

Supplementary Material

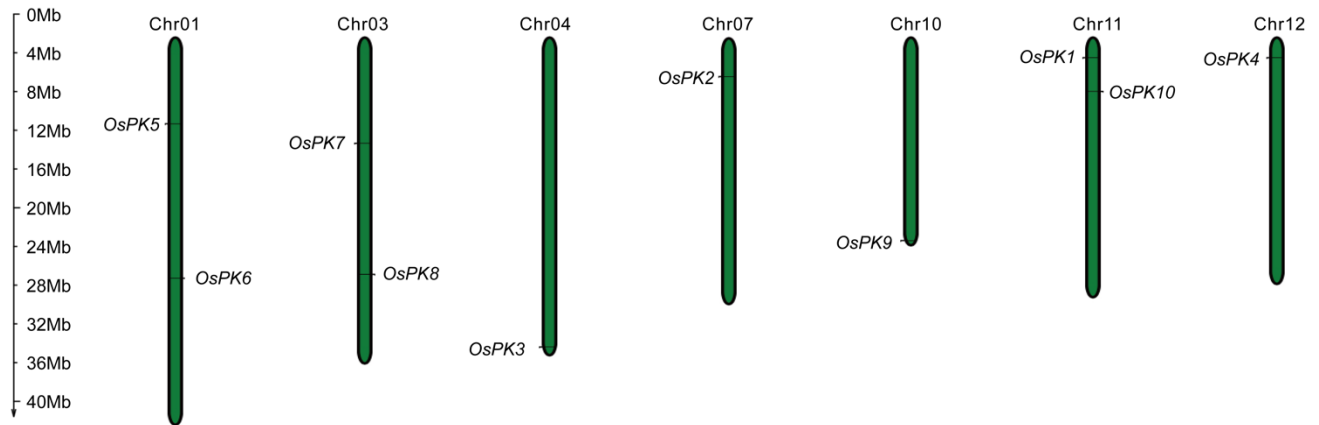


Figure S1. Chromosome localization analysis of PK genes in rice. The chromosome number is displayed at the top of each bar, and the size of the chromosome is indicated by its relative length. The unit on the left scale is Mb, and the short line indicates the approximate location of the PK genes on the corresponding chromosome.

