

Table S1: Family, genus, and species names of individuals in the canopy tree (d>10 cm) cohort. The number of individuals listed refers to all 25 study plots, i.e. to a total ground area of 22'500 m<sup>2</sup>.

Family	Genus	Species	Individuals
Aceraceae	Acer	<i>amplum</i>	1
Aceraceae	Acer	<i>cordatum</i>	1
Alangiaceae	Alangium	<i>kurzii</i>	3
Anacardiaceae	Toxicodendron	<i>succedaneum</i>	13
Aquifoliaceae	Ilex	<i>chinensis</i>	7
Aquifoliaceae	Ilex	<i>micrococca</i>	3
Aquifoliaceae	Ilex	<i>rotunda</i>	1
Araliaceae	Dendropanax	<i>dentiger</i>	3
Betulaceae	Carpinus	<i>viminea</i>	3
Daphniphyllaceae	Daphniphyllum	<i>oldhamii</i>	69
Ebenaceae	Diospyros	<i>glaucofolia</i>	7
Elaeocarpaceae	Elaeocarpus	<i>chinensis</i>	4
Elaeocarpaceae	Elaeocarpus	<i>decipiens</i>	6
Elaeocarpaceae	Elaeocarpus	<i>japonicus</i>	1
Ericaceae	Rhododendron	<i>latouchea</i>	2
Ericaceae	Rhododendron	<i>ovatum</i>	1
Ericaceae	Vaccinium	<i>carlesii</i>	1
Euphorbiaceae	Sapium	<i>japonicum</i>	1
Fabaceae	Albizia	<i>kalkora</i>	17
Fabaceae	Dalbergia	<i>hupeana</i>	5
Fagaceae	Castanea	<i>henryi</i>	20
Fagaceae	Castanopsis	<i>carlesii</i>	26
Fagaceae	Castanopsis	<i>eyrei</i>	354
Fagaceae	Castanopsis	<i>fargesii</i>	43
Fagaceae	Castanopsis	<i>sclerophylla</i>	14
Fagaceae	Castanopsis	<i>tibetana</i>	3
Fagaceae	Cyclobalanopsis	<i>glauca</i>	18
Fagaceae	Cyclobalanopsis	<i>myrsinaefolia</i>	37
Fagaceae	Cyclobalanopsis	<i>stewardiana</i>	4
Fagaceae	Lithocarpus	<i>glaber</i>	89
Fagaceae	Quercus	<i>phillyreoides</i>	6
Fagaceae	Quercus	<i>serrata</i>	49
Hamamelidaceae	Liquidambar	<i>formosana</i>	4
Hamamelidaceae	Loropetalum	<i>chinense</i>	10

(continued next page)

(Table S1, continued)

Lauraceae	Cinnamomum	<i>subavenum</i>	2
Lauraceae	Litsea	<i>coreana</i>	1
Lauraceae	Machilus	<i>leptophylla</i>	1
Lauraceae	Machilus	<i>thunbergii</i>	24
Lauraceae	Neolitsea	<i>aurata</i>	2
Lauraceae	Sassafras	<i>tzumu</i>	1
Myricaceae	Myrica	<i>rubra</i>	40
Myrtaceae	Syzygium	<i>buxifolium</i>	2
Nyssaceae	Nyssa	<i>sinensis</i>	3
Oleaceae	Fraxinus	<i>insularis</i>	4
Oleaceae	Osmanthus	<i>cooperi</i>	1
Pinaceae	Pinus	<i>massoniana</i>	210
Pinaceae	Pinus	<i>taiwanensis</i>	34
Rosaceae	Laurocerasus	<i>spinulosa</i>	1
Rosaceae	Malus	<i>leiocalyca</i>	1
Rosaceae	Photinia	<i>beauverdiana</i>	1
Rosaceae	Prunus	<i>schneideriana</i>	2
Rosaceae	Sorbus	<i>dunnii</i>	1
Sabiaceae	Meliosma	<i>flexuosa</i>	3
Sabiaceae	Meliosma	<i>oldhamii</i>	7
Schoepfiaceae	Schoepfia	<i>jasminodora</i>	1
Styracaceae	Alniphyllum	<i>fortunei</i>	40
Styracaceae	Styrax	<i>dasyanthus</i>	1
Styracaceae	Styrax	<i>odoratissimus</i>	1
Styracaceae	Styrax	<i>suberrifolia</i>	1
Symplocaceae	Symplocos	<i>stellaris</i>	1
Taxodiaceae	Cunninghamia	<i>lanceolata</i>	11
Theaceae	Adinandra	<i>millettii</i>	8
Theaceae	Schima	<i>superba</i>	284
Theaceae	Ternstroemia	<i>gymnanthera</i>	5
Tiliaceae	Tilia	<i>endochrysea</i>	2
Ulmaceae	Celtis	<i>biondii</i>	1

---

Table S2: Family, genus, and species names of individuals in the understory tree (3 cm<d<10 cm) cohort. The number of individuals listed refers to the central 10 × 10 cm quadrat of all 25 study plots, i.e. to a total ground area of 2500 m<sup>2</sup>.

Family	Genus	Species	Individuals
Anacardiaceae	Rhus	<i>hypoleuca</i>	4
Anacardiaceae	Toxicodendron	<i>succedaneum</i>	8
Aquifoliaceae	Ilex	<i>buergeri</i>	4
Aquifoliaceae	Ilex	<i>chinensis</i>	5
Aquifoliaceae	Ilex	<i>litseifolia</i>	10
Aquifoliaceae	Ilex	<i>pubescens</i>	1
Aquifoliaceae	Ilex	<i>suaveolens</i>	1
Aquifoliaceae	Ilex	<i>wilsonii</i>	1
Daphniphyllaceae	Daphniphyllum	<i>oldhamii</i>	9
Ericaceae	Lyonia	<i>ovalifolia</i>	2
Ericaceae	Rhododendron	<i>latouchea</i>	27
Ericaceae	Rhododendron	<i>mariesii</i>	2
Ericaceae	Rhododendron	<i>ovatum</i>	26
Ericaceae	Vaccinium	<i>bracteatum</i>	6
Ericaceae	Vaccinium	<i>carlesii</i>	7
Ericaceae	Vaccinium	<i>mandarinorum</i>	3
Fabaceae	Albizia	<i>kalkora</i>	5
Fagaceae	Castanopsis	<i>carlesii</i>	4
Fagaceae	Castanopsis	<i>eyrei</i>	44
Fagaceae	Castanopsis	<i>fargesii</i>	6
Fagaceae	Castanopsis	<i>sclerophylla</i>	12
Fagaceae	Castanopsis	<i>tibetana</i>	2
Fagaceae	Cyclobalanopsis	<i>glauca</i>	31
Fagaceae	Cyclobalanopsis	<i>myrsinaefolia</i>	6
Fagaceae	Cyclobalanopsis	<i>stewardiana</i>	34
Fagaceae	Lithocarpus	<i>glaber</i>	91
Fagaceae	Quercus	<i>serrata</i>	29
Hamamelidaceae	Corylopsis	<i>glandulifera</i>	15
Hamamelidaceae	Liquidambar	<i>formosana</i>	2
Hamamelidaceae	Loropetalum	<i>chinense</i>	13
Lauraceae	Cinnamomum	<i>subavenum</i>	4
Lauraceae	Litsea	<i>coreana</i>	1
Lauraceae	Litsea	<i>elongata</i>	1
Lauraceae	Machilus	<i>thunbergii</i>	11
Myricaceae	Myrica	<i>rubra</i>	8
Myrtaceae	Syzygium	<i>buxifolium</i>	13
Pinaceae	Pinus	<i>massoniana</i>	16
Pinaceae	Pinus	<i>taiwanensis</i>	1

(continued next page)

(Table S2, continued)

