New Phytologist Supporting Information Figs S1–S6 and Tables S1 & S2
Article title: Diffuse light and wetting differentially affect tropical tree leaf photosynthesis
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Table S1. List of species used in this study, including the abundance of each species as measured by number of stems and basal area of individuals >30 cm DBH represented within the 4 ha plot in Monteverde, Costa Rica.

Species	**Family**	**% of stems**	**% of plot basal area**
Cecropia polyphlebia	Urticaceae	6.0	4.3
Conostegia rufescens	Melastomataceae	3.7	2.7
Elaeagia auriculata	Rubiaceae	2.3	1.7
Ficus spp.	Moraceae	2.3	17.0
Heliocarpus americanus	Malvaceae	2.8	2.6
Meliosma vernicosa	Sabiaceae	4.2	3.6
Ocotea meziana	Lauraceae	5.6	4.8
Ocotea tonduzii	Lauraceae	15.3	22.2

Table S2. Canopy leaf traits measured for eight tree species from a tropical montane forest in Monteverde, Costa Rica. Values are the mean ± standard error (n = 5-7 individuals species^{-1}).

Species	Leaf thickness (cm)	Specific leaf area (cm^2 g^{-1})	Leaf dry matter content (mg g^{-1})	Stomatal density (# mm^{-2})	Stomatal length (μm)	Trichomes present (Yes/No)
Cecropia polyphlebia	0.309 ± 0.03	112.8 ± 13.6	230.1 ± 21.3	240 ± 27	7.93 ± 0.41	Yes
Conostegia rufescens	0.332 ± 0.03	130.0 ± 3.2	266.7 ± 6.2	662 ± 41	9.35 ± 0.28	Yes
Elaeagia.auriculata	0.320 ± 0.01	101.6 ± 5.0	289.8 ± 12.3	250 ± 16	15.52 ± 0.30	Yes
Ficus spp.	0.474 ± 0.09	65.2 ± 14.0	311.4 ± 62.9	345 ± 22	21.62 ± 1.18	No
Heliocarpus americana	0.255 ± 0.01	160.6 ± 10.7	237.1 ± 11.4	542 ± 25	12.23 ± 0.33	No
Meliosma vernicosa	0.244 ± 0.02	106.8 ± 16.8	286.6 ± 22.3	97 ± 4	20.76 ± 0.73	Yes
Ocotea meziana	0.251 ± 0.01	107.1 ±8.9	328.7 ± 14.6	413 ± 16	17.09 ± 0.40	No
Ocotea tonduzii	0.333 ± 0.01	86.4 ± 7.4	349.5 ± 17.0	451 ± 18	12.20 ± 0.35	No