OsPK5	1	MAVMeEQ--EAGAGVMRR-----	-----	RPKTKIVCTLGPASRSVEMIGRLLRAGMCVARFNFSHGSHEY	59	
OsPK6	1	MAQV-VAA-AGTAAAVAAVGRPL[6]	ADALRPAA[77]	RRRTKIVCTIGPSTNTKEMIWLKAEAGMNVARLNMSHGHDAS	154	
OsPK7	1	MAA-----AV-----	-----	RPTVKGSCSSGGHAGAGR-----GAGWAPRRRRRRRGDPRR	41	
OsPK8	1	MATS-AAAAASTLPYLVAAASSS[2]	-----AR[36]	-RKTKLVCTVGPAC--VGALPALARGGMGVARVNLCHGGRGW	101	
OsPK3	1	MANIdMGKILAGLENDLDA-----	-----	VPKTKLVCTLGPASRSVPMLEKLLRAGMNVARFNFSHGTHEY	16	
OsPK2	1	MAAT-AAAA-HTLLHLAAPRKPS[2]	-PPLPPAT[68]	-RRTKLVCTVGPATCGADEALAVGGMNVARVNMCHGDREW	139	
OsPK9	1	MAAA-AAEIVGSAARMA-----	APAVRPA- [63]	RRRTKIVCTIGPSTNTREMIWKLAEETGMNVARVNMCHGDHQS	129	
OsPK1	1	MHST--NLLLEEFIRMASILEPS	KPSFFPAM	---TKIVGTLGPKSRVADTISSCLKAGMSVARFDFSWGDAEY	68	
OsPK10	1	MQGA--NMLLDEPVRILTSLVTFV	KPKVFPSL	---TKIVGTLGPNSSHSEVVIQECLETAGMAVARFDFSWMDASY	68	
OsPK4	1	MHST--NLLLEEFIRMASILEPS	KPSFFPAM	---TKIVGTLGPKSRSVDTISSCLKAGMSVARFDFSWGDAEY	68	
OsPK5	60	HQETLDNLRAMES--TGILCAVMLDTK-GPEIRTGFLKDGKPVQLKKQ	QETVSTDYSIKGDDN-MISMSYKKLAVDLK	135		
OsPK6	155	HQKVIDLVEYNAQTKd-NVIAIMLDTK-GPEVRSGLDPQ--PIMLETGQ	EFTFTTIKRG-VGTET-CVSVNYDDFVNDVE	228		
OsPK7	42	GRSTRASSRRRRRPrSGYQSRVSRAEQVGEIRTDGFLKDGKPIQLKQ	KEITITIDYSIKGDN-LISMSYHKLAIIDLK	120		
OsPK8	102	HRAVMREVRLNEEE--GFCVSLMVDTE-GSQLLVADHGGAASKEADG	SEWLFSTKRTDESHFF-TMHVNFDFKSEDL	177		
OsPK3	62	HQETLDNLRQAMHN--TGVLCAVMLDTK-GPEIRTGFLKDGKPIKLTG	QELTFTDYEIKGDN-MITMSYKKLPVDVK	137		
OsPK2	140	HRGVIRAVRRLNEEK--GFAVAVMMDTE-GSEIHMGDLGGAAAKAEDG	EIWTFSVRSFEAPPErTIHVNYEGFAEDVR	216		
OsPK9	130	HQKVIDLVEYNAKNDGNVIAIMLDTK-GPEVRSGLDPQ--PIMLEEG	QEFNFTIKRG-VSTKD-TVSVNYDDFINDVE	204		
OsPK1	69	HQETLENLKLAKST--KKLCAVMLDTV-GPELQVNVKSEA-AISLEAN	GTVVLTDPDQGEASSE-LLPINFSGLAKALK	143		
OsPK10	69	HQETLNNLRKAAQNV--NKLCPVMLDTL-GPEIQVHNSTGG-PIELK	AGNHVTITPDLKAPASSE-ILPIKFGGLAKAVK	143		
OsPK4	69	HQETLENLKLAKST--KKLCAVMLDTV-GPELQVNVKSEA-SISLEEN	GTVILTDPDQGEASSQ-VLPINFAGGLAKAVK	143		
OsPK5	136	PGSVILCADGTIT	LTVLHCDKEqgLVRCRCENTAML-GERKNVNL	GVIV	DLPTLTEKDKEDILKWGPVNK	205
OsPK6	229	VGDMLLVDDGMMMS	LLVKSXTED--SVKCEVIDGGEL-KSRRLNVR	GKSA	TLPSITDKDWDIDK-FGVENQ	195
OsPK7	121	PGSTILCADGTIT	LTVLSCDCEqgLVRCRCENSAML-GERKNVNL	GVIV	DLPTLTEKDKVDILQWGPVNK	190
OsPK8	178	VGDELVDGGMAR	FEVIEKVG--DLRCKCTDPGLL--LPRAKLS[4]	GKLV[4]	GLPTLSAKDWADIE-FGIAEG	250
OsPK3	138	PGNVILCADGTIS	LTVLSCDPCagTVRCRCENTAML-GERKCNLP	GIVV	DLPTLTEKDKEDILKWGPVND	207
OsPK2	217	VGDELVDGGMAR	FEVVEKLG--DVKCRCTDPGLL--LPRANLT[4]	GSIV[5]	MLPTISSKDWLID-FGISeg	290
OsPK9	205	VGDILLVDGMMMS	LAVKSKTAD--TVKCEVDDGEL-KSRRLNVR	GKSA	TLPSITEKDWEDIK-FGVENG	271
OsPK1	144	PGATIFVQGYLFT[8]	LEVSEVKG--DVVCIKNSATaGSLFTLHCS	QIHI	DLPTLSDDEKVEIRRWGAPNK	220
OsPK10	144	KGDTLFGQYLYFT[8]	LEVVEVTSGE--NVECLVTNTATLaGPMFTLHVS	KAHV	SLPTLSDYDKEVISTWGLHNS	220
OsPK4	144	PGDTIFVQGYLYFT[8]	LEVSIQIKGD--DVVCIKNTATLaGSLFTLHCS	QIHI	DLPTLSDDEKVEIRKWGAPNK	220
Pfam:PK						
OsPK5	206	IDMIALSFVRKGSDLVEVRKVL--GKHA--KSIMLSKVENEQ	EGVANFDDILAQSDAFMVARGDLGMEIPIEKIFYAQKV	281		
OsPK6	296	VDYYAVSFVKDAQVVEHLKDYL--RSSN--ADIHVIVKIES	ADSIPLNLSIITASDGMVARGDLGAELPIEEVLLQEE	371		
OsPK7	191	IDMIALSFVRKGSDLMLVRSVL--GEHA--KSILLMSKVENEQ	EGVANVDEIIANSDAFMVARGDLGMEIPIEKIFYAQKV	266		
OsPK8	251	VDICALSFVKDANDIKYLTXYL--SRKS-LEHIKIFAKVESLES	LNKLDIEASDGMVARGDLGVQIPLEQIPAIQEA	327		
OsPK3	208	IDMIALSFVRKGSDLTVVRQLL--GQHA--KRILKMSKVENEQ	EGVNFDEILRETDAFMVARGDLGMEIPIEKIFYAQKV	283		
