

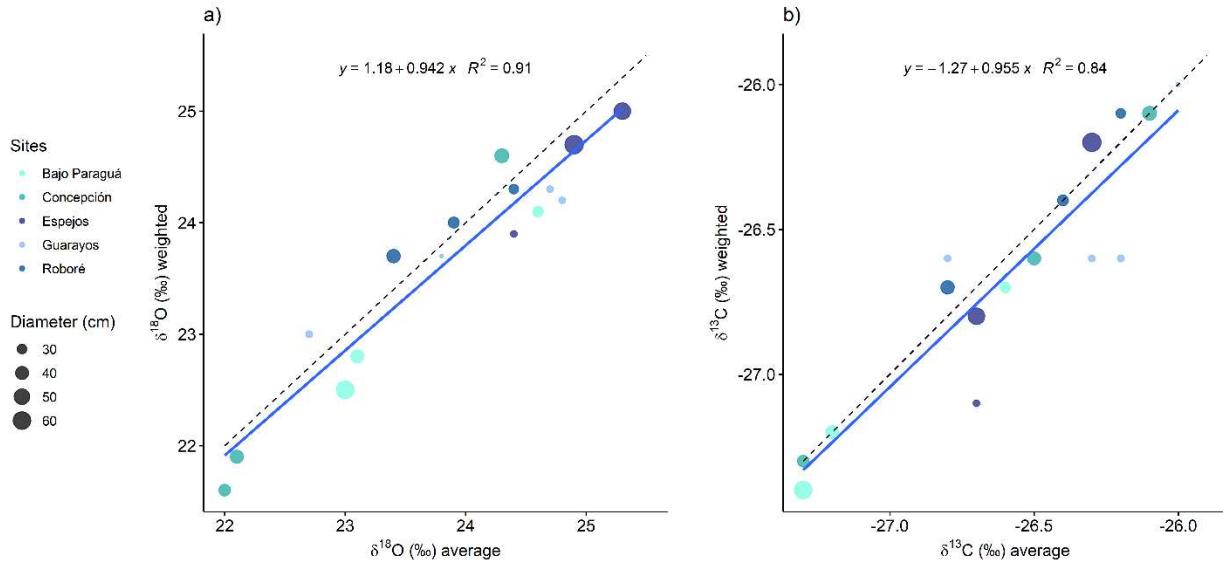
## Supplementary Material for

Paredes-Villanueva, K., Boom, A., Ottenburghs, J., van der Sleen, P., Manzanedo, R.D., Bongers, F., Zuidema, P.A., 2022. Isotopic characterization of *Cedrela* to verify species and regional provenance of Bolivian timber. *Tree-Ring Research* 78(2):73–89.