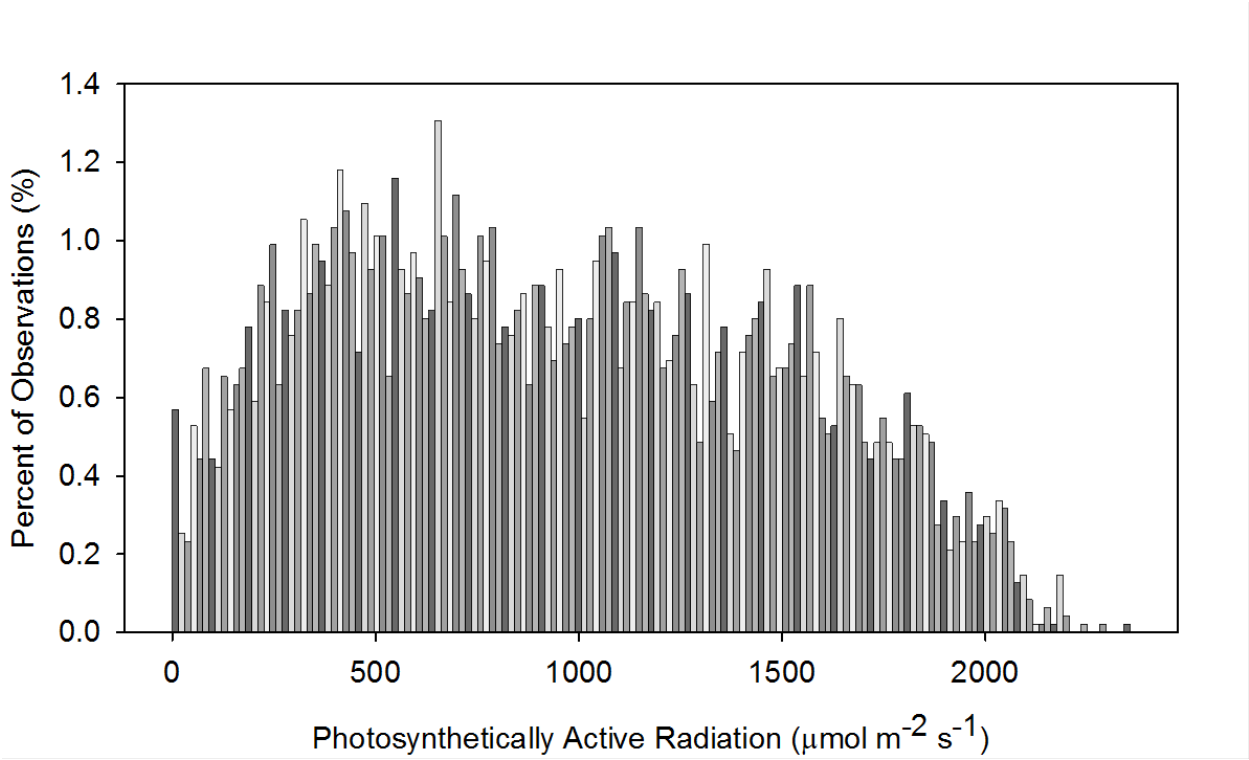

Figure S1. Distribution of midday hours (1200 to 1400 solar time) spent at different levels of photosynthetically active radiation (PAR). Data were collected every 15 minutes from 2013 to 2018 from a tower above the canopy in Monteverde, Costa Rica. Hourly averages were then sorted into each range of PAR and percentage calculated as the number of hours at that PAR level over the total number of hourly observations (S. Gotsch, unpublished data). Each bar represents a range of 15 µmol m^{-2} s^{-1}.