Rosaceae	Photinia	<i>glabra</i>	1
Rosaceae	Photinia	<i>parvifolia</i>	2
Rosaceae	Sorbus	<i>folgneri</i>	4
Rubiaceae	Randia	<i>cochinchinensis</i>	2
Sabiaceae	Meliosma	<i>flexuosa</i>	1
Sabiaceae	Meliosma	<i>oldhamii</i>	1
Saxifragaceae	Itea	<i>chinensis</i>	6
Styracaceae	Styrax	<i>odoratissimus</i>	5
Symplocaceae	Symplocos	<i>anomala</i>	5
Symplocaceae	Symplocos	<i>setchuensis</i>	1
Symplocaceae	Symplocos	<i>stellaris</i>	4
Symplocaceae	Symplocos	<i>sumuntia</i>	8
Theaceae	Adinandra	<i>millettii</i>	18
Theaceae	Camellia	<i>chekiang-oleosa</i>	12
Theaceae	Camellia	<i>fraterna</i>	8
Theaceae	Cleyera	<i>japonica</i>	3
Theaceae	Eurya	<i>muricata</i>	75
Theaceae	Eurya	<i>rubiginosa</i>	2
Theaceae	Schima	<i>superba</i>	46
Theaceae	Ternstroemia	<i>gymnanthera</i>	3

---

Fig. S1. Functional trait dendrogram of the species found in the experimental plots. Branch lengths reflect Euclidean distances in a normalized trait space ( $\sigma=1$  along each axis). Functional diversity (FD) was calculated for each plot as total branch length of the subtree containing the species present.

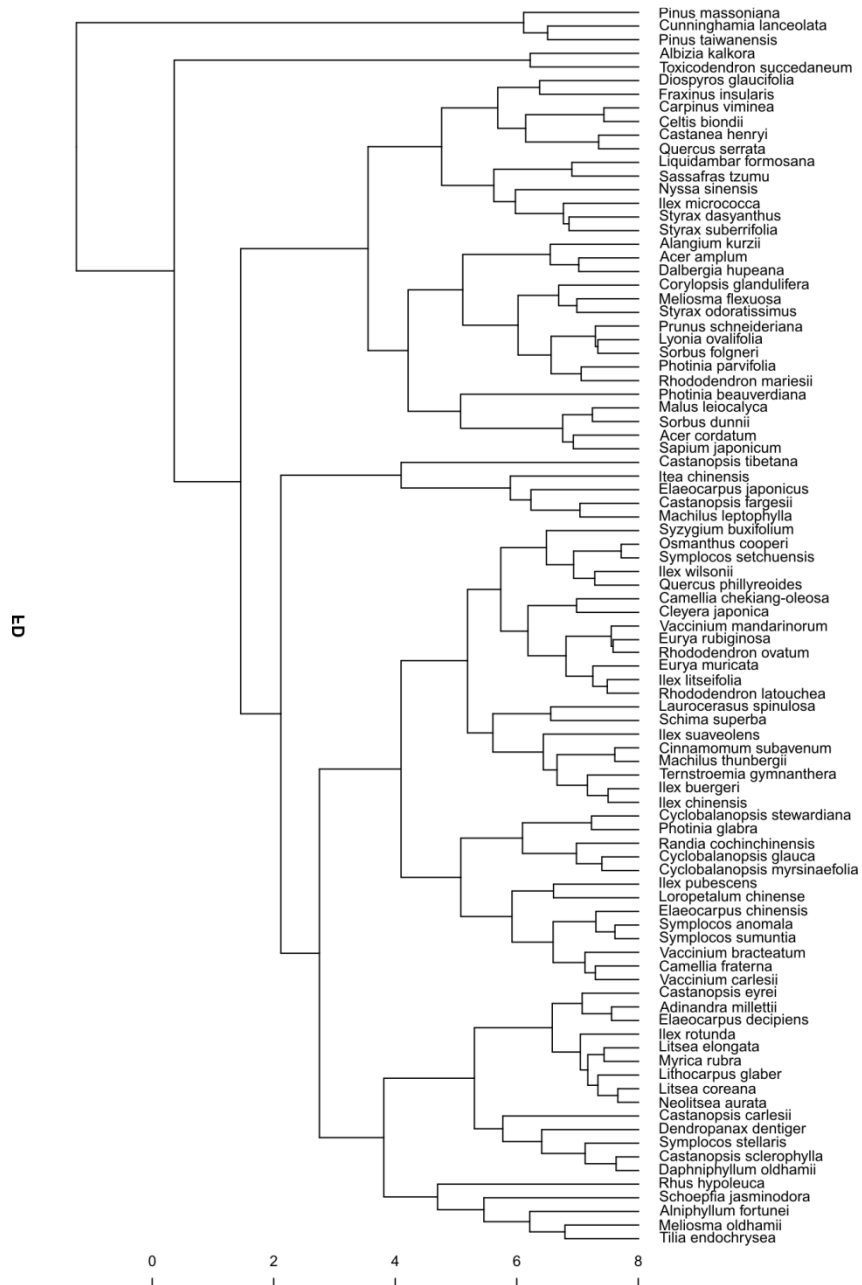


Fig. S2: Phylogeny of species found in the study plots. Phylogenetic diversity (PD) was calculated for each plot as total branch length of the subtree containing the species present.



## Method S1. Generation of phylogenetic tree

We gathered sequence information, i.e. *matK*, *rbcL* and the ITS region including the 5.8s gene for all woody species from Gutianshan National Nature Reserve [1] or closely related species available in GenBank (<http://www.ncbi.nlm.nih.gov/genbank/>, accessed between May and June 2012). For some species found in the study plots, *matK* and *rbcL* were sequenced using standard barcoding protocols [2] (Table S3, accessions KF569888-KF569890). All sequences were aligned separately for the different markers using MAFFT v6 [3]. Sequences for *matK* and *rbcL* were aligned with the ‘Auto’ option in the online version of the program (<http://mafft.cbrc.jp/alignment/server/>). The ITS region was aligned with the ‘Q-INS-I’ option considering secondary structure of RNA using the MAFFT application at Bioportal [<https://www.bioportal.uio.no/>, 4]. Aligned sequences were concatenated for each species resulting in a total alignment of 3521 nucleotide positions. A phylogenetic tree was inferred using a Maximum Likelihood (ML) method implemented in PhyML [5]. For ML inference, the best fitting model (GTR+I+G) selected by Modeltest [6] was applied with the following options: tree topology search operation: best of NNI and SPR search, number of substitution rate categories =6, all other parameters were estimated (Gamma Distribution Parameter Alpha, Proportion of Invariable Sites, Transition/Transversion Ratio).

Four species occurring in the CSPs but without sequence information available (Table 1) were added manually to the obtained ML tree by the following procedure. *Acer cordatum* was added within *Acer* as a polytomy to the most recent common ancestor (MRCA) of a monophyletic clade formed by other members of *Acer* sect. *Palmata* (i.e. *A. elegantulum*, *A. wilsonii*, *A. olivaceum*). Its branch length was defined as the average distance from the MRCA of that clade to the tips. *Styrax wuyuanensis*, *Symplocos oblongifolia* and *Vaccinium mandarinorum* were added similarly as polytomy emerging from the MRCA for all other members of the respective genus included, with branch lengths equalling the average branch length from that MRCA to the tips of congeners.

Using the ML topology and branch lengths an ultrametric tree was created by non-parametric rate smoothing (nprs) as implemented in r8s [7]. Absolute node ages were obtained using 27 published fossils or dates as age constrains. A fixed age of 125 million years was applied to the crown node of the Eudicots (Table S4).

Table S3. List of woody species in the Gutianshan National Reserve included in the phylogenetic analysis.

