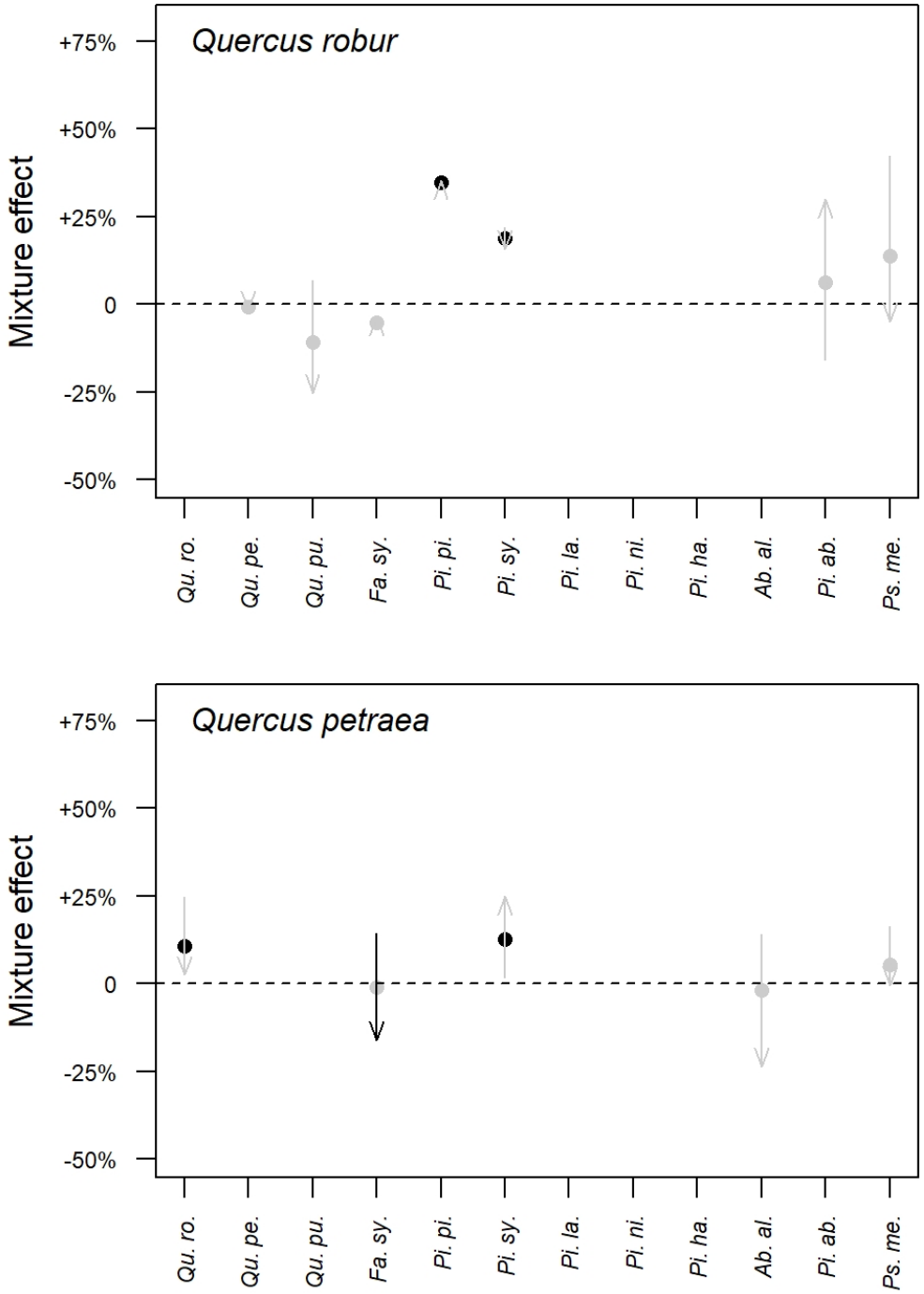
Effect		Parameter s_0		
on	of	Estimate	Std. Error	p-value
Qu. ro.	*Qu. pe.*	-0.017	0.064	0.790
Qu. ro.	*Qu. pu.*	-0.216	0.151	0.158
Qu. ro.	*Fa. sy.*	-0.106	0.077	0.170
Qu. ro.	***Pi. pi.***	**0.692**	**0.146**	**<10e-3**
Qu. ro.	***Pi. sy.***	**0.374**	**0.138**	**0.008**
Qu. ro.	*Pi. ab.*	0.125	0.209	0.554
Qu. ro.	*Ps. me.*	0.278	0.209	0.197
Qu. pe.	***Qu. ro.***	**0.215**	**0.068**	**0.002**
Qu. pe.	*Fa. sy.*	-0.023	0.039	0.559
Qu. pe.	***Pi. sy.***	**0.253**	**0.089**	**0.006**
Qu. pe.	*Ab. al.*	-0.038	0.160	0.817
Qu. pe.	*Ps. me.*	0.108	0.172	0.537
Qu. pu.	*Qu. ro.*	-0.227	0.195	0.250
Qu. pu.	*Pi. sy.*	0.091	0.132	0.493
Fa. sy.	***Qu. ro.***	**0.438**	**0.071**	**<10e-3**
Fa. sy.	***Qu. pe.***	**0.201**	**0.035**	**<10e-3**
Fa. sy.	***Pi. sy.***	**0.714**	**0.097**	**<10e-3**
Fa. sy.	***Ab. al.***	**0.544**	**0.066**	**<10e-3**
Fa. sy.	***Pi. ab.***	**0.435**	**0.094**	**<10e-3**
Pi. pi.	***Qu. ro.***	**0.384**	**0.126**	**0.003**
Pi. pi.	*Pi. la.*	0.227	0.205	0.279
Pi. sy.	*Qu. ro.*	0.240	0.121	0.050
Pi. sy.	*Qu. pe.*	-0.058	0.076	0.452
Pi. sy.	***Qu. pu.***	**0.902**	**0.246**	**<10e-3**
Pi. sy.	***Fa. sy.***	**-0.676**	**0.066**	**<10e-3**
Pi. sy.	***Pi. la.***	**1.025**	**0.273**	**0.001**
Pi. sy.	*Pi. ni.*	0.124	0.140	0.379
Pi. sy.	***Ab. al.***	**-0.406**	**0.115**	**<10e-3**
Pi. sy.	*Pi. ab.*	-0.160	0.089	0.075
Pi. sy.	*Ps. me.*	0.212	0.190	0.273
Pi. la.	*Pi. pi.*	-0.030	0.277	0.914
Pi. la.	*Pi. sy.*	-0.276	0.210	0.202
Pi. ni.	***Pi. sy.***	**0.466**	**0.120**	**<10e-3**
Ab. al.	*Qu. pe.*	0.143	0.176	0.426
Ab. al.	*Fa. sy.*	0.044	0.053	0.404
Ab. al.	***Pi. sy.***	**0.991**	**0.213**	**<10e-3**
Ab. al.	***Pi. ab.***	**0.209**	**0.052**	**<10e-3**
Ab. al.	***Ps. me.***	**0.386**	**0.128**	**0.004**
Pi. ab.	*Qu. ro.*	0.131	0.187	0.489
Pi. ab.	*Fa. sy.*	-0.135	0.073	0.065
Pi. ab.	***Pi. sy.***	**0.417**	**0.103**	**<10e-3**
Pi. ab.	***Ab. al.***	**0.166**	**0.075**	**0.027**
Pi. ab.	*Ps. me.*	-0.051	0.084	0.544
Ps. me.	*Qu. ro.*	0.093	0.083	0.273
Ps. me.	*Qu. pe.*	0.065	0.113	0.572
Ps. me.	*Pi. sy.*	-0.072	0.106	0.499
Ps. me.	***Ab. al.***	**0.259**	**0.103**	**0.015**
Ps. me.	*Pi. ab.*	-0.023	0.083	0.784