OsPK2	291	VDFAVSFVKSAEIVNHLKSYIaaRSRG--SDIAVIAKIES	IDSLNLEEIRASDGMVARGDMGAQIPLEQVPSVQK	368		
OsPK9	272	VDFYAVSFVKDAKVIHELKDYL--KSN--ADIHVIVKIES	ADSIPLNLSIITASDGMVARGDLGAELPIEEVLLQEE	347		
OsPK1	221	IDFLSLSYTRHAEVDVQAREFL--SKLGLdSQTQIFAKIEN	VEGLNFDEILQEADGIIILSGNLGIDLPEKVFLLFQKS	298		
OsPK10	221	VDIISLSYTRHAEVDVRLRSFL--QSHG-1QDTQIYAKVENTE	GLDHDFDEILQEADGVIISRGDLGIDLPEKVFLLFQKS	297		
OsPK4	221	IDFLSLSYTRHAEVDVQAREFL--SKLGLdSQTQIFAKIEN	VEGLNFDEILQEADGIIILSGNLGIDLPEKVFLLFQKS	298		
OsPK5	282	MIFKCNIGQKPVVTTATQMLESMIKSPRPTRAEATDVANAVLDG	TCVMLSGETAAGAYPELAVRTMAKICLQAESCVDHA	361		
OsPK6	372	IIRMCRSMGKAVIVATNMLESIMVHPTPTRAEVSIDIAVREGS	DGIMLSGETAHGKFLKAVKVMHTVALRTEATMSGG	451		
OsPK7	267	MIHKCNIGQKPVVTTATQMLESMIKSPCPTRAEATDVANAVLDG	TCVMSGETAAGAYPELAVQTMANICSRAEYLDYP	346		
OsPK8	328	IVDLCRNLKPKVIVASQLESMEVYPTPTRAEADVSEAVRQYAD	AVMLSAESAIGAYPQKALAVLRAASERMEWSRD	407		
OsPK3	284	MIYKCNLAGKPVVTTATQMLESMIKSPRPTRAEATDVANAVLDG	TCVMLSGETAAGAYPELAVKIMARICVEAESLNE	363		
OsPK2	369	IVKLCRQNLKPKVIVASQLESMEYPTPTRAEADVSEAVRQYAD	AVMLSGESAMGRYPEKALSLSVLSRISRIEKKWRE	448		
OsPK9	348	IVTRCRSMGKAVIVATNMLESIMHPTPTRAEVSIDIAVREGS	DAIMLSGETAHGKFLKAVKVMHTVAQRTESWLYNP	427		
OsPK1	299	ALHKCNMAGKPAVV--TRVDSMTDNLRPTRAETDVANAVLDG	SDAILLGAETLRGLYPVETISIVGKICAEAEKVFNQD	377		
OsPK10	298	AIKKCNLAGKPVII--TRVDSMTDNLRPTRAETDVANAVLDG	TDGILLGAETHRGYPVDVAVSTVGRICAEAESVYNQ	376		
OsPK4	299	ALHKCNMAGKPAVV--TRVDSMTDNLRPTRAETDVANAVLDG	SDAILLGAETLRGLYPVETISIVGKICAEAEKVFNQD	377		
OsPK5	362	AVFKSITASAPIPM	SPLESASSAVRTANSAKAALILVLT	TRGGTARLVAKYRPSMPILSVVVP	PELKqTDSFDWTC	438
OsPK6	452	ETPANL-----[6]	HMSMFAYHSTMSNTLG-TSIVV	TRTGFMALLSHYRPSGTIFAFTDQ	-----	512
OsPK7	347	FIFKKLSSAPVPL	SPLESASSAVQTANISKASLILVLT	TRGGTARLVAKYRPSMPILSVVVP	PELKqTDSFDWTC	423
OsPK8	408	NMQKLLPQHQAIA[3]	RISEQICTSAEMANNLAVDAIFVYTKYGHMA	LLSRNRPPIFAFTDN	-----	474
OsPK3	364	AVFKEMIRSAPLPM	SPLESASSAVRTANSAKAALILVLT	TRGGTARLVAKYRPSMPILSVVVP	PELKqTDSFDWTC	439
OsPK2	449	KRHEELKDVSSS[3]	KISEEICISAAKMANKLEVDVAVVTNT	GHMASSLLSRCRPPCIFAFTTS	-----	515
OsPK9	428	TTSFSLVAHPQALL[7]	QLSKMFGSHATMMANTLC-TPII	VTRTGSMALLSHYRPSSTIFAFTNE	-----	497
OsPK1	378	LYFKRTVKYVGEPM	THLESIASSAVRAAIKVKASVICTSS	GRAARLIAKYRPTMPVLSVVIP	RLK-TNQLRWSFT	453
OsPK10	377	VHFKLVLKHVGDPM	PHEESVASSAVRTAMKVKAAIVVFTFS	GRAARLIAKYRPTMPVLSVVIP	REG-SDPTKWSY	452
OsPK4	378	LYFKRTVKHVGEPM	THLESIASSAVRAAIKVKASVICTSS	GRAARLIAKYRPTMPVLSVVIP	RLK-TNQLRWSFT	453
Pfam:PK_C						
OsPK5	439	DEAPARHSLIVRGVIMPLSAATAKAFDNEA-TEEALGFAISNAK	AGLNSGESVVALH	RIGTASVIKLLTAN--	510	
OsPK6	513	-ERVQRRLALYQGVCPVQME-----	FSDDA--EKTFGDALSYLLKHGMVKEGEEVALVQ[9]	QSTHNIQVRKV----	583	
OsPK7	424	DEAPARQS-----	HCQGFDPNA-----EHRYTKGI-----	448		
OsPK8	475	-ANSRSMNLYWGVIPQLPL-----	LSNNM--EDNFNQTIKLMKSGSVKSGD	TVLVVA[9]	ATSVFQSIQVRIVD--	548
OsPK3	440	SEGPARHSLIVRGLVPLLAEGSAKATDS	ES-TEVILDAALKSAVQKQLCKPGDAVVALH	RIGVASVIKICIVK--	511	
OsPK2	516	-TSVRRRLNLQGLIFPRLS-----	FSDDM--ESNLNRTEFSLKARGMIQSGDLVIALS[1]	---MLQSIQVMNV--	578	
OsPK9	498	-ERVQRRLALYQGVVPIYMK-----	FSDDA--EETFSRAISSLLNAQFVKEG	DVYTLVQ[9]	ESTHHIQVRKVQG--	570
OsPK1	454	GAFAERQSLIVRGLFPLADPRHPAEST	NAENESVLKVALDHGKASGVIKSHDRVVVCQ	KVGDSVVVKIIELDd-	527	
OsPK10	453	GTTQARQCFARGVYPLMASTEEAETGGLT	rEYGIKLAQNYGRSVGMQLPYDRLIIFQ	KIGDSSVVVKIIECDss	527	
OsPK4	454	GAFAERQSLIVRGLFPLADPRHPAEST	NAENESVLKVALDHGKASGVIKSHDRVVVCQ	KVGDSVVVKIIELDd-	527	