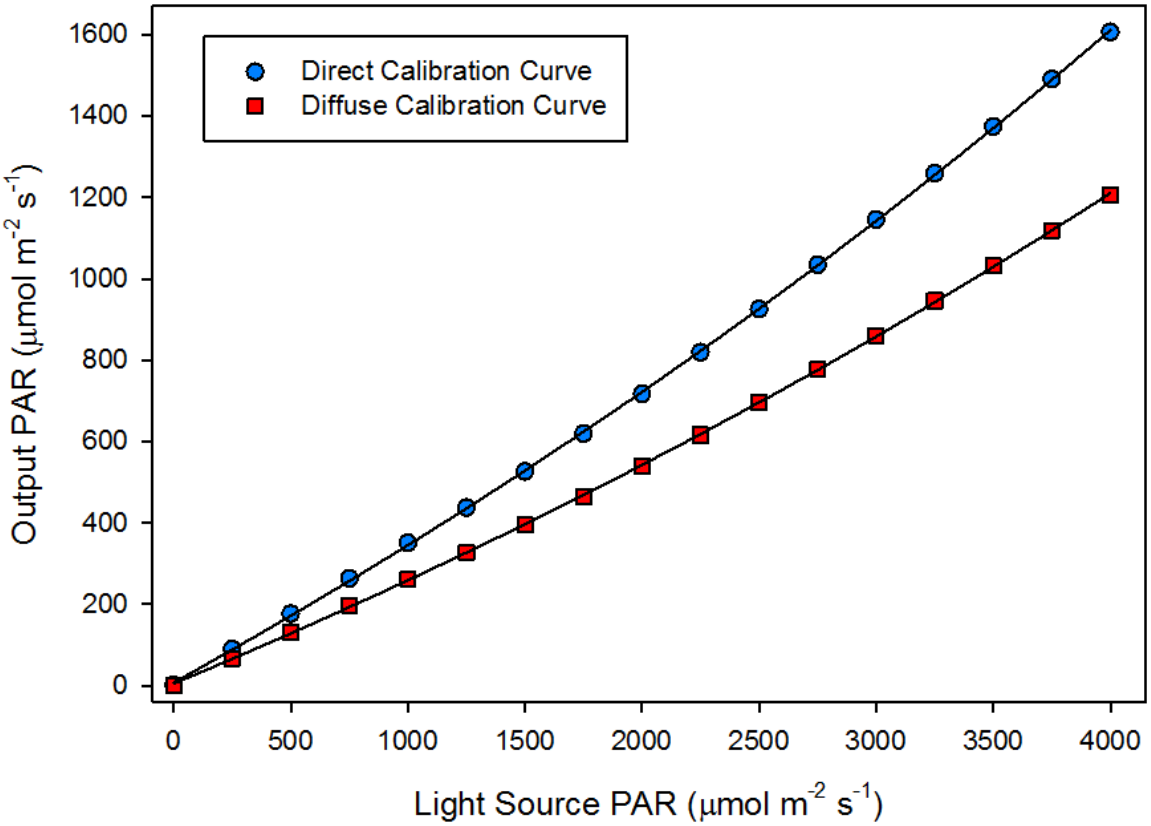

Figure S2. Calibration curves between the programmed value of photosynthetically active radiation (PAR) coming out of the light source and the actual light received in the leaf chamber under the modified direct and diffuse light setup, where an integrating sphere was placed between the light source and the chamber head. Curves were developed by mounting a PAR sensor (LI-190R, LiCor Biosciences) in the chamber head that normally contains the leaf. The light source PAR was programmed on the LI-6800 and the output PAR read at this mounted sensor. The calibration was done with the light source in both the direct and diffuse positions.

