

Supplementary Material 1

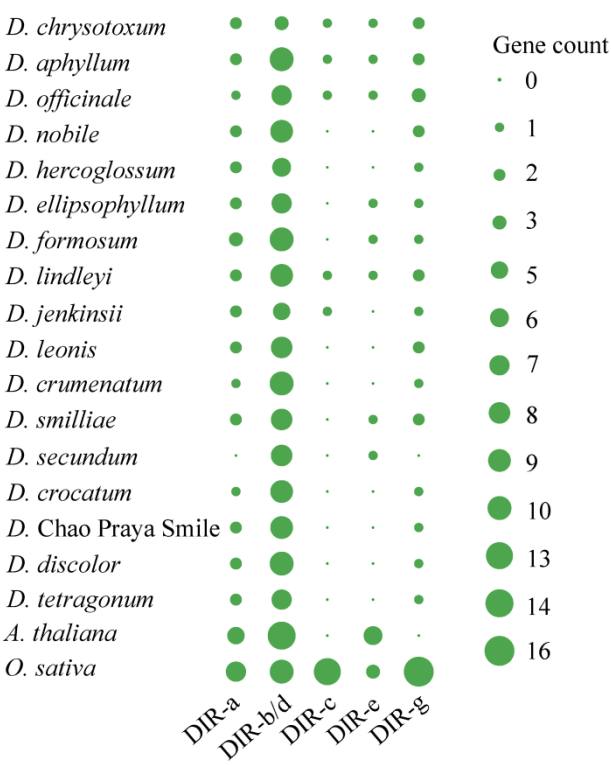


Figure S1. Subfamily distribution of DIR proteins from *Dendrobium*, *A. thaliana*, and *O. sativa*. The size of the bubbles is proportional to the number of DIR genes

Table S1. Genome assembly statistics and accessions for *Dendrobium*

Species	Assembly version	Assembly level	Source URL	Release Date
<i>D. chrysotoxum</i>	GCA_019925795.1_ASM1992579v1	Chromosome	https://www.ncbi.nlm.nih.gov/datasets/genome/GCA_019925795.1/	10-Sep-21
<i>D. nobile</i>	GCA_022539455.1_Dnoble	Chromosome	https://www.ncbi.nlm.nih.gov/datasets/genome/GCA_022539455.1/	10-Mar-22
<i>D. officinale</i>	GCA_019514585.1_ASM1951458v1	Chromosome	https://www.ncbi.nlm.nih.gov/datasets/genome/GCA_019514585.1/	10-Aug-21
<i>D. aphyllum</i>	D18_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. hercoglossum</i>	D15_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. ellipsophyllum</i>	D13_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. formosum</i>	D9_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. lindleyi</i>	D17_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. jenkinsii</i>	D21_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. leonis</i>	D7_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. crumenatum</i>	D8_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. smilliae</i>	D6_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. secundum</i>	D11_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. crocatum</i>	D5_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. Chao Praya Smile</i>	D1_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. discolor</i>	D3_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24
<i>D. tetragonum</i>	D14_v1	Chromosome	https://doi.org/10.6084/m9.figshare.26342338.v1	9-Dec-24

Table S2. Conserved domains of DIR genes in *Dendrobium*

No.	Gene ID	Start	End	Domain	Incomplete
1	DchrDIR01	33	182	Dirigent	-
2	DchrDIR02	66	153	Dirigent	N
3	DchrDIR03	51	193	Dirigent	-
4	DchrDIR04	33	179	Dirigent	-
5	DchrDIR05	125	217	Dirigent	N
6	DchrDIR06	39	185	Dirigent	-
7	DchrDIR07	34	173	Dirigent	-
8	DchrDIR08	31	173	Dirigent	-
9	DchrDIR09	42	186	Dirigent	-
10	DaphDIR01	35	171	Dirigent	-
11	DaphDIR02	30	172	Dirigent	-
12	DaphDIR03	40	182	Dirigent	-
13	DaphDIR04	40	182	Dirigent	-
14	DaphDIR05	7	117	Clat_adaptor_s	N
15	DaphDIR05	135	281	Dirigent	-
16	DaphDIR06	39	183	Dirigent	-
17	DaphDIR07	125	234	Dirigent	N
18	DaphDIR08	42	186	Dirigent	-
19	DaphDIR09	34	169	Dirigent	-
20	DaphDIR10	1	105	Dirigent	N
21	DaphDIR11	41	185	Dirigent	-
22	DaphDIR12	35	171	Dirigent	-
23	DaphDIR13	37	180	Dirigent	-
24	DaphDIR14	51	194	Dirigent	-
25	DaphDIR15	39	185	Dirigent	-
26	DaphDIR16	66	153	Dirigent	N
27	DoffDIR01	31	167	Dirigent	-
28	DoffDIR02	92	234	Dirigent	-
29	DoffDIR03	33	179	Dirigent	-
30	DoffDIR04	42	188	Dirigent	-
31	DoffDIR05	40	183	Dirigent	-
32	DoffDIR06	41	185	Dirigent	-
33	DoffDIR07	37	179	Dirigent	-
34	DoffDIR08	39	185	Dirigent	-
35	DoffDIR09	38	165	Dirigent	-
36	DoffDIR10	87	196	Dirigent	N
37	DoffDIR11	66	153	Dirigent	N
38	DoffDIR12	33	179	Dirigent	-
39	DoffDIR13	40	182	Dirigent	-
40	DnobDIR01	39	183	Dirigent	-
41	DnobDIR02	51	193	Dirigent	-
42	DnobDIR03	39	181	Dirigent	-

43	DnobDIR04	39	181	Dirigent	-
44	DnobDIR05	33	179	Dirigent	-
45	DnobDIR06	41	182	Dirigent	-
46	DnobDIR07	41	185	Dirigent	-
47	DnobDIR08	33	175	Dirigent	-
48	DnobDIR09	35	178	Dirigent	-
49	DnobDIR10	39	185	Dirigent	-
50	DnobDIR11	34	173	Dirigent	-
51	DnobDIR12	31	173	Dirigent	-
52	DnobDIR13	41	185	Dirigent	-
53	DherDIR01	51	193	Dirigent	-
54	DherDIR02	39	181	Dirigent	-
55	DherDIR03	40	182	Dirigent	-
56	DherDIR04	34	180	Dirigent	-
57	DherDIR05	42	180	Dirigent	-
58	DherDIR06	1	99	Dirigent	N
59	DherDIR07	34	173	Dirigent	-
60	DherDIR08	38	187	Dirigent	-
61	DherDIR09	43	187	Dirigent	-
62	DellDIR01	105	189	Dirigent	N
63	DellDIR02	34	173	Dirigent	-
64	DellDIR03	42	186	Dirigent	-
65	DellDIR04	39	185	Dirigent	-
66	DellDIR05	35	178	Dirigent	-
67	DellDIR06	35	177	Dirigent	-
68	DellDIR07	35	177	Dirigent	-
69	DellDIR08	42	175	Dirigent	-
70	DellDIR09	37	179	Dirigent	-
71	DellDIR10	40	182	Dirigent	-
72	DellDIR11	40	182	Dirigent	-
73	DforDIR01	38	181	Dirigent	-
74	DforDIR02	38	181	Dirigent	-
75	DforDIR03	38	181	Dirigent	-
76	DforDIR04	41	182	Dirigent	-
77	DforDIR05	30	172	Dirigent	-
78	DforDIR06	29	171	Dirigent	-
79	DforDIR07	36	171	Dirigent	-
80	DforDIR08	42	184	Dirigent	-
81	DforDIR09	42	186	Dirigent	-
82	DforDIR10	37	173	Dirigent	-
83	DforDIR11	18	133	Dirigent	-
84	DforDIR12	35	178	Dirigent	-
85	DforDIR13	35	178	Dirigent	-
86	DforDIR14	41	185	Dirigent	-

