

G. Kozłowski et al.

Relict tree on Crete

## The Tertiary relict tree *Zelkova abelicea* (Ulmaceae): distribution, population structure and conservation status on Crete

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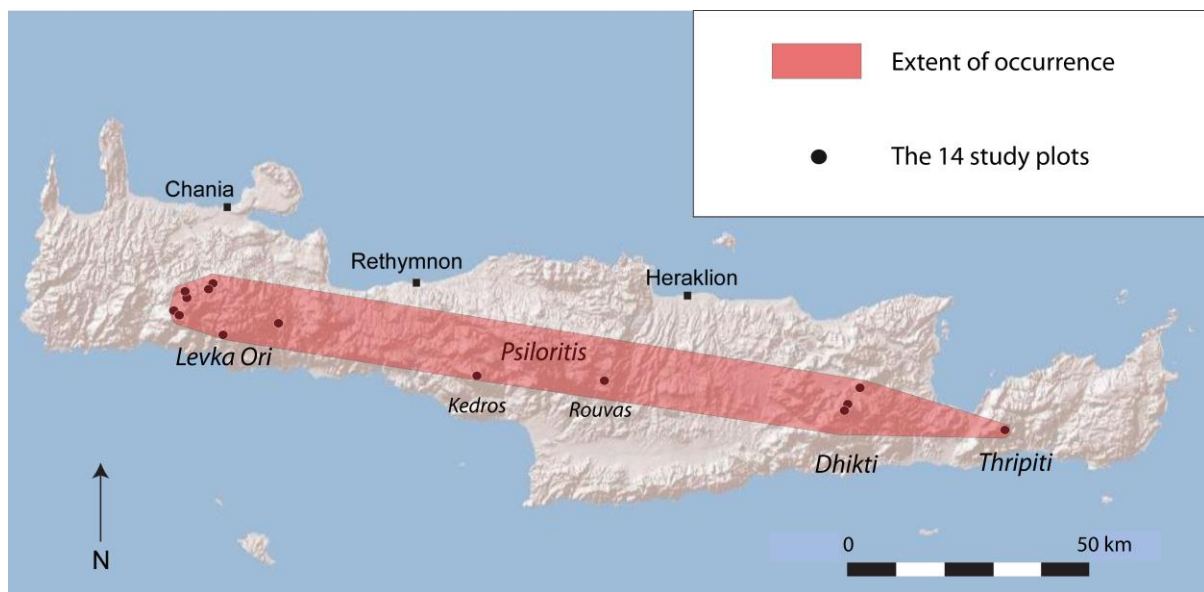


FIG. S1 Extent of occurrence of *Zelkova abelicea* and locations of the study plots.

TABLE S1 Details of the 14 plots (Fig. S1) in which *Zelkova abelicea* was surveyed, with the number of individual trees, and densities, by tree type.

Study Plot	Number of trees (%)				Density of trees (ha <sup>-1</sup> )			
	Dwarf	Intermediate	Large	Total	Dwarf	Intermediate	Large	Overall
<b>Levka Ori Mountains</b>								
OMA1	120 (56)	13 (6)	82 (38)	215	250.6	27.1	171.2	448.9
OMA2	202 (53)	57 (15)	121 (32)	380	141.1	39.8	84.5	265.3
OMA3	57 (85)	4 (6)	6 (9)	67	1,140.0	80.0	120.0	1,340.0
OMA4	215 (96)	7 (3)	2 (1)	224	1,433.3	46.7	13.3	1,493.3
AMB1	241 (88)	10 (4)	21 (8)	272	964.0	40.0	84.0	1,088.0
AMB2	107 (71)	18 (12)	26 (17)	151	577.8	97.2	140.4	815.3
ELI	250 (99)	1 (0.5)	2 (1.5)	253	691.4	2.8	5.5	699.7
NIA	254 (99)	2 (1)	0	256	1,733.8	13.7	0.0	1,747.4
<b>Psiloritis Mountains</b>								
KED	1,264 (98)	12 (1)	15 (1)	1,291	615.9	5.8	7.3	629.1
PSI	706 (90)	48 (6)	34 (4)	788	1,178.0	80.1	56.7	1,314.9
<b>Dhikti Mountains</b>								
LAS1	567 (93)	31 (5)	9 (2)	607	1,839.1	100.6	29.2	1,968.9
LAS2	368 (94)	20 (5)	2 (1)	390	4,748.4	258.1	25.8	5,032.3
LAS3	149 (100)	0	0	149	1,810.4	0.0	0.0	1,810.4
<b>Thripiti Mountains</b>								
STA	959 (99)	5 (1)	0	964	5,134	1,867.9	9.7	0.0
Total/median±SE	5459 (91)	228 (4)	320 (5)	6,007	66,873	1,159.0±305.0	39.9±18.1	27.5±15.5

TABLE S2 Historical distribution of *Z. abelicea* (1700–1993) based on herbarium and literature data, in chronological order. Blank cells indicate that no data are available.