Species	Species substitute or synonym	GeneBank accession number		
		<i>matK</i>	<i>rbcl</i>	5.8s+ITS
<i>Abelia_chinensis</i>		AY310461	HQ680737	FJ745388
<i>Abutilon_theophrasti</i>		HM850990	HM849734	DQ006017
<i>Acanthopanax_trifoliatum</i>		U58603	U50239	
<i>Acer_amplum</i>	<i>Acer_campestre</i>	JN894032	DQ978399	DQ238431
<i>Acer_buergerianum</i>			DQ978396	U89908
<i>Acer_cordatum</i>	added manually to ML tree			
<i>Acer_davidii</i>		JF952989	DQ978406	JF975773
<i>Acer_elegantulum</i>		HQ427339	HQ427191	
<i>Acer_mono</i>			DQ978416	AY605447
<i>Acer_olivaceum</i>		HQ427338		
<i>Acer_tataricum</i>			DQ978436	AY605363
<i>Acer_wilsonii</i>		HQ427337	HQ427189	HM352665
<i>Actinidia_callosa</i>		AF322620	AJ549061	AF323829
<i>Actinidia_chinensis</i>		U61324	L01882	
<i>Actinidia_hemsleyana</i>		AF322608	AJ549036	AF323802
<i>Actinidia_lanceolata</i>			AJ549072	
<i>Actinidia_melanandra</i>		AF322600		AF443211
<i>Adina_rubella</i>			AJ346965	AJ346856
<i>Adinandra_millettii</i>		AF380069	HQ427223	AY626848
<i>Aesculus_chinensis</i>		EU687709		JF421459
<i>Ailanthus_altissima</i>		EF489111	HM849750	JF755934
<i>Akebia_quinata</i>		AF542587	L12627	GQ339575
<i>Akebia_trifoliata</i>		GQ434168	AF335305	AY029788
<i>Alangium_kurzii</i>		FJ644650	DQ340449	FJ610018
<i>Alangium_platanifolium</i>		FJ644640	JF308649	FJ610006
<i>Albizia_julibrissin</i>		AY386855	GU135262	FJ572041
<i>Albizia_kalkora</i>		HQ427295	HQ427141	JF708202
<i>Alniphyllum_fortunei</i>		HQ427279	AF396149	AF396437
<i>Amelanchier_asiatica</i>				JQ392362
<i>Antidesma_japonicum</i>	<i>Antidesma_venosum</i>	HQ415372	JF265291	
<i>Aphananthe_aspera</i>		AF345320	AF500339	



<i>Aralia chinensis</i>		HQ427393	HQ427250	U63181
<i>Aralia dasyphylla</i>				DQ007355
<i>Aralia echinocaulis</i>				AF273525
<i>Ardisia brevicaulis</i>				FJ482141
<i>Ardisia crenata</i>		HQ427412	L12599	JN645186
<i>Ardisia crispa</i>				FJ482139
<i>Ardisia hanceana</i>				JN645190
<i>Ardisia japonica</i>		JF416274	GQ436756	JN645201
<i>Berberis soulieana</i>	<i>Berberis fortunei</i>		FJ449857	FJ980428
<i>Berchemia huana</i>	<i>Berchemia zeyheri</i>	JF270656	JF265303	
<i>Betula luminifera</i>		FJ011821		AY761116
<i>Bischofia polycarpa</i>	<i>Bischofia javanica</i>	GU135116	AY663571	
<i>Broussonetia papyrifera</i>		AF345326	JF317478	HM623778
<i>Buddleja lindeyana</i>	<i>Buddleja davidii</i>	HQ384530	AJ001757	
<i>Buxus sinica</i>	<i>Buxus sempervirens</i>	AF543728	HM849831	EF123195
<i>Caesalpinia decapetala</i>		HM049555		JF708207
<i>Callicarpa bodinieri</i>		HQ427330	HQ427182	
<i>Callicarpa giraldii</i>		HQ427332	HQ427184	FJ593347
<i>Callicarpa japonica</i>		FM163257		FM163230
<i>Callicarpa rubella</i>		HQ427329	HQ427181	FM163232
<i>Camellia brevistyla</i>				HM061465
<i>Camellia chekiangoleosa</i>		HQ427374	HQ427229	EU579685
<i>Camellia cuspidata</i>		HQ427370	HQ427225	EU579693
<i>Camellia fraterna</i>			HQ427224	EU579705
<i>Camellia oleifera</i>			GQ436647	HM061454
<i>Camellia sinensis</i>		AJ429305	AF380037	HM061514
<i>Camptotheca acuminata</i>		JF953409	L11211	JF976064
<i>Campylotropis macrocarpa</i>		AY386870	EU717277	GU572164
<i>Caragana sinica</i>		HM049541	FJ537233	FJ537284
<i>Carpinus londoniana</i>		AY211990		AF432040
<i>Carpinus viminea</i>		AY212000	HQ427161	AF432058
<i>Castanea henryi</i>		EF057123		
<i>Castanea mollissima</i>		EF057124		
<i>Castanea seguinii</i>		AY263920	AY263937	
<i>Castanopsis carlesii</i>		AY040496	HQ427175	AY040372

<i>Castanopsis_eyrei</i>		EF057125	HQ427167	EF057109
<i>Castanopsis_fargesii</i>		EF057133	HQ427173	AY040383
<i>Castanopsis_sclerophylla</i>		EF057137		EF057106
<i>Castanopsis_tibetana</i>		AY263921	AY147096	
<i>Celastrus_aculeatus</i>				JQ424095
<i>Celastrus_angulatus</i>		EU328938		JQ424098
<i>Celastrus_gemmatus</i>				JQ424102
<i>Celastrus_oblanceifolius</i>				JQ424119
<i>Celastrus_rosthornianus</i>		EU328940		JQ424130
<i>Celastrus_stylosus</i>				JQ424136
<i>Celtis_biondii</i>		KF569895	KF569888	
<i>Celtis_tetrandra</i>			JF317479	
<i>Cephalotaxus_fortunei</i>		AF228109	AY450863	
<i>Cephalotaxus_sinensis</i>		AF228110	EF660728	
<i>Cerasus_campanulata</i>	syn. <i>Prunus campanulata</i>		AF411501	AF318658
<i>Chimonanthus_salicifolius</i>		HQ427325	HQ427177	AY786102
<i>Choerospondias_axillaris</i>		HQ427341	HQ427193	GQ434625
<i>Cinnamomum_camphora</i>		AJ247154	L12641	AY878325
<i>Cinnamomum_chekiangense</i>		HQ427409	HQ427267	
<i>Cinnamomum_subavenium</i>		HQ427408	HQ427266	GU598529
<i>Cladrastis_wilsonii</i>	<i>Cladrastis sikokiana</i>		U74232	JQ676968
<i>Clerodendrum_bungei</i>				U77744
<i>Clerodendrum_cyrtophyllum</i>		HQ427333	HQ427185	JF755940
<i>Clerodendrum_trichotomum</i>		AF477760	HQ427186	U77771
<i>Clethra_barbinervis</i>		AB697681	AF421089	AY190573
<i>Cleyera_japonica</i>		HQ427371	EU980811	AF456257
<i>Coptosapelta_diffusa</i>			EU145453	DQ358882
<i>Corchoropsis_crenata</i>			FJ848895	
<i>Corchorus_aestuans</i>				DQ311675
<i>Cornus_controversa</i>		U96893	AF190433	AY530918
<i>Cornus_kousa</i>		DQ341345	L14395	DQ340555
<i>Corylopsis_glandulifera</i>	syn. <i>Corylopsis hypoglauca</i>	HQ427314	HQ427165	EF456719
<i>Corylopsis_sinensis</i>		AF013038	AB237032	EF456711
<i>Crataegus_cuneata</i>	<i>Crataegus monogyna</i>	JN893932	JN890652	
<i>Cryptomeria_fortunei</i>		AB030117		