87	DforDIR15	54	137	Dirigent	N
88	DlinDIR01	27	169	Dirigent	-
89	DlinDIR02	34	173	Dirigent	-
90	DlinDIR03	39	185	Dirigent	-
91	DlinDIR04	31	174	Dirigent	-
92	DlinDIR05	31	174	Dirigent	-
93	DlinDIR06	31	174	Dirigent	-
94	DlinDIR07	30	168	Dirigent	-
95	DlinDIR08	1	105	Dirigent	N
96	DlinDIR09	9	142	Dirigent	-
97	DlinDIR10	33	178	Dirigent	-
98	DlinDIR11	32	173	Dirigent	-
99	DlinDIR12	43	178	Dirigent	-
100	DlinDIR13	94	203	Dirigent	N
101	DlinDIR14	35	182	Dirigent	-
102	DlinDIR15	25	149	Dirigent	-
103	DlinDIR15	233	274	Jacalin	N
104	DjenDIR01	43	178	Dirigent	-
105	DjenDIR02	27	169	Dirigent	-
106	DjenDIR03	29	170	Dirigent	-
107	DjenDIR04	33	178	Dirigent	-
108	DjenDIR05	39	181	Dirigent	-
109	DjenDIR06	35	182	Dirigent	-
110	DjenDIR07	1	105	Dirigent	N
111	DjenDIR08	514	603	Dirigent	N
112	DjenDIR09	34	173	Dirigent	-
113	DleoDIR01	34	176	Dirigent	-
114	DleoDIR02	32	178	Dirigent	-
115	DleoDIR03	32	159	Dirigent	-
116	DleoDIR04	30	172	Dirigent	-
117	DleoDIR05	28	170	Dirigent	-
118	DleoDIR06	34	173	Dirigent	-
119	DleoDIR07	40	182	Dirigent	-
120	DleoDIR08	38	171	Dirigent	-
121	DleoDIR09	34	176	Dirigent	-
122	DleoDIR10	41	184	Dirigent	-
123	DleoDIR11	36	182	Dirigent	-
124	DleoDIR12	36	165	Dirigent	-
125	DcruDIR01	29	171	Dirigent	-
126	DcruDIR02	34	173	Dirigent	-
127	DcruDIR03	43	153	Dirigent	C
128	DcruDIR04	41	185	Dirigent	-
129	DcruDIR05	36	178	Dirigent	-
130	DcruDIR06	51	194	Dirigent	-

131	DcruDIR07	39	181	Dirigent	-
132	DcruDIR08	40	182	Dirigent	-
133	DcruDIR09	46	188	Dirigent	-
134	DcruDIR10	30	172	Dirigent	-
135	DcruDIR11	35	178	Dirigent	-
136	DcruDIR12	32	134	Dirigent	-
137	DsmiDIR01	28	150	Dirigent	-
138	DsmiDIR02	33	178	Dirigent	-
139	DsmiDIR03	30	172	Dirigent	-
140	DsmiDIR04	34	173	Dirigent	-
141	DsmiDIR05	39	176	Dirigent	-
142	DsmiDIR06	41	183	Dirigent	-
143	DsmiDIR07	51	194	Dirigent	-
144	DsmiDIR08	75	217	Dirigent	-
145	DsmiDIR09	41	184	Dirigent	-
146	DsmiDIR10	1	108	Dirigent	C
147	DsmiDIR11	28	174	Dirigent	-
148	DsmiDIR12	125	234	Dirigent	N
149	DsmiDIR13	33	178	Dirigent	-
150	DsecDIR01	7	116	Dirigent	N
151	DsecDIR02	30	172	Dirigent	-
152	DsecDIR03	51	193	Dirigent	-
153	DsecDIR04	41	185	Dirigent	-
154	DsecDIR05	34	176	Dirigent	-
155	DsecDIR06	35	178	Dirigent	-
156	DsecDIR07	35	178	Dirigent	-
157	DsecDIR08	41	183	Dirigent	-
158	DsecDIR09	40	182	Dirigent	-
159	DcroDIR01	34	173	Dirigent	-
160	DcroDIR02	42	186	Dirigent	-
161	DcroDIR03	34	176	Dirigent	-
162	DcroDIR04	33	174	Dirigent	-
163	DcroDIR05	30	172	Dirigent	-
164	DcroDIR06	35	175	Dirigent	-
165	DcroDIR07	51	194	Dirigent	-
166	DcroDIR08	75	217	Dirigent	-
167	DcroDIR09	42	187	Dirigent	-
168	DcroDIR10	41	184	Dirigent	-
169	DcroDIR11	39	182	Dirigent	-
170	DcpsDIR01	35	177	Dirigent	-
171	DcpsDIR02	33	179	Dirigent	-
172	DcpsDIR03	30	172	Dirigent	-
173	DcpsDIR04	42	186	Dirigent	-
174	DcpsDIR05	35	177	Dirigent	-

175	DcpsDIR06	34	177	Dirigent	-
176	DcpsDIR07	35	174	Dirigent	-
177	DcpsDIR08	34	178	Dirigent	-
178	DcpsDIR09	35	177	Dirigent	-
179	DcpsDIR10	34	178	Dirigent	-
180	DcpsDIR11	49	102	Dirigent	C
181	DcpsDIR12	37	179	Dirigent	-
182	DdisDIR01	33	179	Dirigent	-
183	DdisDIR02	30	172	Dirigent	-
184	DdisDIR03	33	175	Dirigent	-
185	DdisDIR04	42	186	Dirigent	-
186	DdisDIR05	34	173	Dirigent	-
187	DdisDIR06	34	178	Dirigent	-
188	DdisDIR07	92	144	Dirigent	C
189	DdisDIR08	38	187	Dirigent	-
190	DdisDIR09	39	181	Dirigent	-
191	DdisDIR10	41	183	Dirigent	-
192	DdisDIR11	71	213	Dirigent	-
193	DdisDIR12	71	213	Dirigent	-
194	DdisDIR13	71	213	Dirigent	-
195	DtetDIR01	33	179	Dirigent	-
196	DtetDIR02	31	173	Dirigent	-
197	DtetDIR03	37	179	Dirigent	-
198	DtetDIR04	55	199	Dirigent	-
199	DtetDIR05	34	177	Dirigent	-
200	DtetDIR06	35	178	Dirigent	-
201	DtetDIR07	35	178	Dirigent	-
202	DtetDIR08	42	186	Dirigent	-
203	DtetDIR09	42	184	Dirigent	-
204	DtetDIR10	40	182	Dirigent	-

Note: Incomplete: "-" indicates complete; "N" indicates incomplete at N-terminus; "C" indicates incomplete at C-terminus.

Table S3. Physiochemical characteristics of the DIR genes in *Dendrobium*

No.	Gene name	Gene id	chromose	start	end	strand	Number of amino acid residues	Molecular Weight (Da)	Protein pI value	Predicted subcellular localization
1	<i>DchrDIR01</i>	IEQ34_002814	chr4	10134459	10135019	+	186	20448.61	6.79	Chloroplast
2	<i>DchrDIR02</i>	IEQ34_007828	chr8	10517328	10517873	-	181	20042.33	8.78	Chloroplast
3	<i>DchrDIR03</i>	IEQ34_008994	chr9	26912592	26913182	-	196	21060.08	4.72	Endoplasmic reticulum
4	<i>DchrDIR04</i>	IEQ34_009263	chr9	82316048	82317025	-	181	20212.14	4.68	Extracellular
5	<i>DchrDIR05</i>	IEQ34_012685	chr12	26046495	26047232	-	245	27090.12	9.66	Cytoplasm
6	<i>DchrDIR06</i>	IEQ34_017933	chr16	22014905	22015468	+	187	20068.73	6.8	Chloroplast
7	<i>DchrDIR07</i>	IEQ34_018413	chr17	68694748	68695275	-	175	19380.48	10.43	Extracellular
8	<i>DchrDIR08</i>	IEQ34_020139	chr18	11762167	11762703	+	178	19503.57	8.95	Chloroplast
9	<i>DchrDIR09</i>	IEQ34_022335	chr19	7445896	7446465	-	189	21410.73	7.66	Extracellular
10	<i>DaphDIR01</i>	chr02.g03410	chr02	151083414	151088148	-	285	30571.68	7.83	Chloroplast
11	<i>DaphDIR02</i>	chr04.g05172	chr04	20880856	20881409	-	175	18768.43	4.69	Chloroplast
12	<i>DaphDIR03</i>	chr04.g05311	chr04	27002809	27003673	-	197	22045.28	7.62	Chloroplast
13	<i>DaphDIR04</i>	chr04.g05312	chr04	27022094	27022687	-	197	21857.08	6.34	Cytoplasm
14	<i>DaphDIR05</i>	chr04.g06038	chr04	50269655	50299791	-	283	31827.5	4.79	Chloroplast
15	<i>DaphDIR06</i>	chr05.g07859	chr05	20448720	20449336	-	192	21189.43	7.32	Chloroplast
16	<i>DaphDIR07</i>	chr05.g08780	chr05	54691707	54692423	+	238	26355.33	9.34	Cytoplasm
17	<i>DaphDIR08</i>	chr09.g18555	chr09	41383725	41384646	+	189	21520.89	9.51	Chloroplast
18	<i>DaphDIR09</i>	chr10.g20632	chr10	22243394	22246315	+	260	28741.93	10.01	Vacuole
19	<i>DaphDIR10</i>	chr11.g22315	chr11	17125285	17125608	+	107	11720.43	6.23	Chloroplast
20	<i>DaphDIR11</i>	chr11.g22316	chr11	17137534	17138097	+	187	20410.59	8.9	Chloroplast
21	<i>DaphDIR12</i>	chr11.g22317	chr11	17150400	17160490	+	322	36307.21	9.05	Chloroplast
22	<i>DaphDIR13</i>	chr11.g22318	chr11	17179925	17180732	+	182	19809.1	9.86	Chloroplast

