

Supplementary materials:

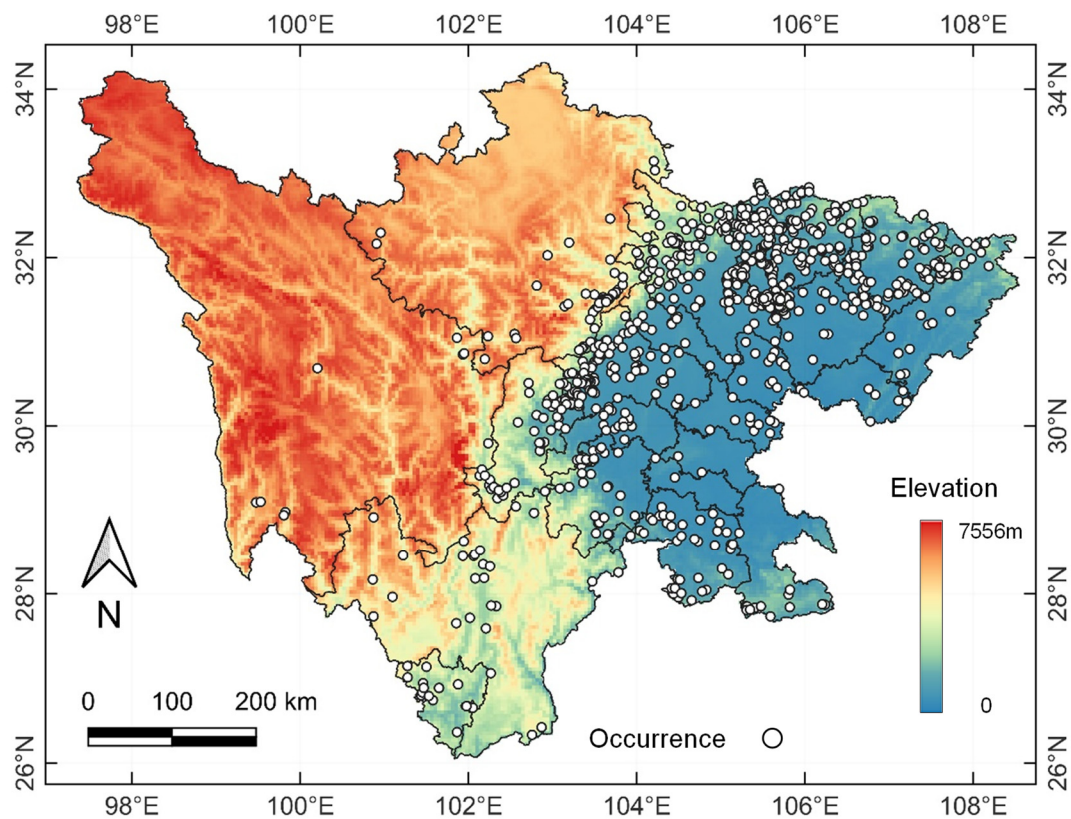


Figure S1. The locations of occurrence records (shown by white dots) of venerable trees in relation to elevation in Sichuan Province, China.

Table S1. Nineteen environmental variables that may predict the geographical distribution of venerable trees in Sichuan.

Bioclimatic variable	Code	Unit	Bioclimatic variable	Code	Unit
Annual mean temperature	Bio 1	°C	Mean temperature of coldest quarter	Bio 11	°C
Mean diurnal range	Bio 2	°C	Annual precipitation	Bio 12	mm
Isothermality (Bio2/Bio7) (×100)	Bio 3	Index	Precipitation of wettest month	Bio 13	mm
Temperature seasonality	Bio 4	Index	Precipitation of driest month	Bio 14	mm
Max temperature of warmest month	Bio 5	°C	Precipitation seasonality	Bio 15	Index
Min temperature of coldest month	Bio 6	°C	Precipitation of wettest quarter	Bio 16	mm
Temperature annual range	Bio 7	°C	Precipitation of driest quarter	Bio 17	mm
Mean temperature of wettest quarter	Bio 8	°C	Precipitation of warmest quarter	Bio 18	mm
Mean temperature of driest quarter	Bio 9	°C	Precipitation of coldest quarter	Bio 19	mm
Mean temperature of warmest quarter	Bio 10	°C			

Table S2. Pearson correlation coefficient matrix of seven chosen environmental variables to predict the geographical distribution of venerable trees in Sichuan.

