

Supplementary Material

Light inhibition of foliar respiration in response to soil water availability and seasonal changes in temperature in Mediterranean holm oak (*Quercus ilex*) forest

Matthew H. Turnbull^{A,K}, Romà Ogaya^{B,C}, Adrià Barbeta^{B,C,J}, Josep Peñuelas^{B,C}, Joana Zaragoza-Castells^D, Owen K. Atkin^E, Fernando Valladares^F, Teresa E. Gimeno^{G,J}, Beatriz Pías^H and Kevin L. Griffin^I

^ACentre for Integrative Ecology, School of Biological Sciences, University of Canterbury, Private Bag 4800, Christchurch 8140, New Zealand.

^BCREAF, Cerdanyola del Vallès, 08193, Catalonia, Spain.

^CCSIC, Global Ecology Unit CREAF-CSIC-UAB, Cerdanyola del Vallès, 08193, Catalonia, Spain.

^DGeography, College of Life and Environmental Sciences, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RJ, UK.

^EARC Centre of Excellence in Plant Energy Biology, Division of Plant Sciences, Research School of Biology, Building 134, The Australian National University, Canberra, ACT 2601, Australia.

^FMuseo Nacional de Ciencias Naturales, CSIC, Serrano 115, E-28006 Madrid, Spain.

^GHawkesbury Institute for the Environment, University of Western Sydney, Locked bag 1797, Penrith, NSW 2751, Australia.

^HDepartamento de Botánica, Universidad Complutense de Madrid, José Antonio Novais 2, 28040, Madrid, Spain.

^ILamont-Doherty Earth Observatory of Columbia University, 61 Route 9W, 6 Biology, Palisades, NY 10964, USA.

^JISPA, Bordeaux Science Agro, INRA, 33140 Villenave d'Ornon, France.