23	<i>DaphDIR14</i>	chr11.g22320	chr11	17188189	17189008	+	196	21227.74	9.86	Chloroplast
24	<i>DaphDIR15</i>	chr11.g22371	chr11	18992567	18993135	+	187	20331.14	6.9	Chloroplast
25	<i>DaphDIR16</i>	chr17.g26956	chr17	17512073	17513555	-	252	27926.31	10.16	Chloroplast
26	<i>DoffDIR01</i>	Dof000438	chr1	10718514	10722034	+	208	23024.78	9.38	Cytoplasm
27	<i>DoffDIR02</i>	Dof004671	chr3	18964467	18982026	-	237	25429.78	5.02	Chloroplast
28	<i>DoffDIR03</i>	Dof005704	chr3	67454497	67455241	-	181	20115.07	5.17	Extracellular
29	<i>DoffDIR04</i>	Dof007532	chr4	73524726	73525301	+	191	21547.15	8.77	Chloroplast
30	<i>DoffDIR05</i>	Dof008343	chr5	15992682	15993366	+	185	20109.22	8.9	Chloroplast
31	<i>DoffDIR06</i>	Dof008344	chr5	16004165	16004837	+	187	20435.5	9.45	Chloroplast
32	<i>DoffDIR07</i>	Dof008345	chr5	16016474	16017224	+	181	19630.92	10	Chloroplast
33	<i>DoffDIR08</i>	Dof008419	chr5	18725230	18725793	+	187	20168.94	6.8	Chloroplast
34	<i>DoffDIR09</i>	Dof010093	chr6	20542192	20556585	+	169	18169.88	10.06	Cytoplasm
35	<i>DoffDIR10</i>	Dof019865	chr14	18856501	18861408	-	200	22150.6	10.01	Cytoplasm
36	<i>DoffDIR11</i>	Dof024683	chr18	37899896	37900432	-	178	19752.98	9.56	Chloroplast
37	<i>DoffDIR12</i>	Dof026283	unchr1492	375354	376098	-	181	20159.08	4.89	Extracellular
38	<i>DoffDIR13</i>	Dof026992	unchr704	3115	3708	+	197	22051.36	8.78	Chloroplast
39	<i>DnobDIR01</i>	KFK09_003681	chr4	8982581	8983159	+	192	21095.4	7.02	Chloroplast
40	<i>DnobDIR02</i>	KFK09_011242	chr9	20080513	20081103	-	196	20967.89	4.9	Endoplasmic reticulum
41	<i>DnobDIR03</i>	KFK09_011406	chr9	25672768	25673358	-	196	21960.17	8.22	Cytoplasm
42	<i>DnobDIR04</i>	KFK09_011407	chr9	25677954	25678544	-	196	21848.9	6.87	Cytoplasm
43	<i>DnobDIR05</i>	KFK09_012441	chr9	68647654	68648654	-	181	20131.25	7.52	Extracellular
44	<i>DnobDIR06</i>	KFK09_022397	chr16	15950148	15952927	+	258	28043.03	7.16	Chloroplast
45	<i>DnobDIR07</i>	KFK09_022399	chr16	15979859	15980422	+	187	20455.55	8.91	Chloroplast
46	<i>DnobDIR08</i>	KFK09_022400	chr16	15985906	15986439	+	177	19187.24	9.76	Chloroplast
47	<i>DnobDIR09</i>	KFK09_022403	chr16	16028851	16029393	+	180	19591.81	9.64	Chloroplast
48	<i>DnobDIR10</i>	KFK09_022461	chr16	18019835	18020398	+	187	20271.08	6.8	Chloroplast

49	<i>DnobDIR11</i>	KFK09_024565	chr17	56467502	56468029	-	175	19387.38	10.21	Chloroplast
50	<i>DnobDIR12</i>	KFK09_025964	chr18	9722395	9722931	+	178	19397.4	7.59	Chloroplast
51	<i>DnobDIR13</i>	KFK09_027906	chr19	6281255	6281821	-	188	21359.61	7.66	Chloroplast
52	<i>DherDIR01</i>	chr04.g08122	chr04	5506472	5511159	-	279	30048.34	5.74	Vacuole
53	<i>DherDIR02</i>	chr04.g08270	chr04	10301252	10301874	-	196	21930.1	8.22	Cytoplasm
54	<i>DherDIR03</i>	chr04.g08271	chr04	10305049	10305642	-	197	22078.22	8.09	Cytoplasm
55	<i>DherDIR04</i>	chr04.g09242	chr04	46470072	46472073	-	182	20211.06	4.53	Extracellular
56	<i>DherDIR05</i>	chr05.g11206	chr05	16177216	16184008	+	392	42865.64	10.1	Chloroplast
57	<i>DherDIR06</i>	chr05.g11208	chr05	16229149	16234950	+	105	11321.98	5.81	Mitochondrion
58	<i>DherDIR07</i>	chr06.g13323	chr06	19345261	19345883	+	175	19329.38	10.21	Chloroplast
59	<i>DherDIR08</i>	chr07.g15771	chr07	55994780	55995372	-	191	20968.21	6.86	Chloroplast
60	<i>DherDIR09</i>	chr10.g20742	chr10	50286221	50286793	+	190	21545.87	7.21	Extracellular
61	<i>DellDIR01</i>	chr01.g00626	chr01	43985286	43985942	+	193	21367.47	9.9	Extracellular
62	<i>DellDIR02</i>	chr02.g03025	chr02	24190401	24191041	+	175	19418.62	10.48	Extracellular
63	<i>DellDIR03</i>	chr04.g05613	chr04	3591818	3592387	+	189	21476.92	8.64	Extracellular
64	<i>DellDIR04</i>	chr07.g09794	chr07	28188950	28189513	-	187	20111.8	7.16	Chloroplast
65	<i>DellDIR05</i>	chr07.g09834	chr07	30296560	30297277	-	180	19596.79	9.86	Chloroplast
66	<i>DellDIR06</i>	chr07.g09835	chr07	30297720	30303038	-	318	34647.55	9.85	Chloroplast
67	<i>DellDIR07</i>	chr07.g09837	chr07	30330197	30331028	-	179	19611.89	9.97	Chloroplast
68	<i>DellDIR08</i>	chr07.g09838	chr07	30353120	30357047	-	209	22841.34	10.61	Chloroplast
69	<i>DellDIR09</i>	chr09.g12581	chr09	14165531	14168056	-	192	20931.05	6.74	Chloroplast
70	<i>DellDIR10</i>	chr19.g21571	chr19	2587291	2587901	-	197	22071.4	9.01	Vacuole
71	<i>DellDIR11</i>	chr19.g21572	chr19	2591409	2592182	-	197	21921.12	5.66	Chloroplast
72	<i>DforDIR01</i>	chr01.g02842	chr01	8673103	8673693	-	196	21903.11	7.62	Vacuole
73	<i>DforDIR02</i>	chr01.g02843	chr01	8690534	8691124	-	196	21880.22	9.36	Cytoplasm
74	<i>DforDIR03</i>	chr01.g02844	chr01	8707962	8708552	-	196	21880.22	9.36	Cytoplasm

