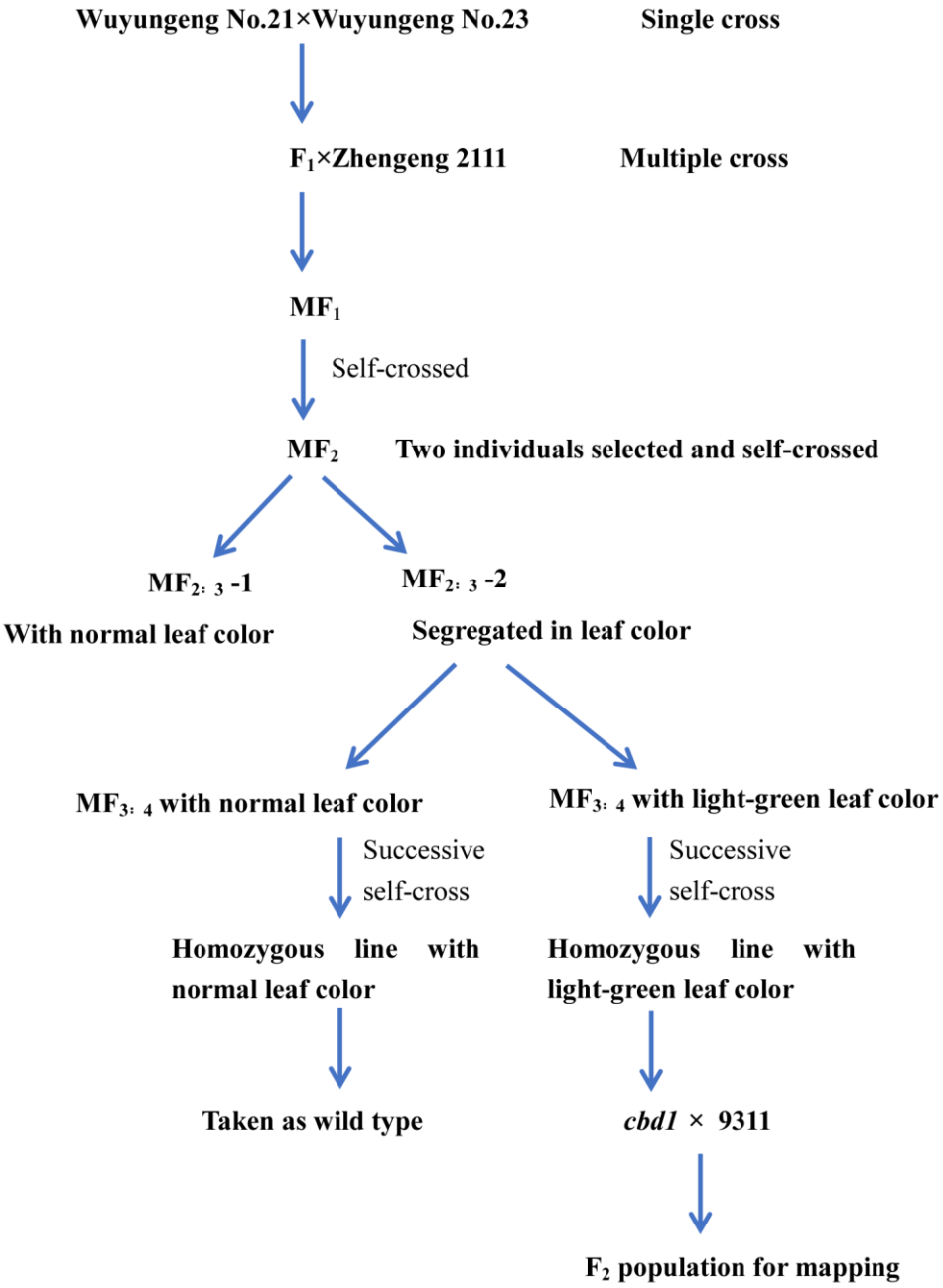
