**Table S1.** Primers, markers and constructs used in the study

| Primer name | Forward primer | Enzyme site | Reverse primer | Enzyme site | Use of primers | Resultant construct |
|---|---|---|---|---|---|---|
| | | | | | **Gene cloning** | |
| KP3 | TTTTGGCGCGCCGCCAGTGTCCACCAACCACAGTAATAAA | *Asc*I | TTTTGGCGCGCCGAACAGCCTGAGGAAGCAGAACATCGTC | *Asc*I | *Pikh-1* full-length gene | |
| KP3 ORF | TTTTGGCGCGCCGAGTAGCACTCAACGCAAAAGGGCATCGGC | *Asc*I | TTTTGGCGCGCCGAGCGGGGACTTAGAGTATTACATGAAGGA | *Asc*I | *Pihk-1* ORF | |
| KP4 | TTTTGGCGCGCCGCAAGATCAGTACCATCACGAGTAATAGCA | *Asc*I | TTTTGGCGCGCCAGGGACAGAATGACAGTGTAAGTGAGTTTG | *Asc*I | *Pikh-2* full-length gene | |
| KP4 ORF | TTTGGCGCGCCAGCTGAAAGTTGCAGTGAGAAGTACAGA | *Asc*I | TTTGGCGCGCCTCAGATGATTGGTAAGTTCTCCGATTTG | *Asc*I | *Pikh-2* ORF | |
| | | | | | **RNAi analysis** | |
| KP3i1 | TTTACTAGTGGTACCTGGCCAGATCTCCCAATCGT | *Spe*I-*Kpn*I | TTTGAGCTCGGATCCTGTGCCTGTGCAGGCTCAGT | *Sac*I-*Bam*HI | *Pikh-1* RNAi | |
| KP4i | CACCTTGAGCTGTCCGGCAAGTT | | CAGTGACGATGCCATCAACAA | | *Pikh-2* RNAi | |
| | | | | | **RACE** | |
| KP3-5RACE1 | CGGCATCATCCAGGTCGTAGGACAGC | | | | *Pikh-1* 5’ RACE | |
| KP3-5RACE2 | CCATCCTTGCACGCCGCATCGTCATC | | | | *Pikh-1* 5’ RACE nested primer | |
| KP3-3RACE1 | CCATCGGCATCACCAACCTGAAGAGC | | | | *Pikh-1* 3’ RACE | |
| KP3-3RACE2 | TGAAGAAAGAAGCCGAGGAGCATCCC | | | | *Pikh-1* 3’ RACE nested primer | |
| KP4-5RACE1 | CGATCTGCGATCTGTTGTGCCCGTAC | | | | *Pikh-2* 5’ RACE | |
| KP4-5RACE2 | GAATCCTGAGGGAGGCGGTGGGCAAA | | | | *Pikh-2* 5’ RACE nested primer | |
| KP4-3 RACE1 | TCGCCCTTGAGCTGTCTGGCAAGTTGGA | | | | *Pikh-2* 3’ RACE | |
| KP4-3 RACE2 | AGCTACCCAAGTGGATCACCAGCATCAC | | | | *Pikh-2* 3’ RACE nested primer | |
| | | | | | **Expression analysis** | |
| RRT5 | GAAGCTCTGATCAACGGTATTCC | | TCTTTGATCATCTTCGGGATACG | | *Pikh-1* | |
| RRT17 | TGAACTTCCACGATTGGATCCAC | | ACATGGTTCTTGAATACATCATGTC | | *Pikh-2* | |
| *Actin* | GAGACATTCAGCGTTCCAGC | | GTATGTCGTCTCGTGGATGC | | Internal reference | |
| *PBZ1* | GCCGCAAGTCATGTCCTAAAG | | GCCGTCCTCGAGCTCGTA | | Internal reference | |
| | | | | | **Transgenic plant test** | |
| Gus-linker | CATGAAGATGCGGACTTACG | | ATCCACGCCGTATTCGG | | | |
| *Hpt* | CCGCGCGGATCCGGGTGCCTAATGAGTGAGC | | TCCGGATGCCTCCGCTCGAAGTA | | | |
| | | | | | **Yeast two-hybrid assay** | |
| Y2H-kh1 | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCCGCTAGTAGTTTCTGTTTGAATTTCA | *AscI* | *Pikh-1* CDS | BD/ AD-kh1 |