Figure S2. Multiple sequence alignment among PKs in rice. Constraint-based Multiple Alignment Tool was used for the multiple sequence alignment. The red color indicates highly conserved columns and blue indicates less conserved ones. The long black line represents the Pfam:PK domain and the black wavy line represents the Pfam:PK_C domain.

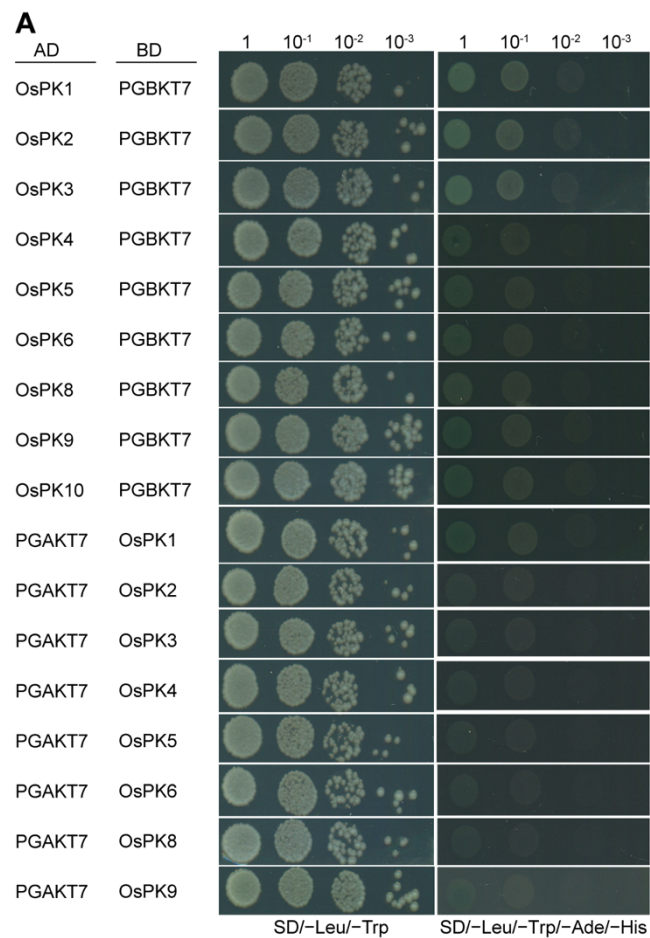


Figure S3. Interaction among PKs in rice. Y2H assay was used to detect interaction among PKs. Follow the concentration gradient of one-tenth on the non-selective pressure medium (SD/-Leu/-Trp) and the selective medium (SD/-Leu/-Trp/-Ade/-His) for dot observation. The interaction between T (pGADT7-T) and 53 (pGBKT7-53) was used as a positive control. And pGADT7, pGBKT7 were used as negative control.

