

The following is the supplementary data related to this article:

Supplementary Figure S1. Correlation analysis among the various petal types color difference values (L^* , a^* , and b^*) in *S. japonica* ‘AM’ mutant at different flower developmental stages.

Supplementary Figure S2. Heat map of correlation between anthocyanin content and expression of anthocyanin synthesis structural genes.

Supplementary Figure S3. Phylogenetic tree of *SjbHLH1* amino acid sequences and other published anthocyanin-related bHLHs. The GenBank accession numbers are: AhNAI1 (LOC112775145), AibHLH18-like (LOC107614694), AhbHLH18 (LOC112712823), AdbHLH18-like (LOC107463717), AsNAI1-like (LOC130976602), LjbHLH18-like (LOC130742633), GmbHLH25-like (LOC100795184), GmbHLH18 (LOC100809223), ApbHLH18-like (LOC113854852), CcbHLH25 (LOC109808911), PabHLH19-like ((LOC114740048), GmbHLH2 (LOC100809888), VubHLH18-like (LOC124835930), VabHLH18 (LOC108320439), VuNAI1 (LOC114166803), GsbHLH18-like (LOC114424526), GmNAI1 (LOC100809956), CcbHLH18 (LOC109818143), ApNAI1-like (LOC1138571390).

Supplementary Table S1. Anthocyanin candidate gene primers.

Supplementary Table S2. qRT-PCR reaction system and reaction protocol.

Supplementary Table S3. Color variation of different petal types in *S. japonica* 'AM' mutant at different flower developmental stages.

Supplementary Table S4. Reference genome sequence alignment.