| Y2H-kh2 | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCCTGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* CDS | BD/AD-kh2 |
| Y2H-kh1$_{CC}$ | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCCCTTCACATCTTTCTTTGCTTGGCTG | *AscI* | *Pikh-1* CC domain | BD/AD-kh1$_{CC}$ |
| Y2H-kh1$_{NBS}$ | TTGGCGCGCCGAGACGACGCCGATGCTTGC | *AscI* | TTGGCGCGCCTGGGGAGGATGCACTAGTACT | *AscI* | *Pikh-1* NBS domain | BD/AD-kh1$_{NBS}$ |
| Y2H-kh1$_{LRR}$ | TTGGCGCGCCAGGTTGATTCGCCGGCTGTCTC | *AscI* | TTGGCGCGCCGGCGCTGATGCCAGGGGCGTCGC | *AscI* | *Pikh-1* LRR domain | BD/AD-kh1$_{LRR}$ |
| Y2H-kh1$_{NBLRR}$ | TTGGCGCGCCGAGACGACGCCGATGCTTGC | *AscI* | TTGGCGCGCCGCTAGTAGTTTCTGTTTGAATTTCA | *AscI* | *Pikh-1* NBLRR domain | BD/AD-kh1$_{NBSLRR}$ |
| Y2H-k1$_{RATX1}$ | TTGGCGCGCCATGAAAATCGTGTTCAAGATTCCCA | *AscI* | TT GGCGCGCCTCAATCTTCCTTTACTTGGCTGAC | *AscI* | *Pik-1* RATX1 domain | BD/ AD-k1 $_{RATX1}$ |
| Y2H-Ks1$_{RATX1}$ | TTGGCGCGCCATGAAAATCGTGTTCAAGATTCCCA | *AscI* | TTGGCGCGCCTCAATCTTCCTTTACTTGGCTGAC | *AscI* | *Piks-1* RATX1 domain | BD/ AD-ks1 $_{RATX1}$ |
| Y2H-km1$_{RATX1}$ | TTGGCGCGCCATGAAAATCGTGTTCAAGATTCCCA | *AscI* | TTGGCGCGCCTCAATCTTCCTTTGCTTGGCTGA | *AscI* | *Pikm-1* RATX1domain | BD/ AD-km1$_{RATX1}$ |
| Y2H-kp1$_{RATX1}$ | TTGGCGCGCCATGAAAATCGTGATCAAGGTTGCC | *AscI* | TTGGCGCGCCTCAATCTTTATTTGCTTGGCTGACC | *AscI* | *Pikp-1* RATX1 domain | BD/ AD-kp1$_{RATX1}$ |
| Y2H-kh1$_{RATX1}$ | TTGGCGCGCCATGAAAATCGTGATCAAGGTTGCC | *AscI* | TTGGCGCGCCTCAATCTTTCTTTGCTTGGCTGAC | *AscI* | *Pikh-1* RATX1 domain | BD/ AD-kh1$_{RATX1}$ |
| Y2H-kh2$_{CC}$ | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCCCCCCACAGGCTCCTTTATACCAATG | *AscI* | *Pikh-2* CC domain | BD/AD-kh2$_{CC}$ |
| Y2H-kh2$_{NBS}$ | TTGGCGCGCCATGAAGACGGTCATGGAGGAGC | *AscI* | TTGGCGCGCCGCCTTTTGTTGAACTTCCACGATT | *AscI* | *Pikh-2* NBS domain | BD/AD-kh2$_{NBS}$ |
| Y2H-kh2$_{LRR}$ | TTGGCGCGCCCTGAACTTGGCTCAAGTGAGATCAC | *AscI* | TTGGCGCGCCTGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* LRR domain | BD /AD-kh2$_{LRR}$ |
| Y2H-kh2$_{NBLRR}$ | TTCCCCCGGGTATGAAGACGGTCATGGAGGAGC | *AscI* | TTGGCGCGCCTGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* NBLRR domain | BD/AD-kh2$_{NBSLRR}$ |
| Y2H-Ak | TTGGCGCGCCATGCGTGTTACCACTTTTA | *AscI* | TTGGCGCGCCAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* CDS | BD/AD-Ak |
