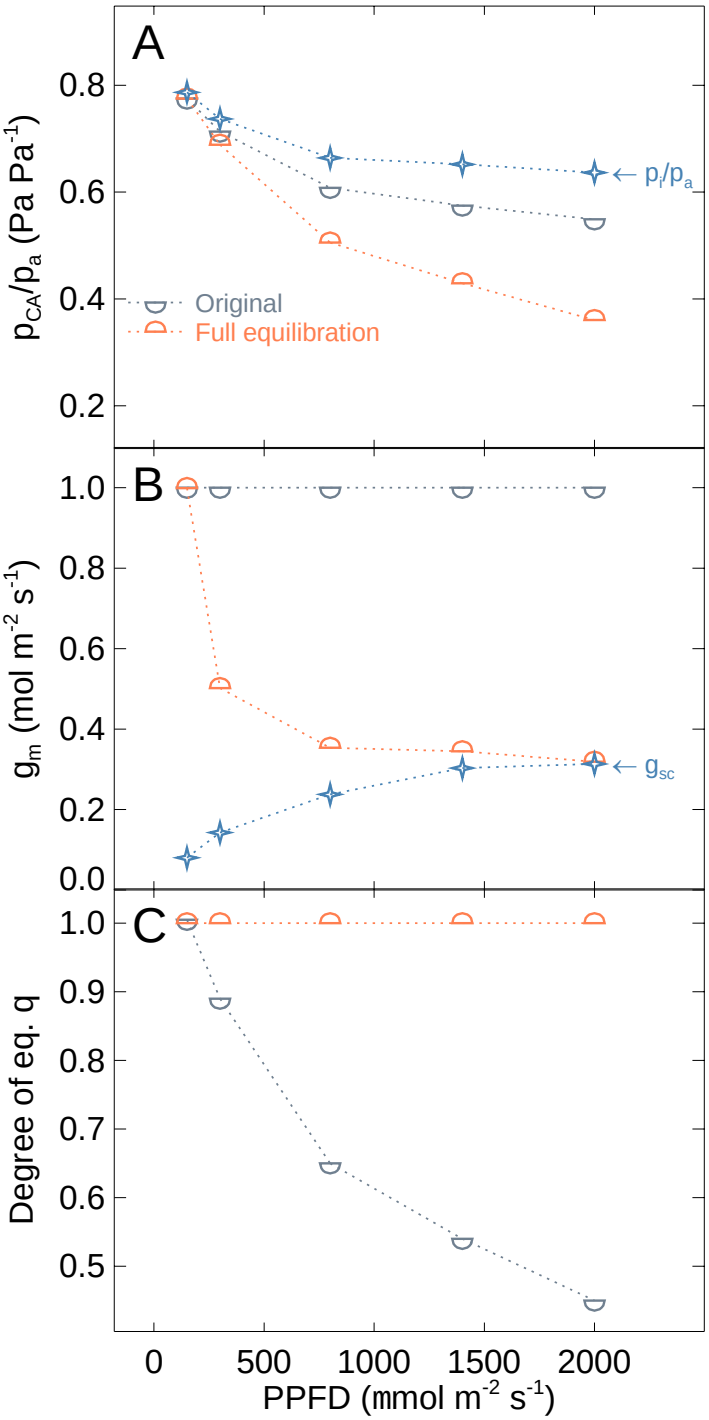
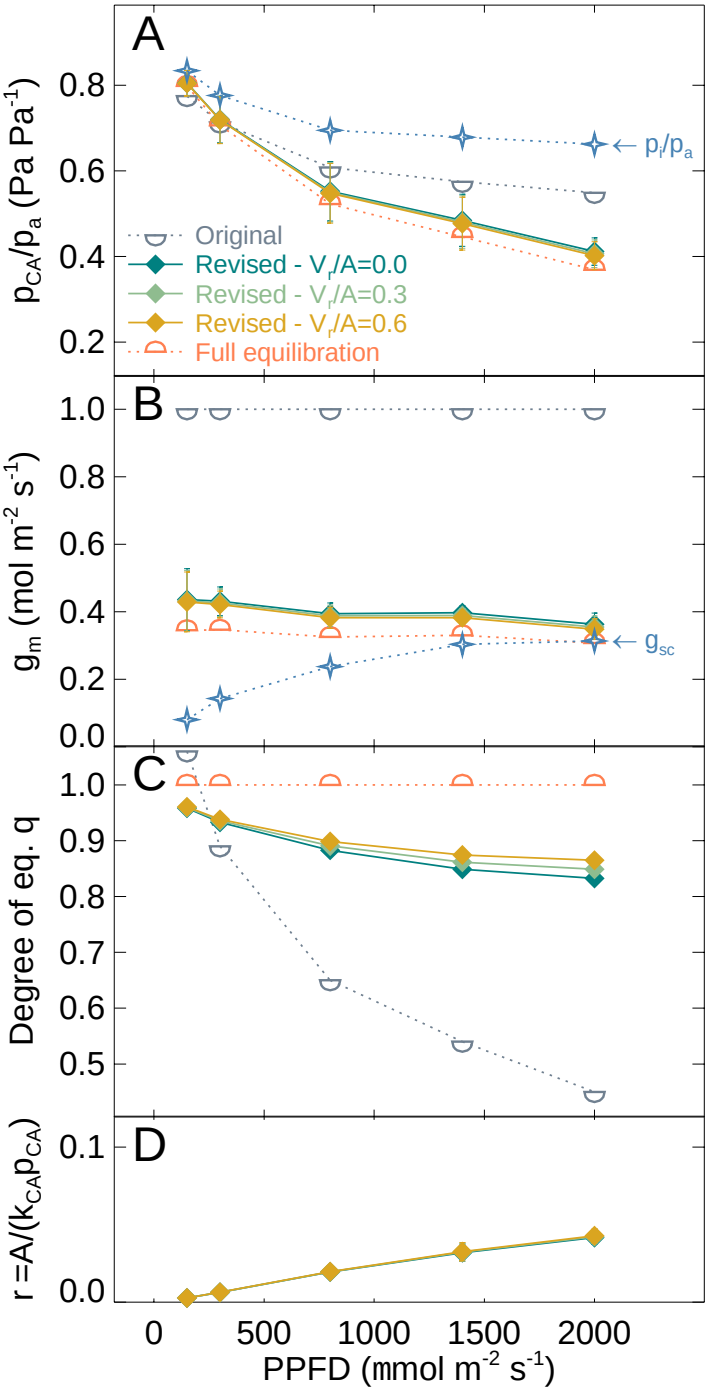
# Supplemental Data

