

Supplementary Materials:

Table S1. Classification of aridity index (AI) categories.

Classification	Aridity Index (AI)
Hyper-arid	$AI \leq 0.05$
Arid	$0.05 \leq AI \leq 0.20$
Semi-arid	$0.20 \leq AI \leq 0.50$
Dry sub-humid	$0.50 \leq AI \leq 0.65$
Sub-humid	$0.65 \leq AI \leq 0.80$
Humid	$0.80 \leq AI \leq 1.50$
Very humid	$1.5 \leq AI$

Table 2. Significant regression models describing the relationship between physiological and single or combined environmental parameters over different time intervals. The adjusted R^2 values and the levels of significance are presented. The models in bold are the most significant ones with the highest adjusted R^2 , explaining the variation in the respective physiological parameter, which are presented in figures.

Environmental parameters; exact day of measurements	Physiological parameters			
	Midday Ψ	$\delta^{13}C$	A_{max} (November–March)	Hourly Q_i (October–March)
VPD	$0.55, p < 0.01$	$0.36, p < 0.01$	-	$0.52, p < 0.001$
Daytime VPD	$0.41, p < 0.01$	$0.52, p = 0.001$	-	-
PET	$0.78, p < 0.001$	$0.51, p = 0.001$	-	-
aSWC	$0.32, p < 0.01$	-	-	-
Net radiation	$0.68, p < 0.001$	$0.32, p < 0.05$	$0.47, p < 0.05$	$0.49, p < 0.001$
Daytime net radiation	$0.54, p < 0.001$	$0.26, p < 0.05$	-	-
T_{mean}	$0.65, p < 0.001$	$0.47, p < 0.01$	$0.25, p < 0.05$	-
T_{min}	$0.59, p < 0.001$	$0.44, p < 0.01$	-	-
T_{max}	$0.54, p < 0.001$	$0.37, p < 0.01$	-	-
aSWC, PET	$0.70, p < 0.001$	$0.50, p < 0.01$	-	-
aSWC, VPD	$0.53, p < 0.001$	$0.31, p < 0.01$	-	-
PET, Net radiation	$0.75, p < 0.001$	$0.48, p < 0.01$	-	-

VPD, Net radiation	0.74, $p < 0.001$	0.38, $p < 0.05$	-	0.62, $p < 0.001$
T _{mean} , Net Radiation	0.76, $p < 0.001$	0.44, $p < 0.01$	0.62, $p < 0.05$	-
SWC, T _{mean} , Net radiation	0.76, $p < 0.001$	0.44, $p < 0.05$		-
Environmental parameters; 1 week prior to measurements	Midday Ψ	$\delta^{13}\text{C}$		
VPD	0.60, $p < 0.001$	0.52, $p < 0.001$		
Daytime VPD	0.59, $p < 0.001$	0.48, $p < 0.01$		
PET	0.69, $p < 0.001$	0.49, $p < 0.01$		
aSWC	0.34, $p < 0.01$	0.23, $p < 0.05$		
Net radiation	0.72, $p < 0.001$	0.31, $p < 0.05$		
Daytime net radiation	0.70, $p < 0.001$	0.26, $p < 0.05$		
T _{mean}	0.58, $p < 0.001$	0.30, $p < 0.05$		
T _{min}	0.37, $p < 0.01$	0.29, $p < 0.05$		
T _{max}	0.58, $p < 0.001$	0.29, $p < 0.05$		
aSWC, PET	0.68, $p < 0.001$	0.44, $p < 0.05$		
aSWC, VPD	0.60, $p < 0.001$	0.48, $p < 0.05$		
PET, Net radiation	0.74, $p < 0.001$	0.44, $p < 0.05$		
VPD, Net radiation	0.73, $p < 0.001$	0.48, $p < 0.05$		
T _{mean} , Net Radiation	0.73, $p < 0.001$	0.29, $p < 0.05$		
SWC, T _{mean} , Net radiation	0.72, $p < 0.001$	0.36, $p < 0.05$		
Environmental parameters; 2 weeks prior to measurements	Midday Ψ	$\delta^{13}\text{C}$		
VPD	0.64, $p < 0.001$	0.64, $p < 0.001$		
Daytime VPD	0.66, $p < 0.001$	0.62, $p < 0.001$		
PET	0.70, $p < 0.001$	0.50, $p = 0.001$		
aSWC	0.31, $p < 0.05$	0.26, $p < 0.05$		
Net radiation	0.75, $p < 0.001$	0.31, $p < 0.05$		
Daytime net radiation	0.73, $p < 0.001$	0.25, $p < 0.05$		
T _{mean}	0.29, $p < 0.05$	0.29, $p < 0.05$		
T _{min}	-	-		
T _{max}	0.27, $p < 0.05$	0.27, $p < 0.05$		
aSWC, PET	0.46, $p < 0.01$	0.46, $p < 0.01$		

