

SUPPLEMENTARY MATERIAL

Tropical Forest Restoration in the Eastern Himalaya: Evaluating Early Survival and Growth of Native Tree Species

Supplementary Table S1: Percent overall species survival at the end of 18 months at the restoration site inside Pakke Tiger Reserve, Arunachal Pradesh, India. Species with more than 10 planted individuals have been included. Species were classified into different survival categories following Raman et al. (2009).

No	Species	Family	Dispersal mode	No. of saplings planted	Percentage survival after 18 months	Species classification
1	<i>Pterygota alata</i>	Malvaceae	Wind	35	94.3	Excellent
2	<i>Syzygium formosum</i>	Myrtaceae	Animal	67	86.6	Excellent
3	<i>Polyalthia simiarum</i>	Annonaceae	Animal	169	85.2	Excellent
4	<i>Cryptocarya amygdalina</i>	Lauraceae	Animal	414	82.1	Excellent
5	<i>Dysoxylum gotadhora</i>	Meliaceae	Animal	312	82.1	Excellent
6	<i>Litsea panamanja</i>	Lauraceae	Animal	20	80	Excellent
7	<i>Beilschmiedia</i> sp. 3	Lauraceae	Animal	61	73.8	Good
8	<i>Aglaia spectabilis</i>	Meliaceae	Animal	126	68.3	Good
9	<i>Phoebe</i> sp.	Lauraceae	Animal	71	66.2	Good
10	<i>Beilschmiedia</i> sp. 2	Lauraceae	Animal	47	63.8	Good
11	<i>Actinodaphne obovata</i>	Lauraceae	Animal	33	63.6	Good

12	<i>Mesua ferrea</i>	Calophyllaceae	Mechanica 1	24	62.5	Good
13	<i>Beilschmiedia</i> sp. 1	Lauraceae	Animal	103	62.1	Good
14	<i>Chisocheton</i> <i>cumingianus</i>	Meliaceae	Animal	132	62.1	Good
15	<i>Chukrasia</i> <i>tabularis</i>	Meliaceae	Wind	108	61.1	Good
16	<i>Bauhinia</i> <i>purpurea</i>	Leguminosae	Wind	125	59.2	Good
17	<i>Elaeocarpus</i> <i>sphaericus</i>	Elaeocarpaceae	Animal	33	54.5	Good
18	<i>Tetrameles</i> <i>nudiflora</i>	Tetramelaceae	Wind	139	53.2	Good
19	<i>Adenanthera</i> <i>pavonina</i>	Leguminosae	Animal	40	52.5	Good
20	<i>Magnolia</i> <i>hodgsonii</i>	Magnoliaceae	Animal	41	46.3	Moderate
21	<i>Sterculia villosa</i>	Malvaceae	Animal	43	44.2	Moderate
22	<i>Gmelina</i> <i>arborea</i>	Lamiaceae	Animal	36	41.7	Moderate
23	<i>Prunus</i> <i>ceylanica</i>	Rosaceae	Animal	61	39.3	Moderate
24	<i>Artocarpus</i> <i>chaplasha</i>	Moraceae	Animal	145	36.6	Moderate
25	<i>Litsea</i> <i>monopetala</i>	Lauraceae	Animal	18	33.3	Moderate
26	<i>Dysoxylum</i> <i>procerum</i>	Meliaceae	Animal	24	29.2	Moderate
27	<i>Phoebe</i> <i>cooperiana</i>	Lauraceae	Animal	242	28.9	Moderate
28	<i>Beilschmiedia</i> <i>assamica</i>	Lauraceae	Animal	33	27.3	Moderate
29	<i>Bombax ceiba</i>	Lauraceae	Wind	19	26.3	Moderate
30	<i>Horsfieldia</i> <i>kingii</i>	Myristicaceae	Animal	175	25.7	Poor
31	<i>Picrasma</i> <i>javanica</i>	Simaroubaceae	Animal	36	19.4	Poor

32	<i>Choerospondias axillaris</i>	Anacardiaceae	Animal	11	9.1	Poor
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Supplementary Table S2: Average stem diameter (mm) and height (cm) of nine tree species 18 months after planting. Mean value is for individuals that survived 18 months at the restoration site inside Pakke Tiger Reserve, Arunachal Pradesh.