<i>Cunninghamia lanceolata</i>		AB030125	AY140260	
<i>Cyclobalanopsis glauca</i>	syn. <i>Quercus glauca</i>	AB060062	AB060571	AY040458
<i>Cyclobalanopsis gracilis</i>	syn. <i>Quercus ciliaris</i>	HQ427318	HQ427169	
<i>Cyclobalanopsis nubium</i>	syn. <i>Quercus sessilifolia</i>	AB060068	AB060577	
<i>Cyclobalanopsis stewardiana</i>		KF569896	KF569889	
<i>Cyclocarya paliurus</i>		AY147098	AY147094	AF303817
<i>Dalbergia hupeana</i>		HQ427296	U74236	GU217673
<i>Daphne genkwa</i>	<i>Daphne laureola</i>	JN894952	HM849946	GQ167533
<i>Daphniphyllum macropodum</i>			AM183400	
<i>Daphniphyllum oldhamii</i>		HQ427311	HQ427162	JN040993
<i>Dendropanax dentiger</i>		HQ427394	HQ427251	GU054694
<i>Deutzia glauca</i>	<i>Deutzia setchuenensis</i>	JF308687	JF308658	
<i>Diospyros glaucifolia</i>		HQ427382	EU980694	FJ624405
<i>Diospyros morrisiana</i>		HQ427383	HQ427240	
<i>Diospyros oleifera</i>		AB174997		AB175016
<i>Diospyros rhombifolia</i>		AB174999	EU980741	AB175018
<i>Distylium myricoides</i>		GU576683	AM183408	GU576648
<i>Edgeworthia chrysantha</i>			AJ297920	AJ744932
<i>Ehretia thyrsoiflora</i>			EU599831	
<i>Elaeagnus glabra</i>				JQ062502
<i>Elaeagnus multiflora</i>				JQ062478
<i>Elaeagnus pungens</i>		GU135102	GU135269	JQ062488
<i>Elaeagnus umbellata</i>		AY257529	HM849968	JQ062486
<i>Elaeocarpus chinensis</i>			HQ427153	
<i>Elaeocarpus decipiens</i>		HQ415261	HQ415077	
<i>Elaeocarpus japonicus</i>		HQ415264	HQ415080	
<i>Eleutherococcus gracilistylus</i>			GQ436710	FJ980422
<i>Emmenopterys henryi</i>		FJ905360	Y18715	FJ984985
<i>Euchresta japonica</i>			AB127040	
<i>Euodia faugeaii</i>	<i>Euodia hupehensis</i>	EF489105	FN552679	
<i>Euonymus alatus</i>		EU328950		EU328755
<i>Euonymus carnosus</i>		HQ427389	HQ427246	
<i>Euonymus centidens</i>		HQ427390	HQ427247	
<i>Euonymus fortunei</i>		HQ393828	HM755927	HQ393699
<i>Euonymus myrianthus</i>		HQ427388	HQ427245	HQ393721

<i>Euonymus oblongifolius</i>	syn. <i>Euonymus nitidus</i>	HQ393835	HQ427248	JQ424144
<i>Euonymus oxyphyllus</i>		HQ393836		HQ393704
<i>Eurya alata</i>				AF456259
<i>Eurya hebeclados</i>				AY626865
<i>Eurya loquaiana</i>		HQ427372	HQ427227	AY626870
<i>Eurya muricata</i>		HQ427373	HQ427228	AY626872
<i>Eurya nitida</i>				AY096026
<i>Eurya rubiginosa</i>		HQ427368	HQ427222	AY626877
<i>Euscaphis japonica</i>		DQ663628	DQ307099	
<i>Fagus engleriana</i>		AY042391	JF941501	AY232907
<i>Fagus longipetiolata</i>		AY042402	JF941508	AY232955
<i>Fagus lucida</i>		EF057139	JF941510	AY232963
<i>Ficus erecta</i>		HQ427366	HQ427220	HQ890729
<i>Ficus heteromorpha</i>			JF941536	
<i>Ficus pandurata</i>		HQ415327	HQ415153	
<i>Ficus pumila</i>		HM851109	AF500352	AY063580
<i>Ficus sarmentosa</i>				AB485901
<i>Firmiana platanifolia</i>			AY328192	AF460185
<i>Fontanesia fortunei</i>	syn. <i>Fontanesia phillyreoides</i>			AF534815
<i>Forsythia viridissima</i>		FJ263957		AF534810
<i>Fraxinus chinensis</i>		HM171509	DQ673301	HQ705225
<i>Fraxinus insularis</i>		HQ427335	HQ427187	
<i>Gardenia jasminoides</i>		HQ427344	GQ436564	GQ434646
<i>Gardneria multiflora</i>				JF937929
<i>Gleditsia sinensis</i>		AM086835		AF510019
<i>Glochidion puberum</i>		HQ427285	AY663586	AY936659
<i>Gymnocladus chinensis</i>				AF510033
<i>Hamamelis mollis</i>		AF128827	L01922	GU576659
<i>Helwingia japonica</i>		AJ430195	L11226	AF200593
<i>Hibiscus syriacus</i>		AF345329	AY328174	AF460188
<i>Holboellia coriacea</i>	<i>Holboellia grandiflora</i>	FJ626513	AF398181	AY029779
<i>Hovenia dulcis</i>				DQ146607
<i>Hovenia trichocarpa</i>		JF317429	JF317489	DQ146608
<i>Hydrangea angustipetala</i>		GU217336		
<i>Hydrangea anomala</i>		GU369710	AF323202	JF976651

<i>Hydrangea chinensis</i>		KF569897	KF569890	AB377211
<i>Hydrangea paniculata</i>		HQ427310	AB236036	
<i>Hydrangea strigosa</i>	syn. <i>Hydrangea aspera</i>	AJ429277	JF941958	JF976653
<i>Idesia polycarpa</i>		FJ670040	AF206781	AJ006441
<i>Ilex buergeri</i>			FJ394593	FJ394663
<i>Ilex cornuta</i>		GQ997309	FJ394601	EU647650
<i>Ilex elmerrilliana</i>			HQ427132	
<i>Ilex ficoidea</i>		HQ427288	HQ427133	FJ394682
<i>Ilex latifolia</i>		HQ427289	X98731	DQ200798
<i>Ilex litseaefolia</i>		KF569898		
<i>Ilex macrocarpa</i>			AJ4927271	AJ492689
<i>Ilex micrococca</i>		HQ427290	X98721	JF976691
<i>Ilex pubescens</i>		HQ427291	AJ492722	AJ492686
<i>Ilex purpurea</i>		HQ427292	AJ492710	FJ394708
<i>Ilex rotunda</i>		HQ415255	X98720	FJ394710
<i>Ilex suaveolens</i>		HQ427293	HQ427139	
<i>Ilex triflora</i>			AJ4927131	AJ492675
<i>Ilex tsoii</i>			FJ394645	FJ394718
<i>Ilex wilsonii</i>		HQ427294	FJ394649	FJ394722
<i>Illicium lanceolatum</i>		HQ427283	HQ427126	JQ180205
<i>Indigofera decora</i>				AF534797
<i>Itea chinensis</i>		HQ415356	HQ415186	
<i>Jasminum sinsense</i>	syn. <i>Jasminum nudiflorum</i>	AF531779		AF361301
<i>Juglans cathayensis</i>		AF118028		
<i>Juniperus chinensis</i>		HM024014	HM024292	
<i>Juniperus formosana</i>		HM024028	HM024306	
<i>Kerria japonica</i>		AB073686	AF132893	
<i>Koelreuteria bipinnata</i>			DQ978447	
<i>Lasianthus japonicus</i>		HQ427345	HQ427196	
<i>Lespedeza buergeri</i>				JN402408
<i>Lespedeza cyrtobotrya</i>				JN402422
<i>Lespedeza dunnii</i>				JN402431
<i>Lespedeza floribunda</i>		HM049538	GQ436353	JN402438
<i>Lespedeza formosa</i>	syn. <i>Lespedeza thunbergii</i>		HQ427143	JN402486
<i>Ligustrum lucidum</i>		EU669873	GQ436542	JF976848