75	<i>DforDIR04</i>	chr01.g02845	chr01	8716913	8717506	-	197	21899.92	4.7	Chloroplast
76	<i>DforDIR05</i>	chr01.g04675	chr01	105757961	105758624	-	175	18733.34	5.11	Extracellular
77	<i>DforDIR06</i>	chr02.g01998	chr02	44800511	44801041	+	176	19261.27	8.66	Cytoplasm
78	<i>DforDIR07</i>	chr04.g09702	chr04	66953433	66954676	-	239	26812.05	10.44	Vacuole
79	<i>DforDIR08</i>	chr05.g11220	chr05	63018873	63022589	-	200	22723.31	7.76	Extracellular
80	<i>DforDIR09</i>	chr05.g11234	chr05	63524123	63524692	+	189	21513.91	8.22	Extracellular
81	<i>DforDIR10</i>	chr06.g12355	chr06	43164771	43171397	-	208	23265.12	4.43	Chloroplast
82	<i>DforDIR11</i>	chr08.g14897	chr08	33556021	33556428	-	135	14759.74	6.68	Cytoplasm
83	<i>DforDIR12</i>	chr08.g14950	chr08	35843782	35844633	-	180	19563.8	9.86	Chloroplast
84	<i>DforDIR13</i>	chr08.g14951	chr08	35849190	35850042	-	180	19621.8	9.86	Chloroplast
85	<i>DforDIR14</i>	chr08.g14952	chr08	35887754	35888499	-	187	20450.69	9.35	Chloroplast
86	<i>DforDIR15</i>	chr10.g17956	chr10	41610215	41614524	+	152	16442.56	6.94	Nucleus
87	<i>DlinDIR01</i>	chr02.g03204	chr02	63096228	63097117	-	174	19069.03	9.36	Chloroplast
88	<i>DlinDIR02</i>	chr03.g04415	chr03	45261485	45262208	-	175	19285.37	10.18	Chloroplast
89	<i>DlinDIR03</i>	chr04.g05891	chr04	45107629	45108192	-	187	20381.21	8.82	Chloroplast
90	<i>DlinDIR04</i>	chr04.g05937	chr04	46934596	46935320	-	176	19203.31	9.8	Chloroplast
91	<i>DlinDIR05</i>	chr04.g05938	chr04	46943950	46944654	-	176	19143.21	9.8	Chloroplast
92	<i>DlinDIR06</i>	chr04.g05939	chr04	46951394	46952102	-	176	19198.29	9.64	Chloroplast
93	<i>DlinDIR07</i>	chr04.g05940	chr04	47022316	47023887	-	210	23022.31	7.74	Chloroplast
94	<i>DlinDIR08</i>	chr04.g05941	chr04	47029496	47029819	-	107	11676.33	5.53	Cytoplasm
95	<i>DlinDIR09</i>	chr05.g07744	chr05	34943047	34957120	-	157	17245.6	4.7	Chloroplast
96	<i>DlinDIR10</i>	chr06.g08775	chr06	12454439	12455468	+	181	19946.88	5.09	Extracellular
97	<i>DlinDIR11</i>	chr06.g09179	chr06	38827014	38829902	+	219	23384.55	5.62	Chloroplast
98	<i>DlinDIR12</i>	chr08.g11281	chr08	6074058	6083785	-	307	34598.54	8.13	Chloroplast
99	<i>DlinDIR13</i>	chr10.g13913	chr10	19978097	19978958	-	207	22749.91	9.41	Cytoplasm
100	<i>DlinDIR14</i>	chr13.g17393	chr13	35230403	35231040	-	188	20773.09	7.74	Chloroplast

101	<i>DlinDIR15</i>	unchr364.g23784	unchr364	27641	29034	+	275	29721.55	7.01	Peroxisome
102	<i>DjenDIR01</i>	chr01.g00237	chr01	5193261	5206144	-	359	40387.88	6.74	Chloroplast
103	<i>DjenDIR02</i>	chr02.g02782	chr02	4130166	4130690	-	174	19037.03	9.61	Chloroplast
104	<i>DjenDIR03</i>	chr04.g06886	chr04	20301543	20304431	-	216	22989.01	5.62	Chloroplast
105	<i>DjenDIR04</i>	chr04.g07322	chr04	46089937	46091104	-	181	19946.88	5.09	Extracellular
106	<i>DjenDIR05</i>	chr05.g09265	chr05	34374626	34375216	-	196	21884.08	8.21	Vacuole
107	<i>DjenDIR06</i>	chr06.g10422	chr06	38651941	38652507	-	188	20773.09	7.74	Chloroplast
108	<i>DjenDIR07</i>	chr08.g12707	chr08	14369824	14370147	+	107	11676.33	5.53	Cytoplasm
109	<i>DjenDIR08</i>	chr16.g20472	chr16	28284998	28347084	+	659	73332.44	9.82	Nucleus
110	<i>DjenDIR09</i>	chr19.g22538	chr19	5371920	5372498	-	175	19390.52	10.33	Chloroplast
111	<i>DleoDIR01</i>	chr02G001990	chr02	70622183	70623167	-	180	19586.45	6.24	Chloroplast
112	<i>DleoDIR02</i>	chr03G000507	chr03	10428535	10429664	+	179	19895.87	5.7	Extracellular
113	<i>DleoDIR03</i>	chr03G000508	chr03	10443980	10447619	+	163	17880.78	10.18	Extracellular
114	<i>DleoDIR04</i>	chr03G001240	chr03	51283349	51284048	+	175	18707.26	4.87	Extracellular
115	<i>DleoDIR05</i>	chr04G001178	chr04	41614529	41615341	+	174	18905.73	4.39	Extracellular
116	<i>DleoDIR06</i>	chr04G002642	chr04	72401481	72402008	+	175	19356.48	10.1	Extracellular
117	<i>DleoDIR07</i>	chr05G000777	chr05	33835036	33835829	-	197	22174.37	4.91	Chloroplast
118	<i>DleoDIR08</i>	chr05G001656	chr05	57570279	57573137	-	212	23424.29	10.81	Chloroplast
119	<i>DleoDIR09</i>	chr05G001657	chr05	57592289	57592977	-	178	19610.85	10.27	Chloroplast
120	<i>DleoDIR10</i>	chr05G001659	chr05	57608936	57614253	-	186	20499.77	9.81	Chloroplast
121	<i>DleoDIR11</i>	chr06G001395	chr06	55586945	55589513	-	228	24955.63	10.61	Chloroplast
122	<i>DleoDIR12</i>	chr16G000303	chr16	4796381	4801108	-	254	28655.04	9.81	Chloroplast
123	<i>DcruDIR01</i>	chr01.g00681	chr01	38551851	38552769	-	175	19187.95	4.83	Chloroplast
124	<i>DcruDIR02</i>	chr02.g02672	chr02	16713995	16714639	+	175	19348.42	10.43	Extracellular
125	<i>DcruDIR03</i>	chr03.g05053	chr03	56610027	56610580	+	156	17500.25	8.45	Extracellular
126	<i>DcruDIR04</i>	chr04.g05886	chr04	14123448	14124145	+	187	20490.68	9.37	Chloroplast

