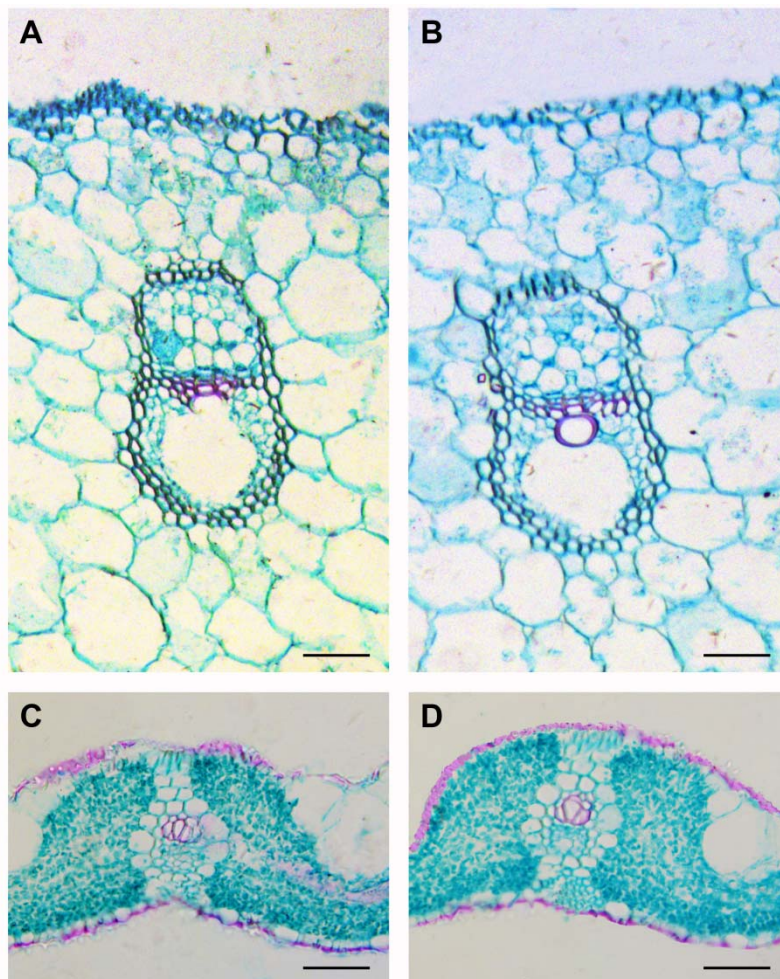


Appendix A. List of primer pairs used in this study.