Species	n	Mean \pm SD diameter (mm)	Mean \pm SD height (cm)
<i>A. spectabilis</i>	10	25.8 \pm 5.7	92.2 \pm 36.8
<i>Beilschmiedia</i> sp.1	11	18.0 \pm 3.7	100.8 \pm 37.0
<i>C. cumingianus</i>	12	17.4 \pm 3.3	74.6 \pm 24.7
<i>C. amygdalina</i>	14	20.9 \pm 2.5	131.8 \pm 20.3
<i>D. gotadhora</i>	14	25.0 \pm 5.9	100.2 \pm 22.5
<i>G. arborea</i>	9	22.3 \pm 5.1	28.9 \pm 11.7
<i>P. cooperiana</i>	11	21.6 \pm 5.9	124.3 \pm 45.5
<i>P. simiarum</i>	15	18.9 \pm 3.6	88.1 \pm 18.5
<i>T. nudiflora</i>	9	35.8 \pm 13.0	108.8 \pm 36.2

Supplementary Table S3: Mean stem diameter (mm day⁻¹) and height (cm day⁻¹) with Standard deviation (SD) of nine tree species in wet and dry seasons. Mean values at the time of planting are for individuals that survived 18 months at the restoration site inside Pakke Tiger Reserve, Arunachal Pradesh.

Tree species	n	First wet season	First dry season	Second wet season	18 months
		Mean diameter growth rate (mm day ⁻¹ ± SD)	Mean diameter growth rate (mm day ⁻¹ ± SD)	Mean diameter growth rate (mm day ⁻¹ ± SD)	Mean diameter growth rate (mm day ⁻¹ ± SD)
<i>A. spectabilis</i>	10	0.020 ± 0.006	0.021 ± 0.016	0.043 ± 0.016	0.028 ± 0.009
<i>Beilschmiedia</i> sp.1	11	0.013 ± 0.008	0.008 ± 0.005	0.025 ± 0.015	0.015 ± 0.007
<i>C. cumingianus</i>	12	0.017 ± 0.007	0.006 ± 0.005	0.019 ± 0.013	0.014 ± 0.005
<i>C. amygdalina</i>	14	0.023 ± 0.008	0.014 ± 0.007	0.023 ± 0.014	0.020 ± 0.006
<i>D. gotadhora</i>	14	0.020 ± 0.011	0.009 ± 0.006	0.051 ± 0.027	0.027 ± 0.011
<i>G. arborea</i>	9	0.011 ± 0.015	0.004 ± 0.008	0.008 ± 0.011	0.008 ± 0.006
<i>P. cooperiana</i>	11	0.018 ± 0.011	0.012 ± 0.007	0.030 ± 0.024	0.020 ± 0.010
<i>P. simiarum</i>	15	0.015 ± 0.009	0.010 ± 0.007	0.027 ± 0.012	0.017 ± 0.007
<i>T. nudiflora</i>	9	0.040 ± 0.031	0.007 ± 0.006	0.043 ± 0.044	0.030 ± 0.024
		Mean height growth rate (cm day ⁻¹ ± SD)	Mean height growth rate (cm day ⁻¹ ± SD)	Mean height growth rate (cm day ⁻¹ ± SD)	Mean height growth rate (cm day ⁻¹ ± SD)
<i>A. spectabilis</i>	10	0.018 ± 0.061	0.067 ± 0.085	0.126 ± 0.177	0.070 ± 0.065
<i>Beilschmiedia</i> sp.1	11	0.031 ± 0.096	-0.019 ± 0.109	0.053 ± 0.110	0.022 ± 0.053
<i>C. cumingianus</i>	12	0.049 ± 0.036	0.012 ± 0.024	-0.008 ± 0.112	0.018 ± 0.029
<i>C. amygdalina</i>	14	0.071 ± 0.039	0.042 ± 0.069	0.156 ± 0.086	0.089 ± 0.038
<i>D. gotadhora</i>	14	0.035 ± 0.009	0.013 ± 0.014	0.099 ± 0.069	0.049 ± 0.029
<i>G. arborea</i>	9	-0.208 ± 0.292	-0.233 ± 0.267	-0.261 ± 0.260	-0.234 ± 0.042