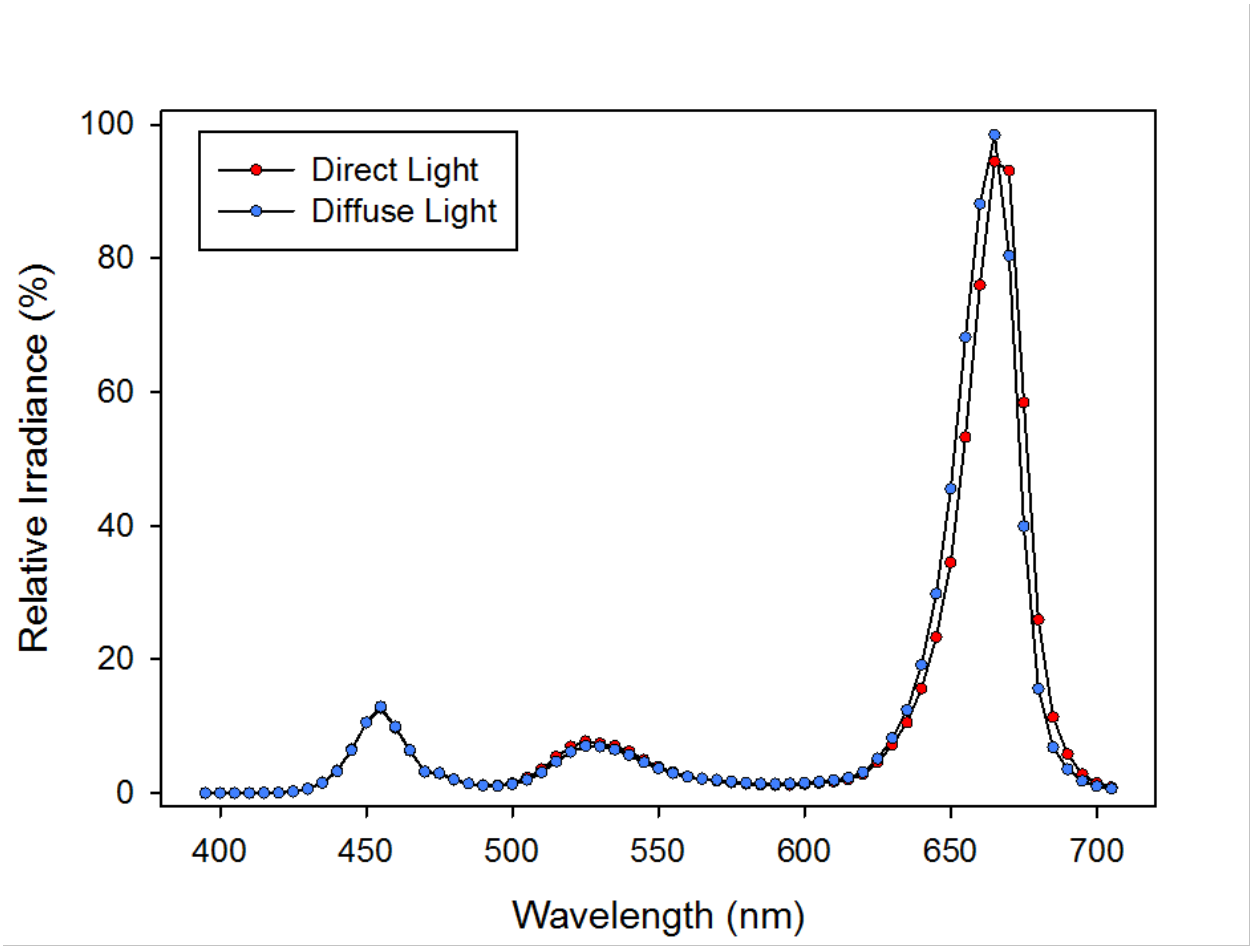

Figure S3. Spectral analysis of the output of light when the light source was in the direct light position (red symbols) and the diffuse light position (blue symbols). All photosynthesis measurements used a combination of the red, green, blue and white LEDs on the 6 x 6 cm chamber light source (65% red, 10% green, 20% blue, and 5% white). Spectra were normalized to 665 nm, the peak of the red LED lights used in the light source. All measurements were conducted on a Horiba iHR550 Imaging Spectrometer with the light source in both direct and diffuse positions.