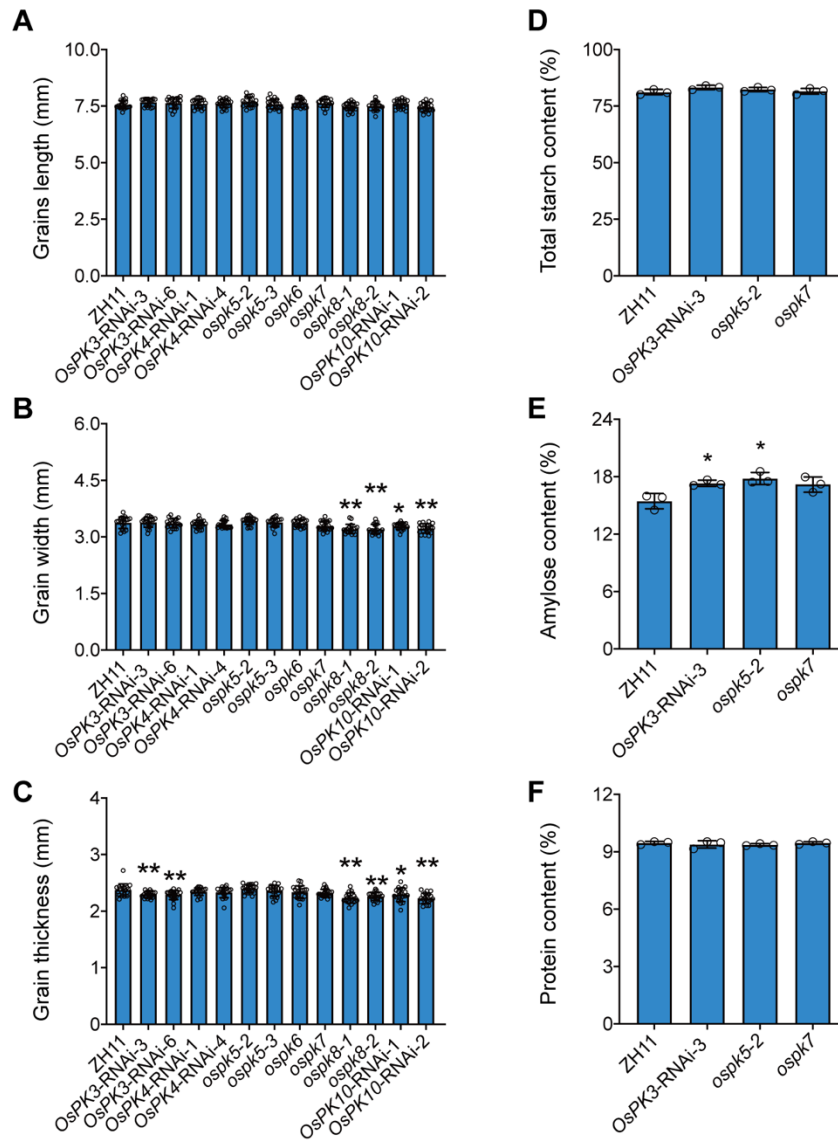


Figure S4. Yield-related traits and grain quality of ZH11, CRISPR/Cas9-based mutants, and RNAi-based material of PK genes in rice. **(A-C)** Grain length, grain width, and grain thickness of ZH11, the CRISPR/Cas9-based mutants, and RNAi material. $n=20$. Error bars indicate the mean \pm SD. **(D-F)** Total starch content, amylose content, and protein content of WT and mutants and RNAi lines seeds. Error bars indicate the mean \pm SD of three individual replicates. Asterisks indicate statistical significance between the WT and the CRISPR/Cas9-based mutants or RNAi-based materials, as determined by a Student's t -test (* $P<0.05$; ** $P<0.01$).