aSWC, VPD	0.61, $p = 0.001$	0.61, $p = 0.001$
PET, Net radiation	0.47, $p < 0.01$	0.47, $p < 0.01$
VPD, Net radiation	0.32, $p < 0.05$	0.32, $p < 0.05$
T _{mean} , Net Radiation	0.28, $p < 0.05$	0.28, $p < 0.05$
SWC, T _{mean} , Net radiation	-	-
Environmental parameters; Preceding month	Midday Ψ	$\delta^{13}\text{C}$
VPD	0.22, $p < 0.05$	0.55, $p = 0.001$
Daytime VPD	0.48, $p < 0.001$	0.57, $p = 0.001$
PET	0.34, $p < 0.01$	0.61, $p < 0.001$
aSWC	-	0.31, $p < 0.01$
Net radiation	0.60, $p < 0.001$	0.35, $p < 0.01$
Daytime net radiation	0.48, $p < 0.001$	0.57, $p < 0.001$
T _{mean}	0.38, $p < 0.01$	0.33, $p = 0.001$
T _{min}	0.28, $p < 0.01$	0.58, $p = 0.001$
T _{max}	0.23, $p < 0.05$	0.44, $p < 0.01$
aSWC, PET	0.35, $p < 0.01$	0.58, $p < 0.01$
aSWC, VPD	0.62, $p < 0.001$	0.52, $p < 0.01$
PET, Net radiation	0.60, $p < 0.001$	0.58, $p < 0.01$
VPD, Net radiation	0.60, $p < 0.001$	0.55, $p < 0.01$
T _{mean} , Net Radiation	0.58, $p < 0.001$	0.34, $p < 0.01$
SWC, T _{mean} , Net radiation	0.56, $p = 0.001$	0.43, $p < 0.05$
Environmental parameters; Current month	G _s	
VPD	0.58, $p < 0.001$	
Daytime VPD	0.62, $p < 0.001$	
PET	0.69, $p < 0.001$	
aSWC	0.72, $p < 0.001$	
Net radiation	0.37, $p < 0.01$	
Daytime net radiation	0.34, $p < 0.01$	
T _{mean}	0.68, $p < 0.001$	
T _{min}	0.55, $p < 0.001$	

T _{max}	0.69, $p < 0.001$
aSWC, PET	0.70, $p < 0.001$
aSWC, VPD	0.73, $p < 0.001$
PET, Net radiation	0.67, $p < 0.001$
VPD, Net radiation	0.59, $p < 0.001$
T _{mean} , Net Radiation	0.70, $p < 0.001$
SWC, T _{mean} , Net radiation	0.69, $p < 0.001$

Table 3. Characterization of the study site, in comparison to other Aleppo pine sites of Mediterranean countries.

Site	T _{mean} [°C]	Annual Rainfall [mm]	Source
Sani, Greece (15 m.a.s.l., 40°06'N, 23°19' E)	16.2	568	Present study
Girona, Spain (190 m.a.s.l., 42°01' N, 03°00' E)	14.0	835	
Rasquera, Spain (180 m.a.s.l., 41°01' N, 00°36' E)	15.3	547	Del Castigio et al. 2014, <i>Trees</i> : DOI 10.1007/s00468-014-1106-y.
Riba-roja, Spain (80 m.a.s.l., 41°20' N, 00°30' E)	15.1	395	
Otricoli, Italy (400 m.a.s.l., 42°26'N, 12°28' E)	13.0	830	Michelozzi et al. 2011, <i>Photosynthetica</i> : DOI: 10.1007/s11099-011-0068-1
Taranto, Italy (40°29' N, 16°58' E, sea level).	16.0	535	Borghetti et al. 1998, <i>Trees</i> : DOI: 10.1007/pl00009709
Beit Dagan, Israel (20 m.a.s.l., 31°59' N, 34°48' E)	20	490	Klein et al. 2013, <i>ForEcolManage</i> : DOI: 10.1016/j.foreco.2013.03.044