

G. S. Polymeris (1), A. Martinis (2), Ch. Minotou (2), K. Poirazidis (2), A. Skiadaressis (2), Y. Maniatis (1)

(1) Laboratory of Archaeometry, Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research "Demokritos", P.O. BOX 60037, 15310 Aghia Paraskevi, Attiki, Greece
 (2) Ionian University, Department of Environment, Zakynthos, Greece

INTRODUCTION

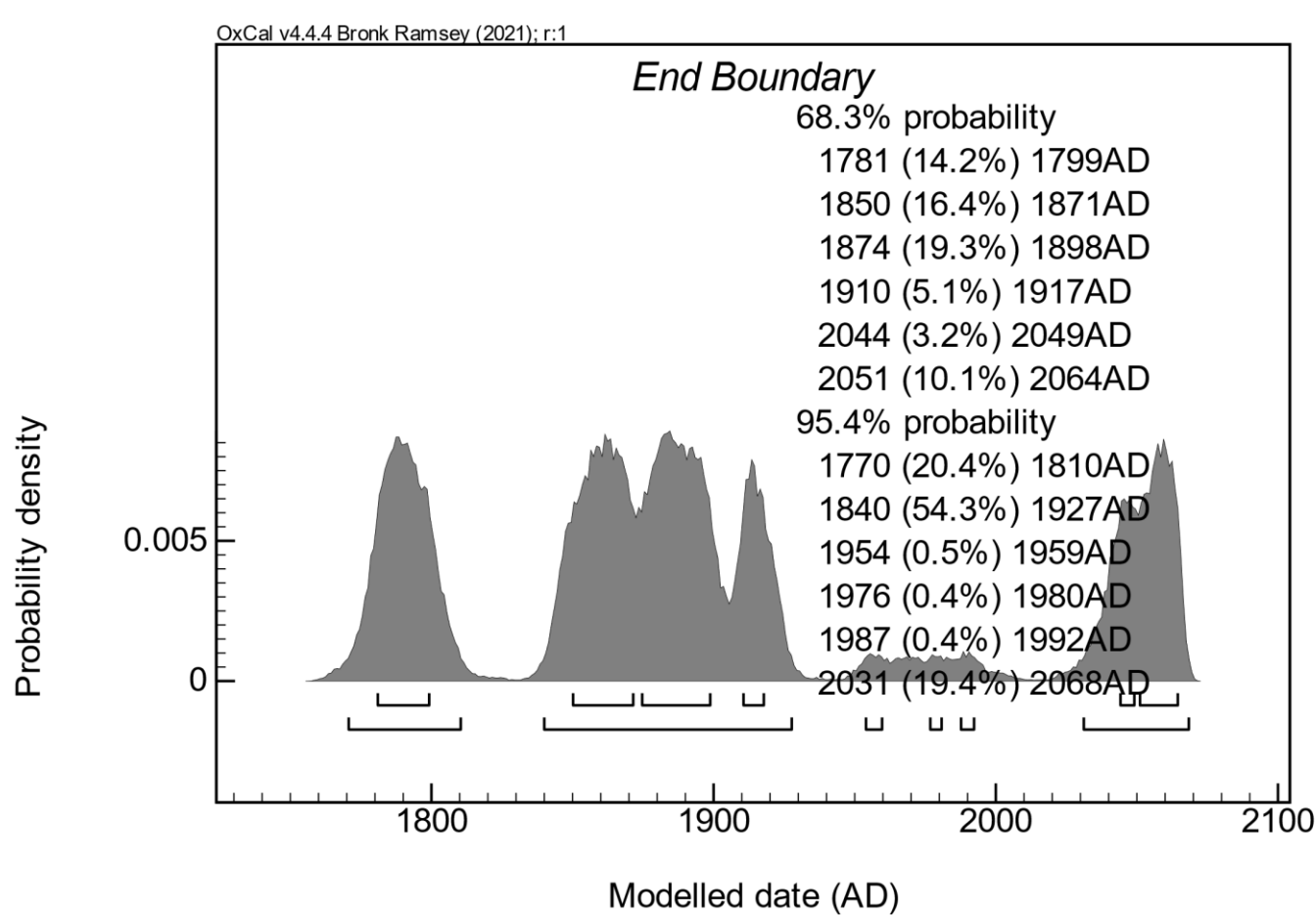
The present study focuses on several monumental olive trees that were recorded and mapped by the Ionian University, located at the Ionian islands (Corfu, Paxoi, Cephalonia, Ithaca, Lefkada and Zakynthos), in the Western part of Greece. Their corresponding perimeters at human breast height, ranges between 6.9 m and ~15 m. Towards an effort to preserve these monumental olive trees, dating was attempted using the following three approaches: (a) calculation of the radial growth rate from the existing, healthy wood pieces and calculating the number of rings (thus the age) that correspond to the radius of each tree according to the respective perimeter; (b) radiocarbon dating for selected pieces of wood from the trunks and (c) both optically and infrared stimulated luminescence (OSL and IRSL) dating of the sediments either surrounding or beneath the roots of the trees.