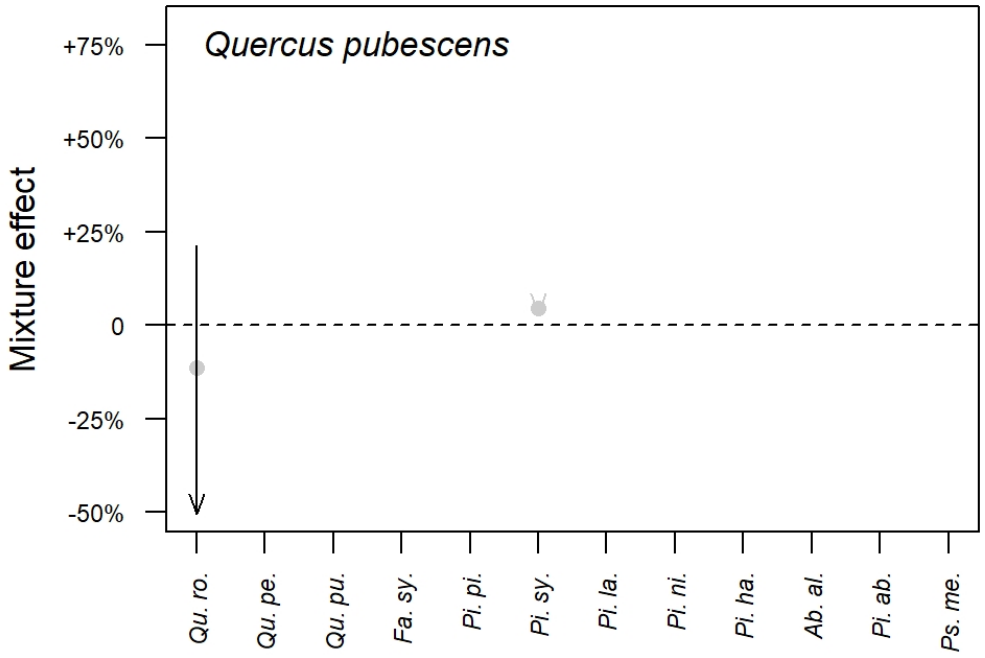
Table A.1: Estimates of the s_0 parameter in Equation 10. Significant mixture effects are shown in bold.

