Cytological, Physiological and Genotyping-by-Sequencing Analysis Revealing Dynamic Variation of Leaf Color in *Ginkgo biloba* L.

Fangdi Li [1, †], Yaping Hu [1, 2, †], Wenxuan Jing [1, 3, †], Yirui Wang [1], Xiaoge Gao [1], Qirong Guo [1, *]

[1] Co-Innovation Center for Sustainable Forestry in Southern China, College of Forestry and Grassland College of Soil and Water Conservation, Nanjing Forestry University, Nanjing 210037, China; lfd@njfu.edu.cn (F.L.); wangyirui@njfu.edu.cn (Y.W.); gaoxiaoge@njfu.edu.cn (X.G.)

[2] Key Laboratory of Plant Innovation and Utilization, Institute of Subtropical Crops of Zhejiang Province, Zhejiang Academy of Agricultural Sciences, Wenzhou 325005, China. huyp@zaas.ac.cn (Y.H.)

[3] Wuwei Talent Exchange and Development Service Center, Wuwei 733099, China. daxuan@njfu.edu.cn (W.J.)

* Correspondence: qrguo@njfu.edu.cn (Q.G.)

† These authors contributed equally to this work as co-first author.

Supplementary Figures



Figure S1 HJWL and XJ Growing in the Golden Leaves Ginkgo Germplasm Resources Garden

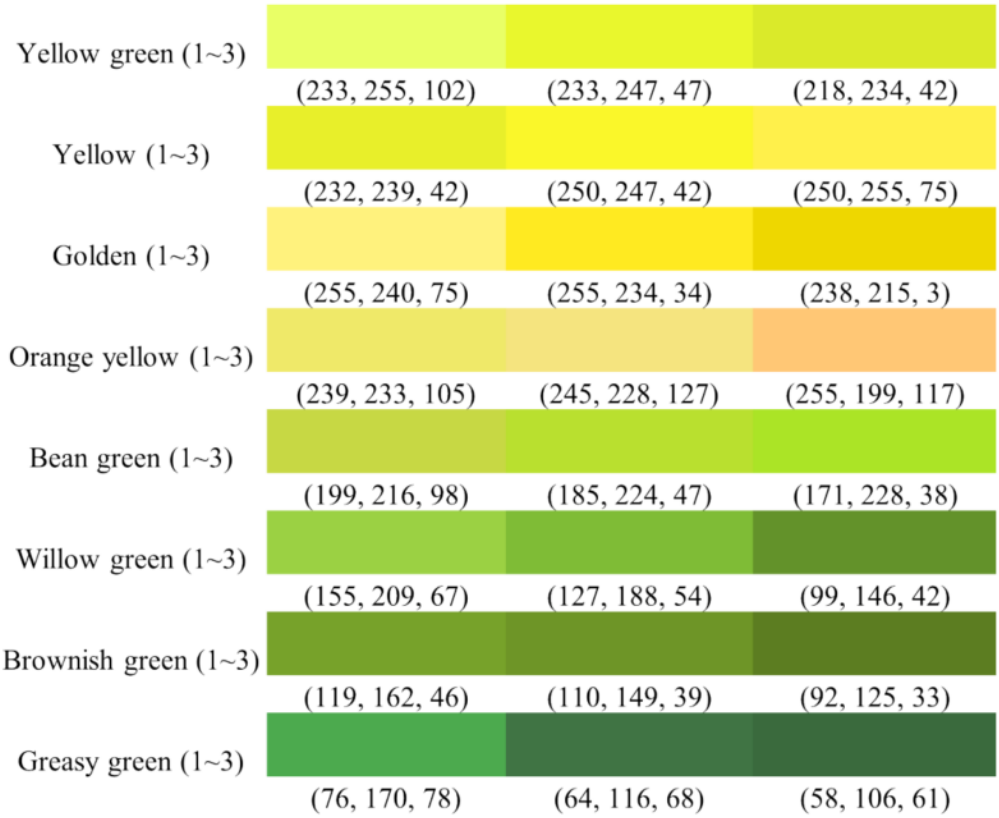


Figure S2 Description of Ginkgo biloba leaf color, (1 ~ 3) Represents the light to deep color

Supplementary Tables

Table S1. Sequencing data of 10 materials including *Ginkgo biloba* 'Huangjinwangliang' and 'Xiajin'

Sample number	Material name	Before filter			After filter		
		Q20 (%)	Q30(%)	GC (%)	Q20 (%)	Q30(%)	GC (%)
1	Huangjinwanliang	97.28	92.10	37.18	97.67	92.63	36.99
2	Xiajin	97.31	92.19	37.19	97.69	92.71	37.03
3	Guizhou Zunyi Male NO.3	97.22	92.22	37.29	97.58	92.66	37.21
4	Tiefu NO.3	97.18	92.18	37.22	97.66	92.65	37.18
5	Tiefu NO.1	97.38	92.21	37.36	97.62	92.28	37.09
6	Nanlin No.3	97.25	92.24	37.27	97.55	92.72	36.11
7	Nanlin Male	97.29	92.14	37.18	97.47	92.63	36.95
8	Guizhou Zhengan NO.2	97.26	92.25	37.10	97.55	92.54	37.22
9	Japan Jiushou	97.33	92.26	37.16	97.36	92.63	36.89
10	Taian Chuizhi	97.37	92.13	37.23	97.66	92.74	37.07

Table S2. The chloroplasts structure of HJWL and XJ in different months

Varieties	Month	Number of chloroplasts per cell	Chloroplast length/width	Grana per chloroplast	Osmiophilic granules per chloroplast
HJWL	May	19±2.16a	1.88±0.17a	19±1.0b	15±3.27a
	June	17±0.82b	1.67±0.13b	17.5±3.5a	25±1.0a
	July	14±0.816c	1.38±0.14c	14±0.816c	16±0.15a
XJ	May	4.5±0.5a	2.06±0.55a	3.5±1.5b	52.5±7.5a
	June	5.0±1.0b	2.04±0.11b	4.0±1.0a	24±2.0a
	July	3.5±0.50c	2.35±0.33c	2.5±0.50c	40±5.0a

Table S3 Characteristic parameters of light response curve of *Ginkgo biloba*

Month	Variety	*Pn*, max/μmol $CO_2 \cdot m^{-2} \cdot s^{-1}$	*LSP*/lx	*Lcp*/lx	*Rd*/μmol $CO_2 \cdot m^{-2} \cdot s^{-1}$
July	HJWL	6.42±0.58a	958.86±27.54a	62.67±5.98a	1.94±0.17a
	XJ	4.11±0.29b	919.41±24.37a	29.05±2.58b	1.73±0.11b
August	HJWL	7.88±0.68a	1397.75±38.98a	19.57±1.79a	1.24±0.89a
	XJ	7.64±0.71a	1081.31±40.22b	18.20±1.43a	1.22±0.92a
September	HJWL	9.30±0.76a	1754.94±68.29a	30.48±3.66a	1.87±0.58a
	XJ	7.50±0.65b	1038.74±29.22b	14.53±1.52b	1.62±0.44b

Table S4 Regional distribution statistics of variant loci

Type	Quantitative statistics	Percentage (%)
intergenic	5476258	95.58
intronic	536621	9.366
exonic	10320	0.180
upstream	7415	0.288
downstream	3728	0.129
upstream/downstream	645	0.011
splicing	128	0.002