

Supplemental Table 1. HMR peptides identified by LC-MS/MS analysis.

Sequence	Prob	Start	Stop
(C)KKEDGDGDVSEGSKKSEEGFE(Y)	95%	58	78
(E)YVTVER(H)	50%	79	84
(E)RHPYHSYmD(S)	96%	84	92
(E)RHPYHSYMD(S)	92%	84	92
(E)RHPYHSYmD(S)	17%	84	92
(E)RHPYHSYmDSTSGKLEPASG(A)	82%	84	103
(E)RHPYHSYMDSTSGKLEPASG(A)	60%	84	103
(E)RHPYHSYmDSTSGKLEPASGAR(A)	100%	84	105
(E)RHPYHSYmDSTSGKLEPASGAR(A)	100%	84	105
(E)RHPYHSYmDSTSGKLEPASGAR(A)	100%	84	105
(E)RHPYHSYMDSTSGKLEPASGAR(A)	100%	84	105
(E)RHPYHSYmDSTSGKLEPASGAR(A)	100%	84	105
(E)RHPYHSYmDSTSGKLEPASGAR(A)	98%	84	105
(E)RHPYHSYMDSTSGKLEPASGAR(A)	95%	84	105
(E)RHPYHSYMDSTSGKLEPASGAR(A)	56%	84	105
(E)RHPYHSYMDSTSGKLEPASGARASIPGE(D)	11%	84	111
(E)RHPYHSYMDSTSGKLEPASGARASIPGEDYWPE(G)	93%	84	116
(E)RHPYHSYMDSTSGKLEPASGARASIPGEDYWPE(G)	87%	84	116
(E)RHPYHSYmDSTSGKLEPASGARASIPGEDYWPE(G)	74%	84	116
(E)RHPYHSYMDSTSGKLEPASGARASIPGEDYWPE(G)	53%	84	116
(E)RHPYHSYmDSTSGKLEPASGARASIPGEDYWPE(G)	49%	84	116
(E)RHPYHSYMDSTSGKLEPASGARASIPGEDYWPE(G)	45%	84	116
(E)RHPYHSYMDSTSGKLEPASGARASIPGEDYWPE(G)	28%	84	116
(E)RHPYHSYmDSTSGKLEPASGARASIPGEDYWPE(G)	28%	84	116
(E)RHPYHSYMDSTSGKLEPASGARASIPGEDYWPE(G)	9%	84	116
(H)SYmDSTSGKLEPASGARASIPGEDYWPE(G)	35%	89	116
(D)STSGKLEPASGAR(A)	99%	93	105
(D)STSGKLEPASGAR(A)	95%	93	105
(D)STSGKLEPASGARASIPGEDYWPE(G)	77%	93	116
(D)STSGKLEPASGARASIPGEDYWPE(G)	40%	93	116
(S)GKLEPASGARASIPGEDYWPE(G)	35%	96	116
(A)SGARASIPGEDYWPE(G)	91%	102	116
(S)GARASIPGEDYWPE(G)	87%	103	116
