

Table S1 | Clean-reads in BSA pools

#Sample_ID	Total_Reads	Total_Bases	Total_Reads_with_Ns	N_Reads%	A%	T%	C%	G%	N%	Error%	Q20%	Q30%	GC%
The CK (Weilyu11) pool	196869736	29231893396	63942	0.03	33.07	32.65	17.18	17.1	0	0.0416	97.58	92.02	34.28
Male sterile plants in M ₃ pool	213597502	31776404012	68853	0.03	32.94	32.31	17.4	17.34	0	0.0403	97.86	92.97	34.74
Male sterile plants in M ₄ pool	193903636	28835330095	61414	0.03	32.94	32.4	17.36	17.3	0	0.0404	97.86	92.91	34.66
Fertile pool in M4 pool	200865064	29766030004	80806	0.04	33.28	32.61	17.05	17.05	0	0.042	91.41	91.84	34.11

Table S2. The list of primers used in this study.

Primer	Sequence (5'to3')	Purpose	Products (bp)	Primer	Sequence (5'to3')	Purpose	Products (bp)
<i>EVM0013050</i> 1F	GCCGGAATTCCACTGCCTAT	Quantitative Real time RT-qPCR	162	<i>EVM0030179</i> 7F	TCTCCAAAGAGGCCGCTAC	Quantitative Real time RT-qPCR	187
<i>EVM0013050</i> 1R	TTCCTCAACAGCTTCTCCCC	Quantitative Real time RT-qPCR		<i>EVM0030179</i> 7R	GCCAGTTGAGTCTTCCATGGTT	Quantitative Real time RT-qPCR	
<i>EVM0001741</i> 2F	GTAAACACGCTCGCTCGGTC	Quantitative Real time RT-qPCR	175	<i>EVM0000114</i> 8F	GGGTATGACAGACCGAGCAA	Quantitative Real time RT-qPCR	155
<i>EVM0001741</i> 2R	GTGGAAAACAATATTTGATC	Quantitative Real time RT-qPCR		<i>EVM0000114</i> 8R	ATGCCCATGTCAGTAGACCC	Quantitative Real time RT-qPCR	
<i>EVM0018917</i> 3F	GCGGTACCATGGCGATTCCGATGA	Quantitative Real time RT-qPCR	149	<i>EVM0029279</i> 9F	CGGTTCCAAACCCGTAACA	Quantitative Real time RT-qPCR	152
<i>EVM0018917</i> 3R	CAGGTCGACTCAGTCAAGTTGCCTA	Quantitative Real time RT-qPCR		<i>EVM0029279</i> 9R	ACTGGATTCCCTGCGTGTATG	Quantitative Real time RT-qPCR	
<i>EVM0017094</i> 4F	CCGGGGCGGTACCATGGCTATTGCA	Quantitative Real time RT-qPCR	169	<i>EVM0019079</i> 10F	AAGAGCAATGTCATCGACGCA	Quantitative Real time RT-qPCR	177
<i>EVM0017094</i> 4R	CAGTGGTCTCACCTGCAGGTCTAGTTTCT	Quantitative Real time RT-qPCR		<i>EVM0019079</i> 10R	AGCCTCATATGTTCCATCTTCCAA	Quantitative Real time RT-qPCR	
<i>EVM0018917</i> 5F	CAGTGGTCTCAGCCCGGGCTCTGTAACATATC	Quantitative Real time RT-qPCR	153	<i>EVM0026892</i> 11F	GTTTTCCAAGGCACAAGGTGT	Quantitative Real time RT-qPCR	172
<i>EVM0018917</i> 5R	CTCAGGGCTGTCATGGTACTCTGTCCAC	Quantitative Real time RT-qPCR		<i>EVM0026892</i> 11R	GGGATCATCGGGGACGAGA	Quantitative Real time RT-qPCR	
<i>EVM0031043</i> 6F	CTCATACAGTTTATGAAAAATATAAAATT	Quantitative Real time RT-qPCR	161	<i>EVM0004172</i> 12F	TCTTCGGAACCGACCACTTG	Quantitative Real time RT-qPCR	149
<i>EVM0031043</i> 6R	ATGGAGAACTCGAGTCAAATCT	Quantitative Real time RT-qPCR		<i>EVM0004172</i> 12R	TCAGCAATATGATTGAGACGGC	Quantitative Real time RT-qPCR	
<i>Tubulin</i> -R	TTCTTTATGGTTGGGTTTGC	Quantitative Real time RT-qPCR	192				
<i>Tubulin</i> -F	GCTCGTCTACCTCCTTTGTG	Quantitative Real time RT-qPCR					

F: forward primers; R: reverse primers. Primers were designed by NCBI, and tested by RCR of Tubulin.

Table S3 | The significant PPI between EVM0001741 and six seed development related genes.