Usage	Primer name	Sequence
Gene mapping	BC-23-F	5' CACTATTGCCTTCCCACCAT 3'
	BC-23-R	5' AATTTTCCCCAACACATGA 3'
	BC-22-F	5' TCGTTGGACACTGACATGGT 3'
	BC-22-R	5' CAACTGTTCAAAAAGCGTGA 3'
	BC-54-F	5' GTTTGTACCGCGTTCCTGTT 3'
	BC-54-R	5' CGGTCACTACCTGTCAGCAA 3'
	BC-57-F	5' CCACCAGAAAATGTTGCAGA 3'
	BC-57-R	5' TGCCAAGTTTATGCACTCCA 3'
	BC-44-F	5' CGGAGTCATGTGTCGTC AAC 3'
	BC-44-R	5' ATGGATCTCGCTGAGAGGAC 3'
	I4-5-F	5' GACGAACTCAACTTGGCAAAC 3'
	I4-5-R	5' GGATTCGTCAAAGGACAACAA 3'
qRT-PCR	<i>Ubp</i> -RT-F	5' GCTCCGTGGCGGTATCAT 3'
	<i>Ubp</i> -RT-R	5' CGGCAGTTGACAGCCCTAG 3'
	<i>LOC_Os04g10214</i> -RT-F	5' CTATGGAGCTCACGTCCAAC 3'
	<i>LOC_Os04g10214</i> -RT-R	5' AAGCTCTGTCACCGTCGAT 3'
	<i>LOC_Os04g10240</i> -RT-F	5' ATTTACGCAGCAAGTGTCCA 3'
	<i>LOC_Os04g10240</i> -RT-R	5' AACAGAAGACCACCAAAGCC 3'
	<i>LOC_Os04g10380</i> -RT-F	5' TGCTGCTTTGGGAGTCTATG 3'
	<i>LOC_Os04g10380</i> -RT-R	5' TGAACCAGGACCAACTTCAA 3'
	<i>LOC_Os04g10400</i> -RT-F	5' AAATGCTAGCTGGGTTGCTT 3'
	<i>LOC_Os04g10400</i> -RT-R	5' CATCGACCTCTCTCTCCACA 3'
	<i>LOC_Os04g10420</i> -RT-F	5' CTACGAGGCTGCATCTACCA 3'
	<i>LOC_Os04g10420</i> -RT-R	5' TGCAATGTAGTCCCAAGGAA 3'
	<i>LOC_Os04g10460</i> -RT-F	5' TGGATGTCATTGTTGGGTTTC 3'
	<i>LOC_Os04g10460</i> -RT-R	5' CCTCTTGCCTTTCAATCCAT 3'
	<i>LOC_Os04g10530</i> -RT-F	5' TATGATGCACTTGACGCTGA 3'
	<i>LOC_Os04g10530</i> -RT-R	5' CCTCTTGCCTTTGAATCCAT 3'
	<i>LOC_Os04g10650</i> -RT-F	5' ATGCTAGCAGCATGGATGAG 3'
	<i>LOC_Os04g10650</i> -RT-R	5' ACCGATTGCAGGAGAGACTT 3'
	<i>LOC_Os04g10690</i> -RT-F	5' CCCTGGAGGAGATGTTCAAG 3'
	<i>LOC_Os04g10690</i> -RT-R	5' GACGATGTCGATGAAGAGGA 3'
	<i>LOC_Os04g10750</i> -RT-F	5' CCCTGGAGGAGATGTTCAAG 3'
	<i>LOC_Os04g10750</i> -RT-R	5' TGAAGAAGACGGTGAACCAG 3'
	<i>LOC_Os04g11400</i> -RT-F	5' TGATGTCGGTGGCTGTTTAT 3'
	<i>LOC_Os04g11400</i> -RT-R	5' TTA CTTCATGAGCGTTTGC 3'
	<i>LOC_Os04g11440</i> -RT-F	5' GTGCTGGTTAACTGCAAACG 3'
	<i>LOC_Os04g11440</i> -RT-R	5' GAGGCCGTCATTATCATGTG 3'