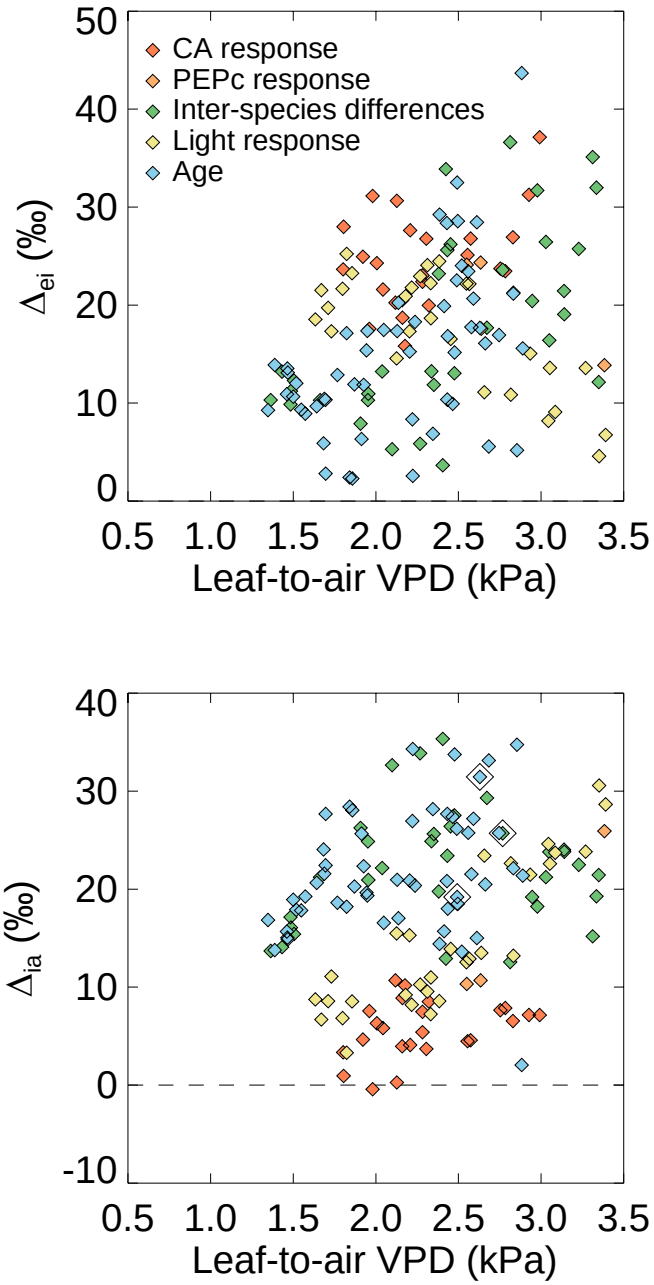
Supplemental Figure S1. Same figure as Fig. 2 in the main text, but with ternary corrections applied only when computing the $CO_2$ partial pressure in the intercellular air space ($p_i$) but not when estimating the $CO_2$ partial pressure at the CA site ($p_{CA}$).



Supplemental Figure S2. Same figure as Fig. 2 in the main text, but with no ternary correction applied when computing both $p_i$ and $p_{CA}$.



Supplemental Figure S3. Top: Isotope difference between the $CO_2$ in equilibrium with the water at the evaporation site and that in the intercellular air space ($\Delta_{ei} = R_{eq}/R_i - 1$) plotted against the leaf-to-air vapour pressure deficit (VPD) for the different experiments revisited in this study (Figs. 2-3: Light response; Fig. 4: Inter-species differences; Fig. 5: PEPc response; Fig. 6: CA response) and the remaining dataset of Barbour et al. (2016) testing the effect of leaf age on mesophyll conductance. Bottom: the same but for the isotope difference between the $CO_2$ in the intercellular air space and that in the outside air ($\Delta_{ia} = R_i/R_a - 1$).



Supplemental Figure S4. Top: Difference between the intercellular $CO_2$ mixing ratio ($C_i = p_i/P$) re-calculated without assuming saturation of intercellular vapour pressure ($e_i$) and that calculated by the LiCor portable photosynthesis system assuming saturation, plotted against the relative humidity in the intercellular air spaces for the different experiments revisited in this study (Figs. 2-3: Light response; Fig. 4: Inter-species differences; Fig. 5: PEPc response; Fig. 6: CA response) and the remaining dataset of Barbour et al. (2016) testing the effect of leaf age on mesophyll conductance. Bottom: the same but for the difference between stomatal conductance ($g_{sw}$) calculated without assuming saturation of $e_i$ and that calculated by the Li-Cor portable photosynthesis system assuming saturation of $e_i$.