Variable ^a	bio3	bio7	bio11	bio15	bio16	bio18	bio19
bio3	1.000						
bio7	-0.026	1.000					
bio11	-0.317**	-0.579**	1.000				
bio15	0.272**	-0.200**	0.118**	1.000			
bio16	-0.079**	-0.137**	0.154**	0.041	1.000		
bio18	-0.180**	-0.605**	0.425**	0.443**	0.105**	1.000	
bio19	-0.492**	-0.525**	0.440**	-0.381**	0.076**	0.577**	1.000

^a The meanings of bioclimatic variables can be found in Table S1.

** Denotes that the difference is significant at the 0.01 level.

Table S3. Species composition and importance values of venerable trees in Sichuan, ranked by importance values (IV).

Scientific name	Family	DBH	Count	RD ^a	RA ^a	IV
<i>Cupressus funebris</i>	Cupressaceae	2,665,828	9489	83.972	88.517	172.489
<i>Ginkgo biloba</i>	Ginkgoaceae	98,418	211	3.100	1.968	5.068
<i>Ficus virens</i> var. <i>sublanceolata</i>	Moraceae	105,223	154	3.314	1.437	4.751
<i>Phoebe zhenнан</i>	Lauraceae	54,531	169	1.718	1.576	3.294
<i>Pistacia chinensis</i>	Anacardiaceae	35,169	95	1.108	0.886	1.994
<i>Keteleeria davidiana</i>	Pinaceae	22,987	50	0.724	0.466	1.190
<i>Platycladus orientalis</i>	Cupressaceae	14,364	37	0.452	0.345	0.798
<i>Cinnamomum camphora</i>	Lauraceae	11,098	29	0.350	0.271	0.620
<i>Taxus wallichiana</i> var. <i>chinensis</i>	Taxaceae	10,332	30	0.325	0.280	0.605
<i>Pterocarya stenoptera</i>	Juglandaceae	11,542	22	0.364	0.205	0.569
<i>Juglans regia</i>	Juglandaceae	10,822	19	0.341	0.177	0.518
<i>Gleditsia sinensis</i>	Caesalpiniaceae	6991	24	0.220	0.224	0.444
<i>Melia azedarach</i>	Meliaceae	6017	23	0.190	0.215	0.404
<i>Ormosia hosiei</i>	Papilionaceae	5405	23	0.170	0.215	0.385
<i>Styphnolobium japonicum</i>	Papilionaceae	7142	17	0.225	0.159	0.384
<i>Cyclobalanopsis glauca</i>	Fagaceae	6208	18	0.196	0.168	0.363
<i>Liquidambar formosana</i>	Hamamelidaceae	6113	16	0.193	0.149	0.342
<i>Ligustrum lucidum</i>	Oleaceae	4468	12	0.141	0.112	0.253
<i>Podocarpus macrophyllus</i>	Podocarpaceae	3591	14	0.113	0.131	0.244
<i>Xylosma congesta</i>	Flacourtiaceae	3412	14	0.107	0.131	0.238
<i>Lagerstroemia indica</i>	Lythraceae	2568	12	0.081	0.112	0.193
<i>Litchi chinensis</i>	Sapindaceae	2829	10	0.089	0.093	0.182
<i>Emmenopterys henryi</i>	Rubiaceae	3866	5	0.122	0.047	0.168
<i>Osmanthus fragrans</i>	Oleaceae	1855	11	0.058	0.103	0.161
<i>Acer oblongum</i>	Aceraceae	2309	9	0.073	0.084	0.157
<i>Cycas revoluta</i>	Cycadaceae	2372	8	0.075	0.075	0.149
<i>Pinus massoniana</i>	Pinaceae	1942	8	0.061	0.075	0.136
<i>Pistacia weinmanniifolia</i>	Anacardiaceae	2081	7	0.066	0.065	0.131
<i>Keteleeria evelyniana</i>	Pinaceae	2290	5	0.072	0.047	0.119
<i>Choerospondias axillaris</i>	Anacardiaceae	2495	4	0.079	0.037	0.116
<i>Cunninghamia lanceolata</i>	Taxodiaceae	1994	5	0.063	0.047	0.109
<i>Machilus nanmu</i>	Lauraceae	1570	6	0.049	0.056	0.105
<i>Bombax ceiba</i>	Bombacaceae	2196	3	0.069	0.028	0.097
<i>Camellia sinensis</i>	Theaceae	321	9	0.010	0.084	0.094
<i>Juniperus chinensis</i>	Cupressaceae	1463	5	0.046	0.047	0.093
<i>Meliosma veitchiorum</i>	Sabiaceae	2330	2	0.073	0.019	0.092
<i>Cupressus chengiana</i>	Cupressaceae	1568	4	0.049	0.037	0.087
<i>Michelia wilsonii</i>	Lauraceae	1557	4	0.049	0.037	0.086
<i>Populus davidiana</i>	Salicaceae	1547	4	0.049	0.037	0.086
<i>Tilia tuan</i>	Tiliaceae	2104	2	0.066	0.019	0.085
<i>Quercus semecarpifolia</i>	Fagaceae	1585	3	0.050	0.028	0.078
<i>Quercus acutissima</i>	Fagaceae	1282	4	0.040	0.037	0.078
<i>Lindera megaphylla</i>	Lauraceae	1387	3	0.044	0.028	0.072
<i>Picea asperata</i>	Pinaceae	1356	3	0.043	0.028	0.071
<i>Pinus bungeana</i>	Pinaceae	1020	4	0.032	0.037	0.069
<i>Diospyros nigrocortex</i>	Ebenaceae	1300	3	0.041	0.028	0.069
<i>Populus tomentosa</i>	Salicaceae	1350	2	0.043	0.019	0.061
<i>Castanopsis platyacantha</i>	Fagaceae	946	3	0.030	0.028	0.058