<i>LOC_Os04g11450-RT-F</i>	5' TTGGAGTGTGATGGTTTCGT 3'
<i>LOC_Os04g11450-RT-R</i>	5' GTATCAAAGCAAAGCACCGA 3'
<i>LOC_Os04g11524-RT-F</i>	5' ACAGCAGCAAGGAGAGGATT 3'
<i>LOC_Os04g11524-RT-R</i>	5' AGAGCCAAGCTGCAAGAGAT 3'
<i>LOC_Os04g11790-RT-F</i>	5' ACGGCATCCTTATCCTCAAC 3'
<i>LOC_Os04g11790-RT-R</i>	5' TGACGAAGAAACCAGTGAGC 3'
<i>LOC_Os04g11820-RT-F</i>	5' CATTGGTTGGAAGTGTGGAG 3'
<i>LOC_Os04g11820-RT-R</i>	5' TGGTTCATCCAGGATCAGAA 3'
<i>LOC_Os04g11850-RT-F</i>	5' TGTGGGAATTCCATGAAAGA 3'
<i>LOC_Os04g11850-RT-R</i>	5' GTATACAGCTCCTGCCGTGA 3'
<i>LOC_Os04g11880-RT-F</i>	5' CAGTTGAAGCAGGACAAGGA 3'
<i>LOC_Os04g11880-RT-R</i>	5' CGTGCAGCTTCAGCATATTT 3'
<i>LOC_Os04g12080-RT-F</i>	5' GAAGGAGCAACGGGATGTAT 3'
<i>LOC_Os04g12080-RT-R</i>	5' CTAGGGATCGTGTCTCCAT 3'
<i>LOC_Os04g12140-RT-F</i>	5' ATATCCACACCTTCGGCTTC 3'
<i>LOC_Os04g12140-RT-R</i>	5' GTGATCAAGTTGCGGTCATC 3'
<i>LOC_Os04g12370-RT-F</i>	5' CATGGAATTGGGTTGGTACTC 3'
<i>LOC_Os04g12370-RT-R</i>	5' GAATCTCGAAGGATGGTGCT 3'
<i>LOC_Os04g12460-RT-F</i>	5' ATTCAGGAATGGGAGATTGC 3'
<i>LOC_Os04g12460-RT-R</i>	5' CGCATCATGTGGTAAAGTCC 3'
<i>LOC_Os04g12480-RT-F</i>	5' TTTATCCGCTTTGCACTCAC 3'
<i>LOC_Os04g12480-RT-R</i>	5' CACGTTGACAATTCATCC 3'
<i>LOC_Os04g12520-RT-F</i>	5' AACGTTGATGGAGTGACCAA 3'
<i>LOC_Os04g12520-RT-R</i>	5' CCCAGTTAGGAAGGTTGCAT 3'
<i>LOC_Os04g12530-RT-F</i>	5' CTCAGAGCTACAGGCAGTCG 3'
<i>LOC_Os04g12530-RT-R</i>	5' GCGGTCAGGAATGAGTTTG 3'
<i>LOC_Os04g12540-RT-F</i>	5' CAATCAGAGCACCAGCACTT 3'
<i>LOC_Os04g12540-RT-R</i>	5' TTGCTACTTGGCACCTTGAG 3'
<i>LOC_Os04g12580-RT-F</i>	5' ACGCAAGGACTAGCTCCAAT 3'
<i>LOC_Os04g12580-RT-R</i>	5' ATGGATCGGAAGAGAGAGT 3'
<i>LOC_Os04g12600-RT-F</i>	5' TACTCCGAACCAACCAAACA 3'
<i>LOC_Os04g12600-RT-R</i>	5' TACACATCCACCTTGGCAGT 3'
<i>LOC_Os04g12744-RT-F</i>	5' ATGGGAACAGGAGATTGAGG 3'
<i>LOC_Os04g12744-RT-R</i>	5' ACAGAACCGACAGCATGAAG 3'
<i>LOC_Os04g12820-RT-F</i>	5' CCAGAGCTACCACTGCTCCT 3'
<i>LOC_Os04g12820-RT-R</i>	5' CTCCACGATGAGGTTCTTGA 3'
<i>LOC_Os04g12900-RT-F</i>	5' TGTGCTCGTCAACTCTTTCC 3'
<i>LOC_Os04g12900-RT-R</i>	5' GCGATCGTCATCCAAGTAGA 3'
<i>LOC_Os04g12920-RT-F</i>	5' TCTTCTGAAGGCCAGTTCT 3'
<i>LOC_Os04g12920-RT-R</i>	5' CCACATTCTACCATCCATGC 3'
<i>LOC_Os04g12980-RT-F</i>	5' CAGTTAGATGAGCTGGGCAA 3'
<i>LOC_Os04g12980-RT-R</i>	5' CTTGCACTTGTCACGGAGTT 3'
<i>LOC_Os04g13220-RT-F</i>	5' TGTCCCATGATCAGACCACT 3'

	<i>LOC_Os04g13220</i> -RT-R	5' TGCAACACTGGTACCTCCAT 3'
	<i>LOC_Os04g13350</i> -RT-F	5' TCCTGGCACACTCTAGCATC 3'
	<i>LOC_Os04g13350</i> -RT-R	5' GAGGGAGACGAGTACCTTCG 3'



Appendix B Comparison of tissue morphology in culms and leaves of wild type and *bc16* mutant. Cross sections of the uppermost culms (A, B) and flag leaves (C, D) of 9311(A, C) and *bc16* mutant (B, D) were double-stained with Safranin O and Fast Green FCF. Scale bars = 50 μ m.