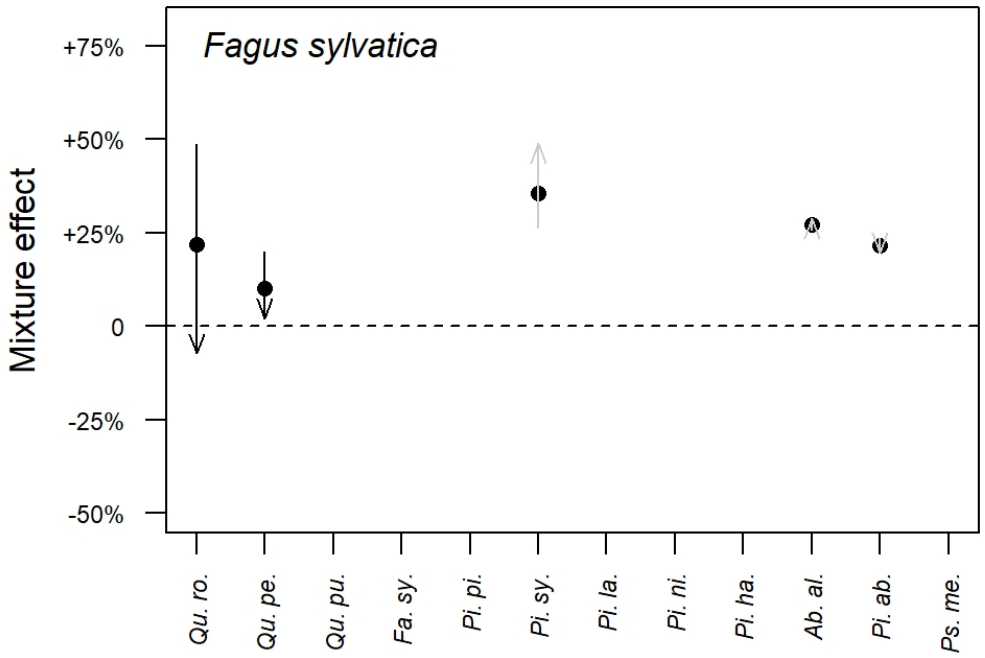
Effect		Parameter s_0			Parameter s_1		
on	of	Estimate	Std. Error	p-value	Estimate	Std. Error	p-value
Qu. ro.	*Qu. pe.*	0.042	0.551	0.940	-0.003	0.030	0.915
Qu. ro.	*Qu. pu.*	0.986	1.044	0.349	-0.066	0.056	0.249
Qu. ro.	*Fa. sy.*	-0.206	0.417	0.622	0.006	0.026	0.807
Qu. ro.	*Pi. pi.*	0.630	1.346	0.641	0.004	0.079	0.963
Qu. ro.	*Pi. sy.*	0.564	0.791	0.478	-0.013	0.052	0.808
Qu. ro.	*Pi. ab.*	-1.552	1.361	0.264	0.106	0.085	0.223
Qu. ro.	*Ps. me.*	2.457	1.574	0.134	-0.122	0.089	0.182
Qu. pe.	*Qu. ro.*	0.910	0.423	0.033	-0.020	0.012	0.098
Qu. pe.	***Fa. sy.***	**0.618**	**0.139**	**<10e-3**	**-0.022**	**0.005**	**<10e-3**
Qu. pe.	*Pi. sy.*	-0.228	0.283	0.423	0.020	0.011	0.078
Qu. pe.	*Ab. al.*	1.134	0.857	0.199	-0.044	0.031	0.178
Qu. pe.	*Ps. me.*	0.566	1.024	0.586	-0.015	0.033	0.648
Qu. pu.	***Qu. ro.***	**2.133**	**1.161**	**0.071**	**-0.323**	**0.155**	**0.042**
Qu. pu.	*Pi. sy.*	0.135	0.458	0.769	-0.010	0.103	0.920
Fa. sy.	***Qu. ro.***	**2.299**	**0.445**	**<10e-3**	**-0.058**	**0.014**	**<10e-3**
Fa. sy.	***Qu. pe.***	**0.833**	**0.266**	**0.002**	**-0.019**	**0.008**	**0.017**
Fa. sy.	*Pi. sy.*	0.246	0.463	0.596	0.019	0.019	0.303
Fa. sy.	*Ab. al.*	0.454	0.413	0.273	0.004	0.016	0.826
Fa. sy.	*Pi. ab.*	0.553	0.530	0.299	-0.005	0.021	0.821
Pi. pi.	*Qu. ro.*	2.005	0.984	0.044	-0.024	0.014	0.100
Pi. pi.	*Pi. la.*	-1.096	0.845	0.207	0.022	0.014	0.121
Pi. sy.	*Qu. ro.*	-0.239	1.034	0.818	0.008	0.017	0.643
Pi. sy.	*Qu. pe.*	0.392	0.610	0.522	-0.007	0.010	0.459
Pi. sy.	*Qu. pu.*	1.976	0.650	0.003	-0.045	0.025	0.078
Pi. sy.	***Fa. sy.***	**0.110**	**0.288**	**0.703**	**-0.012**	**0.004**	**0.006**
Pi. sy.	*Pi. la.*	-0.977	1.643	0.558	0.036	0.028	0.216
Pi. sy.	*Pi. ni.*	0.078	0.308	0.802	0.001	0.008	0.868
Pi. sy.	*Ab. al.*	-0.766	1.060	0.473	0.005	0.016	0.735
Pi. sy.	*Pi. ab.*	0.561	0.704	0.428	-0.011	0.011	0.305
Pi. sy.	*Ps. me.*	-0.587	1.939	0.764	0.013	0.032	0.683
Pi. la.	*Pi. pi.*	-1.510	1.336	0.270	0.033	0.029	0.270
Pi. la.	*Pi. sy.*	-0.294	1.637	0.859	0.000	0.031	0.991
Pi. ni.	*Pi. sy.*	1.419	0.452	0.002	-0.017	0.008	0.032
Ab. al.	***Qu. pe.***	**2.080**	**0.832**	**0.020**	**-0.060**	**0.025**	**0.028**
Ab. al.	***Fa. sy.***	**0.996**	**0.277**	**<10e-3**	**-0.032**	**0.009**	**<10e-3**
Ab. al.	*Pi. sy.*	-0.946	1.079	0.384	0.075	0.041	0.072
Ab. al.	***Pi. ab.***	**0.910**	**0.273**	**<10e-3**	**-0.024**	**0.009**	**0.010**
Ab. al.	***Ps. me.***	**2.371**	**0.962**	**0.016**	**-0.060**	**0.029**	**0.041**
Pi. ab.	*Qu. ro.*	1.987	1.840	0.290	-0.023	0.023	0.319
Pi. ab.	*Fa. sy.*	0.206	0.349	0.555	-0.006	0.006	0.319
Pi. ab.	*Pi. sy.*	0.652	0.739	0.380	-0.004	0.011	0.747
Pi. ab.	***Ab. al.***	**1.792**	**0.490**	**<10e-3**	**-0.024**	**0.007**	**<10e-3**
Pi. ab.	***Ps. me.***	**1.176**	**0.575**	**0.045**	**-0.016**	**0.007**	**0.035**
Ps. me.	*Qu. ro.*	0.514	1.110	0.648	-0.008	0.022	0.708
Ps. me.	*Qu. pe.*	1.857	2.318	0.432	-0.034	0.044	0.447
Ps. me.	*Pi. sy.*	-0.255	1.067	0.813	0.003	0.019	0.865
Ps. me.	*Ab. al.*	0.300	1.505	0.843	-0.001	0.027	0.978
Ps. me.	*Pi. ab.*	0.220	1.224	0.858	-0.004	0.022	0.843

