

Supplementary Materials

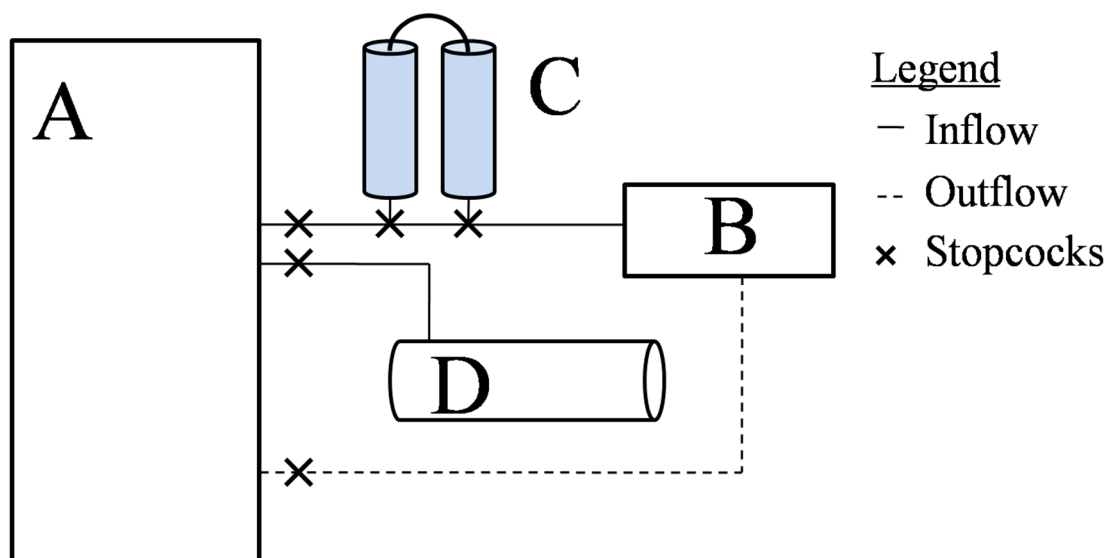
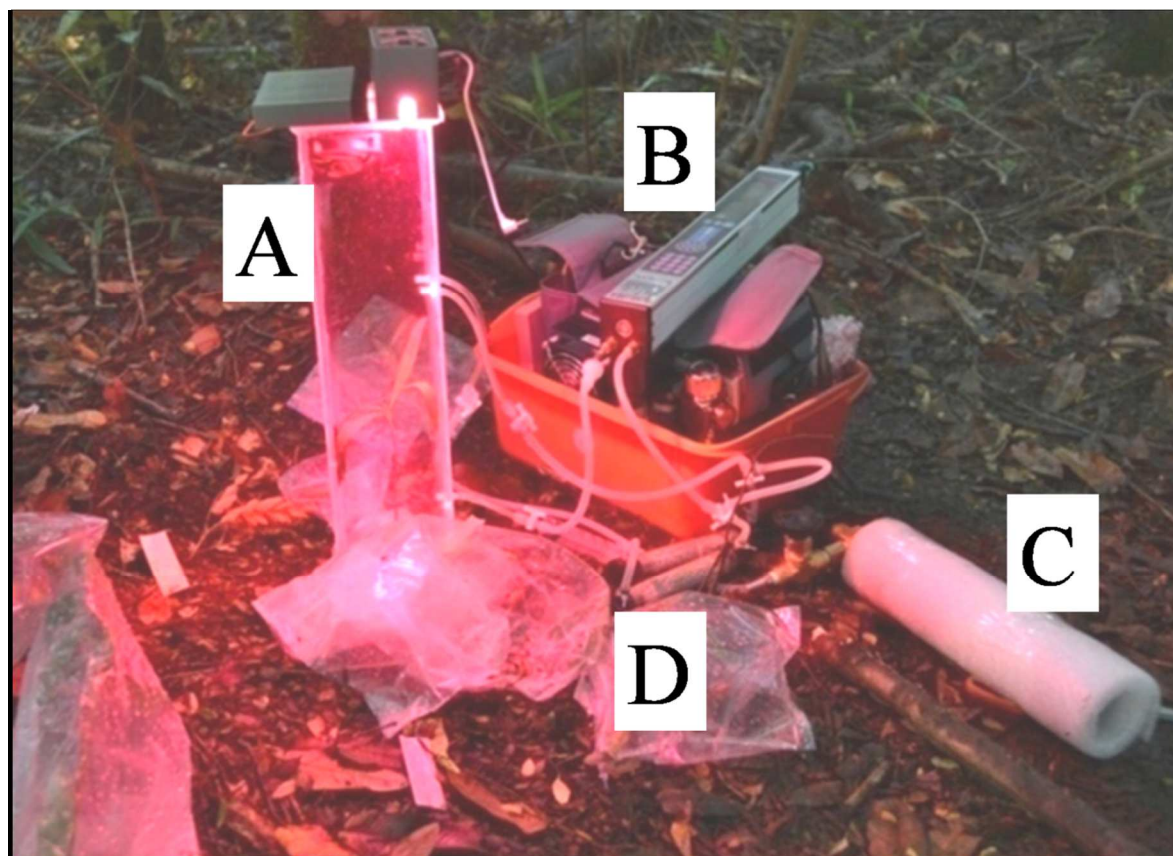