(G)ARASIPGEDYWPE(G)	78%	104	116
(G)ARASIPGEDYWPE(G)	38%	104	116
(R)ASIPGEDYWPE(G)	47%	106	116
(R)ASIPGEDYWPE(G)	29%	106	116
(E)GTSSRVRAARAPQPAGE(S)	10%	117	133
(R)VRAARAPQPAGE(S)	100%	122	133
(R)VRAARAPQPAGE(S)	53%	122	133
(R)AARAPQPAGE(S)	27%	124	133
(E)SSSFPSYGK(N)	16%	134	142
(E)SSSFPSYGKNPGSR(R)	99%	134	147
(E)SSSFPSYGKNPGSR(R)	99%	134	147
(E)SSSFPSYGKNPGSR(R)	97%	134	147
(E)SSSFPSYGKNPGSRR(K)	92%	134	148
(E)SSSFPSYGKNPGSRR(K)	70%	134	148
(E)SSSFPSYGKNPGSRRKK(N)	56%	134	150
(E)SSSFPSYGKNPGSRRKK(N)	11%	134	150
(E)SSSFPSYGKNPGSRRKKNR(K)	10%	134	152
(R)KATEENVTV(E)	59%	153	162
(S)EEEEENDSSDGFVTYKNE(F)	13%	174	191
(E)EEEEENDSSDGFVTYKNE(F)	56%	176	191
(E)ENDSSDGFVTYKNE(F)	68%	178	191
(E)NDSSDGFVTYKNE(F)	100%	179	191
(E)NDSSDGFVTYKNE(F)	100%	179	191
(E)NDSSDGFVTYKNE(F)	99%	179	191
(E)NDSSDGFVTYKNEFE(R)	71%	179	193
(N)DSSDGFVTYKNE(F)	92%	180	191
(D)SSDGFVTYKNE(F)	99%	181	191
(E)FEREEEE(T)	90%	192	198
(E)FEREEEEETGFE(L)	100%	192	202
(E)FEREEEEETGFE(L)	100%	192	202
(E)FEREEEEETGFE(L)	99%	192	202
(E)TGFELDK(K)	90%	199	205
(E)TGFELDK(L)	78%	199	206
(E)LDKKLGRPHPFIDPTK(K)	30%	203	218
(E)LDKKLGRPHPFIDPTKK(K)	97%	203	219
(E)LDKKLGRPHPFIDPTKK(K)	37%	203	219
(E)LDKKLGRPHPFIDPTKKK(Q)	99%	203	220
(E)LDKKLGRPHPFIDPTKKK(Q)	75%	203	220
(E)LDKKLGRPHPFIDPTKKK(Q)	72%	203	220
(E)LDKKLGRPHPFIDPTKKK(Q)	57%	203	220
(E)LDKKLGRPHPFIDPTKKK(Q)	31%	203	220
(E)LDKKLGRPHPFIDPTKKKQIE(K)	99%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	98%	203	223