127	<i>DcruDIR05</i>	chr04.g05887	chr04	14132023	14133051	+	180	19670.98	10.27	Chloroplast
128	<i>DcruDIR06</i>	chr04.g05888	chr04	14147296	14148099	+	196	21501.05	10.18	Chloroplast
129	<i>DcruDIR07</i>	chr04.g06519	chr04	32904396	32905231	-	196	21995.12	8.22	Vacuole
130	<i>DcruDIR08</i>	chr04.g06520	chr04	32906891	32907753	-	197	22067.3	5.61	Chloroplast
131	<i>DcruDIR09</i>	chr06.g09824	chr06	38175914	38176492	+	192	20787.84	4.86	Endoplasmic reticulum
132	<i>DcruDIR10</i>	chr07.g11234	chr07	20605632	20606404	+	175	18782.42	5.5	Chloroplast
133	<i>DcruDIR11</i>	unchr14.g20524	unchr14	11839	12381	+	180	19733.89	9.84	Chloroplast
134	<i>DcruDIR12</i>	unchr40.g25080	unchr40	30620	32264	+	157	17447.29	9.83	Extracellular
135	<i>DsmiDIR01</i>	chr01.g00887	chr01	32639558	32640084	+	155	17354.13	10.01	Cytoplasm
136	<i>DsmiDIR02</i>	chr03.g04941	chr03	18320344	18321170	+	184	20299.42	5.1	Extracellular
137	<i>DsmiDIR03</i>	chr03.g05414	chr03	61156877	61157573	+	175	18675.31	5.48	Extracellular
138	<i>DsmiDIR04</i>	chr04.g06974	chr04	48847486	48848278	-	175	19454.5	10.27	Chloroplast
139	<i>DsmiDIR05</i>	chr05.g08473	chr05	22223907	22232233	-	269	29682.29	10.32	Chloroplast
140	<i>DsmiDIR06</i>	chr05.g08474	chr05	22265635	22266231	-	198	22021.08	5.63	Chloroplast
141	<i>DsmiDIR07</i>	chr05.g09403	chr05	61651256	61652072	-	196	21484.16	10.04	Chloroplast
142	<i>DsmiDIR08</i>	chr05.g09406	chr05	61698451	61699110	-	219	24088.24	10.4	Chloroplast
143	<i>DsmiDIR09</i>	chr05.g09407	chr05	61704461	61705183	-	186	20317.55	8.9	Chloroplast
144	<i>DsmiDIR10</i>	chr07.g13411	chr07	71666716	71667904	+	133	14794.07	5.54	Cytoplasm
145	<i>DsmiDIR11</i>	chr09.g16194	chr09	34792569	34807813	+	300	33886.63	10.46	Chloroplast
146	<i>DsmiDIR12</i>	chr10.g17304	chr10	25460875	25461591	-	238	26389.27	8.85	Cytoplasm
147	<i>DsmiDIR13</i>	chr11.g18039	chr11	215920	216746	-	184	20312.46	4.83	Extracellular
148	<i>DsecDIR01</i>	chr01.g00688	chr01	91677898	91678845	+	165	18064.9	10.09	Cytoplasm
149	<i>DsecDIR02</i>	chr05.g08916	chr05	57462606	57463432	-	177	19328.36	8.21	Endoplasmic reticulum
150	<i>DsecDIR03</i>	chr06.g10703	chr06	54189177	54190162	-	196	21005.99	5.49	Endoplasmic reticulum
151	<i>DsecDIR04</i>	chr11.g15762	chr11	15106606	15107327	+	187	20471.72	9.71	Chloroplast
152	<i>DsecDIR05</i>	chr11.g15763	chr11	15115354	15116278	+	178	19481.77	10.45	Chloroplast

153	<i>DsecDIR06</i>	chr11.g15764	chr11	15141825	15142720	+	180	19616.79	10.2	Chloroplast
154	<i>DsecDIR07</i>	chr11.g15765	chr11	15153510	15154300	+	180	19471.54	8.45	Chloroplast
155	<i>DsecDIR08</i>	chr18.g04459	chr18	37352889	37353616	+	198	22112.12	5.23	Endoplasmic reticulum
156	<i>DsecDIR09</i>	chr18.g04460	chr18	37355525	37356316	+	197	21918.14	9.01	Vacuole
157	<i>DcroDIR01</i>	chr01.g00951	chr01	68930891	68932399	-	175	19397.52	10.13	Vacuole
158	<i>DcroDIR02</i>	chr03.g04619	chr03	48050960	48051529	-	189	21435.84	8.66	Extracellular
159	<i>DcroDIR03</i>	chr04.g05374	chr04	9688077	9688978	+	181	19790.89	7.62	Extracellular
160	<i>DcroDIR04</i>	chr05.g07296	chr05	13112954	13121664	+	209	23234.62	6.52	Extracellular
161	<i>DcroDIR05</i>	chr05.g07666	chr05	47511280	47512094	+	175	18751.36	4.86	Extracellular
162	<i>DcroDIR06</i>	chr06.g09118	chr06	51753215	51756345	-	229	24783.46	7.62	Chloroplast
163	<i>DcroDIR07</i>	chr06.g09119	chr06	51778738	51779593	-	196	21406.94	9.86	Chloroplast
164	<i>DcroDIR08</i>	chr06.g09120	chr06	51808471	51809602	-	219	24061.11	10.35	Chloroplast
165	<i>DcroDIR09</i>	chr06.g09121	chr06	51817060	51817792	-	189	20661.83	8.9	Chloroplast
166	<i>DcroDIR10</i>	chr08.g12025	chr08	53584568	53585167	+	199	22028.29	6.34	Cytoplasm
167	<i>DcroDIR11</i>	chr08.g12026	chr08	53587423	53588031	+	197	21855.07	8.66	Cytoplasm
168	<i>DcpsDIR01</i>	chr01.g00636	chr01	16761648	16762449	-	182	19877.91	6.78	Endoplasmic reticulum
169	<i>DcpsDIR02</i>	chr03.g03336	chr03	3562685	3563689	-	181	20078.78	4.64	Extracellular
170	<i>DcpsDIR03</i>	chr03.g03966	chr03	31486504	31498000	+	187	20262.13	5.19	Chloroplast
171	<i>DcpsDIR04</i>	chr04.g04864	chr04	3699059	3699628	-	189	21450.76	8.23	Chloroplast
172	<i>DcpsDIR05</i>	chr05.g08460	chr05	37738326	37739112	-	179	19640.78	9.35	Chloroplast
173	<i>DcpsDIR06</i>	chr05.g08461	chr05	37787467	37788148	-	179	19658.8	9.38	Chloroplast
174	<i>DcpsDIR07</i>	chr05.g08462	chr05	37789511	37803817	-	216	23506.41	9.42	Plasma membrane
175	<i>DcpsDIR08</i>	chr05.g08463	chr05	37809108	37809804	-	180	19620.73	9.31	Chloroplast
176	<i>DcpsDIR09</i>	chr05.g08464	chr05	37822017	37830762	-	251	27078.33	8.87	Plasma membrane
177	<i>DcpsDIR10</i>	chr05.g08465	chr05	37836049	37836790	-	180	19631.81	8.82	Chloroplast
178	<i>DcpsDIR11</i>	chr06.g09297	chr06	9986732	9987277	-	128	14338.42	11.36	Chloroplast

179	<i>DcpsDIR12</i>	chr07.g10564	chr07	5654811	5675030	+	296	32651.65	9.74	Chloroplast
180	<i>DdisDIR01</i>	chr01.g00849	chr01	14026579	14027732	+	181	20074.8	4.64	Extracellular
181	<i>DdisDIR02</i>	chr01.g01137	chr01	34707321	34708195	-	214	23056.48	4.61	Chloroplast
182	<i>DdisDIR03</i>	chr02.g02187	chr02	7030305	7030859	+	180	19854.9	7.66	Chloroplast
183	<i>DdisDIR04</i>	chr04.g06036	chr04	24739464	24740033	-	189	21355.65	8.66	Chloroplast
184	<i>DdisDIR05</i>	chr05.g07073	chr05	34377847	34381884	-	210	23060.53	10.07	Chloroplast
185	<i>DdisDIR06</i>	chr05.g07074	chr05	34413454	34414149	-	180	19660.81	8.82	Chloroplast
186	<i>DdisDIR07</i>	chr06.g08329	chr06	29211352	29217687	-	173	19422.55	11.06	Cytoplasm
187	<i>DdisDIR08</i>	chr07.g09188	chr07	18701948	18702808	-	191	21110.42	7.77	Chloroplast
188	<i>DdisDIR09</i>	chr19.g20565	chr19	6206200	6206790	+	196	21917.12	8.17	Chloroplast
189	<i>DdisDIR10</i>	chr19.g20566	chr19	6219369	6219965	+	198	22111.52	8.64	Extracellular
190	<i>DdisDIR11</i>	chr19.g20567	chr19	6227897	6228763	+	228	25691.61	9.5	Chloroplast
191	<i>DdisDIR12</i>	chr19.g20568	chr19	6236531	6237217	+	228	25691.61	9.5	Chloroplast
192	<i>DdisDIR13</i>	chr19.g20569	chr19	6245158	6246024	+	228	25691.61	9.5	Chloroplast
193	<i>DtetDIR01</i>	chr01.g00058	chr01	2091967	2093212	+	181	20271.18	4.82	Extracellular
194	<i>DtetDIR02</i>	chr01.g00390	chr01	25789834	25790705	-	213	22966.4	5.44	Extracellular
195	<i>DtetDIR03</i>	chr06.g13617	chr06	53462859	53465299	-	203	21940.07	6.91	Chloroplast
196	<i>DtetDIR04</i>	chr08.g15043	chr08	3631336	3632083	+	201	22233.83	8.89	Chloroplast
197	<i>DtetDIR05</i>	chr08.g15044	chr08	3671609	3672358	+	179	19648.87	9.86	Chloroplast
198	<i>DtetDIR06</i>	chr08.g15046	chr08	3735530	3736546	+	180	19635.91	9.34	Chloroplast
199	<i>DtetDIR07</i>	chr08.g15048	chr08	3779393	3779988	+	180	19604.9	9.34	Chloroplast
200	<i>DtetDIR08</i>	chr09.g16498	chr09	44257599	44258482	+	189	21491.87	9.3	Chloroplast
201	<i>DtetDIR09</i>	chr10.g17373	chr10	41595812	41596747	-	189	20713.03	8.65	Mitochondrion
202	<i>DtetDIR10</i>	chr18.g24415	chr18	18317363	18317956	+	197	21843.98	8.21	Extracellular

