Rising atmospheric CO_2 concentrations: the overlooked factor promoting SW Iberian Forest development across the LGM and the last deglaciation?

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Supplementary material (table and figures):

Table S1 – Description and interpretation of the pollen record from Site U1385A covering the last 23 ka. Pollen zones are designated after their correspondent Site ID (U1385), followed by the pollen zone number.

Pollen Zones	Top Depth (crmcd)	Top Age (cal yr B.P.)	Pollen signature
U1385-5	0.80	4410	Highest values of TMF (~70%) and Mediterranean taxa (~15%), characterised by the increase of temperate and Mediterranean taxa and marked reduction of semi-desert taxa. Expansion of *Isoetes* undiff. After an initial increase to its maximum values reduction of TMF (~40%) and Mediterranean taxa (~5%) as well *Pinus* sp.; subtle expansion of heathland and semi-desert taxa. Increase in the *Taraxacum*-type group.
U1385-4	1.60	1105	Slight decrease of TMF (~30%) and Mediterranean taxa. Re-expansion of semi-desert taxa (~25%) at the beginning followed by a decrease along the zone.
U1385-3	1.80	12760	Re-expansion and establishment of TMF (~35%) and Mediterranean taxa (~10%) followed by the retraction and slowdown of the TMF, Mediterranean taxa, and slight increase of semi-desertic taxa. Marked decline of semi-desert taxa, a gradual increase of TMF as well as Mediterranean taxa, and subtle expansion of heathland taxa by the end of the zone. Subtle recovery of the pioneer taxa as well as *Isoetes* sp. Start of the gradual decline of *Pinus* sp..
U1385-2	2.38	15400	Highest values in *Pinus* sp. (~80%) as well as semi-desert taxa (reaching 55%). Slight decline of semi-desert taxa with a subtle increase in TMF (driven by the *Quercus deciduous* type). Additionally, there is an increase in Poaceae taxa.
U1385-1	2.95	18130	Semi-desert taxa still dominant, despite a modest decrease (~30% average). TMF consistent with the previous zone but an increase of *Alnus* is observed. Mediterranean taxa faintly recover at the expenses of *Quercus evergreen* and *Cistus*. Pioneer taxa are also showing a consistent pattern promoted by the presence of *Betula* and Cupressaceae. Dominance and subtle increase of semi-desert plants (average 35%) with

a recover of the TMF (average ~10%). There is a faint expression of Mediterranean taxa at the start of the zone while the pioneer plants retracted. Marked expression of pioneer plants (Cupressaceae reaching 10%). High values of semi-desert taxa (~30%) as well Ericaceae (average ~10%).

Figure S1 – Pollen diagram for IODP Site U1385A covering the interval from 22550 to ~5000 cal yr B.P. (we extended the data to a younger age to give a better perspective of the taxa variation), showing the taxonomic groups aggregated by different colours, and respective CONISS zonation.
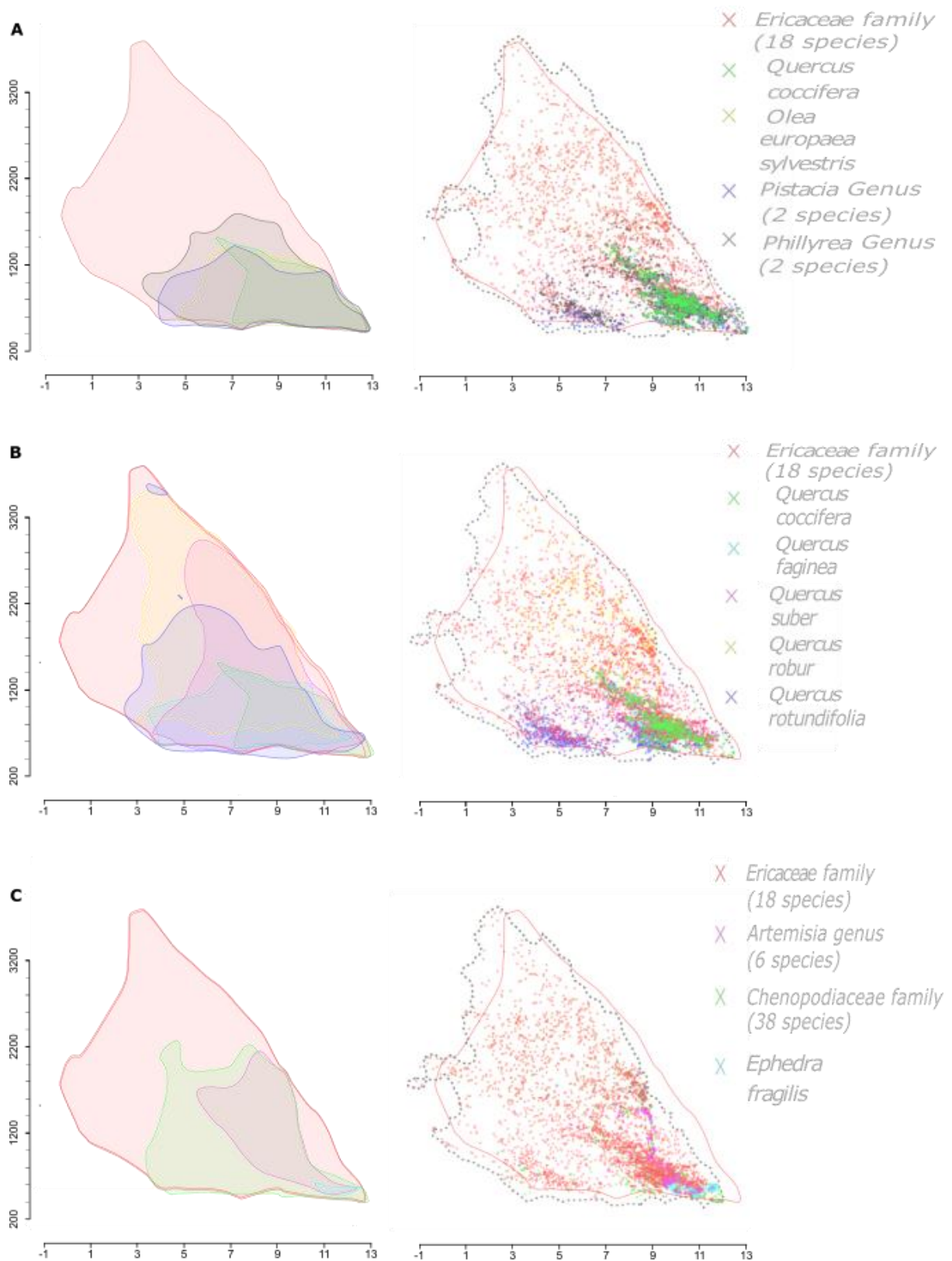
Figure S2 – Environmental space (Annual precipitation Vs Minimum temperature) of different plant groups. a) Heathland vs M.F. (*Quercus coccifera* + *Olea europeaea sylvestris* + *Pistacia* genus + *Phillyrea* genus); b) Heathland (Ericaceae family) vs TMF (represented by *Quercus* sp.); c) Heathland (Ericaceae family) vs Grassland (*Artemisia* sps. + Chenopodiceae family + *Ephedra fragilis*). Source data: www.flora-on.pt