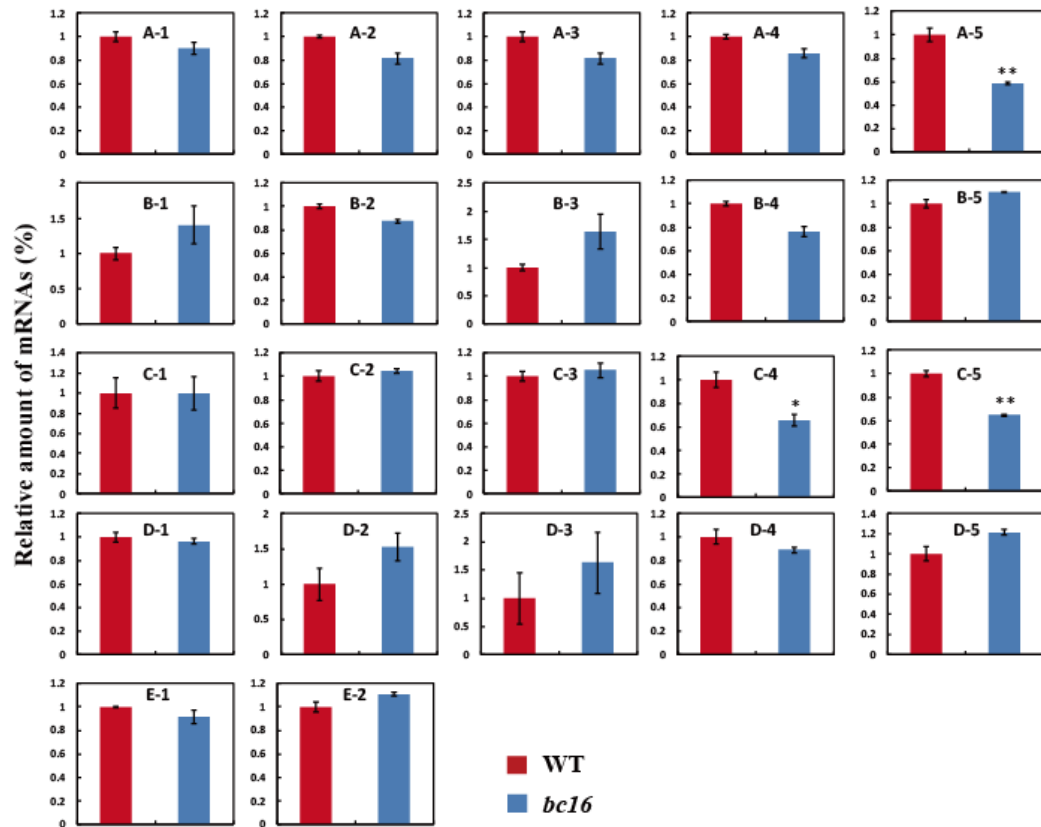
Appendix C. Segregation of the mutant phenotypes in F₂ populations reciprocal crosses between the wild type and *bc16* mutant

Cross	Normal	Brittle	$\chi^2_{3:1}$ ^a
wild type / <i>bc16</i> F ₂	128	44	0.031
<i>bc16</i> / wild type F ₂	115	40	0.053