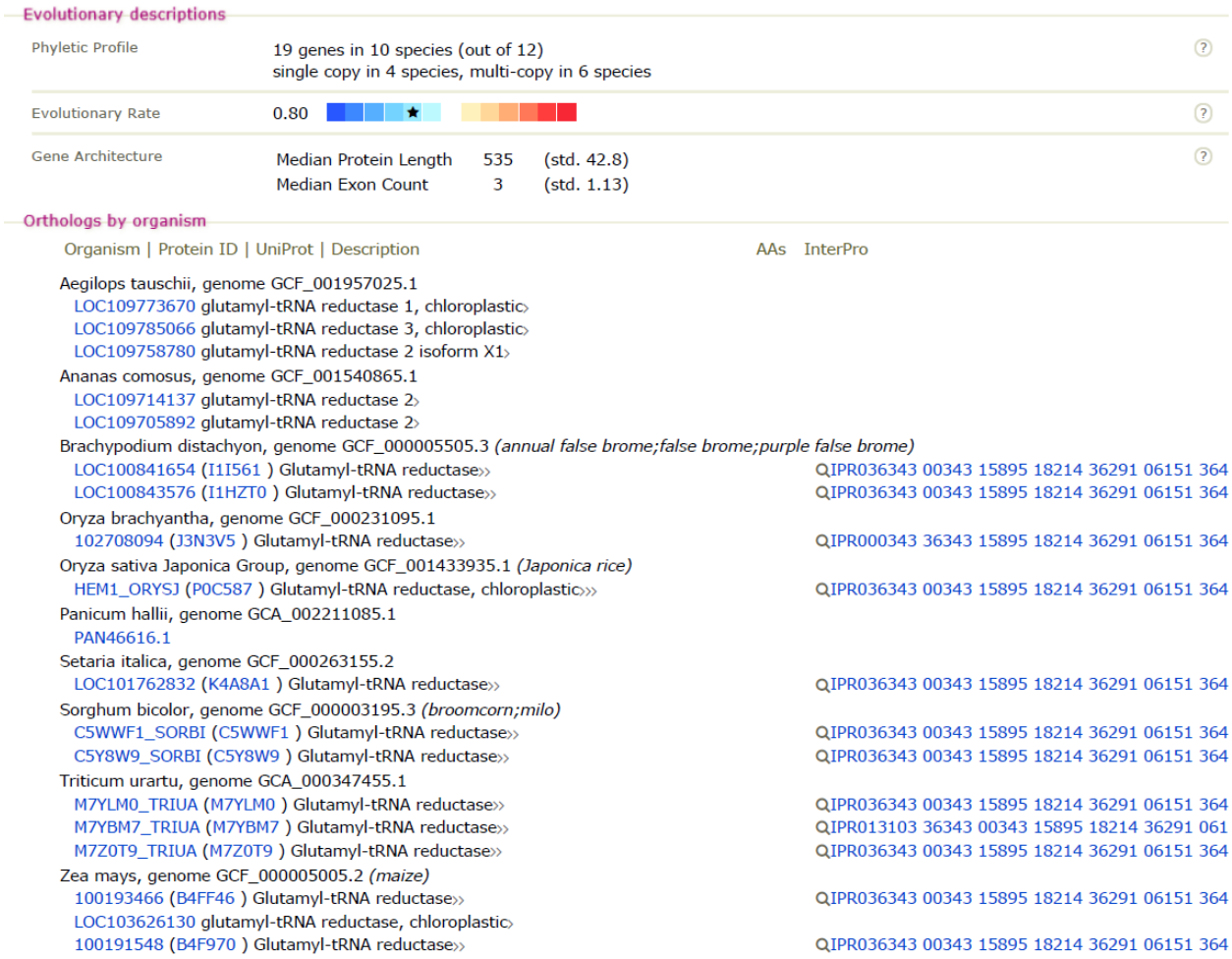


