Optimizing the Quality and Commercial Value of Gyokuro-Styled Green Tea Grown in Australia

Supplementary Materials

Table S1. The total concentration of target constituents (mean ± SD) of green tea plants grown under various ambient light intensities.

Treatment	Target Constituents						
Light (%)	Theanine (mg/g)	Caffeine (mg/g)	EC (mg/g)	EGC (mg/g)	EGCG (mg/g)	GCG (mg/g)	ECG (mg/g)
100[1]	51.4 ± 1.6 [a]	45.1 ± 3.2 [a]	18.7 ± 2.1 [ac]	5.5 ± 0.4 [a]	56.2 ± 3.3 [ab]	7.0 ± 1.5 [a]	7.0 ± 8.0 [a]
40	51.9 ± 2.5 [a]	43.5 ± 1.7 [a]	18.6 ± 1.4 [b]	6.5 ± 0.3 [a]	56.1 ± 1.7 [ab]	8.3 ± 0.9 [a]	6.5 ± 0.7 [a]
16	53.7 ± 3.3 [a]	42.4 ± 1.0 [a]	19.7 ± 3.2 [c]	4.9 ± 0.2 [a]	58.4 ± 2.0 [ab]	9.2 ± 0.7 [a]	6.3 ± 1.0 [a]
10	52.3 ± 2.9 [a]	42.1 ± 0.8 [ab]	19.4 ± 1.9 [ab]	6.0 ± 0.2 [a]	61.5 ± 2.4 [a]	6.9 ± 0.9 [a]	5.9 ± 1.3 [a]
1	61.5 ± 3.0 [b]	38.8 ± 2.2 [b]	15.9 ± 3.1 [ac]	5.4 ± 0.6 [a]	53.1 ± 5.7 [b]	9.7 ± 3.6 [a]	5.4 ± 1.3 [a]

1 Indicates the control group. Values with shared superscripts within the same column indicate a non-significant difference in value ($p > 0.05$).

Table S2. The total concentration of target constituents (mean ± SD) of green tea plants grown with and without red-colored wavelengths compared to full ambient light conditions.

Treatment	Target Constituents						
Shade Color	Theanine (mg/g)	Caffeine (mg/g)	EC (mg/g)	EGC (mg/g)	EGCG (mg/g)	GCG (mg/g)	ECG (mg/g)
NA[1]	51.4 ± 1.6 [a]	45.2 ± 3.2 [a]	5.5 ± 0.4 [a]	18.7 ± 2.1 [a]	56.2 ± 3.3 [a]	7.0 ± 1.5 [a]	7.0 ± 0.8 [a]
Black	51.3 ± 3.3 [a]	42.1 ± 0.8 [a]	5.9 ± 0.2 [a]	19.4 ± 1.9 [a]	50.9 ± 3.8 [a]	6.9 ± 0.9 [a]	5.9 ± 1.3 [a]
Red	41.6 ± 4.0 [b]	34.8 ± 4.6 [b]	4.5 ± 1.0 [b]	22.0 ± 4.3 [a]	50.6 ± 4.6 [a]	13.6 ± 5.1 [b]	22.8 ± 2.4 [b]

1 Indicates the control group. Values with shared superscripts within the same column indicate a non-significant difference in value ($p > 0.05$).

Table S3. The total concentration of target constituents (mean ± SD) of green tea plants grown in reduced light intensity (90% opacity) compared to full ambient sunlight conditions over 11 weeks