Figure S1. Photograph of the field labeling (above) and the gas flow diagram of the pulse-labeling system (bottom). Outflows and inflow are relative to the chamber (A). The treated plant was inside the

chamber “A” and its neighboring plants were covered with thick plastic bags to avoid accidental aerial enrichment. Inside the chamber, a DS1923 hygrochron iButton (Maxim Integrated, CA, USA) was located in one of the walls, in front of the gas exchange holes, and a fan energized with an external battery was placed at the inner top. Over the chamber, a light source coupled to the IRGA “B” was placed. The insertions of the silicon tubes for gas exchange measurements were sealed with neutral silicon. Two silicon tubes were inserted at the middle of total height (upper) and the third one was located in the first quarter from the bottom. Each silicon tube had a three-way stopcock to close/open the chamber once the steps for labeling started/ended. One of the upper inflow tubes was used to diminish the CO₂ concentration inside the chamber. For this, the air coming from the chamber (outflow) was forced to pass through a trap of two soda lime interconnected-columns “C”. The other inflow tube was used to fill the chamber with ¹³CO₂, so it was connected directly to the ¹³CO₂ cylinder “D”. For “steady-state” lectures, the soda lime columns were by-passed handling the three-way stopcocks to direct the air flow straight to the IRGA. To reach the target CO₂ concentration proposed inside the chamber, we controlled manually the three-ways stopcocks correspondingly. Readings of CO₂ concentration inside the chamber were continuously logged (see Figure S2).