Herbarium Acronym	Collector	Genus	Species	Year	Mountain range	Site	Altitude (m)
P	J-B. Lamarck	<i>Zelkova</i>	<i>abelicea</i>	1700			
G	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
G	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
G	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
G	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
P	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
P	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
P	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
P	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Sphakiot?	
K	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo	
K	J. Heldreich	<i>Planera</i>	<i>abelicea</i>	1846	Levka Ori	Omalo plain	1,370
MPU	W. de Schoenefeld	<i>Planera</i>	<i>crenata</i>	1849	Cultivated	Versailles	
G	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
G	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
G	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
G	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884			
MPU	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
MPU	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
P	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
P	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
B	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
K	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos, rochers.	
K	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos, rochers.	
K	E. Reverchon	<i>Planera</i>	<i>abelicea</i>	1884	Dhikti	Amalos	
G	A. Baldacci	<i>Planera</i>	<i>abelicea</i>	1893	Levka Ori	Omalo, M. Volakias	
G	A. Baldacci	<i>Planera</i>	<i>abelicea</i>	1893	Levka Ori	Omalo	

G	A. Baldacci	<i>Planera</i>	<i>abelicea</i>	1893		Madaros (Asph?)	
K	A. Baldacci	<i>Abelicea</i>	<i>cretica</i>	1893	Levka Ori	Omalò et madraìò	
K	L. Biro	<i>Abelicea</i>	<i>cretica</i>	1906	Levka Ori	Omalos, Montes Aspro-Wuma	
K	L. Biro	<i>Abelicea</i>	<i>cretica</i>	1906	Levka Ori	Omalos, Montes Aspro-Wuma	
G	M. Gandoger (1916)	<i>Abelicea</i>	<i>cretica</i>	1915	Psiloritis	Khedros	
G	M. Gandoger (1916)	<i>Abelicea</i>	<i>cretica</i>	1915	Psiloritis	Khedros	
P	M. Gandoger (1916)	<i>Abelicea</i>	<i>cretica</i>	1915	Psiloritis	Khedros	
K	M. Gandoger (1916)	<i>Abelicea</i>	<i>cretica</i>	1915		Rethymo: M. Kleòrn?	
G	C. Regel	<i>Zelkova</i>	<i>cretica</i>	1939	Levka Ori	Omalò	
G	C. Regel	<i>Zelkova</i>	<i>cretica</i>	1939	Psiloritis	silva Rouva	
G	C. Regel	<i>Zelkova</i>	<i>cretica</i>	1939	Psiloritis	silva Rouva	
G	C. Regel	<i>Zelkova</i>	<i>cretica</i>	1939	Levka Ori	Omalò	
G	C. Regel	<i>Zelkova</i>	<i>cretica</i>	1939	Levka Ori	Omalò, M. Spheiotici	
G	K. H. Rechinger (1943)	<i>Zelkova</i>	<i>cretica</i>	1942	Levka Ori	Omalos	c. 1,200
G	K. H. Rechinger (1943)	<i>Zelkova</i>	<i>cretica</i>	1942	Levka Ori	Omalos	c. 1,200
K	K. H. Rechinger (1943)	<i>Abelicea</i>	<i>cretica</i>	1942	Levka Ori	Omalos	1,200
G	W. Greuter	<i>Zelkova</i>	<i>abelicea</i>	1961	Levka Ori	Potamos (Eligias gorge!)	
G	W. Greuter	<i>Zelkova</i>	<i>abelicea</i>	1966	Levka Ori	Omalos	1,100–1,250
K	W. Greuter	<i>Zelkova</i>	<i>abelicea</i>	1966	Levka Ori	Omalos	1,100–1,250
B	NA	<i>Abelicea</i>	<i>cretica</i>	1971	Levka Ori	Omalos	1,200
K	Sir Colville Barclay	<i>Zelkova</i>	<i>abelicea</i>	1975	Levka Ori	Just above Omalò Plain	
K	Sir Colville Barclay	<i>Zelkova</i>	<i>abelicea</i>	1975	Levka Ori	Just above Omalò Plain	1,350

