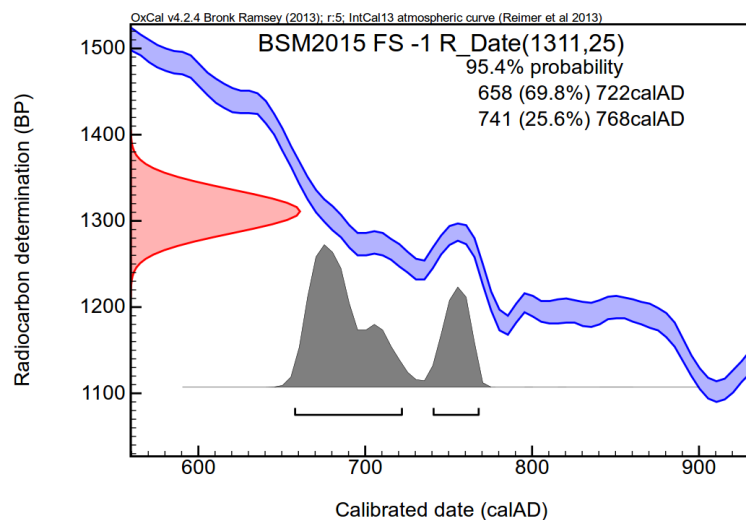
**BSM2015 FS-2.** Core S4. Fruit stone 2 (peach) at 4.165 m depth (AA107038-X29597). Half sample used for analysis, other half with seed retained for further work.

<i>Results</i>	
$\delta^{13}\text{C}$ ( $\pm 0.1\text{‰}$ ):	-24.9 ‰
Fraction of modern carbon:	0.8495 +- 0.0022
Uncalibrated $^{14}\text{C}$ Age:	1,310 +- 21 years BP
Calibration Program / Dataset:	OxCal 4.2 / IntCal13 atmospheric
Calendar Age Range (68%):	665 CE to 762 CE
Calendar Age Range (95%):	660 CE to 767 CE

**Notes:** Linear, semi cylindrical grind marks c. 2-3mm deep were noted on each peach stone during preparation for analysis. It is possible the marks were made during modern retrieval of the samples, however, they appeared to pre-date the sediment coating that infilled them and which was removed from the surface with a fine paintbrush. Microscopic examination showed a continuous erosion pattern across the grooved and ungrooved surface of the pit, also indicating the marks were most likely made prior to deposition. They were in approximately the same place on each stone, perhaps indicative of a repeated activity to remove the edible fruit.



Image: Above: BSM2015 FS -1; Below: BSM2015 FS-2. Showing grooved surface after primary sediment removal



The radiocarbon result also confirms the contemporaneity of the two pits. The precision is good for the two dates, the age range large because of the nature of the calibration curve in this period. See example (left) for BSM2015 FS-1

**BSM2015 – 17.** Core S4. A small piece of wood at 3.90 m depth in soil sample (AA107039 – x29589).

<b>Results</b>	
<b><math>\delta^{13}\text{C}</math> (<math>\pm 0.1\text{‰}</math>):</b>	-25.0 ‰
<b>Fraction of modern carbon:</b>	0.8478 +- 0.0022
<b>Uncalibrated <math>^{14}\text{C}</math> Age:</b>	1,326 +- 21 years BP
<b>Calibration Program / Dataset:</b>	OxCal 4.2 / IntCal13 atmospheric
<b>Calendar Age Range (68%):</b>	659 CE to 687 CE
<b>Calendar Age Range (95%):</b>	653 CE to 764 CE

**Notes:** The sample was identified as *Ulmus* sp. It was a 4 mm by 4mm fragment with neither pith nor bark evident. From the curvature of the rings it appeared to be from towards the outer edge of a fairly short-lived sample. The radiocarbon determination places it approximately contemporary with the peach pits, the slightly older result explained by a number of possibilities; most likely because a number of rings were missing from the outer edge (probably very few given the result).

### Data Summary

AA	lab #	sample ID	MASS	d13C value	F (d13C)	dF (d13C)	14C age BP	d14C age	calendar ages			
									68% confidence		95% confidence	
AA107037	X29596	BSM2015 FS 1P1	2.36mg	-24.7	0.8495	0.0026	1,311	25	662	764	658	768
AA107038	X29597	BSM 2015 FS-2 P2	1.51mg	-24.9	0.8495	0.0022	1,310	21	665	762	660	767
AA107039	X29598	BSM 2015 WS 17	2.08mg	-25.0	0.8478	0.0022	1,326	21	659	687	653	764

The combined dating result places the sedimentary context firmly in the mid 7<sup>th</sup> to mid 8<sup>th</sup> century AD.

### **Addendum on the Microscopic Analysis of Contemporary Sediments**

The markings on the peach pits provide a strong indication of anthropogenic activity associated with deposition of the contemporary sedimentary horizon. Sediments removed from the samples were soaked in de-ionized water and then dried to disaggregate fine particulates from the mud clasts. The material was examined under x20 and x50 magnification. The grayish, fine grained, calcareous sandy clay contained numerous fragments of broken mollusk shell and a mixture of burnt (charcoal) and unburnt woody material. Unfortunately nothing was large enough for dating or clear species identification, but the charcoal all appeared to be wood as opposed to a range of material that might result from a natural fire. Differences in the degree of erosion of the charcoal (some with clean broken edges, some very degraded) may indicate several burning events. The presence of this wood charcoal assemblage in a mixed / disturbed context complete with the marked peach pits is consistent with anthropogenic activity in the area prior to the construction of the first church on the site (832 AD).