Week	Target Constituents													
	Theanine (mg/g)		Caffeine (mg/g)		EC (mg/g)		EGC (mg/g)		EGCG (mg/g)		GCG (mg/g)		ECG (mg/g)	
	100%	10%	100%	10%	100%	10%	100%	10%	100%	10%	100%	10%	100%	10%
0[1]	56.7 ± 2.2[a]	56.7 ± 2.2[a]	53.8 ± 2.0[a]	53.8 ± 2.0[a]	15.6 ± 0.2[a]	15.6 ± 0.2[a]	4.9 ± 0.7[a]	4.9 ± 0.7[a]	58.6 ± 3.9[a]	58.6 ± 3.9[a]	6.8 ± 0.8[a]	6.8 ± 0.8[a]	8.9 ± 1.2[a]	8.9 ± 1.2[a]
1	54.8 ± 2.0[a]	57.1 ± 0.9[a]	54.4 ± 2.6[a]	51.6 ± 3.8[a]	16.8 ± 0.7[a]	15.8 ± 0.7[a]	5.1 ± 1.2[a]	5.1 ± 1.1[a]	53.4 ± 5.5[a]	53.7 ± 5.4[a]	6.0 ± 0.5[a]	6.8 ± 0.8[a]	8.4 ± 1.3[a]	8.5 ± 1.4[a]
2	59.6 ± 2.7[a]	60.1 ± 1.6[a]	54.9 ± 3.0[a]	52.0 ± 4.5[a]	16.9 ± 0.6[a]	17.8 ± 1.2[a]	5.5 ± 0.6[a]	5.4 ± 1.3[a]	53.9 ± 3.0[a]	57.6 ± 2.9[a]	6.9 ± 1.0[a]	6.0 ± 0.5[a]	8.7 ± 0.8[a]	8.2 ± 1.1[a]
3	60.4 ± 1.4[a]	62.1 ± 2.7[a]	53.6 ± 2.5[a]	49.9 ± 1.5[a]	18.5 ± 1.3[a]	18.0 ± 1.4[a]	5.7 ± 1.0[a]	5.4 ± 1.0[a]	55.4 ± 6.8[a]	58.1 ± 1.6[a]	6.8 ± 1.0[a]	6.9 ± 1.1[a]	8.9 ± 1.6[a]	8.4 ± 0.9[a]
4	56.6 ± 2.7[a]	62.2 ± 1.0[b]	53.9 ± 2.7[a]	50.4 ± 4.0[a]	19.2 ± 3.0[a]	19.0 ± 1.6[a]	5.0 ± 1.3[a]	4.4 ± 0.4[a]	55.5 ± 4.9[a]	57.5 ± 2.1[a]	7.2 ± 0.9[a]	7.0 ± 1.1[a]	8.2 ± 1.0[a]	9.6 ± 0.7[a]
5	65.6 ± 1.0[a]	66.5 ± 0.7[a]	55.9 ± 2.8[a]	50.0 ± 1.2[b]	22.6 ± 1.0[a]	23.2 ± 2.1[a]	4.5 ± 0.4[a]	5.0 ± 1.1[a]	54.5 ± 4.6[a]	56.4 ± 5.0[a]	6.2 ± 0.4[a]	6.6 ± 0.3[a]	8.3 ± 1.1[a]	8.5 ± 0.9[a]
6	60.2 ± 4.1[a]	64.7 ± 2.8[a]	53.7 ± 2.5[a]	47.1 ± 1.2[b]	24.0 ± 1.9[a]	25.5 ± 2.2[a]	4.7 ± 0.9[a]	4.6 ± 1.5[a]	56.0 ± 3.5[a]	58.6 ± 4.6[a]	6.0 ± 0.7[a]	5.7 ± 0.3[a]	8.5 ± 1.5[a]	8.3 ± 1.4[a]
7	56.8 ± 3.0[a]	67.4 ± 0.6[b]	54.8 ± 1.9[a]	46.8 ± 3.7[b]	24.4 ± 2.6[a]	27.5 ± 2.4[a]	6.1 ± 1.0[a]	5.7 ± 0.5[a]	51.9 ± 2.1[a]	55.2 ± 5.7[a]	5.9 ± 0.4[a]	7.2 ± 0.9[a]	8.4 ± 1.4[a]	9.0 ± 1.0[a]
8	62.2 ± 3.5[a]	69.3 ± 2.2[b]	52.1 ± 1.6[a]	52.7 ± 1.3[a]	27.4 ± 3.3[a]	26.3 ± 2.8[a]	5.3 ± 1.2[a]	5.7 ± 0.8[a]	53.8 ± 3.5[a]	57.4 ± 5.2[a]	6.7 ± 0.9[a]	6.3 ± 0.6[a]	9.5 ± 0.8[a]	8.7 ± 1.5[a]
9	59.2 ± 6.1[a]	66.8 ± 0.3[b]	53.1 ± 1.7[a]	48.6 ± 5.0[a]	29.9 ± 1.8[a]	28.9 ± 2.5[a]	5.8 ± 0.9[a]	5.3 ± 1.3[a]	54.4 ± 4.6[a]	56.2 ± 5.6[a]	7.0 ± 0.6[a]	6.3 ± 0.9[a]	8.9 ± 1.1[a]	8.4 ± 1.1[a]
10	61.9 ± 3.2[a]	67.0 ± 0.3[b]	53.1 ± 1.4[a]	49.4 ± 3.5[a]	30.8 ± 1.4[a]	30.2 ± 0.7[a]	4.4 ± 1.2[a]	4.8 ± 0.8[a]	53.8 ± 4.0[a]	54.9 ± 2.1[a]	7.0 ± 1.0[a]	6.7 ± 0.8[a]	8.7 ± 1.1[a]	8.2 ± 1.5[a]
11	56.3 ± 2.5[a]	67.3 ± 0.6[b]	54.0 ± 1.0[a]	48.2 ± 6.3[a]	34.8 ± 0.7[a]	30.2 ± 1.5[a]	5.9 ± 1.4[a]	5.2 ± 1.3[b]	58.2 ± 3.4[a]	54.9 ± 2.8[a]	8.2 ± 0.2[a]	6.0 ± 0.5[b]	9.1 ± 1.0[a]	8.3 ± 1.4[a]

1 Indicates the baseline. Values with shared superscripts indicate a non-significant difference in value ($p > 0.05$) between the treatment and control groups, for each target constituent.