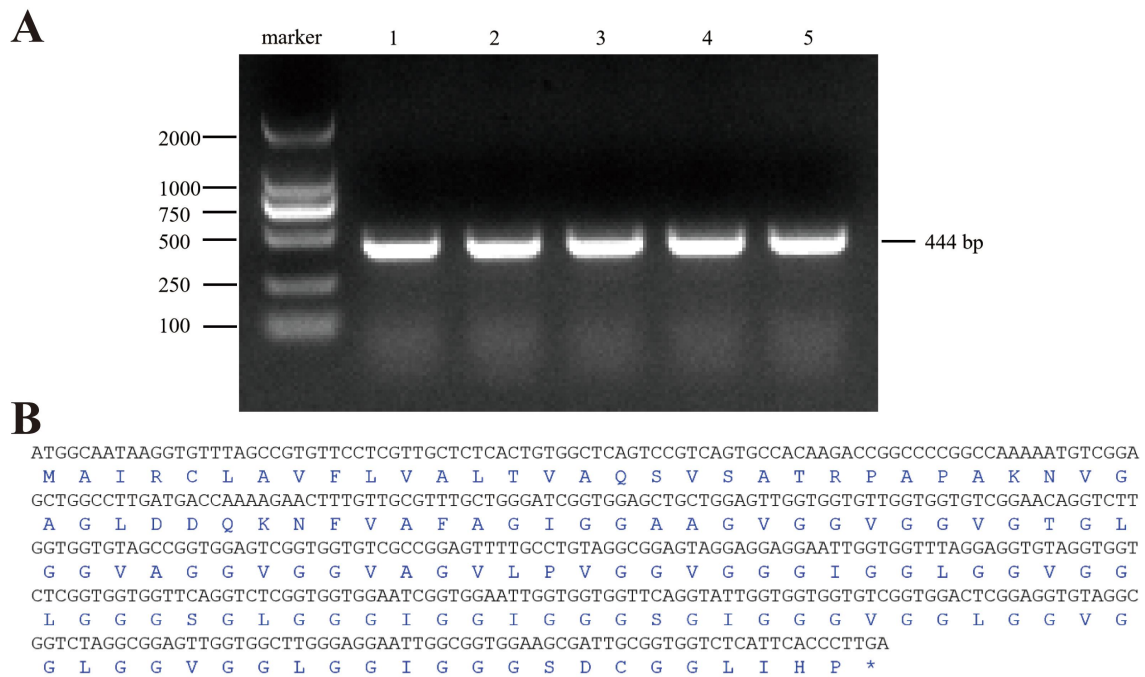
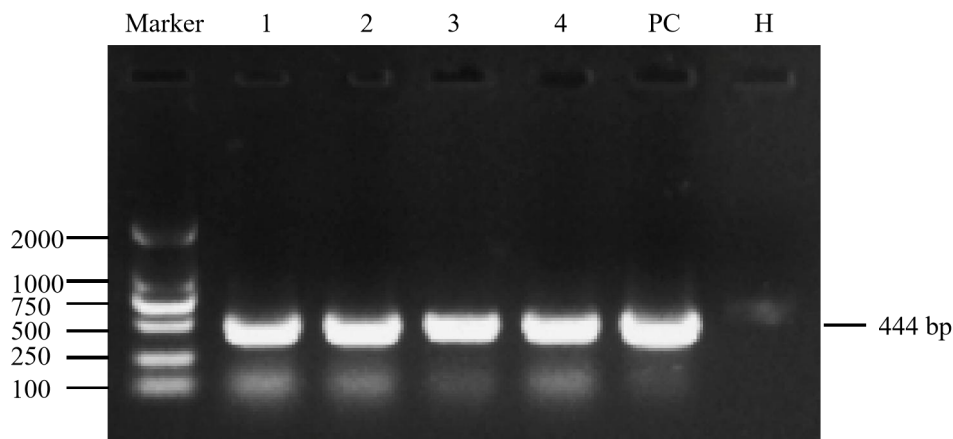


