



Figure S1. Experimental design of this study. Control: clusters exposed to sunlight during the entire developmental period; T1: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of white bags; T2: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of green bags; T3: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of yellow bags; T4: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of non-woven bags; T5: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of transparent bags; T6: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of umbrellas and white bags; T7: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of umbrellas and non-woven bags; T8: clusters excluded from sunlight from the beginning veraison (8 weeks after anthesis) by use of umbrellas and transparent bags.

Table S1. Some physical and chemical characteristics of ‘Kyoho’ berries under shading treatments

Index	Control	T1	T2	T3	T4	T5	T6	T7	T8
Berry fresh weight (g)	7.95 ± 0.30b	7.38 ± 0.32ab	7.53 ± 0.38ab	7.72 ± 0.24ab	6.98 ± 0.75a	7.31 ± 0.67ab	8.06 ± 0.35b	7.62 ± 0.47ab	7.36 ± 0.34ab
Skin fresh weight (g)	0.87 ± 0.06c	0.77 ± 0.01b	0.87 ± 0.02c	0.73 ± 0.04ab	0.69 ± 0.02a	0.74 ± 0.08ab	0.79 ± 0.03b	0.79 ± 0.00b	0.76 ± 0.02ab
Edible rate (%)	88.40 ± 0.18ab	89.04 ± 0.60bc	87.98 ± 0.28a	89.76 ± 0.27c	89.43 ± 0.53c	89.39 ± 0.44c	89.57 ± 0.60c	88.89 ± 0.49bc	89.18 ± 0.66bc
Vertical diameter (mm)	24.14 ± 0.38c	22.82 ± 0.48ab	22.81 ± 0.82ab	23.68 ± 0.23bc	22.24 ± 0.69a	22.98 ± 0.86ab	23.92 ± 0.78bc	23.45 ± 0.20bc	23.55 ± 0.41bc
Lateral diameter (mm)	21.67 ± 0.49ab	21.13 ± 0.36ab	20.56 ± 1.13a	21.10 ± 0.34ab	20.58 ± 0.49a	20.80 ± 0.71ab	21.73 ± 0.27b	21.21 ± 0.59ab	21.07 ± 0.29ab
TSS (°Brix)	19.00 ± 0.10cd	18.63 ± 0.31ab	18.40 ± 0.17a	18.40 ± 0.00a	19.10 ± 0.30cd	18.87 ± 0.23bc	18.60 ± 0.10ab	19.30 ± 0.10d	19.17 ± 0.21cd
TA (g/L)	4.14 ± 0.19ab	3.92 ± 0.19ab	3.81 ± 0.19a	3.70 ± 0.00a	3.81 ± 0.19a	3.92 ± 0.39ab	4.03 ± 0.34ab	4.03 ± 0.00ab	4.37 ± 0.34b

Note: Different small letter between berries under treatments indicate significant differences at 5% level ($P < 0.05$).

Table S2. The chromatography and mass spectrometry information of anthocyanins found in berries of ‘Kyoho’

Peak	RT (min)	Compound	Abbreviations	Molecular ion M+(m/z)	Fragment ion M(m/z)
1	4.533	Petunidin-3,5-O-diglucoside	Pt-DG	641	479,317
2	4.925	Delphinidin-3-O-glucoside	Dp-G	465	303
3	6.326	Peonidin-3,5-O-diglucoside	Pn-DG	625	463,301
4	6.941	Malvidin-3,5-O-diglucoside	Mv-DG	655	493,331
5	8.566	Petunidin-3-O-glucoside	Pt-G	479	317
6	12.916	Peonidin-3-O-glucoside	Pn-G	463	301
7	16.142	Malvidin-3-O-glucoside	Mv-G	493	331
8	20.967	Malvidin-3-acetylglucoside-5-glucoside	Mv-Ac-DG	697	655,493,331
9	21.067	Delphinidin-3-coumaroylglucoside-5-glucoside	Dp-Co-DG	773	611,465,303
10	21.183	Petunidin-3- <i>cis</i> -coumaroylglucoside-5-glucoside	Pt-c-Co-DG	787	625,479,317
11	22.992	Malvidin-3- <i>cis</i> -coumaroylglucoside-5-glucoside	Mv-c-Co-DG	801	639,493,331
12	24.583	Petunidin-3- <i>trans</i> -coumaroylglucoside-5-glucoside	Pt-t-Co-DG	787	625,479,317
13	27.295	Peonidin-3- <i>cis</i> -coumaroylglucoside-5-glucoside	Pn-c-Co-DG	771	609,463,331
14	28.390	Delphinidin-3-coumaroylglucoside	Dp-Co-G	611	303
15	29.520	Malvidin-3-acetylglucoside	Mv-Ac-G	535	331
16	30.536	Malvidin-3- <i>trans</i> -coumaroylglucoside-5-glucoside	Mv-t-Co-DG	801	639,493,331
17	31.401	Peonidin-3- <i>trans</i> -coumaroylglucoside-5-glucoside	Pn-t-Co-DG	771	609,463,331
18	32.115	Cyanidin-3-coumaroylglucoside	Cy-Co-G	595	287
19	33.252	Petunidin-3- <i>trans</i> -coumaroylglucoside	Pn-t-Co-G	609	301
20	33.648	Malvidin-3- <i>trans</i> -coumaroylglucoside	Mv-t-Co-G	639	331



Figure S2. The clusters of 'Kyoho' under different treatments at harvest stage