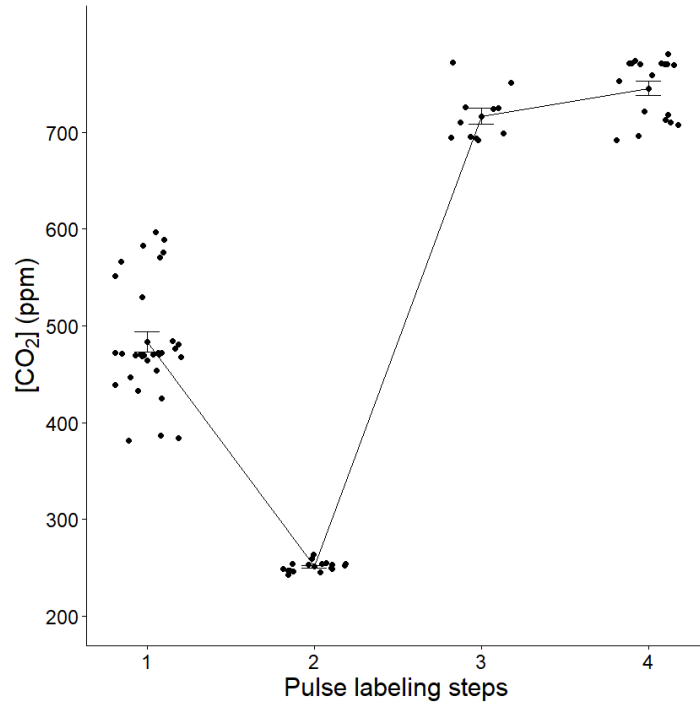


Figure S2. Mean \pm SE of CO₂ concentration inside the chamber during the four-step pulse-labeling procedure. Steps as follow: 1) initial monitoring prior to the CO₂ extraction; 2) reduction of the CO₂ concentration inside the chamber; 3) ¹³CO₂ filled up; 4) final monitoring of CO₂ concentration 3 minutes later step 3. For more details see Materials and Methods section in the Main Manuscript.

Table S1. Results of ANOVAs comparing the light environment (i.e., GSF) and leaf chemical traits between recruit types and species (as well as their interaction) sampled in the study of isotope natural abundance. The significance level was established by means of the step-up false discovery rate (α FDR) procedure (significant differences in bold). *Box-Cox transformed variable. df degrees of freedom; SS sum of squares; MS mean squares; F F-statistic; P probability value; α FDR α false discovery rate. Residual tests of normality (Shapiro-Wilk) and homoscedasticity (NCV test) are shown for each variable.

Variable	Factors	df	SS	MS	F	P	α FDR
GSF	Recruit type (RT)	1	0.063	0.063	1.84	0.180	0.028
	Species (SP)	1	0.055	0.055	1.62	0.210	0.025
	RT \times SP	1	0.004	0.004	0.12	0.730	0.017
	Residuals	124	4.24	0.034			
<i>Shapiro: W = 0.99, P = 0.28; NCV test: $\chi^2 = 0.59, P = 0.44$</i>							
LCC (%)	RT	1	0.303	0.303	0.17	0.690	0.050
	SP	1	132.98	132.98	72.53	0.000	0.036
	RT \times SP	1	0.711	0.711	0.39	0.540	0.014
	Residuals	122	223.69	1.83			
<i>Shapiro: W = 0.99, P = 0.26; NCV test: $\chi^2 = 1.61, P = 0.21$</i>							
LNC (%)*	RT	1	2.719	2.719	21.14	0.000	0.019
	SP	1	8.053	8.053	62.59	0.000	0.042
	RT \times SP	1	0.515	0.515	4.001	0.049	0.008
	Residuals	88	11.32	0.129			
<i>Shapiro: W = 0.99, P = 0.559; NCV test: $\chi^2 = 1.80, P = 0.371$</i>							
Leaf C:N ratio*	RT	1	0.003	0.003	15.85	0.000	0.011
	SP	1	0.010	0.010	63.37	0.000	0.044
	RT \times SP	1	0.001	0.001	3.7	0.058	0.022
	Residuals	86	0.014	0.000			
<i>Shapiro: W = 0.93, P = 0.0001; NCV test: $\chi^2 = 1.66, P = 0.2$</i>							
Leaf $\delta^{13}\text{C}$ (‰)	RT	1	11.757	11.757	10.891	0.001	0.031
	SP	1	53.896	53.896	49.923	0.000	0.006
	RT \times SP	1	0.005	0.005	0.004	0.949	0.047
	Residuals	119	128.469	1.080			
<i>Shapiro: W = 0.98, P = 0.127; NCV test: $\chi^2 = 0.23, P = 0.629$</i>							
Leaf $\delta^{15}\text{N}$ (‰)	RT	1	229.670	229.670	31.789	0.000	0.039
	SP	1	658.630	658.630	91.162	0.000	0.033
	RT \times SP	1	0.040	0.040	0.006	0.938	0.003
	Residuals	89	643.010	7.220			
<i>Shapiro: W = 0.99, P = 0.378; NCV test: $\chi^2 = 1.54, P = 0.215$</i>							

