

Table S1 species information

Number	Species	Family	Genus	Accession Number
1	<i>Ulmus parvifolia</i>	Ulmaceae	<i>Ulmus</i>	This study
2	<i>Ulmus lamellosa</i>	Ulmaceae	<i>Ulmus</i>	This study
3	<i>Ulmus pumila</i> 'zhonghuaajinye'	Ulmaceae	<i>Ulmus</i>	This study
4	<i>Ulmus castaneifolia</i>	Ulmaceae	<i>Ulmus</i>	This study
5	<i>Hemiptelea davidii</i>	Ulmaceae	<i>Hemiptelea</i>	This study
6	<i>Ulmus glabra</i>	Ulmaceae	<i>Ulmus</i>	Unpublished
7	<i>Ulmus bergmanniana</i>	Ulmaceae	<i>Ulmus</i>	Unpublished
8	<i>Ulmus pumila</i>	Ulmaceae	<i>Ulmus</i>	NC_032721
9	<i>Ulmus americana</i>	Ulmaceae	<i>Ulmus</i>	NC_044473
10	<i>Ulmus elongate</i>	Ulmaceae	<i>Ulmus</i>	NC_046061
11	<i>Ulmus gaussenii</i>	Ulmaceae	<i>Ulmus</i>	NC_037840
12	<i>Ulmus laciniata</i>	Ulmaceae	<i>Ulmus</i>	NC_032719
13	<i>Ulmus macrocarpa</i>	Ulmaceae	<i>Ulmus</i>	NC_032720
14	<i>Ulmus chenmouii</i>	Ulmaceae	<i>Ulmus</i>	NC_037758
15	<i>Ulmus davidiana</i>	Ulmaceae	<i>Ulmus</i>	NC_032718
16	<i>Ulmus lanceaefolia</i>	Ulmaceae	<i>Ulmus</i>	NC_058620
17	<i>Aphananthe aspera</i>	Ulmaceae	<i>Aphananthe</i>	NC_039726
18	<i>Celtis biondii</i>	Ulmaceae	<i>Celtis</i>	NC_039727
19	<i>Gironniera subaequalis</i>	Ulmaceae	<i>Gironniera</i>	NC_039729
20	<i>Pteroceltis tatarinowii</i>	Ulmaceae	<i>Pteroceltis</i>	NC_039733
21	<i>Trema orientalis</i>	Ulmaceae	<i>Trema</i>	NC_039734
22	<i>Zelkova schneideriana</i>	Ulmaceae	<i>Zelkova</i>	NC_041074
23	<i>Zelkova serrata</i>	Ulmaceae	<i>Zelkova</i>	NC_040958