<i>Abies fabri</i>	Pinaceae	852	3	0.027	0.028	0.055
<i>Tsuga dumosa</i>	Pinaceae	1130	2	0.036	0.019	0.054
<i>Tsuga chinensis</i>	Pinaceae	818	3	0.026	0.028	0.054
<i>Lagerstroemia excelsa</i>	Lythraceae	767	3	0.024	0.028	0.052
<i>Kalopanax septemlobus</i>	Araliaceae	1002	2	0.032	0.019	0.050
<i>Litsea coreana</i> var. <i>lanuginosa</i>	Lauraceae	624	3	0.020	0.028	0.048
<i>Ehretia dicksonii</i>	Boraginaceae	885	2	0.028	0.019	0.047
<i>Camellia gymnogyna</i>	Theaceae	587	3	0.018	0.028	0.046
<i>Pseudotsuga sinensis</i>	Pinaceae	848	2	0.027	0.019	0.045
<i>Ficus religiosa</i>	Moraceae	535	3	0.017	0.028	0.045
<i>Ziziphus jujuba</i> var. <i>spinosa</i>	Rhamnaceae	816	2	0.026	0.019	0.044
<i>Juniperus saltuaria</i>	Cupressaceae	785	2	0.025	0.019	0.043
<i>Celtis sinensis</i>	Ulmaceae	681	2	0.021	0.019	0.040
<i>Populus cathayana</i>	Salicaceae	950	1	0.030	0.009	0.039
<i>Cinnamomum longepaniculatum</i>	Lauraceae	625	2	0.020	0.019	0.038
<i>Acer pictum</i> subsp. <i>mono</i>	Aceraceae	614	2	0.019	0.019	0.038
<i>Quercus variabilis</i>	Fagaceae	603	2	0.019	0.019	0.038
<i>Cyclobalanopsis gracilis</i>	Fagaceae	288	3	0.009	0.028	0.037
<i>Vitex negundo</i>	Verbenaceae	554	2	0.017	0.019	0.036
<i>Radermachera microcalyx</i>	Bignoniaceae	541	2	0.017	0.019	0.036
<i>Cupressus duclouxiana</i>	Cupressaceae	540	2	0.017	0.019	0.036
<i>Quercus spinosa</i>	Fagaceae	512	2	0.016	0.019	0.035
<i>Engelhardia roxburghiana</i>	Juglandaceae	785	1	0.025	0.009	0.034
<i>Ormosia yaanensis</i>	Papilionaceae	785	1	0.025	0.009	0.034
<i>Acer buergerianum</i>	Aceraceae	487	2	0.015	0.019	0.034
<i>Morus australis</i>	Moraceae	760	1	0.024	0.009	0.033
<i>Lindera aggregata</i>	Lauraceae	442	2	0.014	0.019	0.033
<i>Cercis chinensis</i>	Caesalpiniaceae	439	2	0.014	0.019	0.032
<i>Meliosma alba</i>	Sabiaceae	637	1	0.020	0.009	0.029
<i>Acer flabellatum</i>	Aceraceae	584	1	0.018	0.009	0.028
<i>Juniperus squamata</i>	Cupressaceae	565	1	0.018	0.009	0.027
<i>Populus alba</i>	Salicaceae	540	1	0.017	0.009	0.026
<i>Bischofia polycarpa</i>	Euphorbiaceae	502	1	0.016	0.009	0.025
<i>Yulania liliiflora</i>	Magnoliaceae	495	1	0.016	0.009	0.025
<i>Ailanthus altissima</i>	Simaroubaceae	480	1	0.015	0.009	0.024
<i>Diospyros kaki</i>	Ebenaceae	480	1	0.015	0.009	0.024
<i>Sorbus pohuashanensis</i>	Rosaceae	480	1	0.015	0.009	0.024
<i>Photinia glomerata</i>	Rosaceae	452	1	0.014	0.009	0.024
<i>Laurocerasus zippeliana</i>	Rosaceae	408	1	0.013	0.009	0.022
<i>Lithocarpus confinis</i>	Fagaceae	408	1	0.013	0.009	0.022
<i>Aidia canthioides</i>	Rubiaceae	404	1	0.013	0.009	0.022
<i>Celtis biondii</i>	Ulmaceae	399	1	0.013	0.009	0.022
<i>Castanea mollissima</i>	Fagaceae	393	1	0.012	0.009	0.022
<i>Quercus acrodonta</i>	Fagaceae	380	1	0.012	0.009	0.021
<i>Albizia kalkora</i>	Mimosaceae	377	1	0.012	0.009	0.021
<i>Buxus sinica</i>	Buxaceae	377	1	0.012	0.009	0.021
<i>Dalbergia hupeana</i>	Papilionaceae	360	1	0.011	0.009	0.021
<i>Elaeocarpus japonicus</i>	Elaeocarpaceae	330	1	0.010	0.009	0.020
<i>Morus macroura</i>	Moraceae	316	1	0.010	0.009	0.019
<i>Rosa chinensis</i>	Rosaceae	308	1	0.010	0.009	0.019
<i>Beilschmiedia delicata</i>	Lauraceae	304	1	0.010	0.009	0.019
<i>Sloanea sinensis</i>	Elaeocarpaceae	301	1	0.009	0.009	0.019
<i>Yulania dawsoniana</i>	Magnoliaceae	298	1	0.009	0.009	0.019

