

Supplementary Information

Table S1. The list of *4CL* genes characterized in five species.

Species	Gene name	Gene ID	Length of protein (aa)	Number of intron
<i>Arabidopsis thaliana</i> (At)				
Class I	<i>4CL1</i>	At1g51680	561	3
	<i>4CL2</i>	At3g21240	556	3
	<i>4CL4</i>	At3g21230	570	4
Class II	<i>4CL3</i>	At1g65060	561	6
Class 4CL likes	<i>4CL5</i>	At1g20510	546	3
	<i>4CL6</i>	At1g20500	550	4
	<i>4CL7</i>	At1g20490	447	1
	<i>4CL8</i>	At1g20480	565	4
	<i>4CL9</i>	At1g62940	542	5
	<i>4CL10</i>	At4g19010	566	5
	<i>4CL11</i>	At4g05160	544	5
	<i>4CL12</i>	At5g63380	562	5
	<i>4CL13</i>	At5g38120	550	4
<i>Populus euphratica</i> (Peu)				
Class I	<i>4CL1</i>	CCG029167.1	417	1
	<i>4CL2</i>	CCG032591.1	540	4
	<i>4CL4</i>	CCG031380.1	544	4
	<i>4CL6</i>	CCG005472.1	556	4
Class II	<i>4CL3</i>	CCG021432.1	560	5
Class 4CL likes	<i>4CL5</i>	CCG029325.1	554	4
	<i>4CL7</i>	CCG005977.1	524	3
	<i>4CL8</i>	CCG012691.1	596	3
	<i>4CL9</i>	CCG011911.1	545	5
	<i>4CL10</i>	CCG024728.1	554	5
	<i>4CL11</i>	CCG001141.1	543	5
	<i>4CL12</i>	CCG033354.1	757	7
	<i>4CL13</i>	CCG015470.1	543	5
	<i>4CL14</i>	CCG016610.1	567	3
	<i>4CL15</i>	CCG029088.1	546	5
	<i>4CL16</i>	CCG033353.1	687	9
	<i>4CL17</i>	CCG012530.1	501	6
	<i>4CL18</i>	CCG031826.1	552	5
	<i>4CL19</i>	CCG024486.1	522	3
	<i>4CL20</i>	CCG028829.1	554	4

Table S1. Cont.

Species	Gene name	Gene ID	Length of protein (aa)	Number of intron
<i>Populus pruinosa</i> (Ppr)				
Class I	<i>4CL1</i>	PPR016303.1	534	5
	<i>4CL2</i>	PPR029403.1	540	4
	<i>4CL4</i>	PPR026307.1	544	4
	<i>4CL6</i>	PPR009676.1	556	4
Class II	<i>4CL3</i>	PPR023820.1	543	4
Class 4CL likes	<i>4CL5</i>	PPR030299.1	554	4
	<i>4CL7</i>	PPR005839.1	501	3
	<i>4CL8</i>	PPR010421.1	583	3
	<i>4CL9</i>	PPR030819.1	545	5
	<i>4CL10</i>	PPR001615.1	431	1
	<i>4CL11</i>	PPR021586.1	543	5
	<i>4CL12</i>	PPR021750.3	550	5
	<i>4CL13</i>	PPR028238.1	1087	11
	<i>4CL14</i>	PPR029805.1	567	3
	<i>4CL15</i>	PPR018063.1	371	5
	<i>4CL16</i>	PPR021749.1	492	4
	<i>4CL17</i>	PPR009865.1	554	5
	<i>4CL18</i>	PPR013131.1	522	3
	<i>4CL19</i>	PPR015211.1	524	3
	<i>4CL20</i>	PPR012887.1	484	5
<i>Populus trichocarpa</i> (Ptr)				
Class I	<i>4CL1</i>	Potri.006G169700.1	545	4
	<i>4CL2</i>	Potri.001G036900.1	540	4
	<i>4CL4</i>	Potri.003G188500.1	543	4
	<i>4CL6</i>	Potri.006G169600.1	543	4
	<i>4CL7</i>	Potri.018G094200.2	404	4
Class II	<i>4CL3</i>	Potri.019G049500.2	570	5
Class 4CL likes	<i>4CL5</i>	Potri.002G012800.1	525	4
	<i>4CL8</i>	Potri.010G230200.1	585	4
	<i>4CL9</i>	Potri.001G055700.1	545	5
	<i>4CL10</i>	Potri.003G099700.3	544	6
	<i>4CL11</i>	Potri.017G112800.1	543	5
	<i>4CL12</i>	Potri.012G094800.1	550	5
	<i>4CL13</i>	Potri.004G102000.1	543	5
	<i>4CL14</i>	Potri.008G031500.1	555	4
	<i>4CL15</i>	Potri.017G033600.1	552	5
	<i>4CL16</i>	Potri.012G094900.1	558	5

Table S1. Cont.