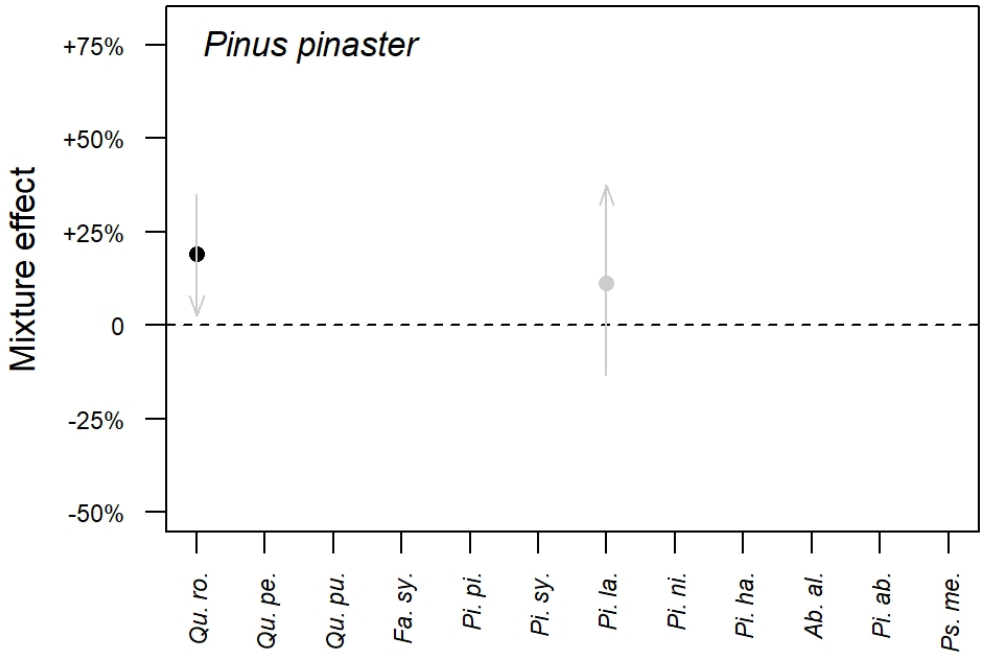
Table A.2: Estimates of the s_0 and s_1 parameters in Equation 11. Significant effects of site productivity on the mixture effects are shown in bold.