Table S4. Chromosome correspondence among *Dendrobium* based on synteny blocks

Species	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19
<i>D. chrysotoxum</i>	chr1	chr2	chr4	chr12	chr5	chr6	chr7	chr8	chr9	chr10	chr17	chr19	chr13	chr11	chr14	chr3	chr15	chr18	chr16
<i>D. nobile</i>	chr15	chr07	chr05	chr19	chr18	chr08	chr14	chr17	chr04	chr10	chr09	chr06	chr01	chr03	chr13	chr16	chr12	chr02	chr11
<i>D. officinale</i>	chr9	chr8	chr14	chr7	chr11	chr2	chr10	chr18	chr3	chr16	chr6	chr4	chr15	chr12	chr17	chr19	chr13	chr1	chr5
<i>D. aphyllum</i>	chr1	chr2	chr12	chr4	chr5	chr6	chr7	chr8	chr9	chr10	chr17	chr19	chr13	chr11	chr14	chr3	chr15	chr18	chr16
<i>D. hercoglossum</i>	chr12	chr11	chr03	chr07	chr19	chr01	chr13	chr17	chr04	chr16	chr06	chr10	chr08	chr18	chr15	chr09	chr14	chr02	chr05
<i>D. ellipsophyllum</i>	chr17	chr11	chr01	chr09	chr10	chr08	chr13	chr18	chr19	chr05	chr02	chr04	chr06	chr14	chr16	chr15	chr12	chr03	chr07
<i>D. formosum</i>	chr14	chr11	chr10	chr06	chr12	chr03	chr15	chr17	chr01	chr13	chr04	chr05	chr07	chr09	chr18	chr19	chr16	chr02	chr08
<i>D. lindleyi</i>	chr09	chr12	chr10	chr13	chr11	chr01	chr07	chr16	chr06	chr14	chr03	chr08	chr15	chr05	chr19	chr18	chr17	chr02	chr04
<i>D. jenkinsii</i>	chr14	chr10	chr07	chr06	chr18	chr03	chr09	chr16	chr04	chr11	chr12	chr19	chr01	chr05	chr13	chr17	chr15	chr02	chr08
<i>D. leonis</i>	chr10	chr12	chr01	chr19	chr06	chr18	chr07	chr17	chr03	chr15	chr09	chr16	chr04	chr08	chr11	chr14	chr13	chr02	chr05
<i>D. crumenatum</i>	chr18	chr08	chr03	chr05	chr10	chr09	chr11	chr12	chr19	chr07	chr15	chr02	chr06	chr13	chr16	chr17	chr14	chr01	chr04
<i>D. smilliae</i>	chr16	chr19	chr07	chr06	chr10	chr09	chr12	chr02	chr18	chr14	chr03	chr17	chr08	chr04	chr13	chr11	chr15	chr01	chr05
<i>D. secundum</i>	chr13	chr16	chr12	chr08	chr01	chr07	chr02	chr04	chr14	chr15	chr06	chr19	chr03	chr09	chr18	chr17	chr10	chr05	chr11
<i>D. crocatum</i>	chr14	chr09	chr03	chr02	chr10	chr07	chr12	chr13	chr17	chr15	chr16	chr05	chr18	chr01	chr08	chr11	chr19	chr04	chr06
<i>D. Chao Praya Smile</i>	chr09	chr11	chr04	chr02	chr13	chr07	chr15	chr10	chr18	chr14	chr08	chr03	chr16	chr06	chr19	chr12	chr17	chr01	chr05
<i>D. discolor</i>	chr12	chr09	chr04	chr03	chr15	chr07	chr14	chr10	chr18	chr13	chr08	chr01	chr17	chr06	chr19	chr11	chr16	chr02	chr05
<i>D. tetragonum</i>	chr11	chr07	chr09	chr19	chr02	chr12	chr06	chr04	chr16	chr14	chr15	chr17	chr01	chr18	chr13	chr03	chr10	chr05	chr08

Note: C1–C19 are chromosome numbers renumbered based on synteny relationships in the *Dendrobium* genome (each column represents a conserved Synteny block).

Table S5. List of orthogroups identifiers and corresponding gene names of DIR genes in *Dendrobium*

No.	Orthogroup	Gene name
1	OGDIR1	<i>DaphDIR09</i>
2	OGDIR1	<i>DaphDIR10</i>
3	OGDIR1	<i>DaphDIR11</i>
4	OGDIR1	<i>DaphDIR13</i>
5	OGDIR1	<i>DaphDIR14</i>
6	OGDIR1	<i>DchrDIR07</i>
7	OGDIR1	<i>DcpsDIR05</i>
8	OGDIR1	<i>DcpsDIR06</i>
9	OGDIR1	<i>DcpsDIR07</i>
10	OGDIR1	<i>DcpsDIR08</i>
11	OGDIR1	<i>DcpsDIR09</i>
12	OGDIR1	<i>DcpsDIR10</i>
13	OGDIR1	<i>DcroDIR01</i>
14	OGDIR1	<i>DcroDIR06</i>
15	OGDIR1	<i>DcroDIR07</i>
16	OGDIR1	<i>DcroDIR08</i>
17	OGDIR1	<i>DcroDIR09</i>
18	OGDIR1	<i>DcruDIR02</i>
19	OGDIR1	<i>DcruDIR04</i>
20	OGDIR1	<i>DcruDIR05</i>
21	OGDIR1	<i>DcruDIR06</i>
22	OGDIR1	<i>DcruDIR11</i>
23	OGDIR1	<i>DdisDIR05</i>
24	OGDIR1	<i>DdisDIR06</i>
25	OGDIR1	<i>DellDIR02</i>
26	OGDIR1	<i>DellDIR05</i>
27	OGDIR1	<i>DellDIR06</i>
28	OGDIR1	<i>DellDIR07</i>
29	OGDIR1	<i>DellDIR08</i>
30	OGDIR1	<i>DforDIR07</i>
31	OGDIR1	<i>DforDIR12</i>
32	OGDIR1	<i>DforDIR13</i>
33	OGDIR1	<i>DforDIR14</i>
34	OGDIR1	<i>DherDIR05</i>
35	OGDIR1	<i>DherDIR06</i>
36	OGDIR1	<i>DherDIR07</i>
37	OGDIR1	<i>DjenDIR07</i>
38	OGDIR1	<i>DjenDIR09</i>
39	OGDIR1	<i>DleoDIR06</i>
40	OGDIR1	<i>DleoDIR08</i>