^aValue for significance at $P = 0.05$ and $1df$ is 3.84

Appendix D. The selected candidate genes for Real-time RT-PCR analysis

Gene Locus	Functional Annotation
<i>LOC_Os04g10214</i>	expressed protein
<i>LOC_Os04g10240</i>	nicotiana lesion-inducing like, putative, expressed
<i>LOC_Os04g10380</i>	glycine-rich protein, putative, expressed
<i>LOC_Os04g10400</i>	electron transfer flavoprotein subunit beta, putative, expressed
<i>LOC_Os04g10420</i>	CW7, putative, expressed
<i>LOC_Os04g10460</i>	amidase, putative, expressed
<i>LOC_Os04g10530</i>	amidase, putative, expressed
<i>LOC_Os04g10650</i>	CDT1A - Putative DNA replication initiation protein, expressed
<i>LOC_Os04g10690</i>	inorganic phosphate transporter, putative, expressed
<i>LOC_Os04g10750</i>	inorganic phosphate transporter, putative, expressed
<i>LOC_Os04g11400</i>	expressed protein
<i>LOC_Os04g11440</i>	F-box protein interaction domain containing protein, expressed
<i>LOC_Os04g11450</i>	OsFBX118 - F-box domain containing protein, expressed
<i>LOC_Os04g11524</i>	retrotransposon protein, putative, unclassified, expressed
<i>LOC_Os04g11790</i>	OsFBX120 - F-box domain containing protein, expressed
<i>LOC_Os04g11820</i>	white-brown complex homolog protein, putative, expressed
<i>LOC_Os04g11850</i>	expressed protein
<i>LOC_Os04g11880</i>	WD domain, G-beta repeat domain containing protein, expressed
<i>LOC_Os04g12080</i>	TKL_IRAK_DUF26-lc.7 - DUF26 kinases have homology to DUF26 containing loci
<i>LOC_Os04g12140</i>	expressed protein
<i>LOC_Os04g12370</i>	expressed protein
<i>LOC_Os04g12460</i>	Leucine Rich Repeat family protein, expressed
<i>LOC_Os04g12480</i>	pumilio-family RNA binding repeat containing protein, expressed
<i>LOC_Os04g12520</i>	transposon protein, putative, unclassified, expressed
<i>LOC_Os04g12530</i>	amino acid transporter family protein, putative, expressed
<i>LOC_Os04g12540</i>	receptor-like protein kinase, putative, expressed
<i>LOC_Os04g12580</i>	receptor-like protein kinase, putative, expressed
<i>LOC_Os04g12600</i>	receptor-like protein kinase, putative, expressed
<i>LOC_Os04g12744</i>	expressed protein
<i>LOC_Os04g12820</i>	expressed protein
<i>LOC_Os04g12900</i>	glucosyltransferase, putative, expressed
<i>LOC_Os04g12920</i>	expressed protein
<i>LOC_Os04g12980</i>	UDP-glucuronosyl/UDP-glucosyl transferase, putative, expressed
<i>LOC_Os04g13220</i>	ABC transporter family protein, putative, expressed
<i>LOC_Os04g13350</i>	retrotransposon protein, putative, unclassified, expressed



Appendix E Real-time RT-PCR analyses for candidate genes in the mapped region. The RNA was extracted from the nodes of wild type and *bc16* mutant at 2 WAH. Red and blue bars indicate the relative expression levels in wild-type and *bc16* mutant plants, respectively. The tested genes are as follow: A-1: *LOC_Os04g10240*, A-2: *LOC_Os04g10380*, A-3: *LOC_Os04g10400*, A-4: *LOC_Os04g10420*, A-5: *LOC_Os04g10750*, B-1: *LOC_Os04g11400*, B-2: *LOC_Os04g11440*, B-3: *LOC_Os04g11524*, B-4: *LOC_Os04g11790*, B-5: *LOC_Os04g11820*, C-1: *LOC_Os04g11850*, C-2: *LOC_Os04g11880*, C-3: *LOC_Os04g12080*, C-4: *LOC_Os04g12460*, C-5: *LOC_Os04g12480*, D-1: *LOC_Os04g12540*, D-2: *LOC_Os04g12580*, D-3: *LOC_Os04g12820*, D-4: *LOC_Os04g12900*, D-5: *LOC_Os04g12920*, E-1: *LOC_Os04g12980*, E-2: *LOC_Os04g13220*. For each RNA sample, three technical replicates were performed. Representative results from two biological replicates are shown. Vertical bars show standard errors (n = 3) (Student's *t*-test: * $P < 0.05$; ** $P < 0.01$).