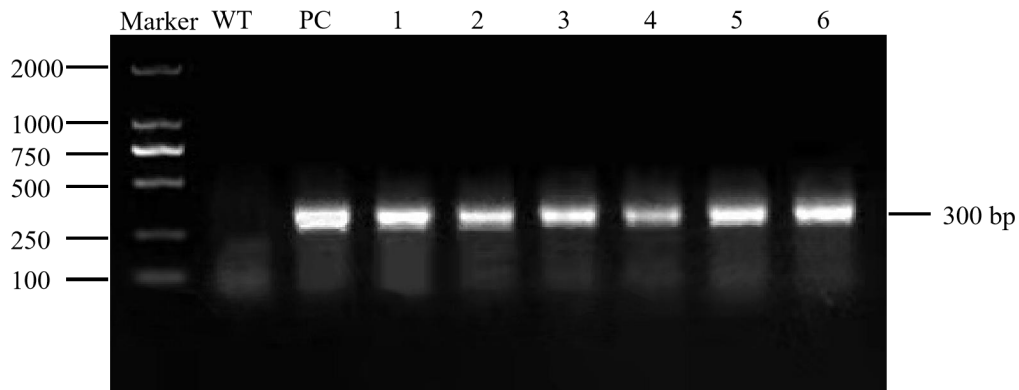
*Supplementary Material*



**Supplementary Figure 1.** Cloning of the *BcGRP23* gene. (A), PCR amplification electropherogram. DNA marker: DL2000; 1-5 are the largest ORF sequence fragments of BcGRP23. (B), BcGRP23 amino acid sequence.

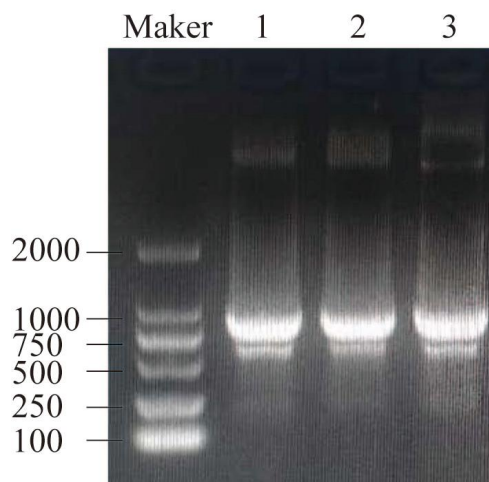


**Supplementary Figure 2.** Bacterial liquid PCR detection of pBI121-BcGRP23-GFP. Note: Maeker: DL2000 ; 1~4: pBI121-BcGRP23-GFP; PC: positive control; H: negative control. The gel size is 444bp.



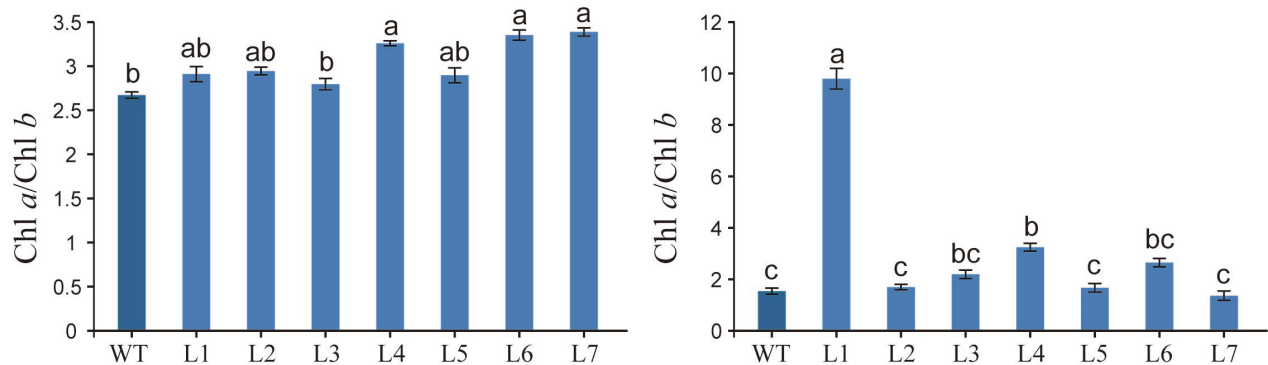
**Supplementary Figure 3.** Bacterial liquid PCR detection of pTRV2-BcGRP23.

Note: Marker: DL2000; 1~6: pTRV2-BcGRP23; PC: positive control; WT: negative control; The gel band size is 300 bp.