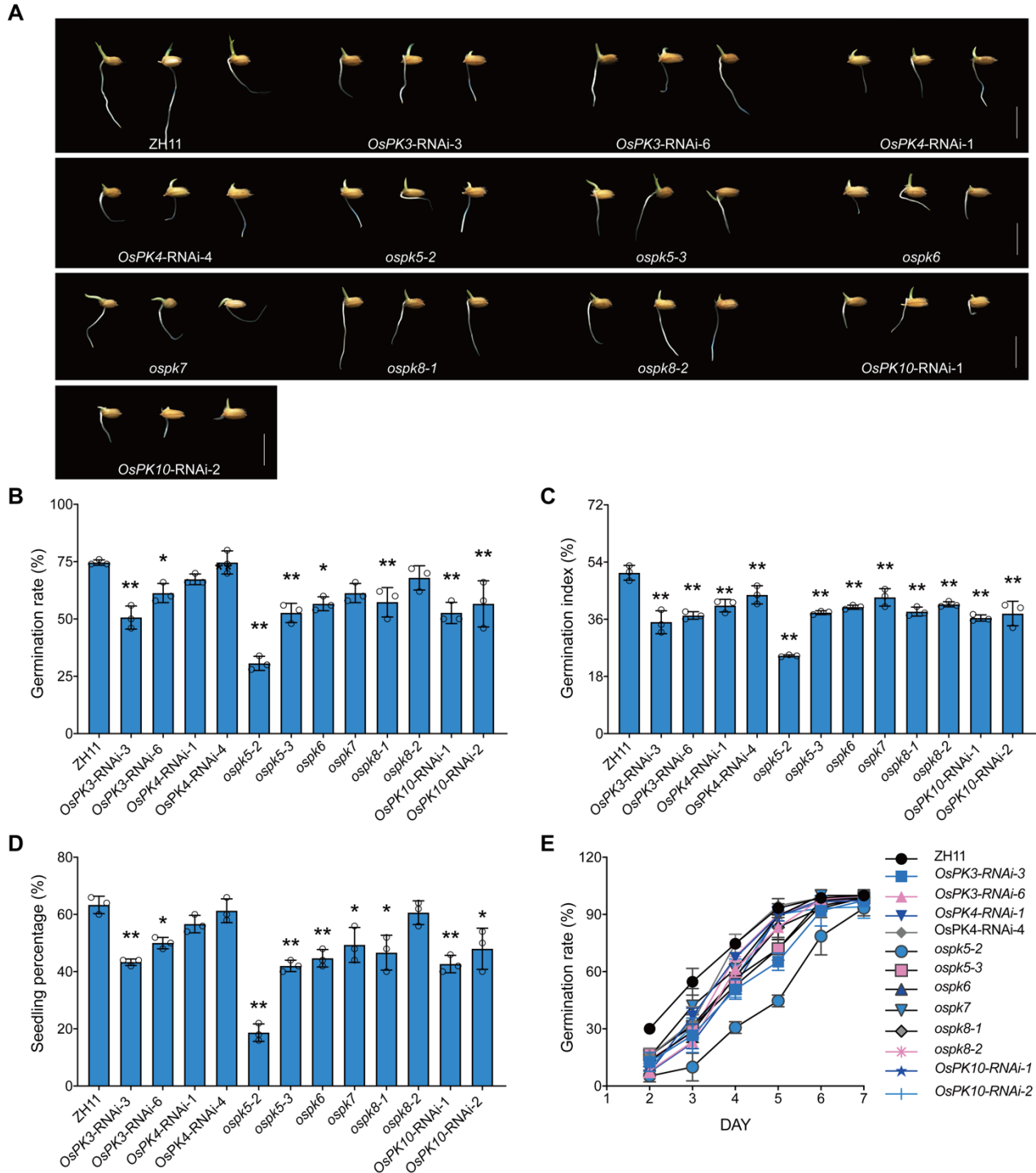


Figure S5. Seed germination of mutant and RNAi material of PK genes in rice. **(A)** Seed germination of CRISPR mutants, RNAi lines, and WT after 4 days of imbibition. Comparison of dynamic seed germination phenotype **(B)**, germination rates **(C)**, germination indexes, **(D)** and seedling percentages **(E)** between mutants, RNAi lines, and WT at 4 days after imbibition. Error bars indicate the mean \pm SD of three individual replicates. Asterisks indicate statistical significance between the WT and the mutant and RNAi material seeds, as determined by a Student's *t*-test (* P < 0.05; ** P < 0.01). Bars = 1 cm. DAY represents days after imbibition.

Table S1. Identification, protein physical and biochemical characteristics analysis of PKs in rice