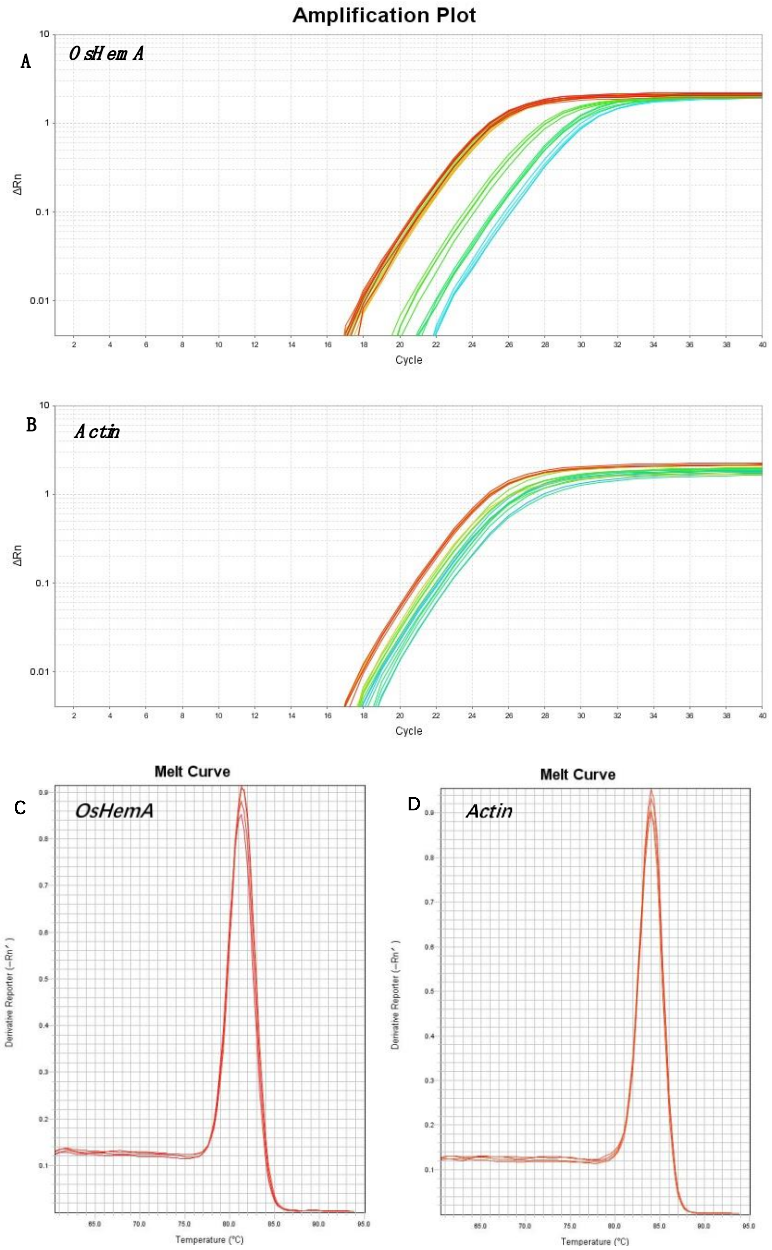
Appendix A Origin and pedigree selection of *cbd1*.