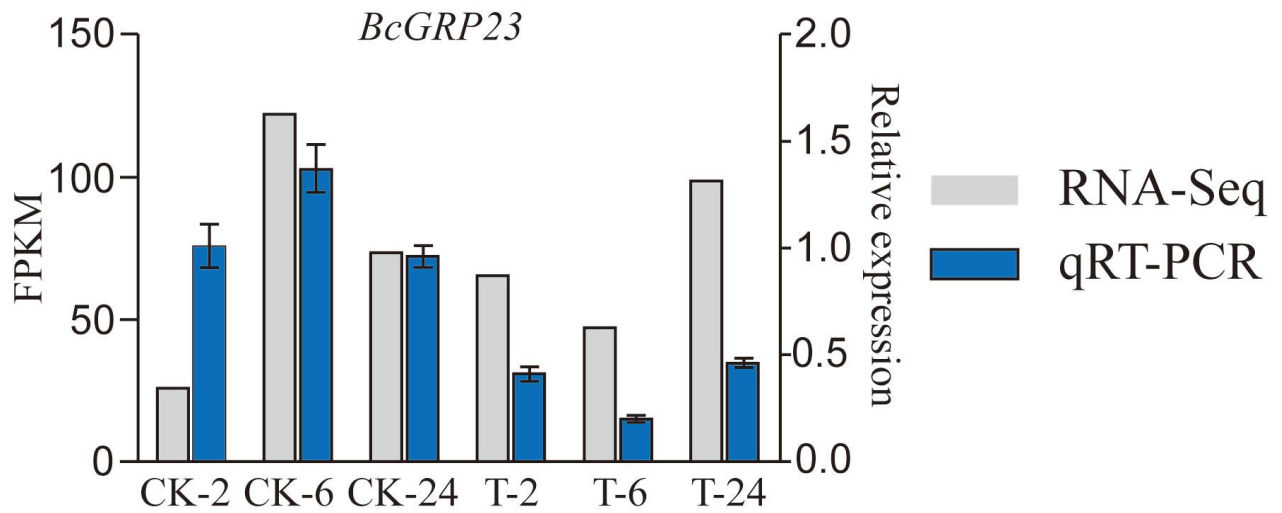


**Supplementary Figure 4.** Bacterial liquid PCR detection of CAMBIA1391-ProBcGRP23

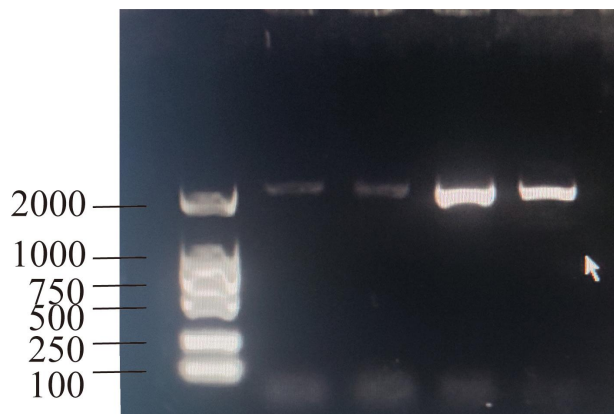
Note: Marker: DL2000; 1~3: pCAMBIA1391-ProBcGRP23.



**Supplementary Figure 5.** The ratio of Chl *a* and Chl *b* (Chl *a*/*b*) in leaves (A) and petioles (B) of BcGRP23 knockdown lines. L1-L7 represent different BcGRP23 knockdown lines. Error bars represent standard errors. Different lowercase letters indicate significant differences at the  $P < 0.05$  level.



**Supplementary Figure 6.** The expression level of *BCGRP23* gene after PCZ (Propiconazole) treatment (83.3 mg/L). The left Y axis represents RNA-Seq results and the right Y axis represents the results of qRT-PCR. T-2: after 2 hours of treatment; T-6: after 6 hours of treatment; T-24: after 24 hours of treatment.



**Supplementary Figure 7.** Bacterial liquid PCR detection of pABAI-*ProBcGRP23*. The correct band size is: 1350 bp + insert size.