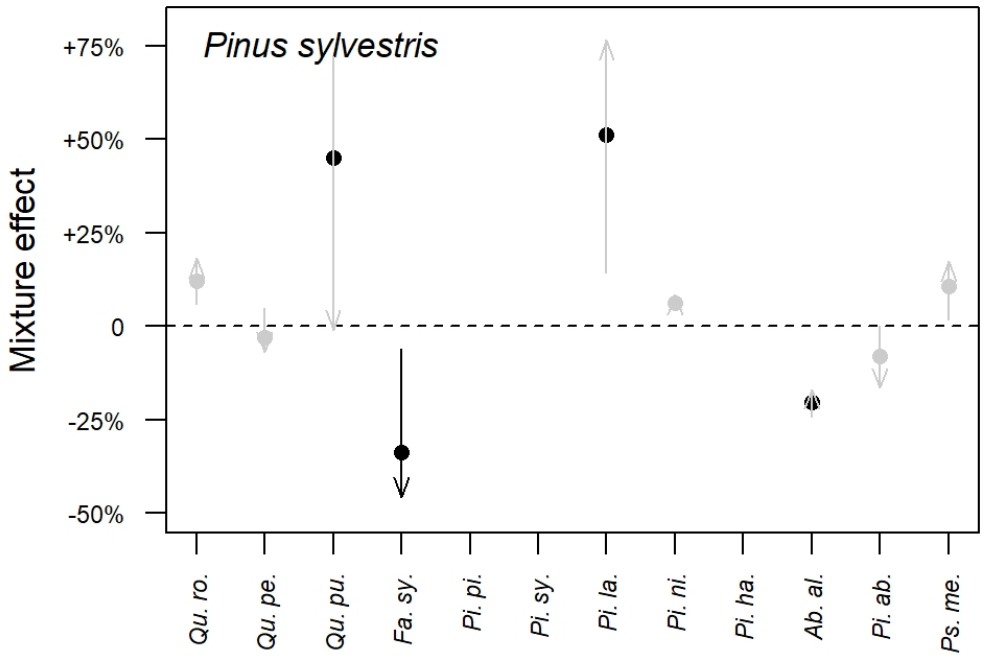
Figure A.1: Mixture effect on species growth. Dots indicate the average mixture effect calculated at Equation 10. Arrows indicate the variation of the mixture effect with site productivity calculated at Equation 11: the beginning of the arrows represents the poorest sites (5% quantile) while the tip of the arrows represents the richest sites (95% quantile). A grey colour indicates that the effect is non-significant, while a black colour indicates a significant effect.

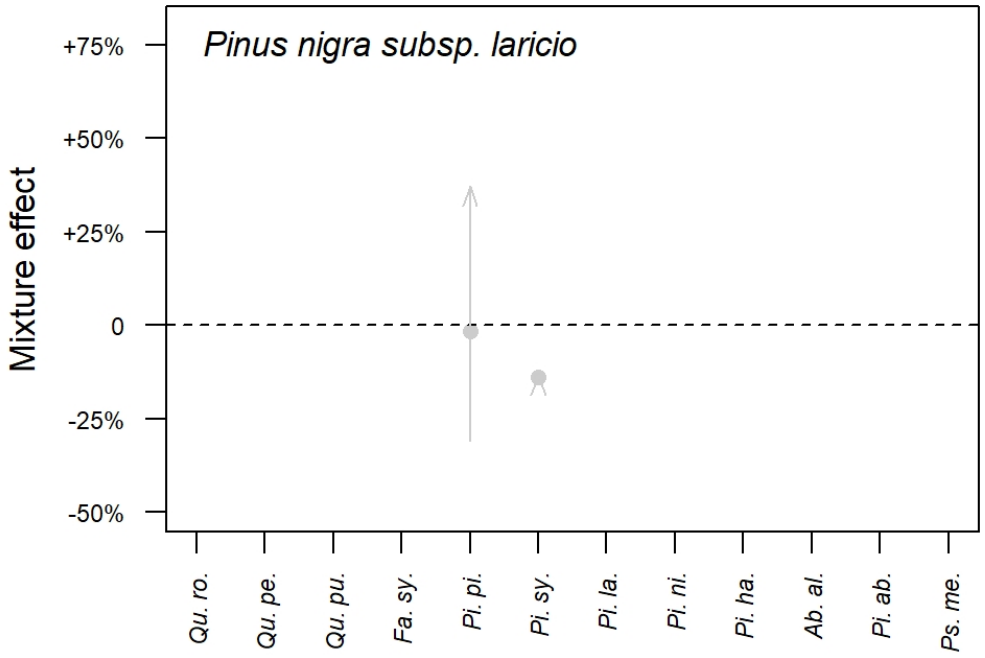


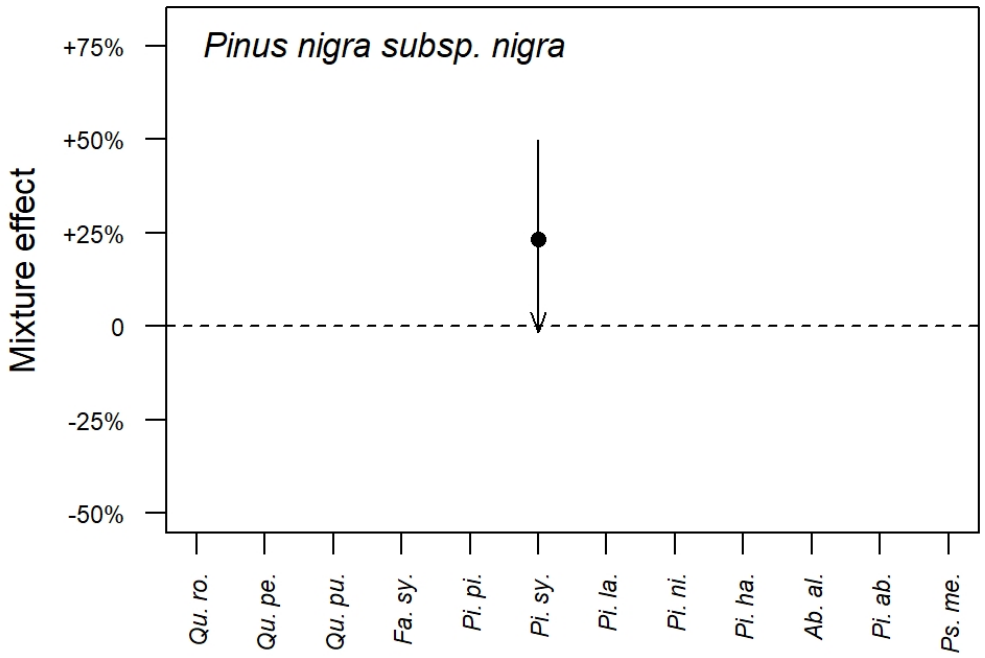

Quercus pubescens
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.