Gene1	Arabidopsis homologs	Gene2 ID	Arabidopsi s homologs	score
EVM0001741	AT1G77390	EVM0030179	AT5G67260	0.77
EVM0001741	AT1G77390	EVM0000114	AT3G15030	0.40
EVM0001741	AT1G77390	EVM0029279	AT4G31400	0.46
EVM0001741	AT1G77390	EVM0019079	AT5G48600	0.65
EVM0001741	AT1G77390	EVM0026892	AT5G22800	0.405
EVM0001741	AT1G77390	EVM0004172	AT5G05560	0.67
EVM0004172	AT5G05560	EVM0026892	AT5G22800	0.97

The critical score for protein-by-protein interaction was set at 0.40.

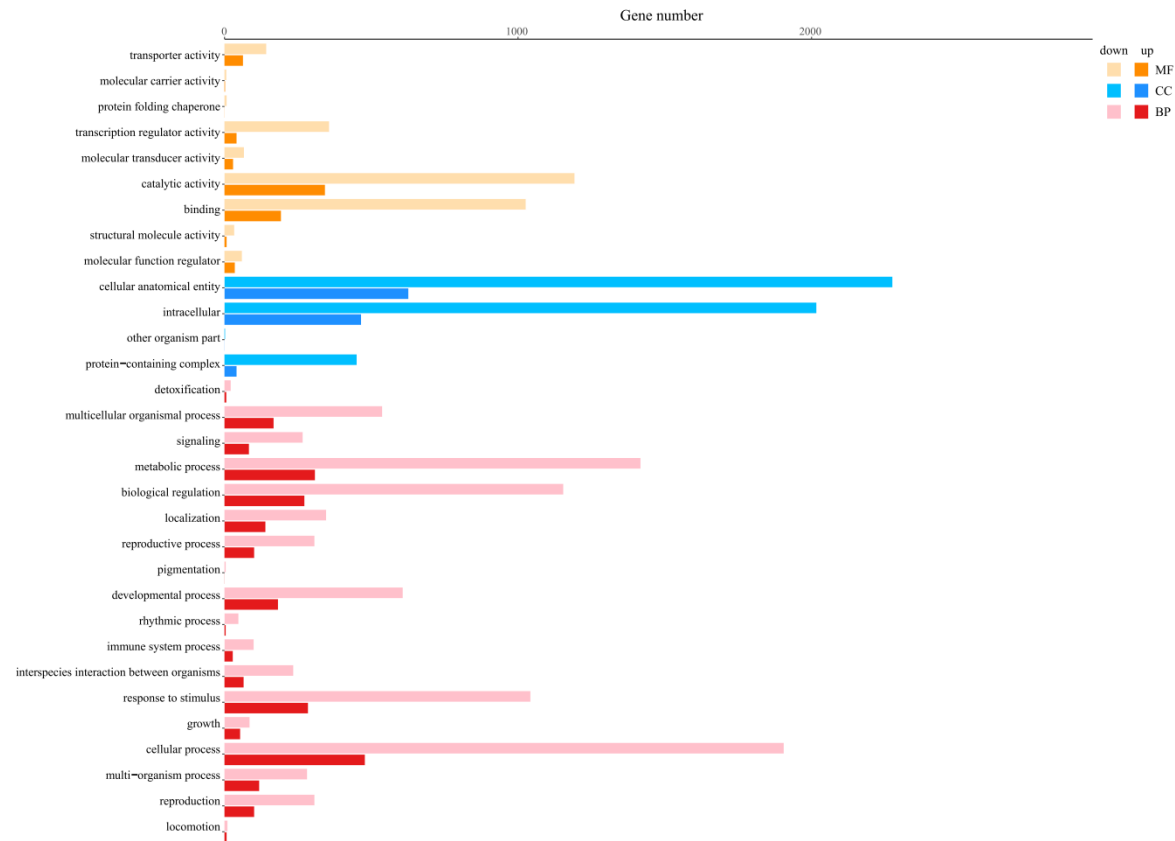


Figure S1. Gene ontology (GO) enrichment analysis for up- and down-regulated genes. The ordinate represents the detailed classification of GO term, and the abscissa represents the number of DEGs. MF(Molecular Function), BP (Biological Process) and CC (Cellular Component).