RADIAL GROWTH RATE CALCULATION EXAMPLES



Calculation of the radial growth rate was performed using the number of rings that were counted over distances on healthy pieces of wood from each tree, assuming that this rate was stable all over the trees' lives. An average value of 0.8 – 1.2 mm/year was calculated. Ages were the ratios of radius over the radial growth rate

RADIOCARBON

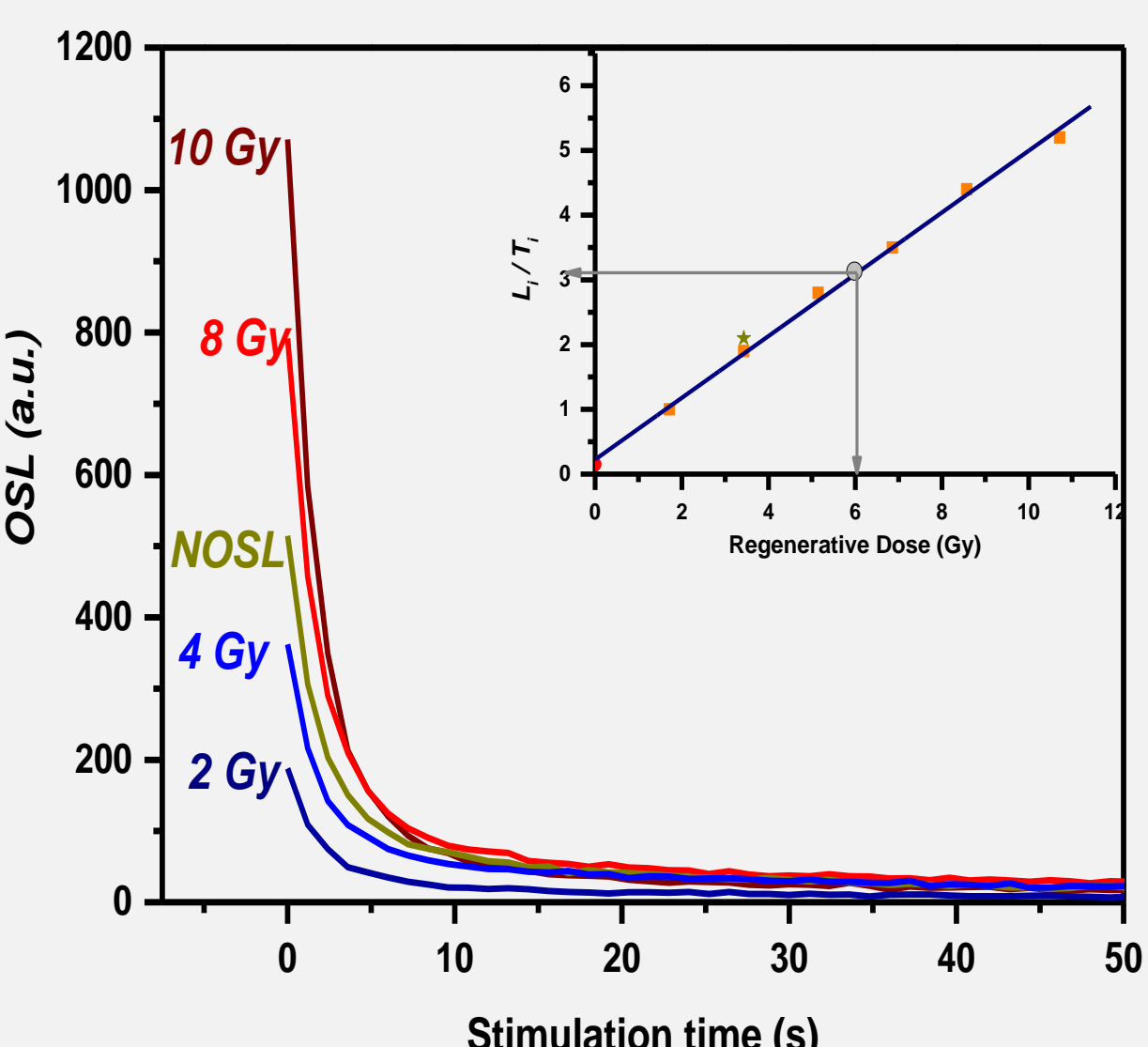


Internal rings were sampled as the oldest preserved ones from the surviving part of the wood for radiocarbon dating (upper photo). As older wood decomposes fast, the preserved part represents younger dates of tree growth. Hence, the ages that are yielded by ¹⁴C are much younger. In the present sample the radiocarbon age was calculated to be younger than 374 years (lower plot).

RESULTS

Island	Location	Perimeter/ Radius (m)	Radial Growth Age (years BCE)	OSL Age (years BCE)	IRSL Age (years BCE)	¹⁴ C Age (years BCE)
Zakynthos	Ampelos	14.20/ 2.261	2213±129	1944±108	1885±96	< 373
Zakynthos	Ampelos (marked)	-	-	1610±180	1529±156	-
Zakynthos	Ag. Pantos	11.70/ 1.863	1573±77	1371±134	1265±77	< 68
Zakynthos	Akrotiti	9.30/ 1.481	1362±34	1291±66	1159±142	< 382
Zakynthos	Apelati	10.50/ 1.672	1516±44	-	-	-
Zakynthos	Elia	10.70/ 1.704	1629±159	-	-	-