41	OGDIR1	<i>DleoDIR09</i>
42	OGDIR1	<i>DleoDIR10</i>
43	OGDIR1	<i>DlinDIR02</i>
44	OGDIR1	<i>DlinDIR04</i>
45	OGDIR1	<i>DlinDIR05</i>
46	OGDIR1	<i>DlinDIR06</i>
47	OGDIR1	<i>DlinDIR07</i>
48	OGDIR1	<i>DlinDIR08</i>
49	OGDIR1	<i>DnobDIR06</i>
50	OGDIR1	<i>DnobDIR07</i>
51	OGDIR1	<i>DnobDIR08</i>
52	OGDIR1	<i>DnobDIR09</i>
53	OGDIR1	<i>DnobDIR11</i>
54	OGDIR1	<i>DoffDIR05</i>
55	OGDIR1	<i>DoffDIR06</i>
56	OGDIR1	<i>DoffDIR07</i>
57	OGDIR1	<i>DoffDIR09</i>
58	OGDIR1	<i>DsecDIR04</i>
59	OGDIR1	<i>DsecDIR05</i>
60	OGDIR1	<i>DsecDIR06</i>
61	OGDIR1	<i>DsecDIR07</i>
62	OGDIR1	<i>DsmiDIR04</i>
63	OGDIR1	<i>DsmiDIR07</i>
64	OGDIR1	<i>DsmiDIR08</i>
65	OGDIR1	<i>DsmiDIR09</i>
66	OGDIR1	<i>DtetDIR04</i>
67	OGDIR1	<i>DtetDIR05</i>
68	OGDIR1	<i>DtetDIR06</i>
69	OGDIR1	<i>DtetDIR07</i>
70	OGDIR2	<i>DaphDIR03</i>
71	OGDIR2	<i>DaphDIR04</i>
72	OGDIR2	<i>DcroDIR10</i>
73	OGDIR2	<i>DcroDIR11</i>
74	OGDIR2	<i>DcruDIR07</i>
75	OGDIR2	<i>DcruDIR08</i>
76	OGDIR2	<i>DdisDIR09</i>
77	OGDIR2	<i>DdisDIR10</i>
78	OGDIR2	<i>DdisDIR11</i>
79	OGDIR2	<i>DdisDIR12</i>
80	OGDIR2	<i>DdisDIR13</i>
81	OGDIR2	<i>DellDIR10</i>
82	OGDIR2	<i>DellDIR11</i>
83	OGDIR2	<i>DforDIR01</i>
84	OGDIR2	<i>DforDIR02</i>

85	OGDIR2	<i>DforDIR03</i>
86	OGDIR2	<i>DforDIR04</i>
87	OGDIR2	<i>DherDIR02</i>
88	OGDIR2	<i>DherDIR03</i>
89	OGDIR2	<i>DjenDIR05</i>
90	OGDIR2	<i>DleoDIR07</i>
91	OGDIR2	<i>DlinDIR09</i>
92	OGDIR2	<i>DnobDIR03</i>
93	OGDIR2	<i>DnobDIR04</i>
94	OGDIR2	<i>DoffDIR13</i>
95	OGDIR2	<i>DsecDIR08</i>
96	OGDIR2	<i>DsecDIR09</i>
97	OGDIR2	<i>DsmiDIR05</i>
98	OGDIR2	<i>DsmiDIR06</i>
99	OGDIR2	<i>DtetDIR10</i>
100	OGDIR3	<i>DaphDIR01</i>
101	OGDIR3	<i>DchrDIR08</i>
102	OGDIR3	<i>DcpsDIR01</i>
103	OGDIR3	<i>DcroDIR03</i>
104	OGDIR3	<i>DcruDIR01</i>
105	OGDIR3	<i>DcruDIR09</i>
106	OGDIR3	<i>DdisDIR03</i>
107	OGDIR3	<i>DforDIR06</i>
108	OGDIR3	<i>DjenDIR02</i>
109	OGDIR3	<i>DleoDIR01</i>
110	OGDIR3	<i>DleoDIR05</i>
111	OGDIR3	<i>DlinDIR01</i>
112	OGDIR3	<i>DlinDIR15</i>
113	OGDIR3	<i>DnobDIR12</i>
114	OGDIR3	<i>DoffDIR01</i>
115	OGDIR3	<i>DsecDIR02</i>
116	OGDIR3	<i>DsmiDIR01</i>
117	OGDIR3	<i>DtetDIR09</i>
118	OGDIR4	<i>DaphDIR05</i>
119	OGDIR4	<i>DchrDIR04</i>
120	OGDIR4	<i>DcpsDIR02</i>
121	OGDIR4	<i>DcroDIR04</i>
122	OGDIR4	<i>DcruDIR12</i>
123	OGDIR4	<i>DdisDIR01</i>
124	OGDIR4	<i>DherDIR04</i>
125	OGDIR4	<i>DjenDIR04</i>
126	OGDIR4	<i>DleoDIR02</i>
127	OGDIR4	<i>DleoDIR03</i>
128	OGDIR4	<i>DlinDIR10</i>

129	OGDIR4	<i>DnobDIR05</i>
130	OGDIR4	<i>DoffDIR03</i>
131	OGDIR4	<i>DoffDIR12</i>
132	OGDIR4	<i>DsmiDIR02</i>
133	OGDIR4	<i>DsmiDIR13</i>
134	OGDIR4	<i>DtetDIR01</i>
135	OGDIR5	<i>DaphDIR02</i>
136	OGDIR5	<i>DchrDIR03</i>
137	OGDIR5	<i>DcpsDIR03</i>
138	OGDIR5	<i>DcroDIR05</i>
139	OGDIR5	<i>DcruDIR10</i>
140	OGDIR5	<i>DdisDIR02</i>
141	OGDIR5	<i>DforDIR05</i>
142	OGDIR5	<i>DherDIR01</i>
143	OGDIR5	<i>DjenDIR03</i>
144	OGDIR5	<i>DleoDIR04</i>
145	OGDIR5	<i>DlinDIR11</i>
146	OGDIR5	<i>DnobDIR02</i>
147	OGDIR5	<i>DoffDIR02</i>
148	OGDIR5	<i>DsecDIR03</i>
149	OGDIR5	<i>DsmiDIR03</i>
150	OGDIR5	<i>DtetDIR02</i>
151	OGDIR6	<i>DaphDIR08</i>
152	OGDIR6	<i>DchrDIR09</i>
153	OGDIR6	<i>DcpsDIR04</i>
154	OGDIR6	<i>DcroDIR02</i>
155	OGDIR6	<i>DcruDIR03</i>
156	OGDIR6	<i>DdisDIR04</i>
157	OGDIR6	<i>DellDIR03</i>
158	OGDIR6	<i>DforDIR08</i>
159	OGDIR6	<i>DforDIR09</i>
160	OGDIR6	<i>DherDIR09</i>
161	OGDIR6	<i>DjenDIR01</i>
162	OGDIR6	<i>DleoDIR12</i>
163	OGDIR6	<i>DlinDIR12</i>
164	OGDIR6	<i>DnobDIR13</i>
165	OGDIR6	<i>DoffDIR04</i>
166	OGDIR6	<i>DsmiDIR10</i>
167	OGDIR6	<i>DtetDIR08</i>
168	OGDIR7	<i>DaphDIR06</i>
169	OGDIR7	<i>DchrDIR01</i>
170	OGDIR7	<i>DcpsDIR12</i>
171	OGDIR7	<i>DdisDIR08</i>
172	OGDIR7	<i>DellDIR09</i>

173	OGDIR7	<i>DforDIR10</i>
174	OGDIR7	<i>DherDIR08</i>
175	OGDIR7	<i>DjenDIR06</i>
176	OGDIR7	<i>DleoDIR11</i>
177	OGDIR7	<i>DlinDIR14</i>
178	OGDIR7	<i>DnobDIR01</i>
179	OGDIR7	<i>DsmiDIR11</i>
180	OGDIR7	<i>DtetDIR03</i>
181	OGDIR8	<i>DaphDIR07</i>
182	OGDIR8	<i>DchrDIR05</i>
183	OGDIR8	<i>DellDIR01</i>
184	OGDIR8	<i>DforDIR15</i>
185	OGDIR8	<i>DlinDIR13</i>
186	OGDIR8	<i>DoffDIR10</i>
187	OGDIR8	<i>DsecDIR01</i>
188	OGDIR8	<i>DsmiDIR12</i>
189	OGDIR9	<i>DaphDIR15</i>
190	OGDIR9	<i>DchrDIR06</i>
191	OGDIR9	<i>DellDIR04</i>
192	OGDIR9	<i>DforDIR11</i>
193	OGDIR9	<i>DlinDIR03</i>
194	OGDIR9	<i>DnobDIR10</i>
195	OGDIR9	<i>DoffDIR08</i>
196	OGDIR10	<i>DaphDIR16</i>
197	OGDIR10	<i>DchrDIR02</i>
198	OGDIR10	<i>DjenDIR08</i>
199	OGDIR10	<i>DoffDIR11</i>
200	OGDIR11	<i>DcpsDIR11</i>
201	OGDIR11	<i>DdisDIR07</i>
202	OGDIR12	<i>DaphDIR12</i>