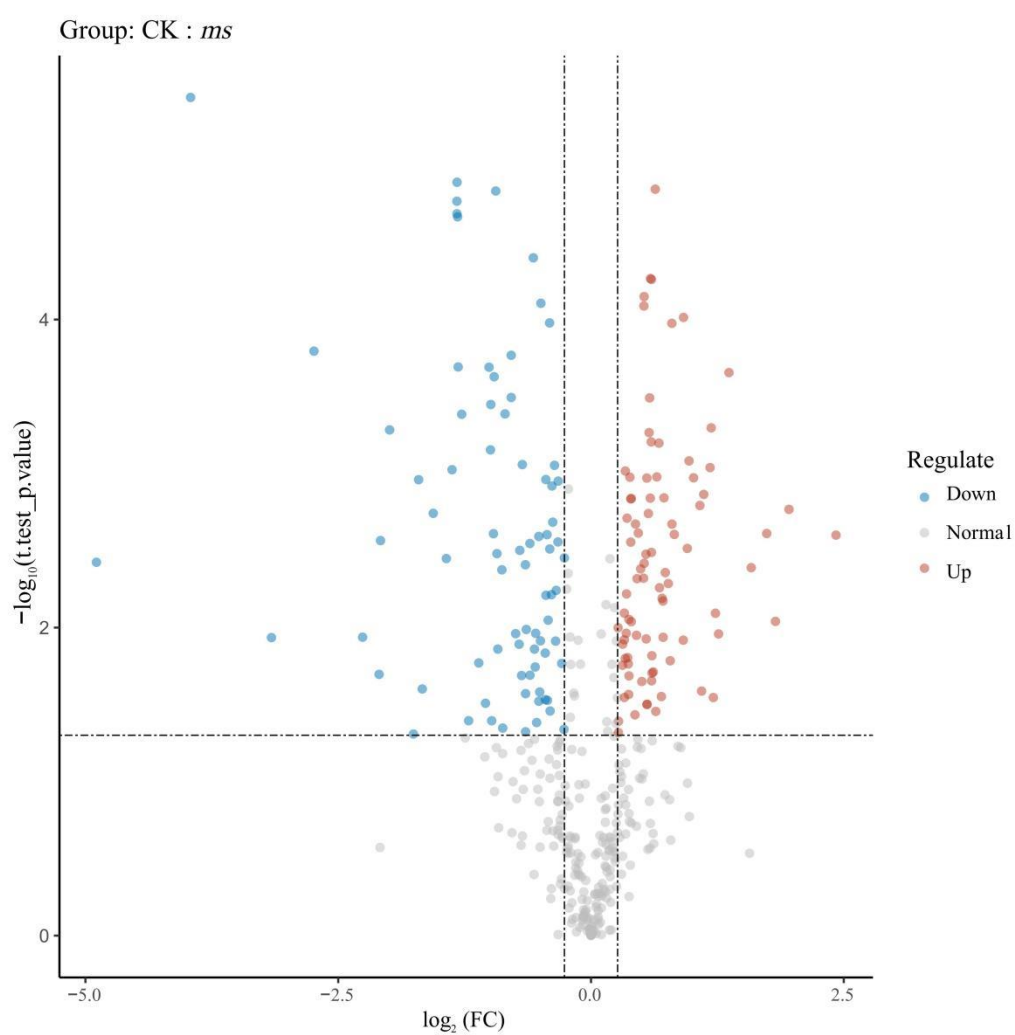


Figure S2. Volcano plots are using for visualizing differential metabolites between CK group and *ms* group. Pink and blue points represent the significant differential metabolites with $p\text{-value} < 0.005$ and $|\log_2\text{FC}| > 0.5$.

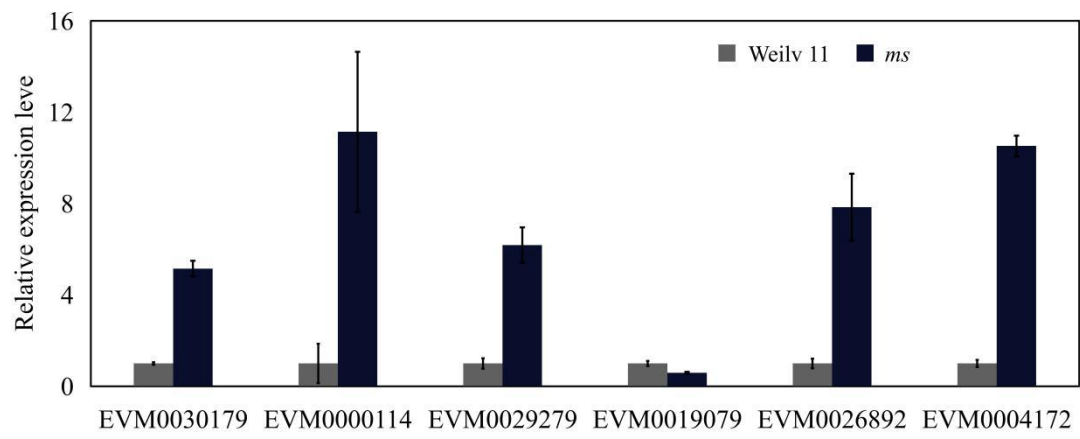


Figure S3. Real-time PCR analysis of six genes interaction with EVM0001741 in mungbean.