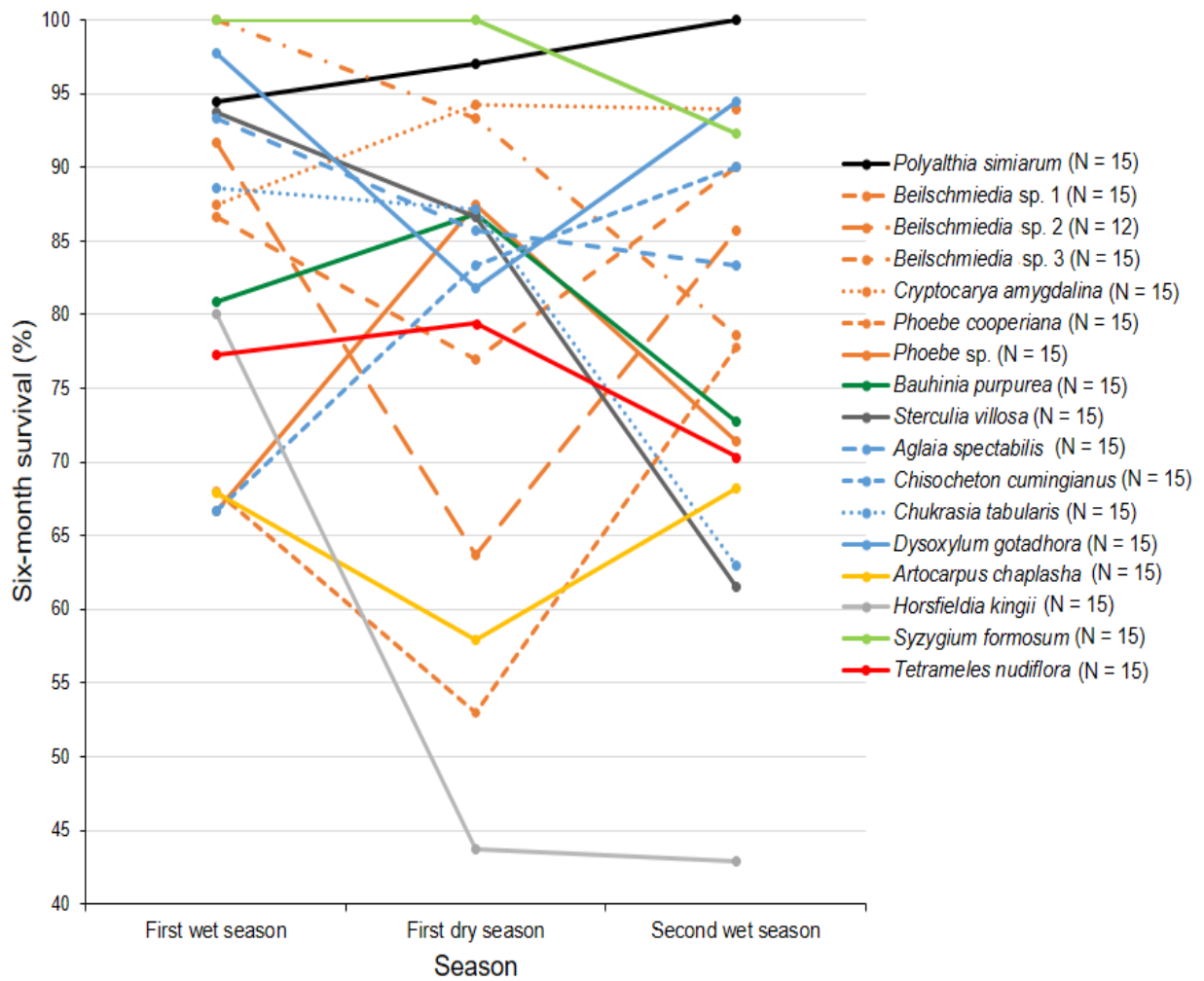
<i>P. cooperiana</i>	11	0.056 ± 0.038	-0.074 ± 0.166	0.136 ± 0.127	0.040 ± 0.072
<i>P. simiarum</i>	15	0.029 ± 0.024	0.034 ± 0.039	0.107 ± 0.095	0.057 ± 0.036
<i>T. nudiflora</i>	9	-0.056 ± 0.183	-0.102 ± 0.231	0.084 ± 0.194	-0.025 ± 0.087

Supplementary Table S4: Post-hoc results for comparison of average stem diameter growth between seasons for all nine species. The Bonferroni adjusted p -values have been reported in the table.