<i>Ligustrum_sinense</i>	JF830514	JF830433	JF830366
<i>Lindera_aggregata</i>	AB442057	HM019473	AB470487
<i>Lindera_erythrocarpa</i>	AB259065		HQ697215
<i>Lindera_glauca</i>	AB442056	HM019478	AB500615
<i>Lindera_megaphylla</i>	AF244404		AY265406
<i>Lindera_reflexa</i>	AF244401	HQ427264	AY265407
<i>Liquidambar_acalycina</i>	AF015649	DQ352380	GU576668
<i>Liquidambar_formosana</i>	AF133221	AJ131772	AF015436
<i>Liriodendron_chinense</i>	AF123481	AY841593	
<i>Lithocarpus_cleistocarpus</i>	EF057117		EF057114
<i>Lithocarpus_glaber</i>	HQ427322	AB060568	AY040435
<i>Lithocarpus_hancei</i>			AY040451
<i>Litsea_coreana</i>	HQ427405	HQ427263	AF272286
<i>Litsea_cubeba</i>	AF244398	AY337734	AB260863
<i>Litsea_elongata</i>	HQ427403	HQ427261	DQ120606
<i>Lonicera_hypoglauca</i>	HM228434	HM228478	FJ372916
<i>Lonicera_japonica</i>	GQ997392	HM850134	JQ780992
<i>Lonicera_macranthoides</i>	HM228448	HM228492	FJ372918
<i>Lonicera_modesta</i>			EU240716
<i>Loropetalum_chinense</i>	HQ427312	AF061999	GU576672
<i>Lyonia_ovalifolia</i>	U61305	AF124580	
<i>Maackia_chinensis</i>			EF457721
<i>Machilus_grijsii</i>	KF569899	KF569893	JF976985
<i>Machilus_leptophylla</i>	HM019350	HM019490	EF538697
<i>Machilus_pauhoi</i>	HQ427418	HM019496	EF538695
<i>Machilus_thunbergii</i>	KF569890	KF569894	FJ755429
<i>Maesa_japonica</i>			JF708192
<i>Magnolia_cylindrica</i>	HQ427420	AY008914	
<i>Magnolia_denudata</i>	AF123465	AY008913	EU593545
<i>Magnolia_officinalis</i>	AF548641	AY008933	EU593549
<i>Mahonia_bealei</i>	DQ478617	L12657	FJ424229
<i>Mallotus_japonicus</i>	AB268027	AY794934	
<i>Mallotus_repandus</i>	EF582678	GU441787	DQ866617
<i>Malus_hupehensis</i>	AF309179	JQ391346	JQ392455
<i>Malus_leiocalyca</i>	HQ427351	HQ427202	

<i>Manglietia_fordiana</i>		AY952412	L12658	
<i>Melastoma_dodecandrum</i>			GQ436727	GQ265883
<i>Melia_azedarach</i>		EF489117	AY128234	AY695595
<i>Meliosma_flexuosa</i>		HQ427361	HQ427214	
<i>Meliosma_oldhamii</i>		HQ427360	HQ427213	
<i>Meliosma_rigida</i>		HQ415309	HQ415132	
<i>Michelia_maudiae</i>		HQ415276	HQ415093	EU593553
<i>Michelia_skinneriana</i>		HQ427417	HQ427275	
<i>Microtropis_fokienensis</i>		HQ393848		HQ393683
<i>Millettia_dielsiana</i>	syn. <i>Callerya_cinerea</i>		GQ436360	FJ980295
<i>Millettia_reticulata</i>	syn. <i>Callerya_reticulata</i>	AF142733		AF467031
<i>Morus_alba</i>		AB038183	L01933	JN407493
<i>Morus_australis</i>		GU145559	GU145573	AY345152
<i>Morus_cathayana</i>		GU145565	GU145579	AM042001
<i>Mussaenda_shikokiana</i>				AJ846854
<i>Myrica_rubra</i>	syn. <i>Morella_rubra</i>	HQ427396	HQ427253	AJ626784
<i>Myrsine_retusa</i>		HM850887	HM850193	
<i>Neolitsea_aurata</i>		HM019358	HM019498	JF977135
<i>Nyssa_sinensis</i>		JF308675	JF308651	EU734444
<i>Orixa_japonica</i>		EF489106		HM851496
<i>Ormosia_henryi</i>		HM049514		
<i>Osbeckia_chinensis</i>			AF215525	
<i>Osmanthus_cooperi</i>		EU669875	HQ427188	EF362772
<i>Osmanthus_fragrans</i>		FM208253		EU314904
<i>Osmanthus_matsumuranus</i>		EU409435		EF362770
<i>Persea_grijsii</i>		AJ247180		
<i>Pertusadina_hainanensis</i>		HQ427346	AJ347002	AJ346892
<i>Philadelphus_brachybotrys</i>	<i>Philadelphus_pekinensis</i>	GU217268		
<i>Phoebe_bournei</i>		HM019369	HM019509	EF538706
<i>Phoebe_sheareri</i>		HQ427400	HM019513	FM957848
<i>Photinia_beauverdiana</i>		HQ427353	HQ427204	JQ392492
<i>Photinia_glabra</i>		HQ427354	HQ427205	FJ796905
<i>Photinia_parvifolia</i>		HQ427355	HQ427206	GQ368497
<i>Photinia_serrulata</i>	syn. <i>Photinia_serratifolia</i>	AF288111	GQ436594	GQ368486
<i>Photinia_villosa</i>				FJ810016

<i>Phyllanthus_glaucus</i>			AY765271	HM106990
<i>Phyllanthus_urinaria</i>			AY765268	AY936735
<i>Picrasma_quassioides</i>		HQ427327	EU043008	GQ434548
<i>Pieris_formosa</i>		U61303	AF124581	EU547690
<i>Pieris_japonica</i>		AB206598	AB206589	EU547692
<i>Pieris_taiwanensis</i>		AB206599	AB206593	
<i>Pinus_massoniana</i>		DQ353716	DQ353732	
<i>Pinus_taiwanensis</i>		AB161016	DQ156493	
<i>Pistacia_chinensis</i>			FN599457	EF193079
<i>Pittosporum_illicioides</i>		HQ427307	HQ427157	
<i>Platycarya_strobilacea</i>		HQ427308	AY263933	AF303808
<i>Pleioblastus_amarus</i>	<i>Arundinaria tecta</i>		EF125165	AJ746179
<i>Podocarpus_macrophyllus</i>			AF228111	AF249616
<i>Podocarpus_nagi</i>	syn. <i>Nageia nagi</i>		AB644449	AB644468
<i>Polygala_arillata</i>				AM234210
<i>Populus_adenopoda</i>	<i>Populus tremula</i>		AJ506086	AJ418827
<i>Pourthiaea_hirsuta</i>				GQ368494
<i>Premna_microphylla</i>		HQ427331	U28883	
<i>Prunus_discoidea</i>				HQ427208
<i>Prunus_mume</i>		JF955822	AF411491	JF978116
<i>Prunus_persica</i>		AF288117	AF411493	JF978127
<i>Prunus_phaeosticta</i>		HQ415272	HQ415089	EU669095
<i>Prunus_salicina</i>			AF411494	AF318725
<i>Prunus_schneideriana</i>		HQ427356	HQ427209	EU370928
<i>Prunus_serrulata</i>		GU363780	AF411487	AF318721
<i>Prunus_spinulosa</i>		HQ427357	AF411503	AF411513
<i>Prunus_undulata</i>				EU669108
<i>Pseudolarix_kaempferi</i>		AB019866	X58782	
<i>Pterocarya_insignis</i>	syn. <i>Pterocarya macroptera</i>			AF303814
<i>Pterocarya_stenoptera</i>		AF118042		AF179587
<i>Pyrus_calleryana</i>			JQ391379	JQ392478
<i>Quercus_acutissima</i>		AB060069	AB060578	AF098428
<i>Quercus_fabri</i>				HE591366
<i>Quercus_myrsinifolia</i>		AB060063	AB060572	AF098414
<i>Quercus_phillyraeoides</i>		HQ427324	AB060573	AY040462