| Y2H-Ak$_{22-113}$ | TTGGCGCGCCGAAACGGGCAACAAATA | *AscI* | TTGGCGCGCCAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* truncated CDS | BD/AD-Ak$_{22-113}$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| Y2H-Ak$_{53-113}$ | TTGGCGCGCCGAATGTTTTTGGTTTATG | *AscI* | TTGGCGCGCCAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* truncated CDS | BD/AD-Ak$_{53-113}$ |
| Y2H-Ak$_{1-107}$ | TTGGCGCGCCATGCGTGTTACCACTTTTA | *AscI* | TTGGCGCGCCCCCCAAAACAATCCAACCTG | *AscI* | *AvrPik-h* truncated CDS | BD/AD-Ak$_{1-107}$ |
| | | | | | **Pull-down assay** | |
| Pd-kh1 | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCCGCTAGTAGTTTCTGTTTGAATTTCA | *AscI* | *Pikh-1* CDS | kh1-Flag |
| Pd-kh1$_{CC}$ | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCCCTTCACATCTTTCTTTGCTTGGCTG | *AscI* | *Pikh-1* CC domain | kh1$_{CC}$-Flag |
| Pd-kh2$_{CC}$ | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCCTCACCCCACAGGCTCCTTTATACCAATG | *AscI* | *Pikh-2* CC domain | Kh2$_{CC}$-GST |
| Pd-Ak | TTGGCGCGCCATGCGTGTTACCACTTTTA | *AscI* | TTGGCGCGCCTTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* CDS | Ak-GST |
| Pd-Ak$_{22-113}$ | TTGGCGCGCCATGGAAACGGGCAACAAATA | *AscI* | TTGGCGCGCCTTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* truncated CDS | Ak$_{22-113}$-GST |
| | | | | | **BiFC analysis** | |
| BiFC-kh1 | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCC T GCTAGTAGTTTCTGTTTGAATTTCA | *AscI* | *Pikh-1* CDS | YCE-kh1 |
| BiFC-kh1$_{CC}$ | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCC T CTTCACATCTTTCTTTGCTTGGCTG | *AscI* | *Pikh-1* CC domain | YCE-kh1$_{CC}$ |
| BiFC-kh2$_{CC}$ | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCC T CCCCACAGGCTCCTTTATACCAATG | *AscI* | *Pikh-2* CC domain | YNE-kh2$_{CC}$ |
| BiFC-Ak | TTGGCGCGCCATGCGTGTTACCACTTTTA | *AscI* | TTGGCGCGCC T TTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* CDS | YNE-Ak |
| BiFC-Ak$_{22-113}$ | TTGGCGCGCCATGGAAACGGGCAACAAATA | *AscI* | TTGGCGCGCC T TTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* truncated CDS | YNE-Ak$_{22-113}$ |
| NLS-*Xba Ⅰ* | AATCTAGAATGCCT AAA AAG AAG CGT AAG GT | *Xba Ⅰ* | AATCTAGA AGAATTCACGGATCCAGGGTC | *Xba Ⅰ* | NLS | |
| NES-*Xba Ⅰ* | ATTTCTAGAATGAATGAATTAGCCTTGAAA | *Xba Ⅰ* | ATTTCTAGATGTCTTGTTGATATCAAGA | *Xba Ⅰ* | NES | |
| | | | | | **Subcellular localization analysis** | |
| eGFP-kh1 | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCC T GCTAGTAGTTTCTGTTTGAATTTCA | *AscI* | *Pikh-1* CDS | Pikh-1-eGFP |