Table S2 The potential positive selection test based on the branch-site model

No.	Genes	Null hypothesis			Alternative hypothesis			Significance test	
		lnL	df	omega (w = 1)	lnL	df	omega (w > 1)	BEB	LRT_P-value
1	<i>accD</i>	-3874.117971	48	1	-3874.117952	49	1		0.99508154
2	<i>atpA</i>	-3044.791429	48	1	-3044.724017	49	1		0.713481864
3	<i>atpB</i>	-2864.816249	48	1	-2864.81626	49	2.46714		1
4	<i>atpE</i>	-844.361015	48	1	-844.361015	49	1.98765		1
5	<i>atpF</i>	-1356.634249	48	1	-1356.634251	49	1.69819		1
6	<i>atpH</i>	-475.6739	48	1	-475.673884	49	1		0.995486507
7	<i>atpI</i>	-1473.108736	48	1	-1473.108743	49	1.60162		1
8	<i>ccsA</i>	-2544.054903	48	1	-2544.054909	49	1		1
9	<i>cemA</i>	-1686.140457	48	1	-1686.140477	49	2.37918		1
10	<i>clpP</i>	-1252.029962	48	1	-1252.029962	49	1		1
11	<i>matK</i>	-4483.327829	48	1	-4483.327747	49	1		0.989782371
12	<i>ndhA</i>	-2387.920139	48	1	-2387.920145	49	2.34564		1
13	<i>ndhB</i>	-2137.375866	48	1	-2137.37587	49	2.04795		1
14	<i>ndhD</i>	-4236.652012	48	1	-4236.65216	49	5.60728		1
15	<i>ndhE</i>	-586.649861	48	1	-586.649861	49	1		1
16	<i>ndhF</i>	-6427.359057	48	1	-6427.359057	49	1		1
17	<i>ndhG</i>	-1336.095405	48	1	-1336.095396	49	1		0.996614873
18	<i>ndhH</i>	-2575.267307	48	1	-2575.267323	49	1.51179		1
19	<i>ndhI</i>	-1074.541696	48	1	-1074.541697	49	1.97447		1
20	<i>ndhJ</i>	-983.505982	48	1	-983.505986	49	1.63901		1
21	<i>ndhK</i>	-1502.513198	48	1	-1502.513198	49	1		1
22	<i>petA</i>	-2255.731352	48	1	-2255.731342	49	1		0.996431764
23	<i>petB</i>	-1233.618713	48	1	-1233.61869	49	1		0.994588525
24	<i>petD</i>	-943.679775	48	1	-943.679775	49	5.21947		1
25	<i>petG</i>	-198.330603	48	1	-198.330603	49	2.42736		1
26	<i>petL</i>	-198.375811	48	1	-198.375811	49	1		1
27	<i>petN</i>	-168.959407	48	1	-168.959407	49	1		1
28	<i>psaA</i>	-4169.025102	48	1	-4169.025137	49	2.29811		1
29	<i>psaB</i>	-4010.413208	48	1	-4010.413285	49	1.09444		1
30	<i>psaC</i>	-423.002257	48	1	-423.002257	49	2.02226		1
31	<i>psaI</i>	-211.093876	48	1	-211.093876	49	1		1
32	<i>psaJ</i>	-277.698808	48	1	-277.698808	49	1.6791		1
33	<i>psbA</i>	-2282.33528	48	1	-2282.335271	49	1		0.996614873
34	<i>psbB</i>	-2997.91126	48	1	-2997.911283	49	1		1

35	<i>rps19</i>	-412.644098	48	1	-412.644099	49	1	1
36	<i>rps2</i>	-1432.587016	48	1	-1432.587046	49	1.80093	1
37	<i>rps3</i>	-1643.233959	48	1	-1643.233967	49	2.26806	1
38	<i>rps4</i>	-1316.585727	48	1	-1316.585723	49	1.09787	0.997743245
39	<i>rps7</i>	-682.658149	48	1	-682.658149	49	2.21764	1
40	<i>rps8</i>	-1022.087003	48	1	-1022.087003	49	1.8015	1
41	<i>rps18</i>	-597.085368	48	1	-597.085367	49	2.264	0.998871621
42	<i>ycf1</i>	-19016.8542	48	1	-19016.85486	49	1	1
43	<i>ycf2</i>	-11470.53597	48	1	-11470.536	49	1.75119	1
44	<i>ycf3</i>	-1013.486751	48	1	-1013.486754	49	2.08366	1
45	<i>ycf4</i>	-1296.721459	48	1	-1295.122438	49	1	0.073726488