Table S6. Sample information of the transcriptome data in *Dendrobium*

Bioproject accession	Organism	Run accession	Tissue	Sample name
PRJNA664445	<i>Dendrobium chrysotoxum</i>	SRR13368538	leaf	leaf1
PRJNA664445	<i>Dendrobium chrysotoxum</i>	SRR13368541	stem	stem1
PRJNA664445	<i>Dendrobium chrysotoxum</i>	SRR13368539	leaf	leaf2
PRJNA664445	<i>Dendrobium chrysotoxum</i>	SRR13368543	stem	stem2
PRJNA664445	<i>Dendrobium chrysotoxum</i>	SRR13368540	leaf	leaf3
PRJNA664445	<i>Dendrobium chrysotoxum</i>	SRR13368542	stem	stem3
PRJNA205609	<i>Dendrobium nobile</i>	SRR870484	flower	flower1
PRJNA205609	<i>Dendrobium nobile</i>	SRR870655	leaf	leaf1
PRJNA205609	<i>Dendrobium nobile</i>	SRR870463	root	root1
PRJNA205609	<i>Dendrobium nobile</i>	SRR870464	root	root2
PRJNA205609	<i>Dendrobium nobile</i>	SRR870475	flower	flower2
PRJNA205609	<i>Dendrobium nobile</i>	SRR870656	leaf	leaf1
PRJNA205609	<i>Dendrobium nobile</i>	SRR870657	stem	stem1
PRJNA205609	<i>Dendrobium nobile</i>	SRR870658	stem	stem1
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124374	leaf	leaf1
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124375	root	root3
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124376	root	root2
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124377	root	root1
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124378	stem	stem3
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124379	stem	stem2
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124380	stem	stem1
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124381	flower	flower3
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124382	leaf	leaf3
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124383	leaf	leaf2
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124384	flower	flower2
PRJNA680456	<i>Dendrobium officinale</i>	SRR13124385	flower	flower1
PRJNA1088629	<i>Dendrobium aphyllum</i>	SRR30612867	root	root1
PRJNA1088629	<i>Dendrobium aphyllum</i>	SRR30612869	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium aphyllum</i>	SRR30612871	leaf	leaf2
PRJNA1088629	<i>Dendrobium aphyllum</i>	SRR30612868	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium aphyllum</i>	SRR30612872	leaf	leaf1
PRJNA1088629	<i>Dendrobium aphyllum</i>	SRR30612866	root	root2
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612884	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612885	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612886	leaf	leaf2
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612882	root	root2
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612899	leaf	leaf1
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612883	root	root1
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612901	flowerbud	flowerbud1
PRJNA1088629	<i>Dendrobium crocatum</i>	SRR30612900	flowerbud	flowerbud2
PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612911	root	root2

PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612917	leaf	leaf1
PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612918	flowerbud	flowerbud2
PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612919	flowerbud	flowerbud1
PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612912	root	root1
PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612913	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612914	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium crumenatum</i>	SRR30612916	leaf	leaf2
PRJNA1088629	<i>Dendrobium discolor</i>	SRR30612850	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium discolor</i>	SRR30612852	leaf	leaf1
PRJNA1088629	<i>Dendrobium discolor</i>	SRR30612846	root	root2
PRJNA1088629	<i>Dendrobium discolor</i>	SRR30612847	root	root1
PRJNA1088629	<i>Dendrobium discolor</i>	SRR30612851	leaf	leaf2
PRJNA1088629	<i>Dendrobium discolor</i>	SRR30612849	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium ellipsophyllum</i>	SRR30612840	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium ellipsophyllum</i>	SRR30612841	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium ellipsophyllum</i>	SRR30612842	leaf	leaf2
PRJNA1088629	<i>Dendrobium ellipsophyllum</i>	SRR30612843	leaf	leaf1
PRJNA1088629	<i>Dendrobium ellipsophyllum</i>	SRR30612844	flowerbud	flowerbud2
PRJNA1088629	<i>Dendrobium ellipsophyllum</i>	SRR30612845	flowerbud	flowerbud1
PRJNA1088629	<i>Dendrobium formosum</i>	SRR30612860	root	root2
PRJNA1088629	<i>Dendrobium formosum</i>	SRR30612861	root	root1
PRJNA1088629	<i>Dendrobium formosum</i>	SRR30612862	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium formosum</i>	SRR30612864	leaf	leaf2
PRJNA1088629	<i>Dendrobium formosum</i>	SRR30612863	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium formosum</i>	SRR30612865	leaf	leaf1
PRJNA1088629	<i>Dendrobium hercoglossum</i>	SRR30612836	root	root1
PRJNA1088629	<i>Dendrobium hercoglossum</i>	SRR30612838	leaf	leaf2
PRJNA1088629	<i>Dendrobium hercoglossum</i>	SRR30612839	leaf	leaf1
PRJNA1088629	<i>Dendrobium hercoglossum</i>	SRR30612835	root	root2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612837	petal	petal1
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612848	lip	lip2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612921	sepal	sepal1
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612922	root	root2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612926	flowerbud	flowerbud2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612859	lip	lip1
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612890	petal	petal2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612870	leaf	leaf2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612881	leaf	leaf1
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612904	column	column2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612927	flowerbud	flowerbud1
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612915	column	column1
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612920	sepal	sepal2
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612923	root	root1
PRJNA1088629	<i>Dendrobium Chao Praya Smile</i>	SRR30612924	pseudobulb	pseudobulb2

PRJNA1088629	<i>Dendrobium</i> Chao Praya Smile	SRR30612925	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium jenkinsii</i>	SRR30612891	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium jenkinsii</i>	SRR30612893	leaf	leaf2
PRJNA1088629	<i>Dendrobium jenkinsii</i>	SRR30612894	leaf	leaf1
PRJNA1088629	<i>Dendrobium jenkinsii</i>	SRR30612892	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium leonis</i>	SRR30612888	flowerbud	flowerbud2
PRJNA1088629	<i>Dendrobium leonis</i>	SRR30612887	leafsystem	leafsystem
PRJNA1088629	<i>Dendrobium leonis</i>	SRR30612889	flowerbud	flowerbud1
PRJNA1088629	<i>Dendrobium lindleyi</i>	SRR30612853	root	root2
PRJNA1088629	<i>Dendrobium lindleyi</i>	SRR30612854	root	root1
PRJNA1088629	<i>Dendrobium lindleyi</i>	SRR30612858	leaf	leaf1
PRJNA1088629	<i>Dendrobium lindleyi</i>	SRR30612855	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium lindleyi</i>	SRR30612856	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium lindleyi</i>	SRR30612857	leaf	leaf2
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612905	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612906	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612907	leaf	leaf2
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612902	root	root2
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612908	leaf	leaf1
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612903	root	root1
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612909	flowerbud	flowerbud2
PRJNA1088629	<i>Dendrobium secundum</i>	SRR30612910	flowerbud	flowerbud1
PRJNA1088629	<i>Dendrobium smilliae</i>	SRR30612897	leaf	leaf2
PRJNA1088629	<i>Dendrobium smilliae</i>	SRR30612896	root	root1
PRJNA1088629	<i>Dendrobium smilliae</i>	SRR30612895	root	root2
PRJNA1088629	<i>Dendrobium smilliae</i>	SRR30612898	leaf	leaf1
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612875	pseudobulb	pseudobulb2
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612880	flowerbud	flowerbud1
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612873	root	root2
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612874	root	root1
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612876	pseudobulb	pseudobulb1
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612877	leaf	leaf2
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612878	leaf	leaf1
PRJNA1088629	<i>Dendrobium tetragonum</i>	SRR30612879	flowerbud	flowerbud2