B	W. Greuter	<i>Zelkova</i>	<i>abelicea</i>	1982	Psiloritis	Eparchie Amari: Kedhros	860–1,500
B	H. Risse	<i>Zelkova</i>	<i>abelicea</i>	1982	Dhikti	Eparchie Mirambello	850–930
B	W. Greuter, U. Matthäs	<i>Zelkova</i>	<i>abelicea</i>	1983	Thripiti	Thripti	1,280
B	H. Risse	<i>Zelkova</i>	<i>abelicea</i>	1983	Levka Ori	Lefka Ori, Omalos- Hochebene	1,225
B	H. Risse	<i>Zelkova</i>	<i>abelicea</i>	1983	Dhikti	Dhikti	1,175–1,300
B	H. Risse	<i>Zelkova</i>	<i>abelicea</i>	1985	Levka Ori	Lefka Ori, Omalos	1,250
B	K. I. Christensen	<i>Zelkova</i>	<i>abelicea</i>	1987	Levka Ori	Plateau of Omalos.	1,100
G	A. Strid	<i>Zelkova</i>	<i>abelicea</i>	1991	Levka Ori	Omalos	1,400

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TABLE S3 Recent distribution of *Z. abelicea* (1993–2010), based on own investigations

Site	Collector	Year	Altitude (m)
<b>Levka Ori Mountains</b>			
Omalos plateau	D. Frey	2010	1,232
Omalos plateau	D. Frey	2010	1,401
Omalos plateau	D. Frey	2010	1,250
Omalos plateau	D. Frey	2010	1,511
Omalos plateau	B. Egli	1997	1,185
Omalos plateau	B. Egli	1997	1,390
Omalos plateau	B. Egli	1997	1,115
Omalos plateau	D. Frey	2010	1,043
Omalos plateau	D. Frey	2010	1,050
Omalos plateau	D. Frey	2010	1,071
Omalos plateau	B. Egli	1997	1,076
Omalos plateau	B. Egli	1997	1,030
Omalos plateau	B. Egli	1998	1,205
Omalos plateau	B. Egli	1998	1,215
Koukoule	D. Frey	2010	1,464
Selia	D. Frey	2010	1,269
Agavani	D. Frey	2010	1,429
Pera Ghourghouthes	B. Egli	1997	1,100
Ambelitsias Potamos	B. Egli	1997	1,010
Dhothe Ghourghouthes	B. Egli	1997	1,075
Xerakocefala	B. Egli	1997	1,070
Ambelitsias Potamos	B. Egli	1997	1,185
Agavani	B. Egli	1997	1,420
Pighadhaki	B. Egli	1997	1,170
Xerakocefala	B. Egli	1993	1,150
Avlimanakou Korifi	B. Egli	NA	1,600
Pachnes	B. Egli	1997	1,780
Avrakota	B. Egli	1997	1,600
Avrakota	D. Frey	2010	1,601
Niato	B. Egli	1997	1,220
Niato	D. Frey	2010	1,221
Kastelos	B. Egli	1997	1,000
Kastelos	B. Egli	1997	1,350
Psari	B. Egli	1998	1,240
Afendis Kavousi	B. Egli	1993/1999	1,190
<b>Dhikti Mountains</b>			
Mt. Varsami	D. Frey	2010	1,201
	D. Frey	2010	1,375
	D. Frey	2010	1,369
	B. Egli	1993/1999	1,580

Mt. Varsami	B. Egli	1993	1,215
	B. Egli	1993	1,415
	B. Egli	1993	1,415
	B. Egli	1993	1,580
	B. Egli	1993	1,595
	B. Egli	2010	1,300

**Psiloritis Mountains**

Rouvas Forest	D. Frey	2010	1,331
Rouvas Forest	B. Egli	1999	
Kedros	D. Frey	2010	1,300
Kedros	B. Egli	1999	1,150

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TABLE S4 Latitude and longitude data used to calculate the area of occupancy of all recently observed and/or described groups of *Z. abelicea* populations (1993–2010), using the online tool developed by the Royal Botanic Gardens, Kew (GeoCAT, 2012).

Latitude (°N)	Longitude (°E)
<b>Levka Ori Mountains</b>	
35.318427	23.89023
35.306869	23.89689
35.259934	24.015425
35.28791	24.146195
35.377639	24.036407
35.379924	23.987241
35.380162	23.987242
35.347573	23.911958
35.341799	23.904745
35.318427	23.89023
<b>Dhikti Mountains</b>	
35.169809	25.537455
35.137909	25.513127
35.064387	25.469182
35.064546	25.507137
35.116457	25.546699
35.122117	25.549818
35.169809	25.537455
<b>Rouvas Forest (Psiloritis Mountains)</b>	
35.17922222	24.92941667
<b>Kedros (Psiloritis Mountains)</b>	
35.18775	24.62736111
<b>Thripiti Mountains</b>	
35.081	25.88844444