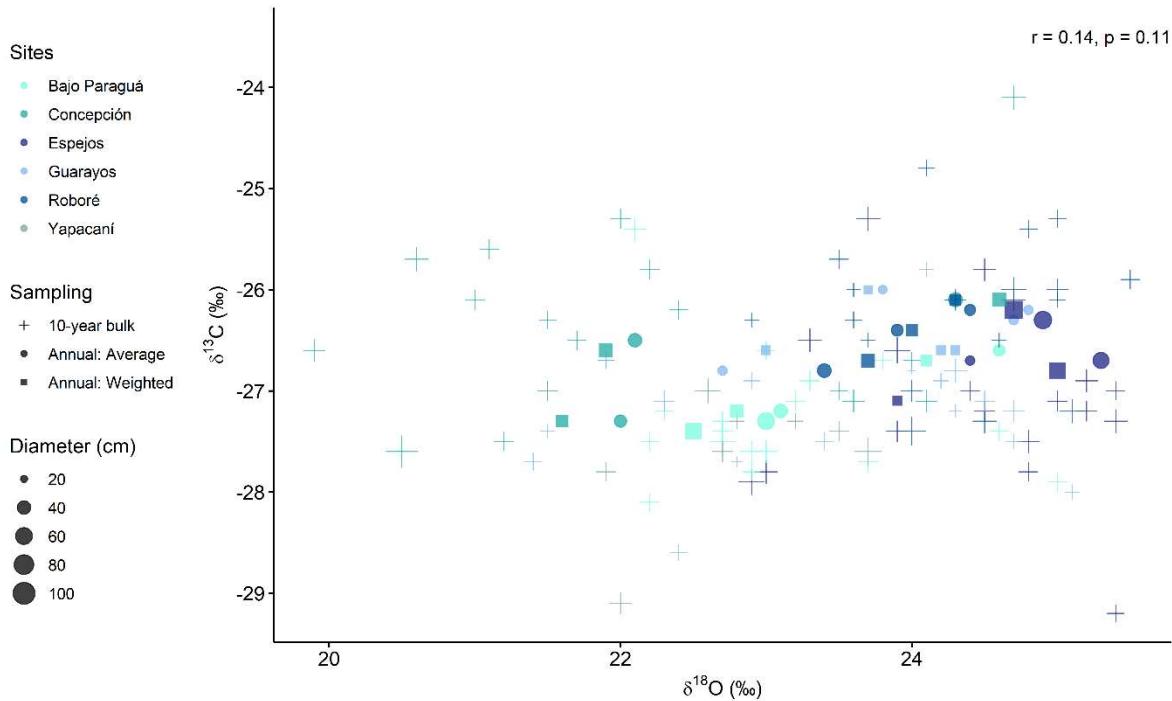
**Figure S1.** Relationship between annual precipitation and annual  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  of tree rings in *C. fissilis*.



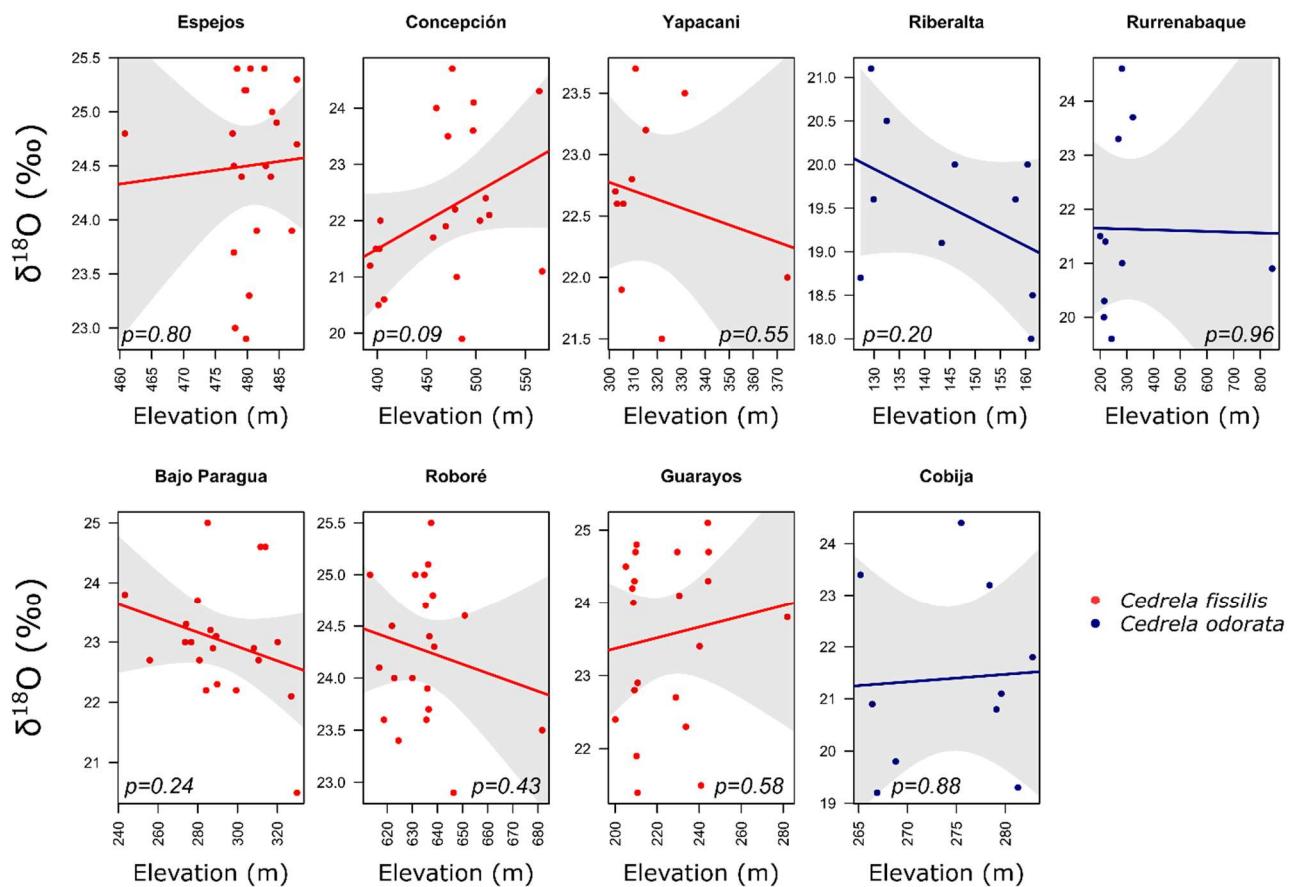
**Figure S2.** Scatterplots of weighted and averaged data of (a)  $\delta^{18}\text{O}$  and (b)  $\delta^{13}\text{C}$  stable isotopes for *C. fissilis* annual samples.