Species	Gene name	Gene ID	Length of protein (aa)	Number of intron
	4CL17	Potri.005G248500.1	554	4
	4CL18	Potri.012G095000.1	558	5
	4CL19	Potri.015G092300.1	546	5
	4CL20	Potri.010G057000.1	552	5
<i>Salix suchowensis</i> (Wil)				
Class I	4CL1	willow_GLEAN_10006487	1490	6
	4CL2	willow_GLEAN_10023310	540	4
	4CL4	willow_GLEAN_10020544	545	4
Class II	4CL3	willow_GLEAN_10007365	556	5
Class 4CL likes	4CL5	willow_GLEAN_10022611	554	4
	4CL6	willow_GLEAN_10016486	533	5
	4CL7	willow_GLEAN_10021672	552	5
	4CL8	willow_GLEAN_10003989	498	3
	4CL9	willow_GLEAN_10023426	523	6
	4CL10	willow_GLEAN_10025677	1084	15
	4CL11	willow_GLEAN_10018659	324	5
	4CL12	willow_GLEAN_10013755	454	5

Table S2. Details of motif sequences.

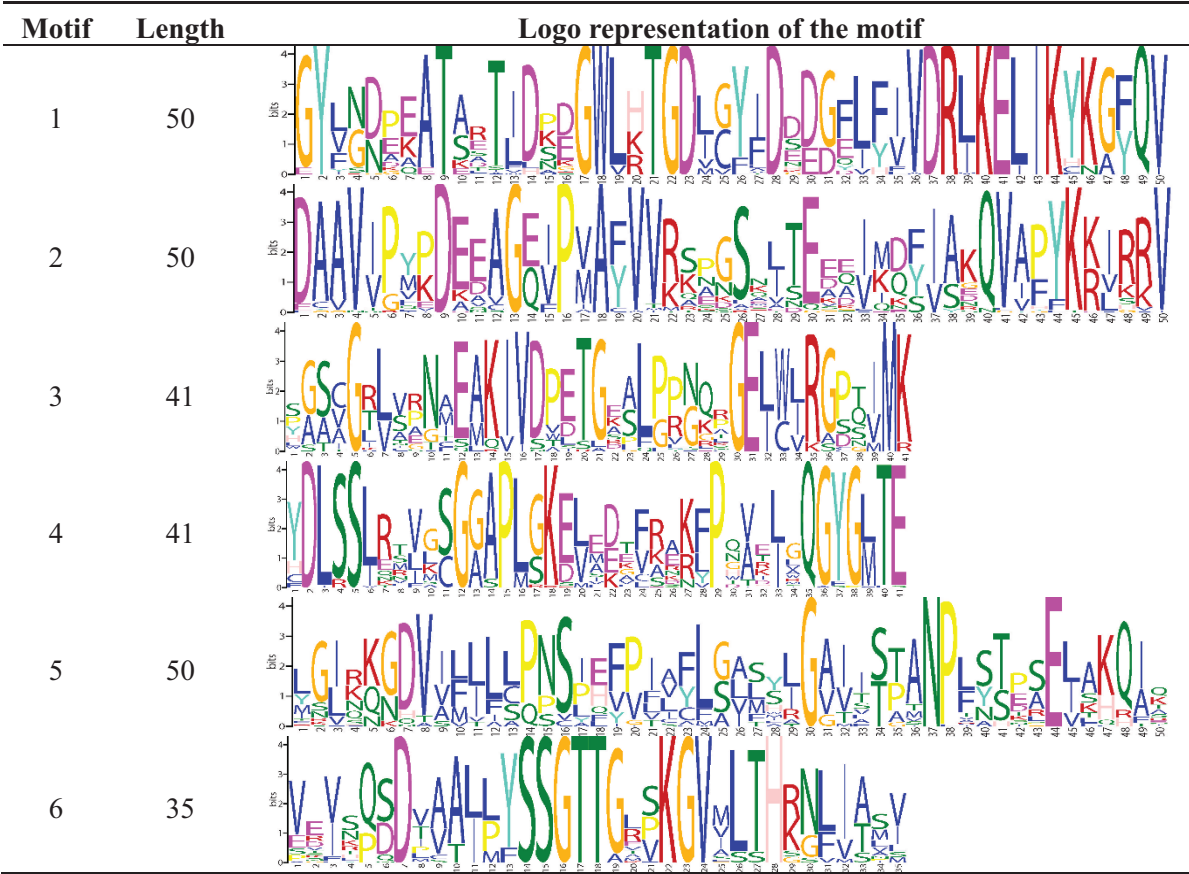


Table S2. *Cont.*

Motif	Length	Logo representation of the motif
7	29	
8	41	
9	21	
10	29	
11	29	
12	41	
13	50	
14	35	
15	21	
16	50	
17	15	
18	15	

Table S2. Cont.

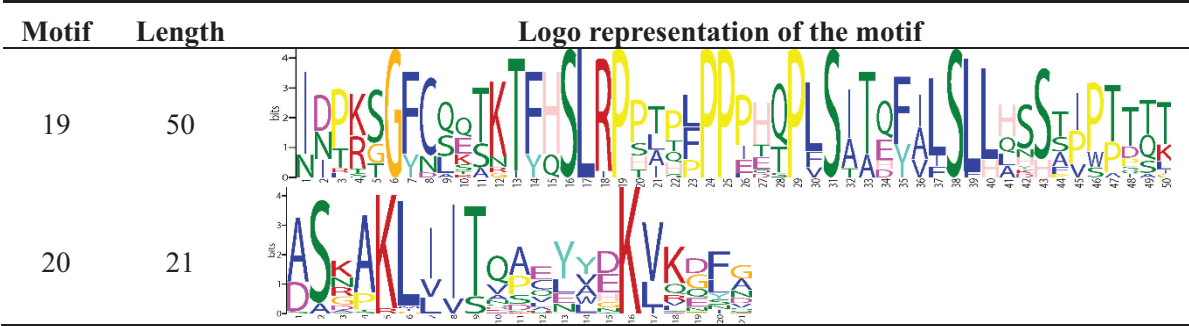


Table S3. The value of ω for 16 pairs of the putative orthologs.

