Leaf-level responses to light in two co-occurring Quercus (*Quercus ilex* and *Quercus suber*): leaf structure, chemical composition and photosynthesis.

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Abstract: We studied morphological, biochemical and physiological leaf acclimation to incident Photon Photosynthetic-Flux-Density (PPFD) in *Quercus ilex* (holm oak) and *Quercus suber* (cork oak) at Mediterranean evergreen oak woodlands of southern Portugal. Specific leaf area (SLA) decreased exponentially with increasing PPFD in both species. *Q. ilex* had lower SLA values than *Q. suber*. Leaf nitrogen, cellulose and lignin concentration (leaf area-based) scaled positively with PPFD. Maximum rate of carboxylation (Vcmax), capacity for maximum photosynthetic electron transport (Jmax), rate of triose-P utilization (VTPU) and the rate of nonphotorespiratory light respiration (Rd) were also positively correlated with PPFD in both *Quercus* species, when expressed in leaf area but not on leaf mass basis. *Q suber* showed to have higher photosynthetic potential (Vcmax, Jmaxmm and VTPUm) and a higher nitrogen efficient nitrogen use than *Q. ilex*. Leaf chlorophyll concentration increased with decreasing PPFD, improving apparent quantum use efficiency (U) in both *Quercus* species. We concluded that, in *Q. ilex* and *Q. suber*, leaf structural plasticity is a stronger determinant for leaf acclimation to PPFD than biochemical and physiological plasticity.