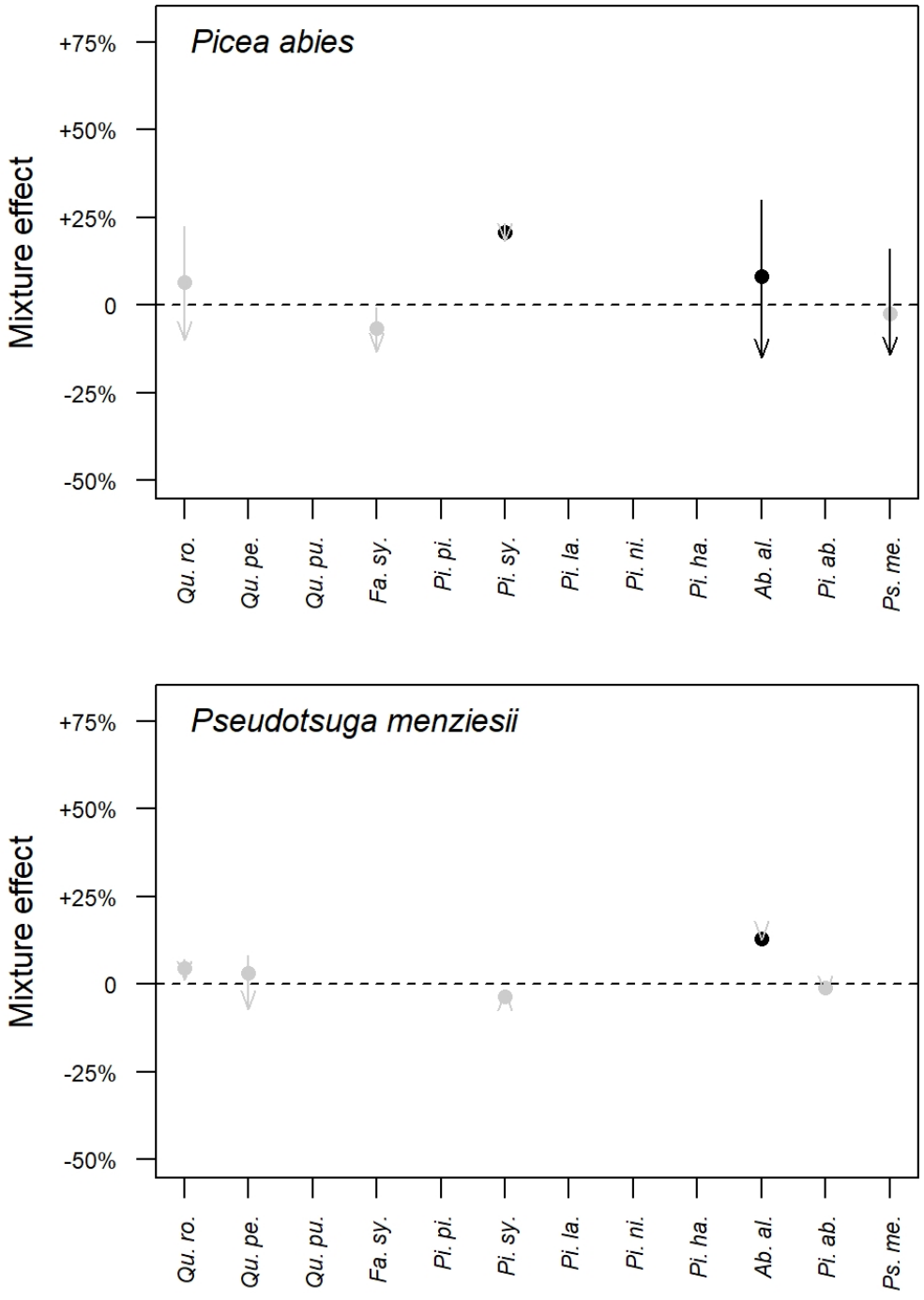

Fagus sylvatica
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.


Pinus pinaster
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.


Pinus sylvestris
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.


Pinus nigra subsp. laricio
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.


Pinus nigra subsp. nigra
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.


Picea abies
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.
Pseudotsuga menziesii
Mixture effect
+75%
+50%
+25%
0
-25%
-50%
Qu. ro.
Qu. pe.
Qu. pu.
Fa. sy.
Pi. pi.
Pi. sy.
Pi. la.
Pi. ni.
Pi. ha.
Ab. al.
Pi. ab.
Ps. me.