Table S2. Results of the linear mixed model comparing global site factor, stem length, and basal diameter for the *Embothrium coccineum* root suckers used in the $^{13}\text{CO}_2$ pulse-labeling experiment. Mean values (\pm SD) for each variable are also shown. Significance level was established by means of the step-up false discovery rate (α FDR) procedure. Residual tests of normality (Shapiro-Wilk) and homoscedasticity (NCV test) are shown for each variable. *Box-Cox transformed. Significant differences are shown in bold.

Variable	SS	MS	Num DF	Den DF	F-value	P	α FDR	Root sucker	
								Receiver	Donor
GSF*	0.00019	0.00019	1	3	13.42	0.0352	0.019	0.08 \pm 0.05	0.13 \pm 0.02
<i>Shapiro: W = 0.91, P = 0.37; NCV test: $\chi^2 = 0.84$, df = 1, P = 0.36</i>									
Stem length (cm)	824.18	824.18	1	6	32.93	0.0012	0.0063	42.9b \pm 3.7	22.6a \pm 6.0
<i>Shapiro: W = 0.92, P = 0.44; NCV test: $\chi^2 = 0.82$, df = 1, P = 0.37</i>									
Basal diameter (mm)	0.086	0.086	1	3	0.06	0.823	0.05	3.8 \pm 1.5	4.0 \pm 1.0
<i>Shapiro: W = 0.92, P = 0.39; NCV test: $\chi^2 = 0.6$, df = 1, P = 0.44</i>									

Table S3. Results of the linear mixed models comparing leaf chemical traits for the *Embothrium* root suckers used in the $^{13}\text{CO}_2$ labeling experiment. Mean values (\pm SD) for each variable are also shown. The significance level was established by means of the step-up false discovery rate (α FDR) procedure. Residual tests of normality (Shapiro-Wilk) and homoscedasticity (NCV test) are shown for each variable. *Box-Cox transformed variable. SS sum of squares; MS mean squares; Num DF degrees of freedom; Den DF degrees of freedom associated with the model errors; *F* F-statistic; *P* probability value; α FDR α false discovery rate.

Variable	SS	MS	Num DF	Den DF	<i>F</i>	<i>P</i>	α FDR	Root suckers	
								Receiver	Donor
LCC (%)	2.71	2.71	1	3	1.66	0.288	0.02	45.87 \pm 0.55	44.71 \pm 2.18
<i>Shapiro: W = 0.86, P = 0.13; NCV test: $\chi^2 = 3.11, df = 1, P = 0.078$</i>									
LNC (%)	0.06	0.06	1	3	0.78	0.443	0.04	2.16 \pm 0.47	2.34 \pm 0.64
<i>Shapiro: W = 0.88, P = 0.21; NCV test: $\chi^2 = 0.35, df = 1, P = 0.55$</i>									
Leaf $\delta^{13}\text{C}$ (‰)	5.8	5.8	1	6	1.14	0.327	0.03	-33.12 \pm 1.67	-31.42 \pm 2.72
<i>Shapiro: W = 0.92, P = 0.43; NCV test: $\chi^2 = 0.81, df = 1, P = 0.37$</i>									
Leaf $\delta^{15}\text{N}$ (‰)	0.023	0.023	1	3	0.12	0.752	0.05	0.81 \pm 3.07	0.7 \pm 2.64
<i>Shapiro: W = 0.94, P = 0.63; NCV test: $\chi^2 = 0.09, df = 1, P = 0.76$</i>									
$^{12}\text{C}_{\text{eq}}$ (mg)*	1.28	1.28	1	3	20.76	0.020	0.01	0.49 \pm 0.01	0.54 \pm 0.033
<i>Shapiro: W = 0.82, P = 0.045; NCV test: $\chi^2 = 2.25, df = 1, P = 0.13$</i>									