**Supplementary Table 1.** Analysis of cis-acting elements in the *BcGRP23* promoter

Name	Quantity	Sequence	Function
-10PEHVPSBD	3	TATTCT	light-responsive element
ABRELATERD 1	1	ACGTG	ABA-responsive elements
ABRERATCAL	1	MACGYGB	abscisic acid-responsive element
ACGTATERD1	6	ACGT	drought-responsive element
ARR1AT	13	NGATT	cytokinin-responsive element
ASF1MOTIFCA MV	1	TGACG	salicylic acid-, auxin-responsive element
BIHD1OS	4	TGTCA	disease resistance-related response element
CAATBOX1	13	CAAT	elements that regulate transcription initiation frequency
CACTFTPPCA1	32	YACT	mesophyll-specific regulatory elements
CARGCW8GAT	11	CWWWWW WWWG	self feedback element
CATATGGMSA UR	4	CATATG	auxin-responsive element
CCAATBOX1	8	CCAAT	transcription factor associated with flowering gene transcription
CPBCSPOR	3	TATTAG	chlorophyll gene-related response elements
CURECORECR	12	GTAC	copper-inducible expression element
DOFCOREZM	15	AAAG	DOF gene binding site
DPBFCOREDC DC3	1	ACACNNG	abscisic acid-responsive element
EBOXBNNAPA	8	CANNTG	brassinolide, a seed development regulatory element
EECCRCAH1	2	GANTTNC	drought and osmotic stress response elements
ELRECOREPC RP1	1	TTGACC	damage specific responsive element
ERELEE4	2	AWTTCAA	ethylene-responsive element
GATABOX	26	GATA	light regulation, chlorophyll a/b binding element

GT1CONSENS US	22	GRWAAW	light-regulated GT-1 factor conserved binding site
GT1CORE	2	GGTTAA	light-responsive element
GT1GMSCAM4	2	GAAAAA	salt regulatory element
GTGANTG10	8	GTGA	pollen late gene promoter element
IBOX	2	GATAAG	light-responsive element
IBOXCORE	15	GATAA	light-responsive element
INRNTPSADB	2	YTCANTYY	initiation factor Inr element
LTRE1HVBLT4 9	2	CCGAAA	low temperature response element
MYB1AT	12	WAACCA	ABA, Dehydration response element
MYB2CONSEN SUSAT	2	YAACKG	drought response element
MYBCORE	4	CNGTTR	dehydration, Light regulation related element
MYBCOREATC YCB1	4	AACGG	light regulation related element
MYBPLANT	2	MACCWAMC	ethylene,flower organ tissue specific element
MYCCONSENS USAT	8	CANNTG	cold stress specific element
NODCON2GM	3	CTCTT	root tissue specific expression element
NTBBF1ARRO LB	2	ACTTTA	auxin induction related element
OSE2ROOTNO DULE	3	CTCTT	junction-specific element
P1BS	4	GNATATNC	phosphorus deficiency response element
POLASIG1	6	AATAAA	polyadenylation site
POLLEN1LELA T52	8	AGAAA	floral organ-specific element
PYRIMIDINEB OXOSRAMY1 A	1	CCTTTT	gibberellin response element
RAV1AAT	6	CAACA	SA signaling pathway-related cis-element

REALPHALGL HCB21	7	AACCAA	light regulatory element
REBETALGLH CB21	3	CGGATA	light regulatory element
RHERPATEXPA 7	2	KCACGW	root hair specific element
ROOTMOTIFT APOX1	30	ATATT	root specific regulatory element
SEF1MOTIF	2	ATATTTAWW	enhancer promoter
SEF3MOTIFG M	1	AACCCA	binding site for embryo-specific protein SEF3
SEF4MOTIFG M7S	3	RTTTTTTR	binding site for embryo-specific protein SEF4
SREATMSD	2	TTATCC	sugar repressive element
SURECOREAT SULTR11	2	GAGAC	sulfur deficiency response element
TAAAGSTKST 1	4	TAAAG	guard cell specific gene expression element
TATABOX2	4	TATAAAT	promoter core element
TATABOX3	2	TATTAAT	promoter core element
TATABOX4	3	TATATAA	promoter core element
TATABOX5	6	TTATTT	promoter core element
TBOXATGAPB	2	ACTTTG	light regulatory element
WBBOXPCWRK Y1	2	TTTGACY	defense response gene expression regulatory element
T/GBOXATPIN2	1	AACGTG	methyl jasmonate inducible element element.
WBOXATNPR1	5	TTGAC	salicylic acid inducible element
WBOXHVISO1	2	TGACT	sugar response element
WBOXNTERF3	4	TGACY	injury-related element
WRKY71OS	9	TGAC	gibberellin-related element