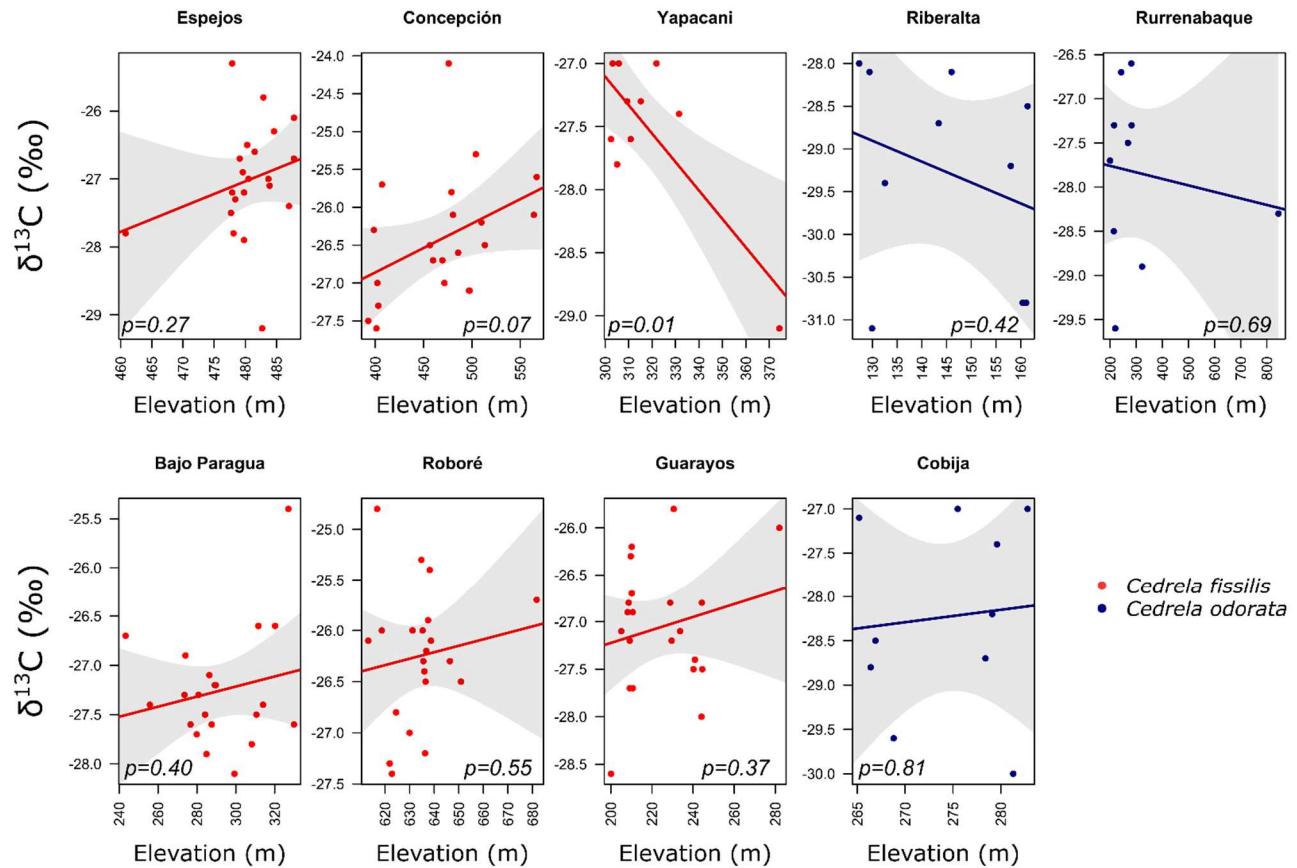
**Figure S3.** Scatterplot of averaged (circles) and weighed (squares) annual data in relation to 10-year bulk samples (crosses) for  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  stable isotopes in *C. fissilis*.