<i>Pinus yunnanensis</i>	Pinaceae	289	1	0.009	0.009	0.018
<i>Pyrus betulifolia</i>	Rosaceae	260	1	0.008	0.009	0.018
<i>Quercus mongolica</i>	Fagaceae	242	1	0.008	0.009	0.017
<i>Crataegus pinnatifida</i>	Rosaceae	229	1	0.007	0.009	0.017
<i>Michelia martini</i>	Magnoliaceae	226	1	0.007	0.009	0.016
<i>Morus alba</i>	Moraceae	220	1	0.007	0.009	0.016
<i>Ulmus parvifolia</i>	Ulmaceae	207	1	0.007	0.009	0.016
<i>Wisteria sinensis</i>	Papilionaceae	206	1	0.006	0.009	0.016
<i>Quercus aquifolioides</i>	Fagaceae	204	1	0.006	0.009	0.016
<i>Ziziphus jujuba</i>	Rhamnaceae	200	1	0.006	0.009	0.016
<i>Idesia polycarpa</i> var. <i>vestita</i>	Flacourtiaceae	165	1	0.005	0.009	0.015
<i>Cinnamomum japonicum</i>	Lauraceae	160	1	0.005	0.009	0.014
<i>Cercidiphyllum japonicum</i>	Cercidiphyllaceae	143	1	0.005	0.009	0.014
<i>Castanea henryi</i>	Fagaceae	138	1	0.004	0.009	0.014
<i>Myrica rubra</i>	Myricaceae	138	1	0.004	0.009	0.014
<i>Camellia japonica</i>	Theaceae	110	1	0.003	0.009	0.013
<i>Diospyros oleifera</i>	Ebenaceae	102	1	0.003	0.009	0.013
<i>Armeniaca mume</i>	Rosaceae	100	1	0.003	0.009	0.012
<i>Amygdalus persica</i>	Rosaceae	95	1	0.003	0.009	0.012
<i>Morus mongolica</i>	Moraceae	88	1	0.003	0.009	0.012
<i>Diospyros armata</i>	Ebenaceae	79	1	0.002	0.009	0.012
<i>Koilodepas hainanense</i>	Euphorbiaceae	65	1	0.002	0.009	0.011
Total		3,174,644	10,720	100.000	100.000	200.000

^a RD denotes relative dominance, and RA relative abundance.

Table S4. Predicted suitable habitats for venerable trees in Sichuan under current and future climate scenarios.

Suitability category	Predicted area (x 10 ⁴ km ²)		Area change (x 10 ⁴ km ²)	Change ratio (%)
	Current	Future		
Excellent		12,579	18	0.15
Very high	57,398	67,856	10,458	18.22
High	74,495	78,184	3689	4.95
Medium	52,455	51,865	-590	-1.13
Low	130,750	117,618	-13,132	-10.04
Not suitable	158,342	157,899	-443	-0.28