^KCorresponding author. Email: matthew.turnbull@canterbury.ac.nz

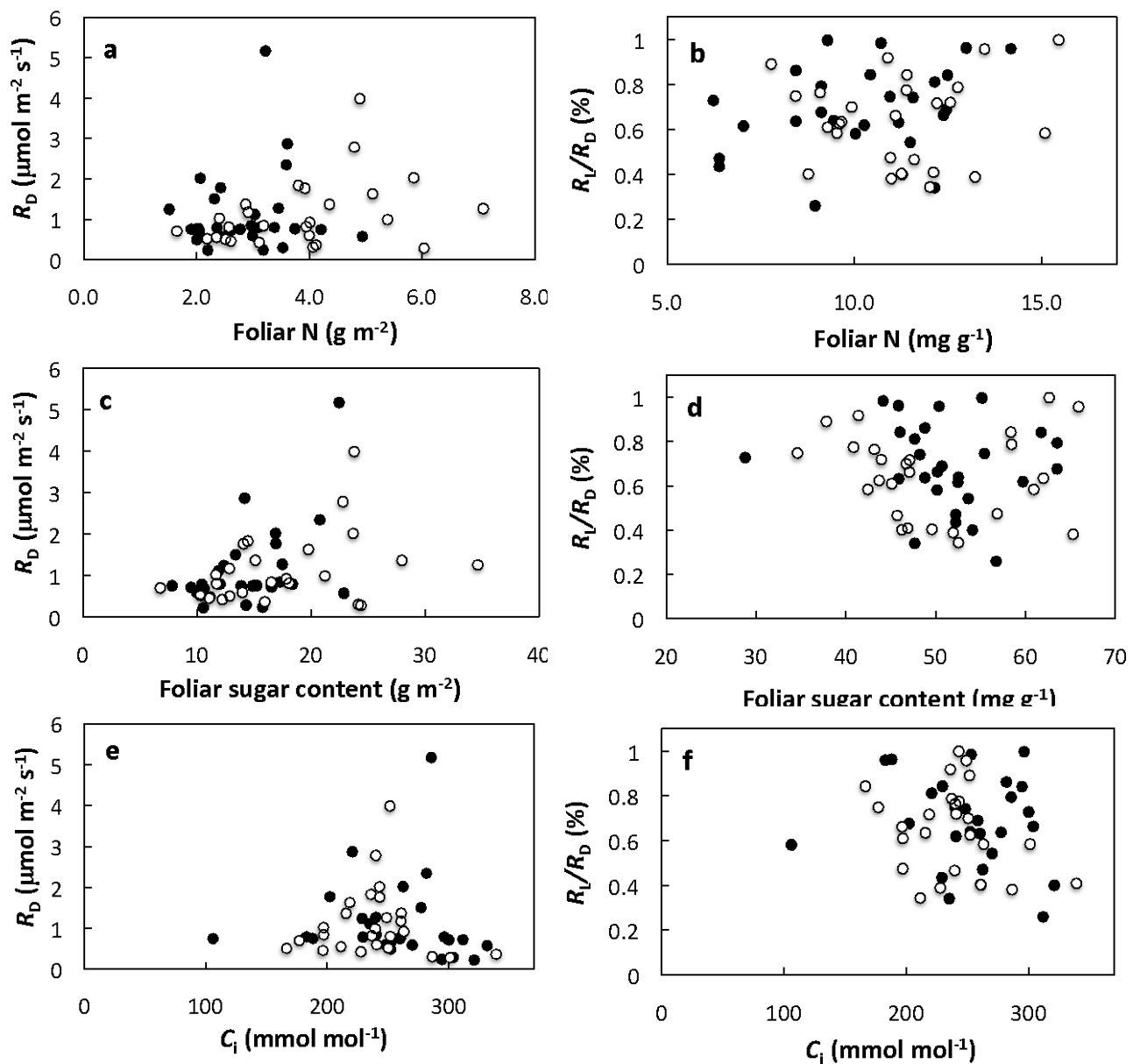


Fig. S1. Relationships between (a, c) foliar respiration rate in darkness (R_D) and (b, d) the ratio of leaf respiration measured in the light to that in darkness (R_L/R_D) and foliar N content and foliar soluble sugar content measured in *Q. ilex* seven times during the course of a year at an upper (closed symbols) and lower (open symbols) slope site at Villar de Cobeta (central Spain).

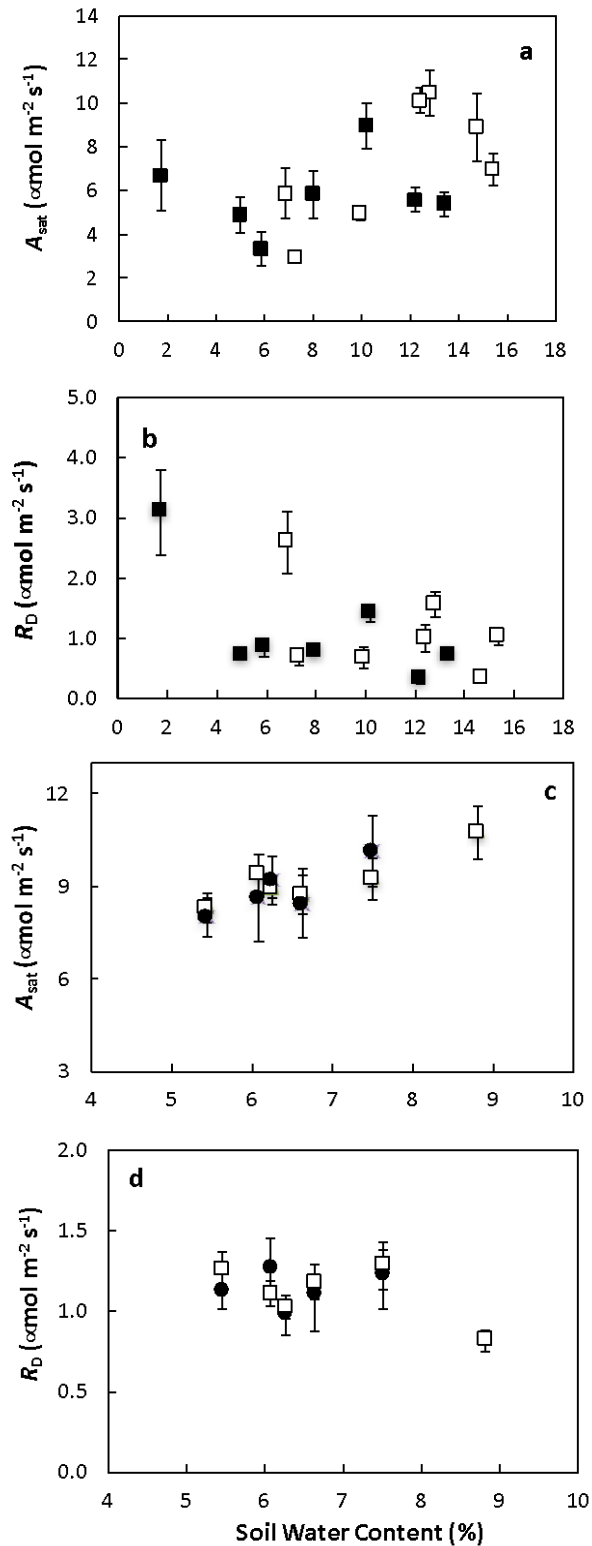


Fig. S2. Relationships between soil water content and (a, c) A_{sat} ; CO₂ uptake measured 1000 $\mu\text{mol m}^{-2} \text{s}^{-1}$ and (b,d) foliar respiration rate in darkness (R_D) measured in *Q. ilex* seven times during the course of a year at an upper (closed symbols) and lower (open symbols) slope site at Villar de Cobeta (central Spain, upper panels), and along a soil water gradient at Prades in NE Spain (lower panels, open symbols denote community average, closed symbols for *Q. ilex*).