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**Supplementary Table 2.** List of primers used in this study

Primer name.	Primer sequence (5'-3').	
GAPDH	F:CAGGTTTGG AATTGTCGAGG R:GAGCTGTGGAAGCACCTTTC	Internal reference gene
BcGRP23-DL	F:GCTGGCCTTGATGACCAAAA R:CTACTCCGCCTACAGGCAAAA	<i>BcGRP23</i> for qRT-PCR
BcGRP23-CDS	F:ATGGCAATAAGGTGTTTAGCC R:TCAAGGGTGAATGAGACCAC	Full-length amplification of <i>BcGRP23</i> CDS.
pBI121-BcGRP23	F:CACGGGGGACTCTAGAATGGCAA TAAGGTGTTTAGCC R:TCCTTTACCCATCCCGGGAGGGT GAATGAGACCAC	<i>Xba</i> I and <i>Sma</i> I
pCAMBIA1391-ProBcGRP23	F:CCGGCGCGCCAAGCTTTGATATT TACAGTTTAGCAA R:GGGGATCCGTCGACCTGCAGCAT TGGGAGGTTTATATAGGA	<i>Hind</i> III and <i>Pst</i> I
pTRV2-BcGRP23	F:CACGGGGGACTCTAGACCAATAC CTGAACCACCACC R:TCCTTTACCCATCCCGGGTGTGG CTCAGTCCGTCAGTG	<i>Xba</i> I and <i>Sma</i> I
GUS	F:TAATGTTCTGCGACGCTCACA R:ATACCTGTTACCGACGACG F:GGCCGCTCTAGAACTAGTGGATC	<i>GUS</i> gene for qRT-PCR
pGreen II -62-SK-BES1	-CATGACAGCATCAGGAG R:ATCGATAAGCTTGATATCGAATTC TTAGCCGCGTCCTTTAGC	<i>Bam</i> H I and <i>Eco</i> R I
pGreen II -0800-LUC-ProGRP23	F:CACTATAGGGCGAATTGGGTACC TGATATTTACAGTTTAGCAA R:TTTATGTTTTTGGCGTCTTCCATC	<i>Kpn</i> I and <i>Nco</i> I

ATTGGGAGGTTTATATAGGA

F:CTTGAATTCGAGCTCGGTACCTA

pABAi-ProGRP23

AGGTAACATGAGATACATATC

*Kpn* I and *Sal* I

R:AGCACATGCCTCGAGGTCGACG

CATAAGTTACGCAAAGGC

F:GGAGGCCAGTGAATTCGAGAAT

pGADT7-BcBES1

GACAGCATCAGGAGG

*EcoR* I and *BamH* I

R:CGAGCTCGATGGATCCCCTCTTA

GCCGCGTCCTTTAG

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**Supplementary Table 3.** List of primers for genes related to chlorophyll synthesis and degradation in flowering Chinese cabbage

Gene name	Primer sequence (5'-3').
<i>BcPORA</i>	F:CGGCGATGATAGATGGAGG
	R:AAGAGTGAACGGAAGAGAGGAATA
<i>BcPORB</i>	F:CGATGATTGATGGAGGAGATT
	R:GCAACCAGGGTAAAGCGAAG
<i>BcPORC</i>	F:AAATCTGACTATCCATCAAAACG
	R:GCTCCATCATACTCTCCTCCA
<i>BcCHLD</i>	F:GCACACCAGCAAACCTCTCTCA
	R:TCTTCGTCCTTATCACCTCCG
<i>BcCAO</i>	F:TGCGACAGAATCAGACAGACC
	R:AAGCAACGGGATACCAAAAAGT
<i>BcPAO</i>	F:CAGCTTCAGCGACTCACC
	R:TCGCCGTGCTCTTCTTCGAT
<i>BcPPH</i>	F:TATCTGATGCGCGGGTGGAT
	R:TTCCCGACCAATGCTGGACT
<i>BcSGRI</i>	F:GTTGGGGTCCGCTTTGGGAA
	R:AATCGAGCTAACCTGCGGGA
<i>BcNYC1</i>	F:TGCTTCTCCGGGCATGGTTC
	R:CTGTCCGCTTCCGCTGCATA
<i>BcRCCR</i>	F:CTCGACCTCCCTCATCGCAA
	R:CGGACAAAGAGAGACGGCGA