<i>Quercus_serrata</i>		AB060067	AB060576	
<i>Quercus_variabilis</i>		AB060065	AB060574	AY040463
<i>Randia_cochinchinensis</i>	syn. <i>Aidia cochinchinensis</i>	HQ427347	HQ427198	
<i>Rhamnella_franguloides</i>			AJ3900271	AY626454
<i>Rhamnus_crenata</i>		HQ427385	HQ427242	AY626443
<i>Rhamnus_utilis</i>		JF317432	JF317492	
<i>Rhaphiolepis_indica</i>		HQ427352	HQ427203	JQ392494
<i>Rhododendron_fortunei</i>		AF454850	HQ706905	AF393407
<i>Rhododendron_latoucheae</i>		HQ427298	HQ427145	
<i>Rhododendron_mariesii</i>		AF454860	HQ427147	AF297202
<i>Rhododendron_ovatum</i>		U61330	HQ427144	JF978354
<i>Rhododendron_simiarum</i>			HQ706935	HQ707070
<i>Rhododendron_simsii</i>		HQ427299	GQ997829	JF978401
<i>Rhus_chinensis</i>			FN599458	EF682845
<i>Rhus_hypoleuca</i>		HQ427342		
<i>Rosa_bracteata</i>		HM490026		
<i>Rosa_cymosa</i>		AB039317		HM593924
<i>Rosa_henryi</i>		AB039310		AB038454
<i>Rosa_laevigata</i>		AB011997	GU363797	JN407516
<i>Rosa_multiflora</i>		AB039304	GQ436573	HM593923
<i>Rosa_rubus</i>		FJ472525		FJ416660
<i>Rubus_amphidasys</i>				AY083367
<i>Rubus_buengeri</i>				FJ472903
<i>Rubus_chingii</i>		HQ427358	HQ427211	
<i>Rubus_corchorifolius</i>				JF708203
<i>Rubus_coreanus</i>				FJ472906
<i>Rubus_hirsutus</i>		GU363753	GU363792	FJ472891
<i>Rubus_hunanensis</i>				FJ472902
<i>Rubus_irenaeus</i>				EF034131
<i>Rubus_lambertianus</i>				FJ472904
<i>Rubus_parvifolius</i>		AB073699	GU363802	JN407526
<i>Rubus_pungens</i>				FJ472893
<i>Rubus_reflexus</i>		JN407197	JN407362	JN407520
<i>Rubus_swinhoei</i>				EF034143
<i>Rubus_tephrodes</i>				EF034144

<i>Rubus_trianthus</i>				AY083366
<i>Sabia_campanulata</i>			AM183414	
<i>Sabia_japonica</i>		AM396512		
<i>Sabia_swinhoei</i>		GU266603	FJ626616	
<i>Sageretia_thea</i>			AJ2257851	AY626453
<i>Salix_babylonica</i>		AJ849593	FJ788588	
<i>Sambucus_chinensis</i>		JF956210	JF944185	JF978521
<i>Sambucus_williamsii</i>				JN040994
<i>Sapindus_mukorossi</i>			FN599461	
<i>Sapium_discolor</i>	syn. <i>Triadica cochinchinensis</i>	HQ415366	HQ415199	JF733770
<i>Sapium_japonica</i>	syn. <i>Neoshirakia japonica</i>		AY794856	
<i>Sapium_sebifera</i>	syn. <i>Triadica sebifera</i>	GU135113	AY794859	GU441830
<i>Sassafras_tzumu</i>		AF244391	HM019516	GU082375
<i>Schima_superba</i>		AJ429306	Z80208	HM100443
<i>Schoepfia_jasminodora</i>		HQ415321	HQ415146	
<i>Securinega_suffruticosa</i>	<i>Securinega capuronii</i>		AY663621	
<i>Serissa_foetida</i>	syn. <i>Serissa serissoides</i>		Z68822	FJ980385
<i>Skimmia_reevesiana</i>		FN668822	FN599464	
<i>Sloanea_sinensis</i>			HQ427152	
<i>Sorbus_alnifolia</i>	syn. <i>Aria alnifolia</i>	DQ860451		FJ810006
<i>Sorbus_dunnii</i>	syn. <i>Aria dunnii</i>			GQ368505
<i>Sorbus_folgeneri</i>		HQ427359	HQ427212	
<i>Sorbus_hemsleyi</i>				FJ810010
<i>Spiraea_blumei</i>		JQ041791		JQ041773
<i>Spiraea_cantonensis</i>		AF288127		DQ897609
<i>Spiraea_chinensis</i>		JQ041792		JQ041774
<i>Spiraea_japonica</i>				DQ897617
<i>Spiraea_prunifolia</i>		JQ041787		DQ897623
<i>Spiraea_vanhouttei</i>			L11206	U16205
<i>Stachyurus_chinensis</i>		AM396501	JF944501	DQ307102
<i>Stauntonia_hexaphylla</i>		FJ626517	L37922	AY029784
<i>Stephanandra_chinensis</i>		AF288128		AF487153
<i>Stewartia_sinensis</i>		AF380106	AF380061	AY070322
<i>Styrax_calvescens</i>				AF327468
<i>Styrax_dasyanthus</i>		HQ427280	HQ427123	AF327469

<i>Styrax_faberi</i>				AF327484
<i>Styrax_japonicus</i>				AF327465
<i>Styrax_odoratissimus</i>		HQ427282	HQ427125	AF327460
<i>Styrax_suberifolius</i>		HQ427281	HQ427124	AF327493
<i>Styrax_wuyuanensis</i>	added manually to ML tree			
<i>Symplocos_anomala</i>		AY679808	HQ427233	AY336291
<i>Symplocos_chinensis</i>		AY336341		AF396229
<i>Symplocos_heishanensis</i>				AY630642
<i>Symplocos_lancifolia</i>		HQ415339	HQ415167	AB114887
<i>Symplocos_laurina</i>		AY336368		AY336318
<i>Symplocos_oblongifolia</i>	added manually to ML tree			
<i>Symplocos_paniculata</i>		AF440433	Z83139	AY336263
<i>Symplocos_phyllocalyx</i>		AY336357		AY336293
<i>Symplocos_setchuensis</i>		AY336359	HQ427235	AY336294
<i>Symplocos_stellaris</i>		HQ427379	HQ427236	AY336329
<i>Symplocos_sumuntia</i>		HQ427377		AY336322
<i>Syzygium_buxifolium</i>		HQ415314	HQ427244	EF026624
<i>Tarenna_mollissima</i>		HQ415401		
<i>Taxodium_distichum</i>		JQ512482	AF119185	
<i>Taxus_chinensis</i>			AY450856	
<i>Taxus_wallichiana</i>		HM590991	HM591042	
<i>Ternstroemia_gymnanthera</i>		AF380109	AF421106	HM061522
<i>Tilia_endochrysea</i>		HQ427306	HQ427156	
<i>Toona_ciliata</i>				FJ462489
<i>Toona_sinensis</i>		JN680343	JN654542	FJ462490
<i>Torreya_grandis</i>		AF228108	DQ478794	
<i>Toxicodendron_succedaneum</i>		HQ427343	AY510144	FJ945957
<i>Toxicodendron_sylvestre</i>		HQ415319	AY510145	FJ945938
<i>Toxicodendron_trichocarpum</i>			AY510143	FJ945927
<i>Trachycarpus_fortunei</i>		HQ720315	AY012460	
<i>Trema_cannabina</i>	<i>Trema_micrantha</i>	GQ982115	AF062004	AY635571
<i>Tricalysia_dubia</i>	<i>Diplospora_dubia</i>	HQ427350	HQ427201	
<i>Tutcheria_microcarpa</i>		HQ427376	HQ427231	AF456277
<i>Ulmus_parvifolia</i>		AF345321	D86316	
<i>Vaccinium_bracteatum</i>		AB623177	KF569892	