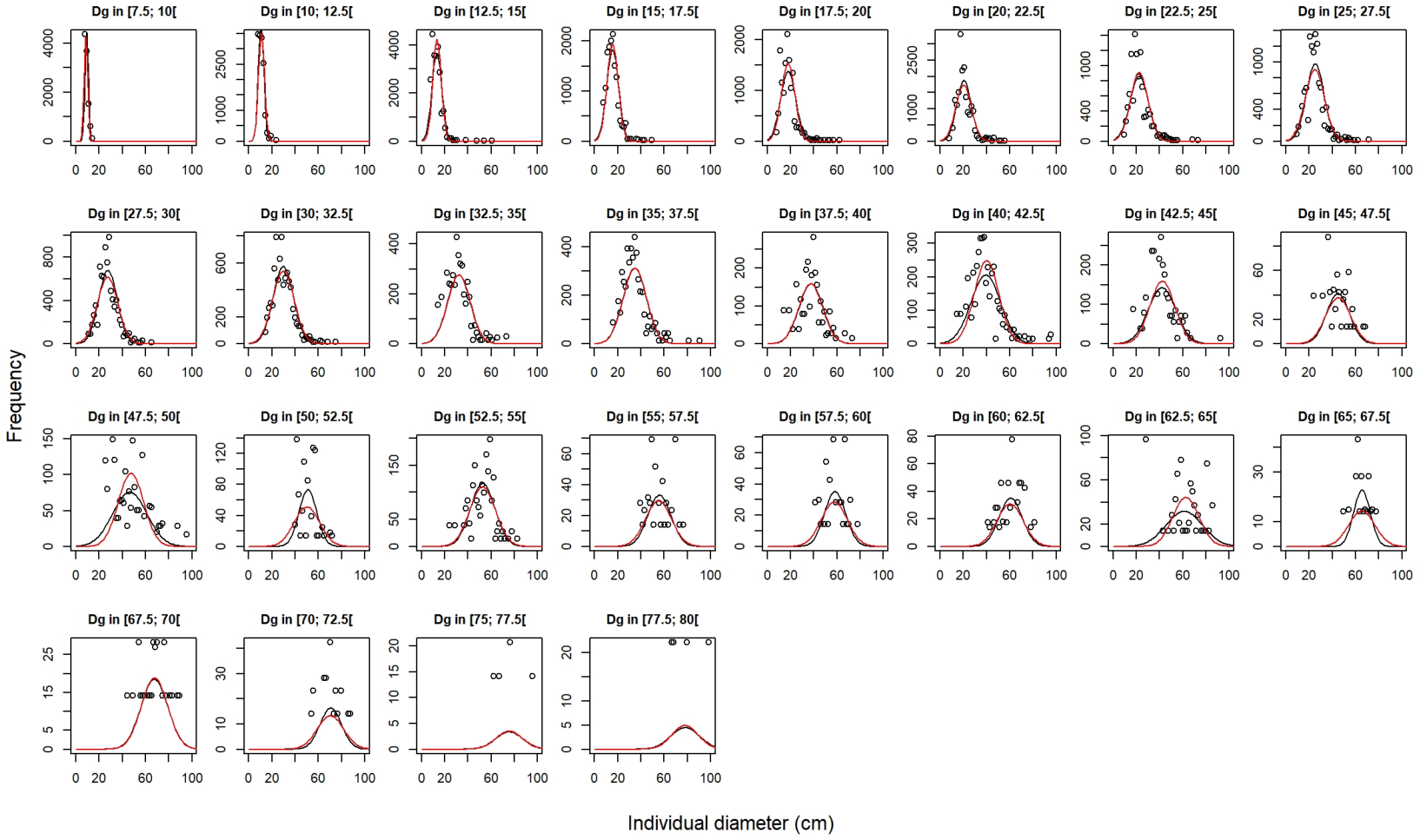


Figure A.2: Normal distributions fitted to observed distributions of individual tree diameters by classes of mean quadratic diameter. Example for *Quercus robur*. Black lines correspond to the normal distributions fitted within each quadratic diameter class. Red lines correspond to the distribution predicted using σ_{Dg} modelled with Equation 15.

Species	n[a]	dbh (cm)	height (m)	volume (dm^3)
Abies concolor	136	16.0 (8.0, 35.0)	13.5 (7.4, 20.8)	154 (10, 870)
Abies grandis	947	16.0 (7.6, 50.9)	14.4 (3.8, 28.9)	206 (6, 2243)
Abies nordmanniana	144	23.3 (7.6, 52.2)	18.0 (5.2, 27.0)	539 (7, 2367)
Acer pseudoplatanus	32	26.4 (12.1, 43.4)	19.9 (12.0, 25.3)	539 (93, 1284)
Betula pendula	34	20.9 (11.8, 31.2)	20.4 (5.5, 28.5)	355 (69, 899)
Carpinus betulus	317	17.4 (7.6, 56.8)	19.2 (6.0, 30.0)	263 (7, 2617)
Carya tomentosa	302	14.1 (7.6, 29.9)	17.3 (8.5, 27.0)	149 (12, 795)
Cedrus atlantica	733	26.1 (7.6, 71.0)	20.6 (6.0, 36.0)	775 (9.0, 4326)
Fraxinus excelsior	322	23.5 (8.3, 57.9)	22.6 (9.0, 32.1)	583.8 (34, 2967)
Juglans nigra	67	31.2 (17.8, 52.5)	23.0 (19.0, 26.3)	887 (237, 2109)
Larix decidua	1098	20.2 (7.8, 63.3)	17.9 (7.7, 28.2)	405 (13, 2420)
Larix kaempferi	71	24.6 (12.4, 32.1)	23.3 (14.0, 30.0)	553 (58, 1232)
Pinus cembra	32	33.3 (8.6, 86.9)	11.8 (5.0, 18.1)	722 (8, 3681)
Pinus strobus	79	20.4 (8.0, 39.5)	15.0 (7.9, 25.0)	334 (24, 1253)
Pinus uncinata	500	23.0 (8.3, 46.5)	13.9 (6.1, 23.5)	411 (25, 1959)
Quercus palustris	48	16.8 (8.0, 32.5)	14.8 (9.0, 20.0)	174 (15, 587)
Quercus rubra	155	17.9 (7.6, 42.0)	18.3 (10.9, 26.2)	266 (23, 1277)
Thuya plicata	56	17.7 (9.9, 29.0)	12.6 (9.0, 15.3)	148 (31, 417)