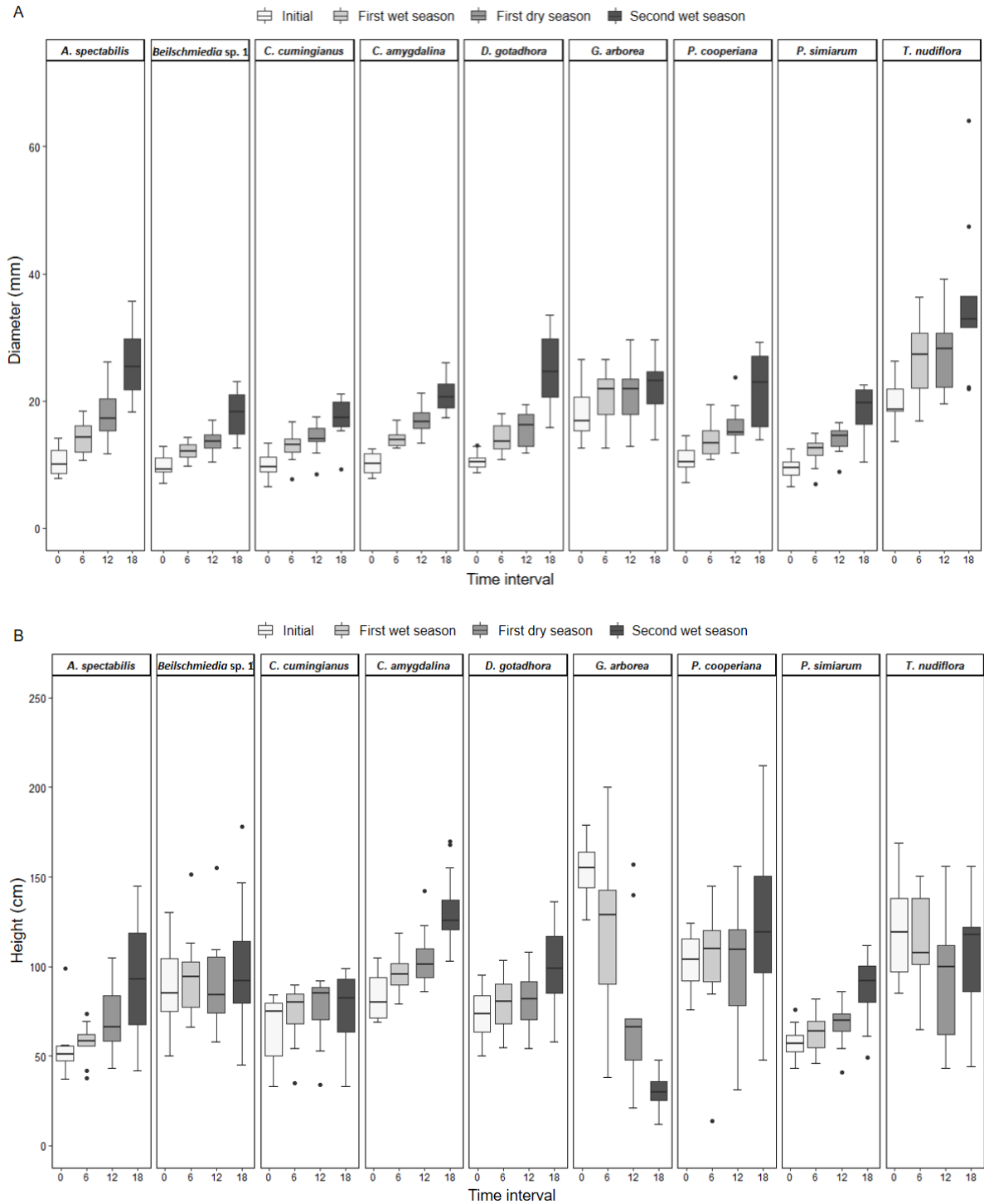
Effect	Season	DFn	DFd	F	p adjusted
Species	1 st wet season	8	96	4.14	<0.001
	1 st dry season	8	96	4.75	<0.001
	2 nd wet season	8	96	4.70	<0.001

Supplementary Table S5: Post-hoc results for comparison of average stem diameter growth between seasons for each species. The Bonferroni adjusted p -values have been reported in the table.

Species	Effect	DFn	DFd	F	p adjusted
<i>A. spectabilis</i>	Season	2	18	10.32	<0.05
<i>Beilschmiedia</i> sp.1	Season	2	20	8.99	<0.05
<i>C. cumingianus</i>	Season	2	22	7.73	<0.05
<i>C. amygdalina</i>	Season	2	26	3.19	0.52
<i>D. gotadhora</i>	Season	2	26	25.07	<0.05
<i>G. arborea</i>	Season	2	16	0.80	1
<i>P. cooperiana</i>	Season	2	20	4.26	0.26
<i>P. simiarum</i>	Season	2	28	16.82	<0.05
<i>T. nudiflora</i>	Season	2	16	5.91	0.11



Supplementary Figure S1: Six monthly survival of planted saplings over a period of 18 months since planting at a restoration site inside Pakke Tiger Reserve. All species belonging to the same family have the same line colour.



Supplementary Figure S2: Box-whisker plots displaying (A) diameter (mm) and (B) height (cm) of surviving saplings (n given in Table S2) of nine species marked for growth rate measurement across seasons at a restoration site inside Pakke Tiger Reserve, Arunachal Pradesh, India.