Appendix B All Markers used in our research

Type	Primer	Forward primer (5'-3')	Reverse primer (5'-3')
Primers for gene mapping	D1	CACCGCCTTCATCGTTTG	TAGCGTCGGTTCCTATTTG
	D2	CGACACATGGTGCAGATATGA	TGTGACACGGTGTAGTGACG
	D3	TATGGATGCGGATGAGGA	CCACATAGTAAGAAATCTAGGG
	D4	TCATGGAAGAAGCCAACAAG	TCATCCAGCCTCCTCATAG
	D5	TTTTGGTTCGTGGCATAG	TAGGTTGGAGTACACGGTAG
	D6	ATTGGCTCGGTCTACTGC	CATCTGAATCCAATCAAGACA
	CR1	GAGCGAAATGCGAGTAAATAC	CAAGCCTAAGGATGAGTTCT
Primers for gene cloning	hemAPG	CCGGCGCGCCAAGCTTGATGTCGCCATTTCCACG	GAATTCCCGGGGATCCCAAATCGGGCTCCACTGT
	OshemA-GFP	CGGAGCTAGCTCTAGAATGATGGCGAGCACGACG	TGCTCACCATGGATCCGTTCTGGGACTTCTCCAC
	GFP-*OshemA*	CGAGCTGTACAGATCTATGATGGCGAGCACGACG	GCCAAATGTTTGAACTGCAGTCAGTTCTGGGACTTCTCCA
Primers for gene expression	*HEML*	AGAACAAAGGGCAGATTGCTGCTG	TGTTTCGTCAAGTCACGGAGAGCA
	HEMB	TGGCATTGTCAGGGAAGATGGAGT	CCAAAGCAGCACGTATTGCTCCAA
	CHLD	TAGCACAGCTGTCAGAGTGGGTTT	TTGCCAGCCACCTCAAGTATCTCA
	CHLH	GCACGGGAACTTGGCGTTTCATTA	ACATGTCCTGGAGCTGCTTCTCAT
	CHLI	AGGGATGCTGAACTCAGGGTGAAA	AAGTAGGACTCACGGAACGCCTTT
	CHLM	GCTTCATCTCCACGCAGTTCTACT	GCAATGACGAATCGAAGACGCACA
	CRD	TGGATCTAACATGACACGCACCCA	ACTGTAACGGCATTCTTCTCCGGT
	DVR	TTCTTCGAGAGGGTGATCAGGGAA	GAAACTGGCAATGGCAGCCAAGAA
	POR	TCGTCGGCCTCGTCTGAGTTTATT	AGGCCTCTCTCACTGAAAGCTGAA
	CHLG	CCAGCCACTGATGAAAGCAGCAAT	AGAGCGCTAATACACTCGCGAACA
	CAO	ACACCTTCATCTGGGCTTCAAGGA	AGATGCGTCGAACATTGCTTGGTG
	OshemA	CCGACCGGTACATGAAGGAAAG	GCAAGTTTCTCACGCATCTCCAC
	Actin1	TGCTATGTACGTCGCCATCCAG	AATGAGTAACCACGCTCCGTCA



Appendix C Homologs of OsHemA shown in Poales. Homologs of OsHemA protein were searched in Orthologs Database by organism. Among the 10 species in Poales, 4 species have a single copy in and 6 species have multi-copy. The protein IDs were shown in the ‘Orthologs by organism’ panel.



Appendix D Amplification plots and melt curves of *OsHemA* gene and its reference gene *Actin1*. Amplification plots and melt curves of *OsHemA* gene and its reference gene *Actin1*. A, amplification plot of *OsHemA* gene. B, amplification plot of *Actin1* gene. C, melt curve of *OsHemA* gene; (B) Melt curve of *Actin1* gene. All the figures were from one of the tissue expression pattern experiments, drawing by ABI 7500 software version 2.3.

Appendix E Comparison of agronomic traits of wild-type (WT) and mutant *cbd1*

	Plant height (cm)	Effective tiller number	Number of primary branches per panicle	Flag leaf length (cm)	Flag leaf width (cm)	Main panicle Length (cm)	Number of full grains per panicle	1000-grain weight (g)
WT	111.41±1.84	9.94±2.31	12.80±0.56	86.6±3.7	2.08±0.09	17.49±0.44	177.15±9.49	27.13±0.12
cbd1	112.97±2.33	9.41±1.62	13.53±0.92	84.1±4.2	2.05±0.10	17.95±0.93	195.95±14.36**	27.27±0.29

** Significant at $P<0.01$ compared to WT by student T test.