<i>Vaccinium_carlesii</i>			KF569891	
<i>Vaccinium_japonicum</i>	syn. <i>Vaccinium_erythrocarpum</i>	AF419710		AF419781
<i>Vaccinium_mandarimorum</i>	added manually to ML tree			
<i>Vernicia_fordii</i>		GU135095	GU135180	
<i>Vernicia_montana</i>		AB268057	AY794899	
<i>Viburnum_dilatatum</i>		HQ591575	HQ591719	JF979005
<i>Viburnum_erosum</i>		HQ427362	HQ427216	JF979007
<i>Viburnum_fordiæ</i>		JF956802	JF944784	
<i>Viburnum_plicatum</i>		HQ591613	HQ591754	AY265143
<i>Viburnum_propinquum</i>		HQ591614	HQ591755	EF462987
<i>Viburnum_sempervirens</i>		HQ427363	HQ427217	HQ591976
<i>Viburnum_setigerum</i>		EF490251	GQ248708	HQ591977
<i>Viburnum_sympodiale</i>		HQ591630	HQ591770	EF462988
<i>Vitex_negundo</i>		AB284176	JQ322525	FM200123
<i>Weigela_japonica</i>		HQ427364	HQ427218	AF078716
<i>Wikstroemia_indica</i>		HQ415322	HQ415147	
<i>Wikstroemia_monnula</i>			HQ427215	
<i>Xylosma_japonica</i>	syn. <i>Xylosma_congesta</i>	AB233834	AB233938	DQ521290
<i>Zanthoxylum_ailanthoides</i>			FN599470	HM851475
<i>Zanthoxylum_armatum</i>			GQ436751	HM851465
<i>Zanthoxylum_austrosinense</i>				HM851488
<i>Zanthoxylum_simulans</i>		EF489100		HM851466
<i>Zelkova_schneideriana</i>		AF345328		AJ622867
<i>Zelkova_serrata</i>			AF206835	AJ622877

---

Table S4. Age constraints for nodes used to create the ultra-metric tree.

Clade	Node defined by MRCA to	Calibration type	Age [Ma]	Reference
Seed plants	<i>Taxodium distichum</i> - <i>Abutilon theophrasti</i>	max	385	[8]
Gymnosperms	<i>Pseudolarix kaempferi</i> - <i>Taxodium distichum</i>	min	318	[9]
Cupressaceae	<i>Cunninghamia lanceolata</i> - <i>Taxodium distichum</i>	min	90	[10]
Pinaceae	<i>Pseudolarix kaempferi</i> - <i>Pinus massoniana</i>	min	90	[11]
Angiosperms	<i>Pleioblastus amarus</i> - <i>Abutilon theophrasti</i>	max	130	[12,13]
Laurales	<i>Chimonanthus salicifolius</i> - <i>Litsea cubeba</i>	min	108.8	[14]
Eudicots	<i>Holboellia coriacea</i> - <i>Abutilon theophrasti</i>	fixed	125	[15]
Ranunculales	<i>Holboellia coriacea</i> - <i>Mahonia bealei</i>	min	91	[16]
Berberidaceae	<i>Berberis soulieana</i> - <i>Mahonia bealei</i>	min	33.9	[17]
Hamamelidaceae	<i>Liquidambar acalycina</i> - <i>Corylopsis sinensis</i>	min	83.5	[18,19]
Fabales	<i>Polygala arillata</i> - <i>Albizia kalkora</i>	min	60	[20]
Malpighiales	<i>Vernicia fordii</i> - <i>Phyllanthus urinaria</i>	min	89.3	[21]
Salicaceae	<i>Idesia polycarpa</i> - <i>Populus adenopoda</i>	min	48	[22]
Fagales	<i>Quercus serrata</i> - <i>Juglans cathayensis</i>	min	93.5	[23,24,25]
Juglandaceae	<i>Cyclocarya paliurus</i> - <i>Juglans cathayensis</i>	min	55.8	[26]
Rosaceae	<i>Rosa cymosa</i> - <i>Prunus pseudocerasus</i>	min	37.2	[17]
Ulmaceae	<i>Ulmus parvifolia</i> - <i>Zelkova schneideriana</i>	min	33.9	[17]
Rutaceae-Meliaceae	<i>Melia azedarach</i> - <i>Skimmia japonica</i>	min	50	[27]
Myrtales	<i>Melastoma dodecandrum</i> - <i>Syzygium buxifolium</i>	min	60	[28]
Ericales	<i>Actinidia melanandra</i> - <i>Ardisia crenata</i>	min	89.6	[29]
Actinidiaceae (stem node)	<i>Actinidia melanandra</i> - <i>Rhododendron latoucheae</i>	min	77.05	[30]
Cornaceae	<i>Alangium kurzii</i> - <i>Cornus kousa</i>	min	55.8	[17]
Nyssaceae	<i>Camptotheca acuminata</i> - <i>Nyssa sinensis</i>	min	33.9	[17]
Hydrangeaceae	<i>Deutzia glauca</i> - <i>Hydrangea strigosa</i>	min	37.2	[17]
Cornales	<i>Camptotheca acuminata</i> - <i>Cornus kousa</i>	min	89	[30]
Oleaceae	<i>Osmanthus matsumuranus</i> - <i>Fraxinus chinensis</i>	min	33.9	[17]
Dipsacales	<i>Viburnum sympodiale</i> - <i>Lonicera modesta</i>	min	33.9	[31]
Apiales	<i>Pittosporum illicioides</i> - <i>Dendropanax dentiger</i>	min	37.2	[17]