Ppr	Peu	dN ± SE	dS ± SE	ω
PPR028238.1	CCG015470.1	0.0054 ± 0.0021	0.0253 ± 0.0079	0.2135
PPR021586.1	CCG001141.1	0.0033 ± 0.0017	0.0097 ± 0.0049	0.339
PPR030819.1	CCG011911.1	0.0032 ± 0.0016	0.0231 ± 0.0077	0.1402
PPR009676.1	CCG005472.1	0.0041 ± 0.0018	0.0416 ± 0.0099	0.0986
PPR016303.1	CCG029167.1	0.0279 ± 0.0056	0.0569 ± 0.0139	0.4899
PPR026307.1	CCG031380.1	0	0.0163 ± 0.0058	0
PPR029403.1	CCG032591.1	0.0024 ± 0.0014	0.0238 ± 0.0080	0.1024
PPR023820.1	CCG021432.1	0.0034 ± 0.0017	0.0126 ± 0.0056	0.2719
PPR010421.1	CCG012691.1	0.0084 ± 0.0025	0.0386 ± 0.0097	0.2168
PPR029805.1	CCG016610.1	0.0065 ± 0.0023	0.0240 ± 0.0073	0.271
PPR012887.1	CCG012530.1	0.0074 ± 0.0028	0.0196 ± 0.0075	0.3759
PPR021750.3	CCG033354.1	0.0129 ± 0.0032	0.0512 ± 0.0120	0.2517
PPR021749.1	CCG033353.1	0.0331 ± 0.0057	0.0564 ± 0.0133	0.5864
PPR018063.1	CCG029088.1	0.0143 ± 0.0041	0.0115 ± 0.0066	1.245
PPR030299.1	CCG029325.1	0.0034 ± 0.0017	0.0102 ± 0.0046	0.3354
PPR005839.1	CCG028829.1	0.0028 ± 0.0016	0.0503 ± 0.0111	0.0559