(E)LDKKLGRPHPFIDPTKKKQIE(K)	98%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	97%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	97%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	97%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	96%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	96%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	92%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	82%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	80%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	72%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	65%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	47%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	32%	203	223
(E)LDKKLGRPHPFIDPTKKKQIE(K)	23%	203	223
(E)LDKKLGRPHPFIDPTKKKQIEK(T)	43%	203	224
(E)LDKKLGRPHPFIDPTKKKQIEK(T)	29%	203	224
(E)LDKKLGRPHPFIDPTKKKQIEK(T)SDE(S)	36%	203	230
(D)KKLGRPHPFIDPTKKKQIE(K)	100%	205	223
(D)KKLGRPHPFIDPTKKKQIE(K)	99%	205	223
(D)KKLGRPHPFIDPTKKKQIE(K)	98%	205	223
(D)KKLGRPHPFIDPTKKKQIE(K)	92%	205	223
(K)KLGRPHPFIDPTKKKQIE(K)	88%	206	223
(K)KLGRPHPFIDPTKKKQIE(K)	75%	206	223
(K)LGRPHPFIDPTKKKQIE(K)	98%	207	223
(K)LGRPHPFIDPTKKKQIE(K)	97%	207	223
(G)RPHPFIDPTKKKQIE(K)	60%	209	223
(K)QIEK(T)SDE(S)	21%	221	230
(E)SWWNWRKPE(K)	97%	231	239
(E)SWWNWRKPE(K)	91%	231	239
(E)SWWNWRKPEKE(Q)	95%	231	241
(E)SWWNWRKPEKE(Q)	36%	231	241
(E)SWWNWRKPEKE(Q)	28%	231	241
(E)TVFLKAmAE(T)	99%	255	263
(E)TVFLKAmAE(T)	99%	255	263
(E)TVFLKAmAE(T)	98%	255	263
(E)TVFLKAmAE(T)	94%	255	263
(E)TVFLKAmAE(T)	75%	255	263
(E)TVFLKAmAE(T)	64%	255	263
(E)TVFLKAmAE(T)	61%	255	263
(E)TVFLKAmAE(T)	61%	255	263
(E)TVFLKAmAE(T)	40%	255	263
(E)TVFLKAmAE(T)	37%	255	263
(E)TVFLKAmAE(T)	31%	255	263
(E)TVFLKAmAE(T)	29%	255	263
(E)TVFLKAmAE(T)	20%	255	263
(E)TVFLKAmAE(T)	14%	255	263
(E)TVFLKAmAE(T)	13%	255	263
(E)TGQVKLYGEEPTLTE(T)	100%	264	278
(E)TGQVKLYGEEPTLTE(T)	100%	264	278
(E)TGQVKLYGEEPTLTE(T)	99%	264	278
(E)TGQVKLYGEEPTLTE(T)	84%	264	278
(Q)VKLYGEEPTLTE(T)	74%	267	278
(E)TSLYRAR(R)	90%	279	285
(E)TSLYRAR(R)	70%	279	285
(E)TSLYRAR(R)HLFKEE(R)	30%	279	292
(R)RHLFKEE(R)	90%	286	292
(R)RHLFKEE(R)	84%	286	292
(E)RLQAERE(R)	85%	293	299
(E)RERLAKEGPmAFYSE(W)	91%	298	312
(E)RERLAKEGPmAFYSE(W)	17%	298	312
(E)RERLAKEGPmAFYSE(W)	9%	298	312
(E)RLAKEGPmAFYSE(W)	100%	300	312
(E)RLAKEGPmAFYSE(W)	99%	300	312
(E)RLAKEGPmAFYSE(W)	77%	300	312
(E)RLAKEGPmAFYSE(W)	24%	300	312
(E)RLAKEGPmAFYSE(W)	14%	300	312
(E)RLAKEGPmAFYSE(W)	11%	300	312
(R)LAKEGPmAFYSE(W)	22%	301	312
(E)GPmAFYSE(W)	77%	305	312
(E)GPmAFYSE(W)	16%	305	312
(E)WVKAWKRD(T)	13%	313	320
(R)EAVQKHFEETGEDE(N)	36%	324	337
(E)AVQKHFEET(T)	90%	325	332
(E)AVQKHFEETGEDE(N)	100%	325	337
(E)AVQKHFEETGEDE(N)	90%	325	337
(E)AVQKHFEETGEDE(N)	82%	325	337
(E)AVQKHFEETGEDE(N)	78%	325	337
(E)AVQKHFEETGEDE(N)	9%	325	337
(E)AVQKHFEETGEDENTQLIE(M)	26%	325	343