## References

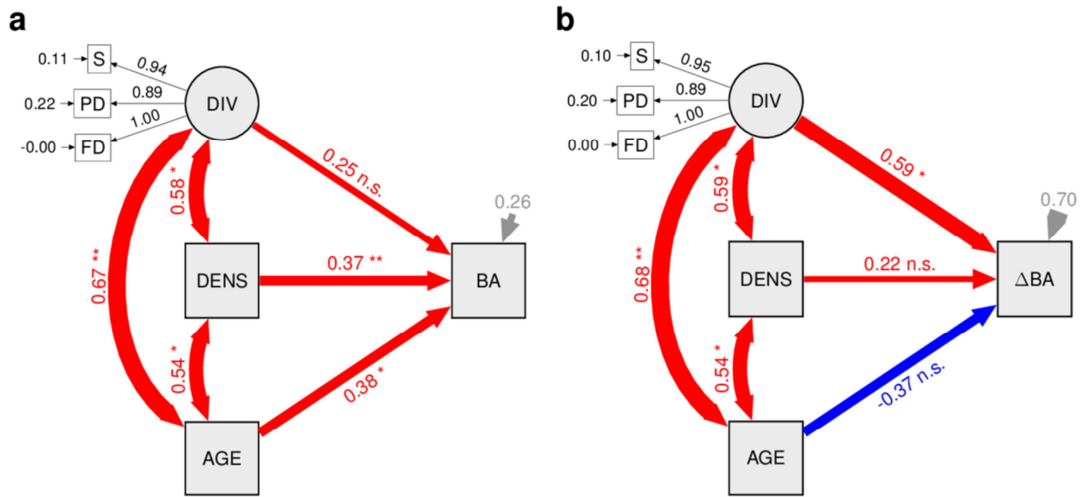
1. Lou LH, Li GY (1998) List of seed plants in Gutianshan.
2. Fazekas AJ, Kuzmina ML, Newmaster SG, Hollingsworth PM (2012) DNA Barcoding Methods for Land Plants In: Kress WJ, Erickson DL, editors. DNA Barcodes: Methods and protocols. New York: Humana Press. pp. 223-252.
3. Katoh K, Misawa K, Kuma Ki, Miyata T (2002) MAFFT: a novel method for rapid multiple sequence alignment based on fast Fourier transform. *Nucleic Acids Research* 30: 3059-3066.
4. Kumar S, Skjaeveland A, Orr R, Enger P, Ruden T, et al. (2009) AIR: A batch-oriented web program package for construction of supermatrices ready for phylogenomic analyses. *BMC Bioinformatics* 10: 357.
5. Guindon S, Gascuel O (2003) A Simple, Fast, and Accurate Algorithm to Estimate Large Phylogenies by Maximum Likelihood. *Syst Biol* 52: 696-704.
6. Posada D, Crandall KA (1998) MODELTEST: testing the model of DNA substitution. *Bioinformatics* 14: 817-818.
7. Sanderson MJ (1997) A nonparametric approach to estimating divergence times in the absence of rate constancy. *Molecular Biology and Evolution* 14: 1218-1231.
8. Gerrienne P, Meyer-Berthaud B, Fairon-Demaret M, StreeL M, Steemans P (2004) Runcaria, a Middle Devonian Seed Plant Precursor. *Science* 306: 856-858.
9. Renner S (2009) Gymnosperms. In: Hedges SB, Kumar S, editors. *The Timetree of Life*. Oxford: Oxford University Press. pp. 157-160.
10. LePage BA (2003) The evolution, biogeography and palaeoecology of the Pinaceae based on fossil and extant representatives. *Acta Horticulturae (ISHS)* 615: 29-52.
11. Gandolfo MA, Nixon KC, Crepet WL (2001) Turonian Pinaceae of the Raritan Formation, New Jersey. *Plant Systematics and Evolution* 226: 187-203.
12. Hughes NF, McDougall AB, Chapman JL (1991) Exceptional new record of Cretaceous Hauterivian angiospermid pollen from Southern England. *Journal of Micropalaeontology* 10: 75-82.
13. Hughes NF, McDougall AB (1987) Records of angiospermid pollen entry into the English early Cretaceous succession. *Review of Palaeobotany and Palynology* 50: 255-272.
14. Crane PR, Friis EM, Pedersen KR (1994) Palaeobotanical evidence on the early radiation of magnoliid angiosperms. *Plant Systematics and Evolution Supplement* 8: 51-72.
15. Hughes NF, McDougall AB (1990) Barremian-Aptian angiospermid pollen records from southern England. *Review of Palaeobotany and Palynology* 65: 145-151.
16. Knobloch E, Mai DH (1986) *Monographie der Früchte und Samen in der Kreide von Mitteleuropa*. Praha. 1-219 p.
17. Manchester SR (1999) Biogeographical relationships of North American tertiary floras. *Annals of the Missouri Botanical Garden* 86: 472-522.
18. Magallon-Puebla S, Herendeen PS, Endress PK (1996) *Allonia decandra*: Floral remains of the tribe *Hamamelideae* (Hamamelidaceae) from Campanian strata of southeastern USA. *Plant Systematics and Evolution* 202: 177-198.
19. Magallón S, Herendeen PS, Crane P (2001) *Androdecidua endressii* gen. et sp. nov., from the Late Cretaceous of Georgia (United States): Further Floral Diversity in Hamamelidoideae (Hamamelidaceae). *International Journal of Plant Sciences* 162: 963-983.

20. Lavin M, Herendeen PS, Wojciechowski MF (2005) Evolutionary rates analysis of Leguminosae implicates a rapid diversification of lineages during the Tertiary. *Systematic Biology* 54: 575-594.
21. Crepet WL, Nixon KC (1998) Fossil Clusiaceae from the Late Cretaceous (Turonian) of New Jersey and implications regarding the history of bee pollination. *American Journal of Botany* 85: 1122-1133.
22. Boucher LD, Manchester SR, Judd WS (2003) An extinct genus of Salicaceae based on twigs with attached flowers, fruits, and foliage from the Eocene Green River Formation of Utah and Colorado, USA. *American Journal of Botany* 90: 1389-1399.
23. Batten DJ (1981) Stratigraphic, palaeogeographic and evolutionary significance of late cretaceous and early tertiary normapolles pollen. *Review of Palaeobotany and Palynology* 35: 125-137.
24. Kedves M (1989) Evolution of the Normapolles complex. In: Crane PR, Blackmore S, editors. *Evolution, Systematics, and Fossil History of the Hamamelidae*, 1-7 Systematics Association Special Volume, vol 40B. Oxford: Clarendon Press.
25. Pacltová B (1966) Pollen grains of angiosperms in the Cenomanian Peruc Formation in Bohemia. *Palaeobotanist* 15: 52-54.
26. Crane PR, Manchester SR, Dilcher DL (1990) A preliminary survey of fossil leaves and well-preserved reproductive structures from the Sentinel Butte Formation (Paleocene) near Almont, North Dakota. *Fieldiana Geology* 20: 1-63.
27. Corbett SL, Manchester SR (2004) Phytogeography and fossil history of *Ailanthus* (Simaroubaceae). *International Journal of Plant Sciences* 165: 671-690.
28. Pigg KB, Stockey RA, Maxwell SL (1993) *Paleomyrtinaea*, a new genus of permineralized myrtaceous fruits and seeds from the Eocene of British Columbia and Paleocene of North Dakota. *Canadian Journal of Botany* 71: 1-9.
29. Nixon KC, Crepet WL (1993) Late Cretaceous fossil flowers of ericalean affinity. *American Journal of Botany* 80: 616-623.
30. Schenk JJ, Hufford L (2010) Effects of substitution models on divergence time estimates: Simulations and an empirical study of model uncertainty using Cornales. *Systematic Botany* 35: 578-592.
31. Manchester SR, Donoghue MJ (1995) Winged fruits of Linnaeae (Caprifoliaceae) in the Tertiary of Western North America: *Diplodipelta* gen. nov. *International Journal of Plant Sciences* 156: 709-722.

Fig. S3. Structural equation models fitting total stem basal area in 2008 (a, c) and the increment of total stem basal area from 2008–2010 (b, d) in dependence of successional age, tree diversity, and tree stem density. In contrast to the path diagrams presented in Fig. 2, these models explore the possibility that variations in tree density occur independently of diversity and successional age. In particular, they do not allow for density-mediated effects of tree diversity on stand-level growth. In the light that studies controlling initial density have shown that this pathway can dominate system-level responses, the true diversity effects may be underestimated in this approach. Nevertheless, size-mediated effects of diversity remained strong and significant for stand-level basal area growth, and marginally significant for stand-level basal area of the canopy tree cohort. The diagrams show standardized path coefficients (red: positive; blue: negative) and associated statistical significances (\*\*\*  $P < 0.001$ ; \*\*  $P < 0.01$ ; \*  $P < 0.05$ ; (\*)  $P < 0.1$ ). Variable abbreviations: S = species richness, PD = phylogenetic diversity, FD = functional diversity, DIV = diversity (latent variable related to previous three), AGE = successional age, DENS = tree density, BA = total stem basal area,  $\Delta$ BA = increment of total stem basal area.



Canopy ( $d \geq 10\text{cm}$ )



Understory ( $3\text{cm} \leq d < 10\text{cm}$ )

