

Identification of Light-independent Anthocyanin Mutants Induced by Ethyl methane Sulfonate in Turnip ‘Tsuda’ (*Brassica rapa*)

Table S1. Phenotypes of F1 progeny in test cross between *white* mutants

	<i>w1</i>	<i>w3</i>	<i>w9</i>	<i>w68</i>	<i>w146</i>	<i>w204</i>
<i>w1</i>		N/A	Wild-type	Wild-type	Wild-type	Wild-type
<i>w3</i>			N/A	Wild-type	N/A	Wild-type
<i>w9</i>				Wild-type	Wild-type	Wild-type
<i>w68</i>					Wild-type	Wild-type
<i>w146</i>						N/A

Table S2. Phenotypes of F1 progeny in test cross between *red* mutants

	<i>r1</i>	<i>r10</i>	<i>r15</i>	<i>r21</i>	<i>r30</i>	<i>r37</i>	<i>r53</i>	<i>r57</i>
<i>r1</i>		Wild-type	Wild-type	N/A	Wild-type	Wild-type	Wild-type	Wild-type
<i>r10</i>			Red	Wild-type	Wild-type	Wild-type	Wild-type	Red
<i>r15</i>				Wild-type	Wild-type	Wild-type	Wild-type	Red
<i>r21</i>					Wild-type	Wild-type	N/A	Wild-type
<i>r30</i>						Wild-type	N/A	Wild-type
<i>r37</i>							Wild-type	Wild-type
<i>r53</i>								Wild-type

Ten F1 seeds of cross combinations were sown for phenotype observation. Some combinations without identification were failed to get F1 seeds.

Table S3. Anthocyanin biosynthetic genes (ABGs) identified in *B. rapa*

<i>A. thaliana</i>	<i>B.rapa</i>	<i>A. thaliana</i>	<i>B.rapa</i>
	<i>BrACTIN</i> (AF111812.1)	<i>Regulatory genes</i>	
<i>Structural genes</i>		<i>AtMYB12</i> (AT2G47460)	<i>BrMYB12</i> (Bra004456)
	<i>BrCHS1</i> (Bra006224)		
<i>AtCHS</i> (AT5G13930)	<i>BrCHS4</i> (Bra008792)	<i>AtPAP1</i> (AT1G56650)	<i>BrPAP1</i> (Bra004162)
	<i>BrCHS5</i> (Bra023441)		
<i>AtCHI</i> (AT3G55120)	<i>BrCHI</i> (Bra007142)	<i>AtTT8</i> (AT4G09820)	<i>BrTT8</i> (Bra037887)
<i>AtF3H</i> (AT3G51240)	<i>BrF3H</i> (Bra036828)	<i>AtTTG1</i> (AT5G24520)	<i>BrTTG1</i> (Bra009770)
<i>AtDFR</i> (AT5G42800)	<i>BrDFR</i> (Bra027457)	<i>Light responsive gene</i>	
	<i>BrANS1</i> (Bra013652)		
<i>AtANS</i> (AT4G22880)	<i>BrANS2</i> (Bra019350)	<i>AtHY5</i> (AT5G11260)	<i>BrHY5</i> (Bra008976)
<i>AtUGT79B1</i> (AT5G54060)	<i>BrUFGT</i> (Bra003021)	<i>AtCOP1</i> (AT2G32950)	<i>BrCOP1</i> (Bra005541)

Table S4. The DNA sequences of PCR primers used for real-time PCR of anthocyanin biosynthetic and regulatory genes

Target gene	Forward primers	Reverse primers
<i>BrACTIN</i>	GCTCAGTCCAAGAGAGGTATTC	GCTCGTTGTAGAAAGTGTGATG
<i>BrCHS</i>	GGGACTCACCTTCCATCTCCTC	CGCGTGGCTCTCATCTTCTCT
<i>BrCHI</i>	TTCACCGTCCACCATCGTCT	GACATAATACAACAACATAAAACACACC
<i>BrF3H</i>	CGAAAGAAGAACATGACCACAAG	CACAACCGAACCAACACAATAG
<i>BrF3'H</i>	GTTTAGGGTTACGGACGATTCA	TCTCTTCCATGTTCAGTTCTC
<i>BrDFR</i>	TGGTGCCAAGGGACGTTATG	TTGCCTGAGAAACTCGGAGATAG
<i>BrANS1</i>	CCTCCAAGGACGTTTGCTCA	GACTTCATCCTTTTTTCTCAGTTACC
<i>BrANS2</i>	GCTGAGACTCCGGCTAAGTTTCC	TTTTGTCTCAGGCACCAACTCC
<i>BrUFGT</i>	CGGAGGTGTACCGATGATTTG	ACAGCCTCCACCGCTCTTC
<i>BrPAP1</i>	AACTTTGGAGCCTGTTGGATG	TCACAATGTCACGCACAAGCA
<i>BrTT8</i>	CGACAATCATTTTGAGGCAGAG	TCAGCAATGGTTGGTTTCTTCC
<i>BrTTG1</i>	CTCTTATCTGGGAGTTGCCGAC	GCAATGCCAATCCAATCAGG
<i>BrMYB4</i>	GGCAAAGAAAGAGACCAACA	AAAAGTTTGTACAGTTACGC
<i>BrMYB12</i>	CGGGCAAAGTAACTGCGAAA	GACAGAAGCCAAGCGACCAAC
<i>BrHY5</i>	CAAGTTTTGGGTTGTTTTTGGGTG	AAAGAGGTCAGAGGCTCGCATC
<i>BrCOP1</i>	AAAAGCGGCGTCAGTTGGT	CCGTGGCTGTATCCTTCCCTA