| eGFP-kh1$_{CC}$ | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCC T CTTCACATCTTTCTTTGCTTGGCTG | *AscI* | *Pikh-1* CC domain | Pikh-1$_{CC}$-eGFP |
| eGFP-kh1$_{NBS}$ | TTGGCGCGCCGAGACGACGCCGATGCTTGC | *AscI* | TTGGCGCGCC T TGGGGAGGATGCACTAGTACT | *AscI* | *Pikh-1* NBS domain | Pikh-1$_{NBS}$-eGFP |
| eGFP-kh1$_{LRR}$ | TTGGCGCGCCAGGTTGATTCGCCGGCTGTCTC | *AscI* | TTGGCGCGCC T GGCGCTGATGCCAGGGGCGTCGC | *AscI* | *Pikh-1* LRR domain | Pikh-1$_{LRR}$-eGFP |
| eGFP-kh2 | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCC T TGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* CDS | Pikh-2-eGFP |
| eGFP-kh2$_{CC}$ | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCC T CCCCACAGGCTCCTTTATACCAATG | *AscI* | *Pikh-2* CC domain | Pikh-2$_{CC}$-eGFP |
| eGFP-kh2$_{NBS}$ | TTGGCGCGCCATGAAGACGGTCATGGAGGAGC | *AscI* | TTGGCGCGCC T GCCTTTTGTTGAACTTCCACGATT | *AscI* | *Pikh-2* NBS domain | Pikh-2$_{NBS}$-eGFP |
| eGFP-kh2$_{LRR}$ | TTGGCGCGCCCTGAACTTGGCTCAAGTGAGATCAC | *AscI* | TTGGCGCGCC T TGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* LRR domain | Pikh-2$_{LRR}$-eGFP |
| NLS- *NotI* | AAGCGGCCGCATGCCT AAA AAG AAG CGT AAG GT | *NotI* | AAGCGGCCGCAGAATTCACGGATCCAGGGTC | *NotI* | NLS | |
| NES- *NotI* | ATTGCGGCCGCATGAATGAATTAGCCTTGAAA | *NotI* | ATTGCGGCCGCCTGTCTTGTTGATATCAAGA | *NotI* | NES | |
| | | | | | **Transient overexpression in tabacoo** | |
| Te-kh1 | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCCTCAGCTAGTAGTTTCTGTTTGAATTTCA | *AscI* | *Pikh-1* CDS | 35S-kh1 |
| Te-kh2 | TTGGCGCGCCATGTATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCCTCATTGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* CDS | 35S-kh2 |
| Te-Ak | TTGGCGCGCCATGCGTGTTACCACTTTTA | *AscI* | TTGGCGCGCCTTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* CDS | 35S-Ak |
| Te-Ak$_{22-113}$ | TTGGCGCGCCATGGAAACGGGCAACAAATA | *AscI* | TTGGCGCGCCTTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* truncated CDS | 35S-Ak$_{22-113}$ |
| Te-kh2$_{CC}$ | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCCTCACCCCACAGGCTCCTTTATACCAATG | *AscI* | *Pikh-2* CC domain | 35S-kh2$_{CC}$ |
| Te-kh2$_{NBS}$ | TTGGCGCGCCATGAAGACGGTCATGGAGGAGC | *AscI* | TTGGCGCGCCTCAGCCTTTTGTTGAACTTCCACGATT | *AscI* | *Pikh-2* NBS domain | 35S-kh2$_{NBS}$ |
| Te-kh2$_{LRR}$ | TTGGCGCGCCATGCTGAACTTGGCTCAAGTGAGATCAC | *AscI* | TTGGCGCGCCTCATGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* LRR domain | 35S-kh2$_{LRR}$ |
