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Genetic diversity and structure through three cycles of a *Eucalyptus urophylla* breeding program

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Supplementary Material

Table S1. Details of the *E. urophylla* trials comprising the first, second and third cycle breeding populations for this species in China.

Parameter	Trial						
	T46	T54	T77	T94	TJJ	T135	T164
Breeding population cycle	1st	1st	1st	1st	1st	2nd	3rd
Year planted	1988	1989	1992	1998	1998	2004	2010
Location	DMFF	DMFF	DMFF	DMFF	JJFF	DMFF	DMFF
No. of replicates	30	40	40	16	7	12	5
No. of trees/plot	1	1	1	4	4	1	4
No. of provenances/ seed sources	3	4	10	10	10	3	5
No. of families/seedlots	42	52	190	157	157	255	185
No. of trees initially established	1,260	2,080	7,600	10,048	4,396	3,060	3,700
No. of trees/families selected for 2nd cycle population	68/35	73/40	114/114	n.a.	n.a.	n.a.	n.a.
Selection method for 2nd cycle	I.I.	I.I.	I.I.	n.a.	n.a.	n.a.	n.a.
Selection traits for 2nd cycle	G & F	G & F	G & F	n.a.	n.a.	n.a.	n.a.
No. of trees/families selected for 3rd cycle population	38/38	n.a.	52/52	50/50	21/21	24/24	n.a.
Selection method for 3rd cycle	C.I.	n.a.	C.I.	C.I.	C.I.	C.I.	n.a.
Selection traits for 3rd cycle	G,F & P	n.a.	G,F & P	G,F & P	G,F & P	G,F & P	n.a.

Key to locations: DMFF = Dongmen Forest Farm, Guangxi, China (approximate latitude 22°23′ N, longitude 107°52′ E, elevation around 120 m above sea level); JJFF = JiJia Forest Farm, Guangdong, China (approximate latitude 20°56′ N, longitude 109°45′ E, elevation around 30 m above sea level).

Key to other abbreviations: n.a. – not applicable; I.I. – individual selection index; C.I. – combined selection index, which combined individual and family information for each trait, taking into account trait variances and heritabilities (Cotterill and Dean 1990) with a restriction of 1 tree per family (and for selection in T135, added restriction of no selection from maternally related families); G & F = growth and stem form; G,F & P = growth, stem form and pilodyn (as an indicator of stem wood basic density).

Table S2. Additional details on Trial T164 (third cycle breeding population).

Reason for incorporation of families into the third cycle population from individuals selected in both trial T94 & TJJ, which contained identical sets of families:	A combination of reasons including increased selection intensities and that not all selected plus-trees produced seed.
Amount of overlap/co-ancestry between families obtained from T94 & TJJ:	The families from which plus-trees were selected from in each trial were mutually exclusive.
Potential GxE between T94 & TJJ:	In analyses of data combined from these two trials, the ratio of interaction component to the family component of variance was well below 0.5 for key traits, indicating that significant family by site interactions (GxE) found should not have serious practical impacts. In addition, correlations (r) of family rankings between sites were generally significant ($P \leq 0.05$), positive and mostly moderate to strong (>0.70) for the key traits.

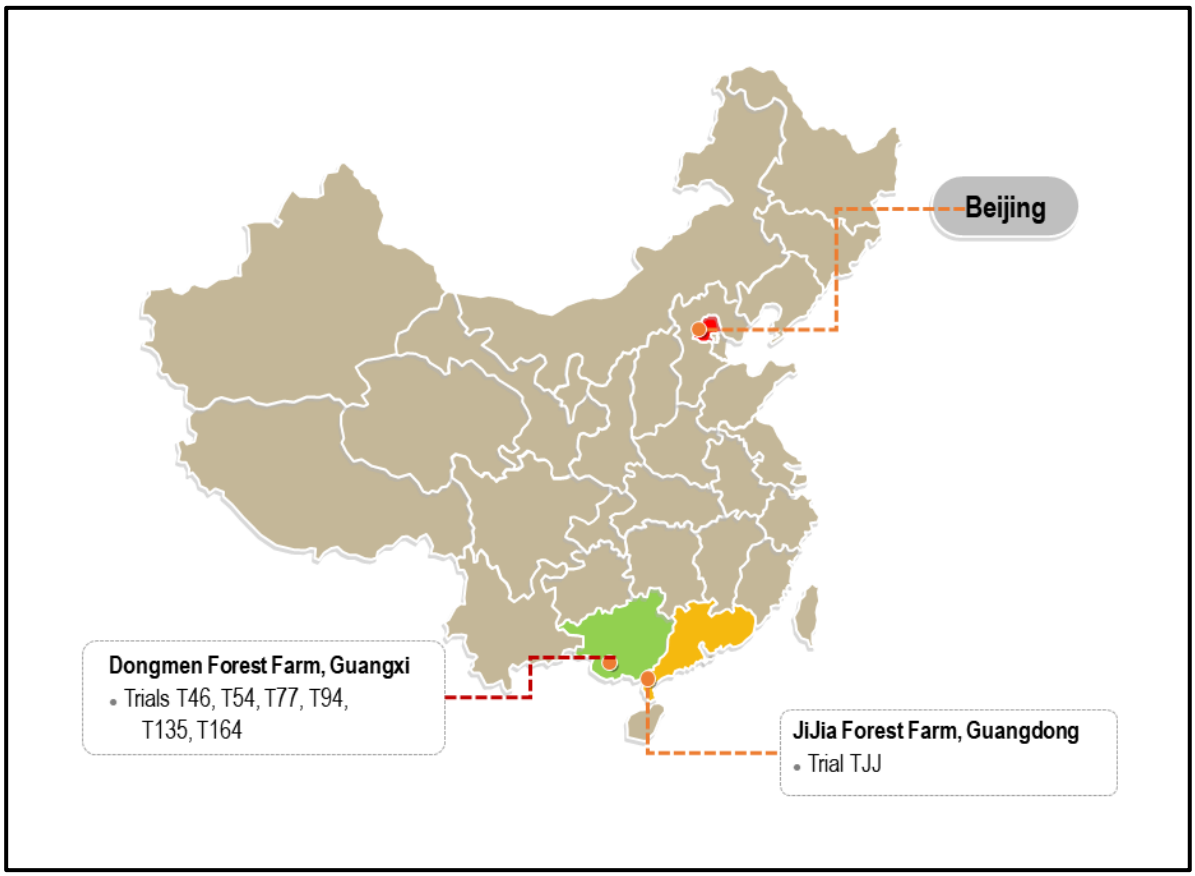

Figure S1. Locations of the *E. urophylla* trials comprising the first, second and third cycle breeding populations for this species in China.

References for Supplementary Material

1. Cotterill, P.P., Dean, C.A., (1990) *Successful Tree Breeding with Index Selection.* CSIRO, Melbourne.