Table A.3: Mean diameter at breast heigh (dbh), height and volume of trees in the volume dataset, for species that are not relevant to Salem. Minimum and maximum values are shown in parentheses. [a]Number of observations.

Species	β_1	β_2	β_3	σ^2
Abies concolor	-1.049$\times10^{1}$*** (1.613)	5.624$\times10^{-1}$*** (2.618$\times10^{-2}$)	-2.674$\times10^{-3}$* (1.199$\times10^{-3}$)	2.671$\times10^{-3}$
Abies grandis	-1.034$\times10^{1}$*** (3.049$\times10^{-1}$)	5.616$\times10^{-1}$*** (4.938$\times10^{-3}$)	-3.216$\times10^{-3}$*** (1.831$\times10^{-4}$)	2.033$\times10^{-3}$
Abies nordmanniana	-6.029*** (1.488)	5.989$\times10^{-1}$*** (1.582$\times10^{-2}$)	-3.017$\times10^{-3}$*** (4.967$\times10^{-4}$)	4.171$\times10^{-3}$
Acer pseudoplatanus		5.427$\times10^{-1}$*** (2.775$\times10^{-2}$)	-3.638$\times10^{-3}$*** (9.565$\times10^{-4}$)	5.268$\times10^{-3}$
Betula pendula	-2.138$\times10^{1}$* (9.198)	6.585$\times10^{-1}$*** (6.780$\times10^{-2}$)	-7.949$\times10^{-3}$** (2.338$\times10^{-3}$)	3.775$\times10^{-3}$
Carpinus betulus	-8.343*** (8.577$\times10^{-1}$)	5.343$\times10^{-1}$*** (1.223$\times10^{-2}$)	-3.411$\times10^{-3}$*** (5.012$\times10^{-4}$)	7.232$\times10^{-3}$
Carya tomentosa	-4.443*** (4.104$\times10^{-1}$)	4.450$\times10^{-1}$*** (3.210$\times10^{-3}$)		3.126$\times10^{-3}$
Cedrus atlantica	-9.471*** (9.482$\times10^{-1}$)	5.832$\times10^{-1}$*** (6.765$\times10^{-3}$)	-2.399$\times10^{-3}$*** (1.869$\times10^{-4}$)	6.038$\times10^{-3}$
Fraxinus excelsior		5.451$\times10^{-1}$*** (7.016$\times10^{-3}$)	-2.817$\times10^{-3}$*** (2.484$\times10^{-4}$)	5.629$\times10^{-3}$
Juglans nigra		5.315$\times10^{-1}$*** (2.535$\times10^{-2}$)	-1.580$\times10^{-3}$* (7.870$\times10^{-4}$)	6.414$\times10^{-3}$
Larix decidua	-8.063*** (6.078$\times10^{-1}$)	5.960$\times10^{-1}$*** (6.698$\times10^{-3}$)	-2.605$\times10^{-3}$*** (2.229$\times10^{-4}$)	4.552$\times10^{-3}$
Larix kaempferi	-1.898$\times10^{1}$** (6.179)	4.879$\times10^{-1}$*** (7.194$\times10^{-3}$)		4.370$\times10^{-3}$
Pinus cembra	-8.920** (2.948)	5.633$\times10^{-1}$*** (2.251$\times10^{-2}$)	-2.121$\times10^{-3}$*** (4.835$\times10^{-4}$)	1.632$\times10^{-3}$
Pinus strobus	-3.346* (1.325)	5.729$\times10^{-1}$*** (1.839$\times10^{-2}$)	-2.566$\times10^{-3}$*** (6.495$\times10^{-4}$)	1.533$\times10^{-3}$
Pinus uncinata		5.633$\times10^{-1}$*** (2.214$\times10^{-3}$)		3.063$\times10^{-3}$
Quercus palustris		4.305$\times10^{-1}$*** (7.097$\times10^{-3}$)		3.386$\times10^{-3}$
Quercus rubra		4.559$\times10^{-1}$*** (3.756$\times10^{-3}$)		4.698$\times10^{-3}$
Thuya plicata		5.270$\times10^{-1}$*** (2.363$\times10^{-2}$)	-4.506$\times10^{-3}$*** (1.256$\times10^{-3}$)	1.762$\times10^{-3}$

Table A.4: Species-specific parameter estimates of the volume models (Equation 19), for species that are not relevant to Salem. Standard errors are shown in parentheses. Levels of significance: * p<0.05; ** p<0.01; *** p<0.001.