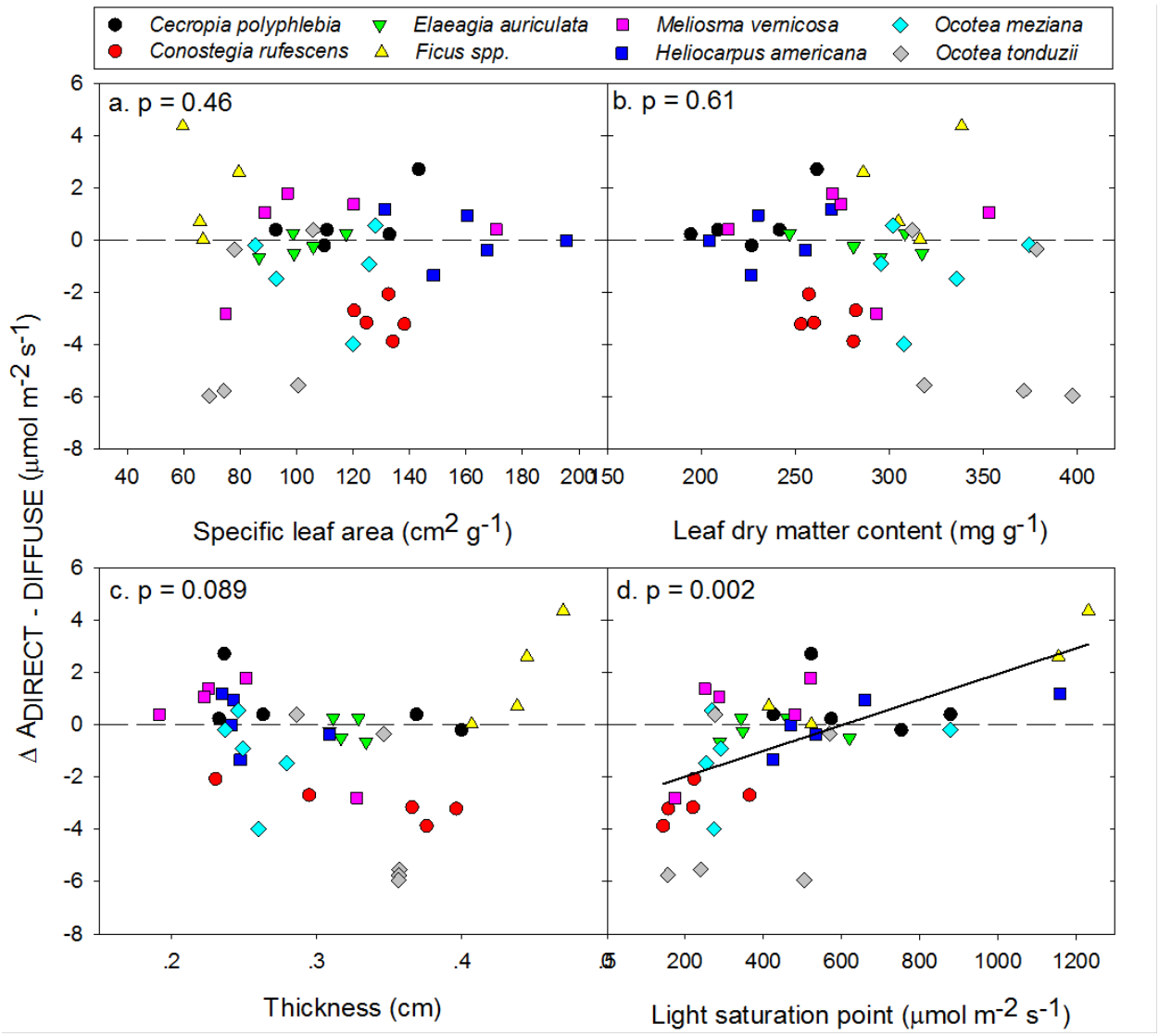

Figure S4. The difference in leaf photosynthesis measured with direct and diffuse light as a function of (a) specific leaf area, (b) leaf dry matter content, (c) leaf thickness, and (d) light saturation point for individuals of different canopy tree species. The relationship in (c) was not significant when all species were included, but became significant (p = 0.003) when the multi-species grouping of *Ficus spp.* (yellow symbols) was excluded.