(K)HFEETGEDE(N)	86%	329	337
(E)NTQLIEmFSHQTDRE(Y)	100%	338	352
(E)NTQLIEmFSHQTDRE(Y)	100%	338	352
(E)NTQLIEmFSHQTDRE(Y)	98%	338	352
(E)NTQLIEmFSHQTDRE(Y)	67%	338	352
(E)MFSHQTDRE(Y)	100%	344	352
(E)MFSHQTDRE(Y)	100%	344	352
(E)mFSHQTDRE(Y)	100%	344	352
(E)mFSHQTDRE(Y)	100%	344	352
(E)MFSHQTDRE(Y)	100%	344	352
(E)MFSHQTDRE(Y)	99%	344	352
(E)MFSHQTDRE(Y)	99%	344	352
(E)mFSHQTDRE(Y)	98%	344	352
(E)mFSHQTDRE(Y)	98%	344	352
(E)mFSHQTDRE(Y)	96%	344	352
(E)mFSHQTDRE(Y)	96%	344	352
(E)mFSHQTDRE(Y)	76%	344	352
(E)MFSHQTDRE(Y)	74%	344	352
(E)YRImMGTD(I)	77%	353	360
(E)DQIKQIWGGD(P)	98%	375	384
(E)DQIKQIWGGDPVYPTINYIQD(P)	71%	375	395
(D)PVYPTINYIQDPNAVmD(F)	95%	385	401
(N)YIQDPNAVMDFRGPDFHEPTPNMLSYLKE(N)	16%	392	420
(D)PNAVmDFRGPDFHEPTPNMLSYLKE(N)	53%	396	420
(D)PNAVmDFRGPDFHEPTPNmLSYLKE(N)	43%	396	420
(D)PNAVMDFRGPDFHEPTPNMLSYLKE(N)	28%	396	420
(D)PNAVmDFRGPDFHEPTPNMLSYLKE(N)	7%	396	420
(D)FRGPDFHEPTPNmLSYLKE(N)	100%	402	420
(D)FRGPDFHEPTPNMLSYLKE(N)	100%	402	420
(D)FRGPDFHEPTPNmLSYLKE(N)	100%	402	420
(D)FRGPDFHEPTPNmLSYLKE(N)	81%	402	420
(D)FRGPDFHEPTPNMLSYLKE(N)	43%	402	420
(D)FRGPDFHEPTPNmLSYLKE(N)	35%	402	420
(N)MLSYLKE(N)	56%	414	420
(E)NGKVISREmHE(A)	41%	421	431
(E)mHEALLTKE(K)	17%	429	437
(E)ALLTKEKTE(Q)	100%	432	440
(E)ALLTKEKTE(Q)	100%	432	440
(E)ALLTKEKTE(Q)	95%	432	440
(A)LLTKEKTE(Q)	97%	433	440
(L)LTKEKTE(Q)	90%	434	440
(E)KTEQLEVPmD(D)	85%	438	448
(E)KVPRNWSVLK(E)	25%	475	484
(E)KVPRNWSVLKE(T)	98%	475	485
(E)KVPRNWSVLKE(T)	53%	475	485
(E)KVPRNWSVLKETPE(L)	99%	475	488
(E)KVPRNWSVLKETPE(L)	96%	475	488
(E)KVPRNWSVLKETPE(L)	35%	475	488
(E)KVPRNWSVLKETPE(L)	21%	475	488
(E)KVPRNWSVLKETPE(L)	13%	475	488
(E)KVPRNWSVLKETPE(L)	13%	475	488
(E)KVPRNWSVLKETPE(L)	11%	475	488
(E)KVPRNWSVLKETPE(L)	10%	475	488
(E)KVPRNWSVLKETPE(L)	8%	475	488
(R)NWSVLKE(T)	78%	479	485
(R)NWSVLKETPE(L)	84%	479	488
(R)NWSVLKETPE(L)	47%	479	488
(W)SVLKETPE(L)	9%	481	488
(E)TPELRTAKPKPKKE(G)	24%	486	499
(E)LRTAKPKPKKE(G)	99%	489	499
(E)LRTAKPKPKKE(G)	52%	489	499
(E)LRTAKPKPKKEGR(M)	91%	489	501
(E)GRMSLDEAVDD(A)	59%	500	510
(E)GRmSLDEAVDDAE(N)	67%	500	512
(E)GRMSLDEAVDDAE(N)	57%	500	512
(E)GRmSLDEAVDDAENLDFLmDFE(E)	62%	500	522
(E)AVDDAENLDFLmDFEEEE(T)	31%	507	524
(E)AVDDAENLDFLmDFEEEE(T)	22%	507	524