**Figure S4.** Relation between elevation and  $\delta^{18}\text{O}$  (from *Cedrela* 10-year-bulk samples) within each of the study sites. Species are highlighted in different colors. Linear regressions are shown with 95% confidence intervals. The p-value of each within-site correlation is also shown. See the estimates across sites in Table 2.



**Figure S5.** Relation between elevation and  $\delta^{13}\text{C}$  (from *Cedrela* 10-year-bulk samples) within each of the study sites. Species are highlighted in different colors. Linear regressions are shown with 95% confidence intervals. The p-value of each within-site correlation is also shown. See the estimates across sites in Table 2.



**Table S1.** Summary of the dendrochronological statistical parameters for the last 10 years: mean sensitivity (MS), mean intercorrelation among series (r), and mean first-order autocorrelation (AR1) of raw tree-ring width data.

Site	Span	Mean sensitivity (MS)	Mean series intercorrelation (r)	Mean AR1
Riberalta	2005-2014	0.583	0.259	0.036
Cobija	2005-2014	0.603	0.268	0.048
Rurrenabaque	2005-2014	0.674	-0.002	-0.007
Villamontes	2005-2014	0.505	-0.053	0.219
Monteagudo	2005-2014	0.571	0.290	0.030
Yapacaní	2005-2014	0.708	0.147	0.029
Guarayos	2006-2015	0.718	0.332	0.163
Espejos	2006-2015	0.634	0.161	0.087
Bajo Paraguá	2006-2015	0.628	0.255	0.223
Concepción	2006-2015	0.658	0.237	0.013
Roboré	2006-2015	0.569	0.163	0.105

**Table S2.** Standard deviations (SD) of stable isotopes ( $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$ ) annual measurements in *C. fissilis* samples per tree and per site.