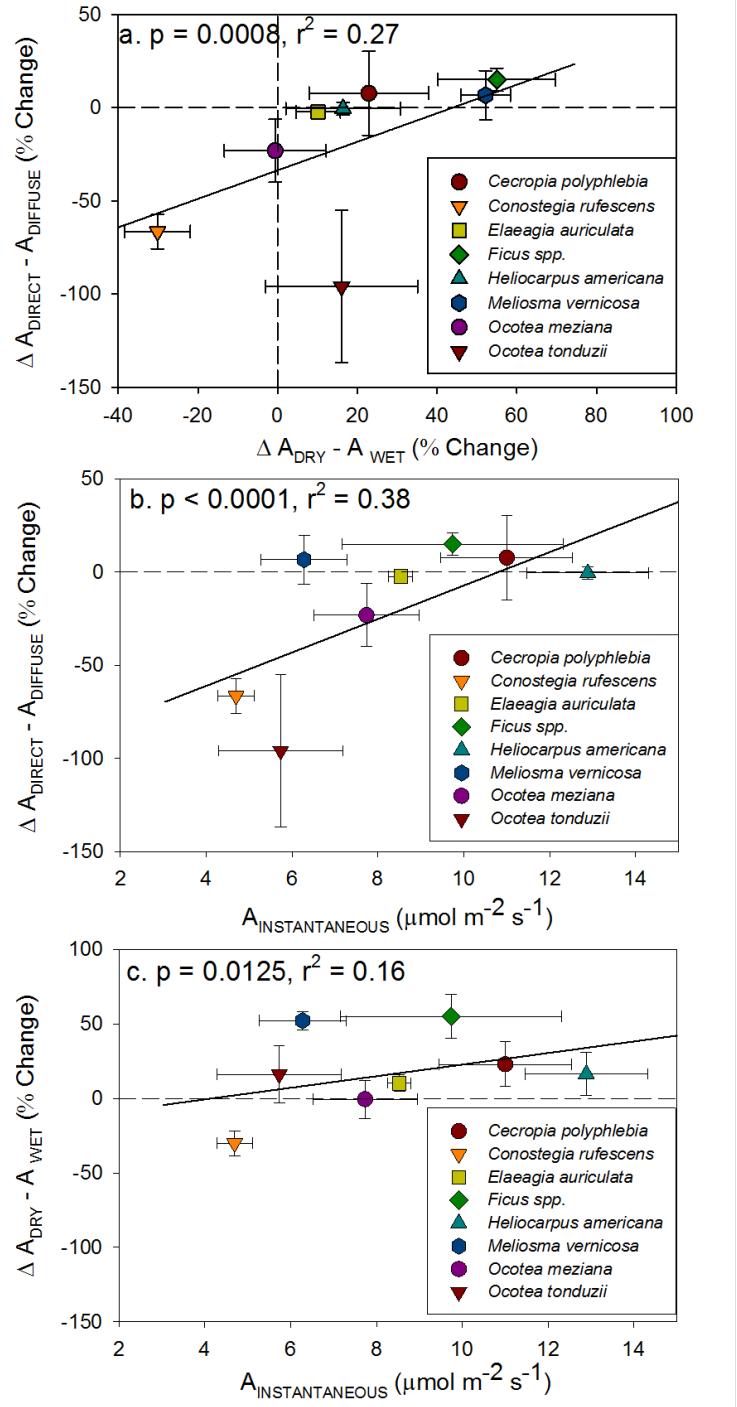

Figure S5. Relationships between the a) response to diffuse light and the response to leaf wetting, b) the response to diffuse light and instantaneous photosynthesis, and c) the response to leaf wetting and instantaneous photosynthesis under dry conditions. There was a significant position relationship between the response to diffuse light and the response to wetting (a, $p = 0.008$) and instantaneous light-saturated photosynthesis (b, $p < 0.0001$). There was also a significant positive relationship between the response to wetting and instantaneous photosynthesis (c, $p = 0.0125$). Points represent the species level average ± standard error.

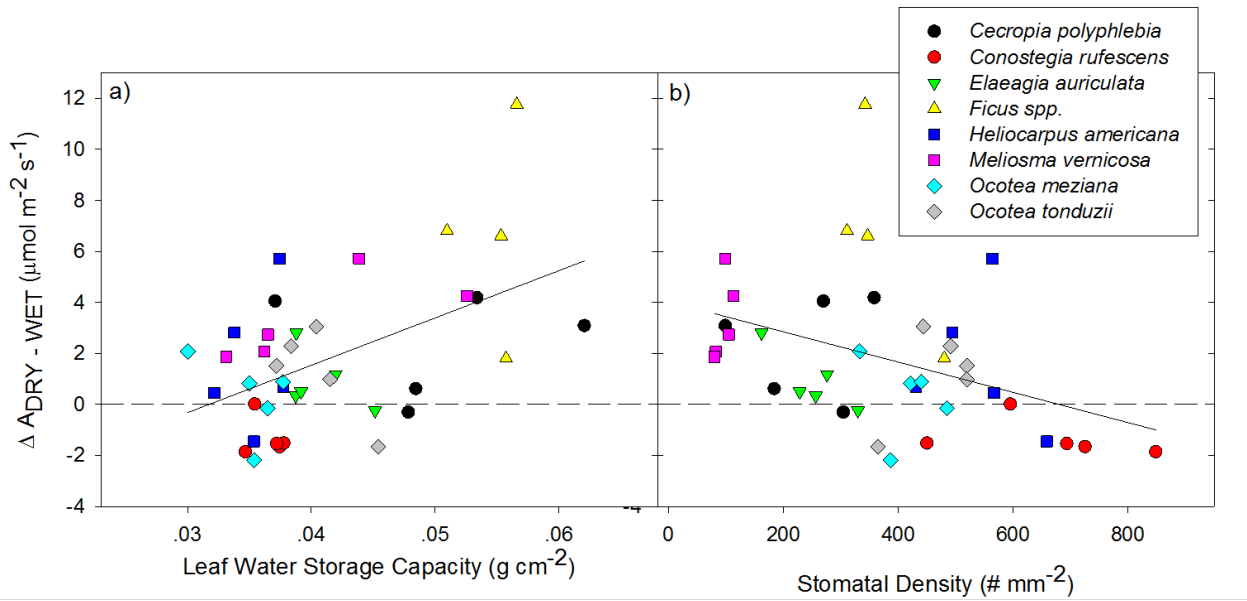

Figure S6. Difference in photosynthesis measured on dry versus wet leaves as a function of (a) leaf water storage capacity ($p = 0.05$, $r^2 = 0.4$) and (b) stomatal density on the abaxial side of leaves ($p = 0.01$, $r^2 = 0.15$) for individuals of different canopy tree species.