Zakynthos	Ag. Prodomos	7.50/ 1.194	1019±38	-	-	-
Zakynthos	Planos	7.90/ 1.258	1097±55	-	-	-
Lefkada	Athani	7.20/ 1.146	1241±66	613±102	685±45	-
Lefkada	Vassiliki	7.20/ 1.146	1233±25	715±128	642±105	-
Lefkada	Fryni	-	-	801±82	829±33	-
Lefkada	Elia Odyssea	9.90/ 1.576	1779±45	1614±61	1320±172	-
Cephalonia	Minies	6.90/ 1.099	1073±53	507±25	522±15	-
Cephalonia	Elia Kouventas	7.40/ 1.178	1119±61	795±94	911±126	-
Cephalonia	Ag. Andreas	-	-	392±45	431±33	-
Cephalonia	Valeriana	-	-	550±81	554±42	-
Cephalonia	Krania, Argostoli	11.85/ 1.887	1773±69	-	-	-
Corfu	Gardiki	11.85/ 1.887	1372±124	Pending	Pending	< 374
Corfu	Argyrades	13.60/ 2.166	2183±232	Pending	Pending	-
Corfu	Prasoudi	8.40/ 1.338	1396±59	Pending	Pending	-
Paxoi	Ludovic. Salvatore	10.30/ 1.640	1770±55	-	-	-

OSL & IRSL



Examples of OSL curves measured for the age assessment of the soil beneath the routes of the olive trees using the SAR protocol. Inset presents the corresponding growth curve. The methodology of Sahiner et al. (2020) was adopted.

References
 1. E. Şahiner, G. S. Polymeris, M. A. Atılhan, S. Aktürk, N. Meriç. Journal of Quaternary Science (2020) 35(5) 706–715.
 2. Murray, A.S., Wintle, A.G., Radiat. Meas. 32, 57-73, 2000.

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