

Table S4 Dataset partition with best-fitting model of molecular evolution (Modelfinder) for ML analyses.

Partition	Best Model	Genes
1	F81+F	<i>rpl23</i> (3rd pos), <i>ndhE</i> (2nd pos), <i>psaI</i> (2nd pos)
2	F81+F+G4	<i>rps11</i> (1st pos), <i>atpE</i> (1st pos), <i>atpF</i> (1st pos)
3	F81+F+I	<i>rps7</i> (1st pos), <i>rpl23</i> (1st pos), <i>psbD</i> (2nd pos)
4	GTR+F	<i>rps4</i> (3rd pos)
5	GTR+F+G4	<i>ycf1</i> (3rd pos), <i>rps14</i> (3rd pos), <i>atpE</i> (3rd pos)
6	GTR+F+I+R2	<i>rpoC2</i> (3rd pos), <i>ccsA</i> (2nd pos), <i>rpoB</i> (3rd pos)
7	HKY+F+G4	<i>rps12</i> (3rd pos), <i>rpl20</i> (1st pos)
8	HKY+F+I	<i>atpB</i> (2nd pos), <i>atpI</i> (2nd pos), <i>petD</i> (2nd pos), <i>psbL</i> (2nd pos), <i>psbZ</i> (2nd pos)
9	HKY+F+I+G4	<i>rbcL</i> (1st pos)
10	HKY+F+I+R2	<i>psbA</i> (3rd pos)
11	HKY+F+R2	<i>rps16</i> (3rd pos), <i>atpA</i> (2nd pos), <i>petA</i> (1st pos), <i>psbA</i> (1st pos), <i>psbE</i> (3rd pos), <i>psbH</i> (1st pos)
12	JC	<i>rpl2</i> (2nd pos), <i>rpl36</i> (1st pos), <i>rpl36</i> (2nd pos), <i>atpH</i> (2nd pos), <i>petG</i> (1st pos), <i>petN</i> (1st pos), <i>petN</i> (2nd pos), <i>psbE</i> (2nd pos), <i>psbF</i> (2nd pos), <i>psbI</i> (2nd pos), <i>psbJ</i> (2nd pos), <i>psbL</i> (1st pos), <i>psbN</i> (2nd pos)
13	JC+G4	<i>rps11</i> (2nd pos), <i>rpl22</i> (2nd pos)
14	JC+I	<i>rps7</i> (2nd pos), <i>rps12</i> (1st pos), <i>rpl16</i> (2nd pos), <i>clpP</i> (2nd pos), <i>psaB</i> (2nd pos), <i>psaC</i> (1st pos), <i>psaC</i> (2nd pos), <i>psaJ</i> (2nd pos), <i>psbN</i> (1st pos), <i>rbcL</i> (2nd pos)
15	K2P	<i>petG</i> (3rd pos), <i>petL</i> (1st pos), <i>psaJ</i> (1st pos), <i>psbA</i> (2nd pos)
16	K2P+G4	<i>rps14</i> (2nd pos), <i>rps16</i> (1st pos)
17	K2P+I	<i>rps2</i> (2nd pos), <i>ycf3</i> (2nd pos), <i>rps12</i> (2nd pos), <i>rps16</i> (2nd pos), <i>rps18</i> (2nd pos), <i>rpl23</i> (2nd pos), <i>atpE</i> (2nd pos), <i>atpI</i> (1st pos), <i>petD</i> (1st pos), <i>petG</i> (2nd pos), <i>psbB</i> (2nd pos), <i>psbE</i> (1st pos), <i>psbF</i> (1st pos), <i>psbK</i> (1st pos), <i>psbZ</i> (1st pos)
18	K2P+R2	<i>rpl20</i> (2nd pos), <i>petB</i> (1st pos)
19	K3P	<i>psbL</i> (3rd pos)
20	K3P+G4	<i>rpl32</i> (1st pos), <i>rpl33</i> (2nd pos), <i>rpl33</i> (3rd pos)
21	K3P+I	<i>rps19</i> (1st pos), <i>psaA</i> (1st pos)
22	K3P+R2	<i>psbC</i> (2nd pos)
23	K3Pu+F	<i>psaI</i> (3rd pos), <i>psbI</i> (3rd pos)
24	K3Pu+F+G4	<i>rpl2</i> (3rd pos), <i>ycf3</i> (3rd pos), <i>rps4</i> (2nd pos), <i>ycf4</i> (2nd pos), <i>rps7</i> (3rd pos), <i>rpl16</i> (3rd pos), <i>rps18</i> (1st pos), <i>psbZ</i> (3rd pos)
25	K3Pu+F+I	<i>rpl2</i> (1st pos), <i>rps3</i> (1st pos), <i>accD</i> (2nd pos), <i>atpH</i> (1st pos), <i>psbD</i> (1st pos)
26	K3Pu+F+R2	<i>atpA</i> (1st pos), <i>cemA</i> (1st pos), <i>psbB</i> (1st pos)
27	TIM+F+G4	<i>rps2</i> (1st pos), <i>petL</i> (3rd pos)
28	TIM+F+I	<i>psbC</i> (1st pos)
29	TIM2e+I	<i>rps8</i> (2nd pos), <i>psbM</i> (1st pos)