**Supplemental Table 2.** Oligonucleotides used for generating constructs used in this study.

Construct	Vector	Forward Primer	Reverse Primer	Template	Cloning Method
N20-YFP	pCHF3-YFP	GGCggatccATGGCGTCAATATCAACCAC	GGCgtcgacTCCACTGTCTGTGCATACTTG	AT2G34640 (HMR)	PCR and Ligation
N31-YFP	pCHF3-YFP	GGCggatccATGGCGTCAATATCAACCAC	GGCgtcgacAACCCGTCTCTGCACAATAC	AT2G34640 (HMR)	PCR and Ligation
N50-YFP	pCHF3-YFP	GGCggatccATGGCGTCAATATCAACCAC	GGCgtcgacAGACCGATCCCTAGAAGTAATC	AT2G34640 (HMR)	PCR and Ligation
N60-YFP	pCHF3-YFP	GGCggatccATGGCGTCAATATCAACCAC	GGCgtcgacCTCTTTCTTGCAATTGATAC	AT2G34640 (HMR)	PCR and Ligation
YFP-GUS	pCHF3-NtermYFP	CGGagatctATGTTACGTCCTGTAGAAAC	CGGggatccTTGTTTGCCTCCCTGCTGCG	GUS	PCR and Ligation
YG-NLS1	pCHF3-YFP-GUS	CGGagatctAAAAAGCTTGGAAGGCCACAT	CGGgtcgacTTAGTTCCACCACGATTCATCGCT	AT2G34640 (HMR)	PCR and Ligation
YG-NLS2	pCHF3-YFP-GUS	CGGagatctAAGACACTCACGAGCGATGAATCG	CGGgtcgacTTAAACATCAGGACGTCTTCTTTG	AT2G34640 (HMR)	PCR and Ligation
YG-2NLS	pCHF3-YFP-GUS	CGGagatctAAAAAGCTTGGAAGGCCACAT	CGGgtcgacTTAAACATCAGGACGTCTTCTTTG	AT2G34640 (HMR)	PCR and Ligation
GST-HMRm	pET42b	GGCgaattcTAAGAAAGAGGATGGAGATGGTG	GGCctgcagTTAAGGATCAGTCTCCTCTTCAAAG	AT2G34640 (HMR)	PCR and Ligation
HMRm-HA	pCHF3	cccggggatcctctagagATGAAGAAAGAGGATGGAGATGGTGATG	cgaaagctctgcaggTTAGGCGGCCGGAGCGTA	HMR-HA	Gibson Assembly
TPrbcS-HMRm-HA	pCHF3	cccggggatcctctagagATGGCTTCCTCTATGCTC	cttctctcatAGTCTCAAACCTCTTCTTTCC	AT1G67090 (RBCS1A)	Gibson Assembly
		ttagactATGAAGAAAGAGGATGGAGATGGTGATG	cgaaagctctgcaggTTAGGCGGCCGGAGCGTA	HMR-HA	Gibson Assembly
YG	pCHF3-YFP-GUS	gatccTAATACCCATACGATGTTCCAGATg	tcgacATCTGGAACATCGTATGGGTATTA	-	Adapter Ligation
YG-NLS SV40	pCHF3-YFP-GUS	gatccCCTAAGAAGAAGCGCAAGGTCTAAg	tcgacTTAGACCTTGCCTTCTTCTTAGGg	-	Adapter Ligation

**Supplemental Table 3.** Primers used for cDNA synthesis and qRT-PCR analysis of PEP-dependent plastidial genes.

<b>Accession</b>	<b>Gene Name</b>	<b>cDNA Synthesis Primer</b>	<b>Primer Pair for qRT-PCR</b>
ATCG00630	PSAJ	GGGAAATGTTAATGCATCTGG	AAACATATCTTTCCGTAGCAC CTCTATTAATAAACCTGCTAACG
ATCG00020	PSBA	TAGATGGAGCCTCAACAGCAGCTA	ACATTTCTTCTTAGCGGCTT CGTCCTTGACTATCAACTACTGA
ATCG00680	PSBB	CATCCAAATCTGGATCAATACCAG	GAATTAGATCGTGCGACTTTGA CTAGCACCATGCCAAATGTGTC
ATCG00490	RBCL	CTTCACAAGCAGCAGCTAGTTCAGG	GGAGATGATTCTGTACTACAAT GTCCCTCATTACGAGCTTGTAC

**Supplemental Table 4.** Primers used for qRT-PCR analysis of nuclear-encoded genes.

<b>Accession</b>	<b>Gene Name</b>	<b>Forward Primer</b>	<b>Reverse Primer</b>
AT1G69960	PP2A	TATCGGATGACGATTCTTCGTGCAG	GCTTGGTCGACTATCGGAATGAGAG
AT2G38530	LTP2	GCATGCAAAGTCAATATTCC	AATATTCGAAACATCCGCTA
AT5G14180	MPL1	TCAGCTACGGTGGTTTAGAT	TTCACAAACTGCACATTCAT
AT2G45210	SAUR36	G TTCAGGATACAACCGGATA	TTGAGTTTGGCTAATGGTCT
AT1G19530	-	CAAGTTGGTAACTCAGGAAGGTG	TTCTCCACCATCCACTACTCTTG
AT2G46970	PIL1	AAATTGCTCTCAGCCATTCGTGG	TTCTAAGTTT GAGGCGGACGCAG
AT4G16780	ATHB-2	TCACAGTACTCTCAATCCGAAGC	CCGTAAGAACTCGCAGTCTAC
AT4G32280	IAA29	CACCATCATTGCCCGTATCA	CCACAGTAGCCGTTGTTGGA
AT4G14130	XTR7	CACCGTCACTGCTTACTACTTG	CATTGGTGTGAAGAACATAAG