Site	$\delta^{18}\text{O}$ per tree		$\delta^{18}\text{O}$ per site		$\delta^{13}\text{C}$ per tree		$\delta^{13}\text{C}$ per site	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	(‰)	(‰)	(‰)	(‰)	(‰)	(‰)	(‰)	(‰)
Bajo Paraguá	23.1	2.1			-27.2	0.6		
	24.6	1.5	23.6	1.8	-26.6	0.6	-27.0	0.6
	23.0	1.5			-27.3	0.5		
Concepción	22.1	1.3			-26.5	0.4		
	24.3	1.8	22.8	2.1	-26.1	0.4	-26.6	0.8
	22.0	2.2			-27.3	0.9		
Espejos	24.9	1.0			-26.3	0.7		
	25.3	1.7	24.9	2.0	-26.7	0.4	-26.6	0.8
	24.4	3.0			-26.7	1.2		
Guarayos	22.7	1.6			-26.8	0.6		
	23.8	2.1			-26.0	0.3		
	24.7	1.7	24.0	2.0	-26.3	0.9	-26.4	0.8
Roboré	24.8	2.0			-26.2	0.8		
	23.4	1.0			-26.8	0.8		
	23.9	1.9	23.9	1.7	-26.4	0.3	-26.5	0.7
	24.4	2.0			-26.2	0.8		

**Table S3.** Pearson correlation between diameter at breast height (DBH) and stable isotopes in *C. fissilis* and *C. odorata* within and across sites.

Pearson correlation	n	$\delta^{18}\text{O}$				$\delta^{13}\text{C}$			
		r-squared	t-value	degrees of freedom	p-value	r-squared	t-value	degrees of freedom	p-value
Cobija	10	-0.56	-1.93	8	0.09	-0.01	-0.02	8	0.98
Riberalta	10	0.53	1.76	8	0.12	0.68	2.6	8	0.03
Rurrenabaque	10	-0.03	-0.07	8	0.94	0.19	0.56	8	0.59
All sites of <i>C. odorata</i>	<b>30</b>	<b>-0.003</b>	<b>-0.02</b>	<b>28</b>	<b>0.99</b>	<b>0.3</b>	<b>1.69</b>	<b>28</b>	<b>0.1</b>
Espejos	21	-0.41	-1.93	19	0.07	0.32	1.47	19	0.16
Bajo Paraguá	21	-0.04	-0.18	19	0.86	0.10	0.44	19	0.67
Concepción	21	-0.21	-0.93	19	0.36	-0.09	-0.38	19	0.71
Roboré	21	0.20	0.91	19	0.37	-0.55	-2.89	19	0.01
Yapacaní	10	0.27	0.78	8	0.46	-0.16	-0.46	8	0.66
Guarayos	21	0.11	0.50	19	0.62	-0.12	-0.54	19	0.59
All sites of <i>C. fissilis</i>	<b>115</b>	<b>-0.02</b>	<b>-0.26</b>	<b>113</b>	<b>0.79</b>	<b>-0.06</b>	<b>-0.62</b>	<b>113</b>	<b>0.53</b>

**Table S4.** Sites classification matrix for the annual samples from *C. fissilis*, with the true classes in rows and the estimated classes in columns. Values in boxes indicate the assignment of sample origin averaged over 100 runs and their standard deviation (SD). Diagonal blue boxes indicate the average correct assignments of samples. White boxes to the lower left and upper right of the shaded diagonal boxes indicate the average assignments of misclassified samples.

TRUE (%)	ESTIMATED (%)				
<i>Cedrela fissilis</i>					
Sites	Bajo Paraguá	Concepción	Espejos	Guarayos	Roboré
<b>Bajo Paraguá</b>	<b>40.7</b>	13.5	11.3	13.1	21.4
SD	20.3	15.0	12.5	18.7	20.9
<b>Concepción</b>	10.5	<b>29.6</b>	6.9	35.5	17.5
SD	15.2	21.1	10.7	22.5	15.5
<b>Espejos</b>	18.9	8.8	<b>28.9</b>	27.5	15.8
SD	14.6	13.5	18.7	19.8	14.7
<b>Guarayos</b>	17.3	22.5	10.4	<b>22.6</b>	27.2
SD	14.0	17.6	12.2	17.9	16.6
<b>Roboré</b>	16.9	7.3	11.7	21.9	<b>42.3</b>
SD	16.1	11.5	14.9	22.8	23.5