Name	Locus Name	Genomic length(bp)	Length of CDS (bp)	Amino acids (aa)	Molecular Weight (KD)	Isoelectric Point	GRAVY	Instability index	Aliphatic index
<i>OsPK1</i>	LOC_Os11g05110	4395	1584	527	57.32	6.3	0.025	30.9	100.09
<i>OsPK2</i>	LOC_Os07g08340	4639	1737	578	62.87	5.92	-0.09	44.06	91.35
<i>OsPK3</i>	LOC_Os04g58110	3934	1536	511	55.23	8.25	0.032	31.61	99.78
<i>OsPK4</i>	LOC_Os12g05110	4515	1584	528	57.44	6.3	0.004	29.58	100.06
<i>OsPK5</i>	LOC_Os01g16960	5791	1533	510	54.905	8.14	0.047	33.3	94.31
<i>OsPK6</i>	LOC_Os01g47080	7340	1752	583	63.25	6.01	-0.143	38.33	87.14
<i>OsPK7</i>	LOC_Os03g20880	3479	1347	448	48.66	9.19	-0.194	48.51	86.67
<i>OsPK8</i>	LOC_Os03g46910	4097	1647	548	59.68	6.08	-0.065	35.29	93.5
<i>OsPK9</i>	LOC_Os10g42100	5870	1713	570	61.65	6.01	-0.159	42.13	87.12
<i>OsPK10</i>	LOC_Os11g10980	6539	1584	527	57.17	5.91	-0.082	35.7	92.66

Table S2. Primer used in this study

Primer name	Sequence
OsPK1-RT-F	ATTGCTGCCCATCAACTTCTC
OsPK1-RT-R	CAGCCAGAGTAGCCGAATTT
OsPK2-RT-F	CATGAGGAACTGGA ACTTAAA
OsPK2-RT-R	GACGAAAACGGCATCTAC
OsPK3-RT-F	GCTCTGTCGTTTGTCCGTAA
OsPK3-RT-R	TTTCAACCTTTGACATCAGCTT
OsPK4-RT-F	GAGGCCTCCTCACAAGTGC
OsPK4-RT-R	CACCTGGCTTCACAGCCTTA
OsPK5-RT-F	GTCATGCTCGACACCAAGG
OsPK5- RT-R	TGACCCTTCTTCAACTGTACG
OsPK6-RT-F	TGTTTCGTGGAAAGAGCG
OsPK6-RT-R	AAAGAAACGGCATAGTAGTCA
OsPK8-RT-F	TCCTCGAGCCAAACTGTCAT
OsPK8-RT-R	GAGCGATGCAATCAACTCCT
OsPK9-RT-F	GCAGTTCGTGAAGGTTCTGA
OsPK9-RT-R	GGATTCTGTTCTCTGTGCCA
OsPK10-RT-F	GGGCTCTGATCCAACAAAGT
OsPK10-RT-R	CTCCTCAGTACTCGCCATCA
OsPK1-1132-F	CGGGCTGCAGGAATTCATGCATTGACGAATCTGCTGC

OsPK1-1132-R	CGGTATCGATAAGCTTATCGTCCAGCTCAATGATCTTC
OsPK2-1132-F	CGGGCTGCAGGAATTCATGGCCGCCACCGCCGCCGCGG
OsPK2-1132-R	CGGTATCGATAAGCTTAGGTACGTTTCATGACCTGGATG
OsPK3-1132-F	CGGGCTGCAGGAATTCATGGCGAACATCGACATGGGG
OsPK3-1132-R	CGGTATCGATAAGCTTCTTCACGATGCAGATCTTGAT
OsPK4-1132-F	CGGGCTGCAGGAATTCATGCATTTCGACGAATCTGCTG
OsPK4-1132-R	CGGTATCGATAAGCTTATCGTCCAGCTCAATGATCTTC
OsPK5-1132-F	CGGGCTGCAGGAATTCATGGCGGTGATGGAGGAGCAGC
OsPK5-1132-R	CGGTATCGATAAGCTTGTTTCGCTGTCAGGAGCTTGAT
OsPK6-1132-F	CGGGCTGCAGGAATTCATGGCGCAGGTGGTGGCTGCGG
OsPK6-1132-R	CGGTATCGATAAGCTTAACCTTCCTGACCTGAATATTA
OsPK7-1132-F	CGGGCTGCAGGAATTCATGGCCGCCGCGGTCAGGCCG
OsPK7-1132-R	CGGTATCGATAAGCTTAATGCCTTTGGTGTAGCGGTG
OsPK8-1132-F	CGGGCTGCAGGAATTCATGGCAACCTCCGCCGCCGCCG
OsPK8-1132-R	CGGTATCGATAAGCTTGTCCACTATTCGAACTTGAAT
OsPK9-1132-F	CGGGCTGCAGGAATTCATGGCGGCGGCGGCGGCTGAG
OsPK9-1132-R	CGGTATCGATAAGCTTGCCCTGGACTTTCCTCACTTGA
OsPK10-1132-F	CGGGCTGCAGGAATTCATGCAGGGCGCCAACATGCTC
OsPK10-1132-R	CGGTATCGATAAGCTTCGAACTGTCACACTCGATGAT
OsPK1-AD-F	GGAGGCCAGTGAATTCATGCATTTCGACGAATCTGCTGC
OsPK1-AD-R	CGAGCTCGATGGATCCCTAATCGTCCAGCTCAATGATCTTC
OsPK2-AD-F	GGAGGCCAGTGAATTCATGGCCGCCACCGCCGCCGCGG