Partition	Best Model	Genes
30	TIM3+F+G4	<i>rpl32</i> (3rd pos)
31	TIM3+F+I	<i>psbM</i> (2nd pos)
32	TIM3+F+R2	<i>psaC</i> (3rd pos), <i>psbH</i> (3rd pos)
33	TIM3e+G4	<i>psbH</i> (2nd pos)
34	TIME+I	<i>rpl14</i> (2nd pos)
35	TN+F	<i>petL</i> (2nd pos)
36	TN+F+R2	<i>rps19</i> (2nd pos)
37	TNe	<i>psbI</i> (1st pos)
38	TNe+G4	<i>rps15</i> (1st pos)
39	TNe+R2	<i>rpl32</i> (2nd pos), <i>psbJ</i> (1st pos)
40	TPM2u+F	<i>clpP</i> (1st pos)
41	TPM2u+F+G4	<i>rps18</i> (3rd pos), <i>cemA</i> (2nd pos), <i>rpoA</i> (2nd pos)
42	TPM2u+F+I	<i>petB</i> (2nd pos)
43	TPM2u+F+R2	<i>rpl16</i> (1st pos)
44	TPM3	<i>ycf3</i> (1st pos), <i>psaJ</i> (3rd pos)
45	TPM3+G4	<i>rps14</i> (1st pos), <i>petN</i> (3rd pos), <i>rpoA</i> (1st pos)
46	TPM3+I	<i>rps4</i> (1st pos), <i>psaB</i> (1st pos), <i>psbN</i> (3rd pos), <i>psbT</i> (1st pos), <i>psbT</i> (2nd pos)
47	TPM3+I+I+R2	<i>ndhE</i> (1st pos)
48	TPM3u+F	<i>rpl33</i> (1st pos), <i>psbK</i> (3rd pos)
49	TPM3u+F+G4	<i>rpoC1</i> (2nd pos), <i>rps3</i> (2nd pos), <i>rps11</i> (3rd pos), <i>rps15</i> (2nd pos), <i>rps15</i> (3rd pos), <i>atpH</i> (3rd pos), <i>psbM</i> (3rd pos), <i>psbT</i> (3rd pos)
50	TPM3u+F+I	<i>rpl20</i> (3rd pos), <i>rpl36</i> (3rd pos), <i>accD</i> (1st pos), <i>petA</i> (2nd pos), <i>psbJ</i> (3rd pos), <i>psbK</i> (2nd pos)
51	TPM3u+F+I+I+R3	<i>atpB</i> (1st pos)
52	TPM3u+F+R2	<i>rpl14</i> (1st pos), <i>psaA</i> (2nd pos), <i>rpoB</i> (1st pos), <i>rpoB</i> (2nd pos) <i>rpoC1</i> (3rd pos), <i>ycf1</i> (1st pos), <i>ycf1</i> (2nd pos), <i>rps2</i> (3rd pos), <i>rps3</i> (3rd pos), <i>rps8</i> (1st pos), <i>rps8</i> (3rd pos), <i>rpl14</i> (3rd pos), <i>rpl22</i> (1st pos), <i>rpl22</i> (3rd pos), <i>accD</i> (3rd pos), <i>atpB</i> (3rd pos),
53	TVM+F+G4	<i>atpF</i> (3rd pos), <i>cemA</i> (3rd pos), <i>clpP</i> (3rd pos), <i>matK</i> (1st pos), <i>matK</i> (3rd pos), <i>ndhE</i> (3rd pos), <i>petA</i> (3rd pos), <i>petB</i> (3rd pos), <i>petD</i> (3rd pos), <i>psaA</i> (3rd pos), <i>psbB</i> (3rd pos), <i>psbD</i> (3rd pos), <i>rbcl</i> (3rd pos), <i>rpoA</i> (3rd pos)
54	TVM+F+I	<i>rps19</i> (3rd pos), <i>ccsA</i> (1st pos)
55	TVM+F+I+I+R2	<i>rpoC2</i> (2nd pos), <i>atpA</i> (3rd pos), <i>atpF</i> (2nd pos), <i>atpI</i> (3rd pos), <i>ccsA</i> (3rd pos), <i>matK</i> (2nd pos), <i>psaB</i> (3rd pos)
56	TVM+F+R2	<i>rpoC2</i> (1st pos), <i>ycf2</i> (1st pos), <i>ycf2</i> (2nd pos), <i>ycf2</i> (3rd pos), <i>ycf4</i> (3rd pos), <i>psbC</i> (3rd pos)
57	TVMe+G4	<i>rpoC1</i> (1st pos), <i>ycf4</i> (1st pos), <i>psaI</i> (1st pos), <i>psbF</i> (3rd pos)