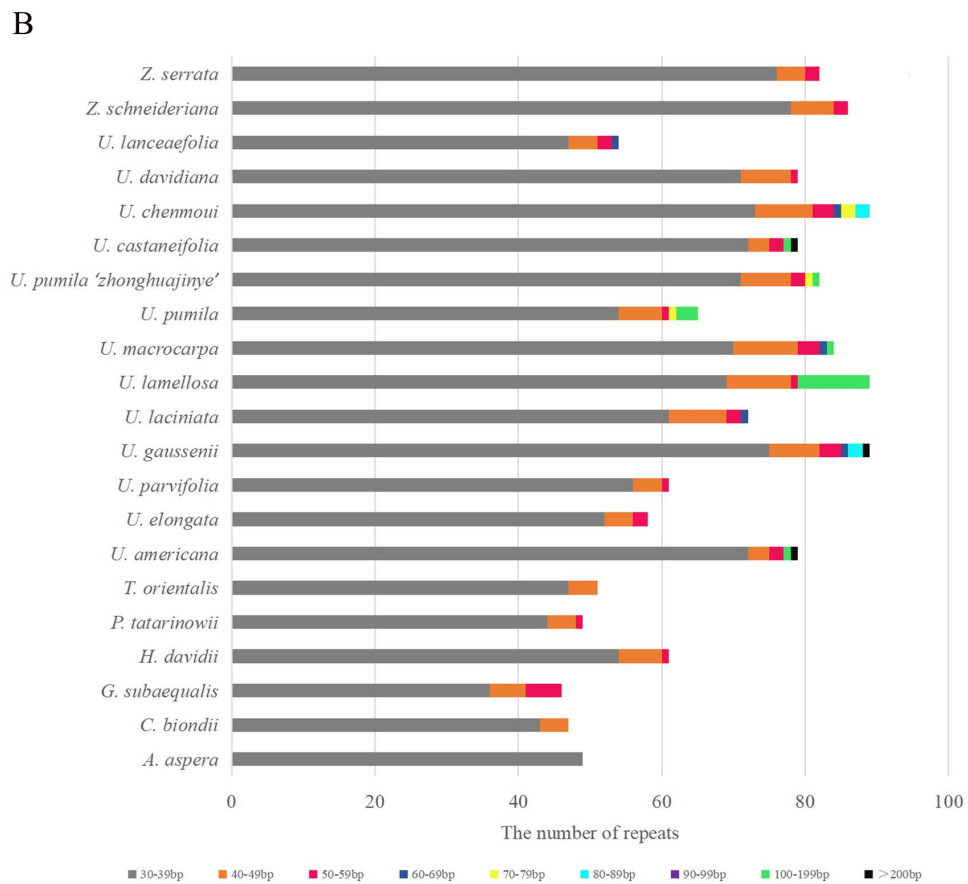
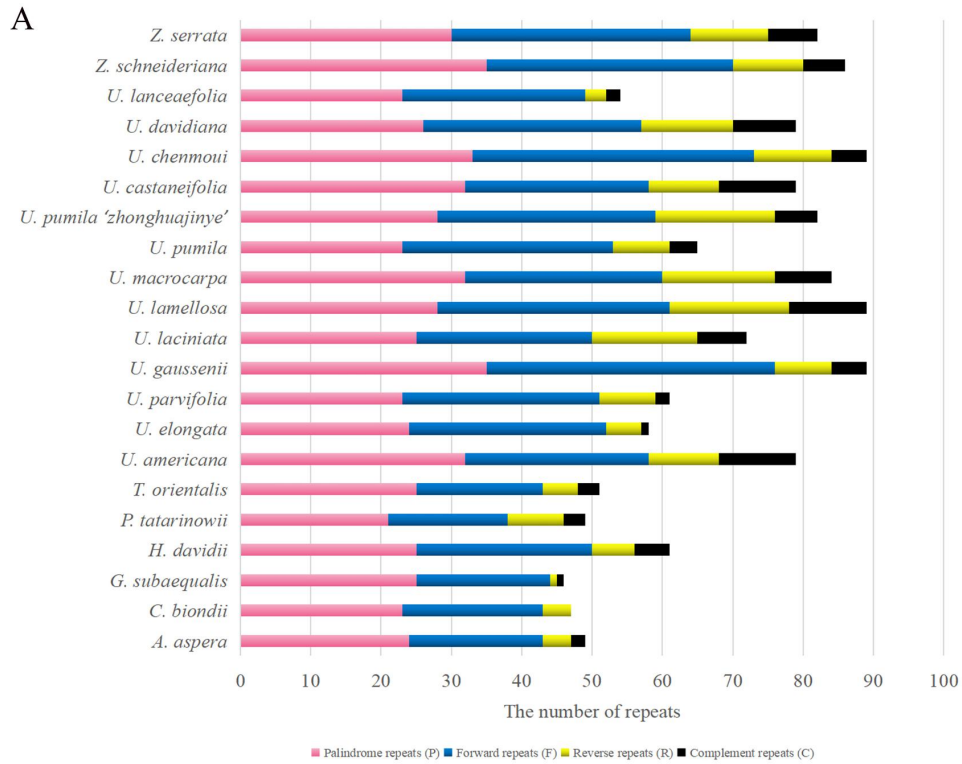


Figure S1. Analysis of repeats in 21 Ulmaceae species chloroplast genomes, (A) Number of Palindromic repeat, Direct repeat, Reverse repeat, Complement repeat; (B) Number of tandem repeats in different lengths.