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OsPK2-AD-R	CGAGCTCGATGGATCCTCAAGGTACGTTTCATGACCTGGATG
OsPK3-AD-F	GGAGGCCAGTGAATTCATGGCGAACATCGACATGGGG
OsPK3-AD-R	CGAGCTCGATGGATCCTTACTTCACGATGCAGATCTTGAT
OsPK4-AD-F	GGAGGCCAGTGAATTCATGCATTTCGACGAATCTGCTG
OsPK4-AD-R	CGAGCTCGATGGATCCCTAATCGTCCAGCTCAATGATCTTC
OsPK5-AD-F	GGAGGCCAGTGAATTCATGGCGGTGATGGAGGAGCAGC
OsPK5-AD-R	CGAGCTCGATGGATCCCTAGTTCGCTGTCAGGAGCTTGAT
OsPK6-AD-F	GGAGGCCAGTGAATTCATGGCGCAGGTGGTGGCTGCGG
OsPK6-AD-R	CGAGCTCGATGGATCCTCAAACCTTCCTGACCTGAATATTA
OsPK8-AD-F	GGAGGCCAGTGAATTCATGGCCGCCGCGGTCAGGCCG
OsPK8-AD-R	CGAGCTCGATGGATCCTCAAATGCCTTTGGTGTAGCGGTG
OsPK9-AD-F	GGAGGCCAGTGAATTCATGGCGGCGGCGGCGGCTGAG
OsPK9-AD-R	CGAGCTCGATGGATCCTTAGCCCTGGACTTTCCTCACTTGA
OsPK10-AD-F	GGAGGCCAGTGAATTCATGCAGGGCGCCAACATGCTC
OsPK10-AD-R	CGAGCTCGATGGATCCTTACGAACTGTCACACTCGATGAT
OsPK1-BD-F	CATGGAGGCCGAATTCATGCATTTCGACGAATCTGCTGC
OsPK1-BD-R	TAGTTATGCGGCCGCTGCAGCTAATCGTCCAGCTCAATGATCTTC
OsPK2-BD-F	CATGGAGGCCGAATTCATGGCCGCCACCGCCGCCGCGG
OsPK2-BD-R	TAGTTATGCGGCCGCTGCAGTCAAGGTACGTTTCATGACCTGGATG
OsPK3-BD-F	CATGGAGGCCGAATTCATGGCGAACATCGACATGGGG
OsPK3-BD-R	TAGTTATGCGGCCGCTGCAGTTCCTTACGATGCAGATCTTGAT

OsPK4-BD-F	CATGGAGGCCGAATTCATGCATTCGACGAATCTGCTG
OsPK4-BD-R	TAGTTATGCGGCCGCTGCAGCTAATCGTCCAGCTCAATGATCTTC
OsPK5-BD-F	CATGGAGGCCGAATTCATGGCGGTGATGGAGGAGCAGC
OsPK5- BD-R	TAGTTATGCGGCCGCTGCAGCTAGTTCGCTGTCAGGAGCTTGAT
OsPK6-BD-F	CATGGAGGCCGAATTCATGGCGCAGGTGGTGGCTGCGG
OsPK6-BD-R	TAGTTATGCGGCCGCTGCAGTCAAACCTTCCTGACCTGAATATTA
OsPK8-BD-F	CATGGAGGCCGAATTCATGGCCGCCGCGGTCAGGCCG
OsPK8-BD-R	TAGTTATGCGGCCGCTGCAGTCAAATGCCTTTGGTGTAGCGGTG
OsPK9-BD-F	CATGGAGGCCGAATTCATGGCGGCGGCGGCGGCTGAG
OsPK9-BD-R	TAGTTATGCGGCCGCTGCAGTTAGCCCTGGACTTTCCTCACTTGA
OsPK10-BD-F	CATGGAGGCCGAATTCATGCAGGGCGCCAACATGCTC
OsPK10-BD-R	TAGTTATGCGGCCGCTGCAGTTACGAACTGTCACACTCGATGAT
OsPK3Ri-K-F	TTACTTCTGCACTAGGTACC GTACGCACAGCCAACAAGG
OsPK3Ri-S-R	CGTAGGGGCGATAGAGCTCGCAGAGCAACAACAGCATCA
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OsPK10Ri-S-R	CGTAGGGGCGATAGAGCTCATTGCCTTGCTGAGTTGTG
OsPK10Ri-P-F	TGCTTTTGGTTTTTCTGCAGATTGCCTTGCTGAGTTGTG
OsPK10Ri-B-R	GAATTCCCGGGGATCCTTGCTTGGTGCGGAGACT