| Te-kh2$_{NBSLRR}$ | TTCCCCCGGGATGTATGAAGACGGTCATGGAGGAGC | *AscI* | TTGGCGCGCCTCATGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* NBLRR domain | 35S-kh2$_{NBSLRR}$ |
| NLS-T | TATGCCT AAA AAG AAG CGT AAG GT | *Xcm Ⅰ* | ATTGGCGCGCCATGCCT AAA AAG AAG CGT AAG GT | *AscI* | NLS | 35S-kh2-NLS |
| NES-T | TATGAATGAATTAGCCTTGAAA | *Xcm Ⅰ* | ATTGGCGCGCCCTGTCTTGTTGATATCAAGA | *AscI* | NES | 35S-kh2-NES |
| kh2-prom | CGCGGATCCCGATGCCCTTTTGCGTTGAGTG | *BamHI* | CGCGGATCC GGCGCGCC CTTGTTCTCTGTACTTCTCACTGC | *BamHI* | *Pikh-2* promoter | |
| HA-kh2 | AACCCGGGATGTACCCATACGATGTTCCAGATT | *Sma Ⅰ* | AACCCGGGTGCAGTGACGATGCCATCAACAAAT | *Sma Ⅰ* | HA-*Pikh-2* | NP-kh2 |
| | | | | | **Transient expression in rice protoplast** | |
| kh1-prom | CGCGGATCCCTTGTTCTCTGTACTTCTCACTGC | *BamHI* | CGCGGATCC GGCGCGCC CGATGCCCTTTTGCGTTGAGTG | *BamHI* | *Pikh-1* promoter | |
| kh2-prom | CGCGGATCCCGATGCCCTTTTGCGTTGAGTG | *BamHI* | CGCGGATCC GGCGCGCC CTTGTTCTCTGTACTTCTCACTGC | *BamHI* | *Pikh-2* promoter | |
| Luc-kh1 | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCCTCAGCTAGTAGTTTCTGTTTGAATTTCA | *AscI* | *Pikh-1* CDS | Luc-kh1 |
| Luc-kh1$_{CC}$ | TTGGCGCGCCATGGAGGCGGCTGCCATGGCCGT | *AscI* | TTGGCGCGCCTCACTTCACATCTTTCTTTGCTTGGCTG | *AscI* | *Pikh-1* CC domain | Luc-kh1$_{CC}$ |

| | | | | | | |
|---|---|---|---|---|---|---|
| Luc-kh1$_{NBS}$ | TTGGCGCGCCATGGAGACGACGCCGATGCTTGC | *AscI* | TTGGCGCGCCTCATGGGGAGGATGCACTAGTACT | *AscI* | *Pikh-1* NBS domain | Luc- kh1$_{NBS}$ |
| Luc-kh1$_{LRR}$ | TTGGCGCGCCATGAGGTTGATTCGCCGGCTGTCTC | *AscI* | TTGGCGCGCCTCAGGCGCTGATGCCAGGGGCGTCGC | *AscI* | *Pikh-1 LRR domain* | Luc-kh1$_{LRR}$ |
| Luc-kh2 | TTGGCGCGCCATGTATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCCTCATTGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* CDS | Luc-kh2 |
| Luc-kh2$_{CC}$ | TTGGCGCGCCATGGAGTTGGTGGTAGGTGCTTC | *AscI* | TTGGCGCGCCTCACCCCACAGGCTCCTTTATACCAATG | *AscI* | *Pikh-2* CC domain | Luc-kh2$_{CC}$ |
| Luc-kh2$_{NBS}$ | TTGGCGCGCCATGAAGACGGTCATGGAGGAGC | *AscI* | TTGGCGCGCCTCAGCCTTTTGTTGAACTTCCACGATT | *AscI* | *Pikh-2* NBS domain | Luc-kh2$_{NBS}$ |
| Luc-kh2$_{LRR}$ | TTGGCGCGCCATGCTGAACTTGGCTCAAGTGAGATCAC | *AscI* | TTGGCGCGCCTCATGCAGTGACGATGCCATCAACAAAT | *AscI* | *Pikh-2* LRR domain | Luc-kh2$_{LRR}$ |
| Luc-Ak | TTGGCGCGCCATGCGTGTTACCACTTTTA | *AscI* | TTGGCGCGCCTTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* CDS | Ubi- Ak |
| Luc-Ak$_{22-113}$ | TTGGCGCGCCGAAACGGGCAACAAATA | *AscI* | TTGGCGCGCCTTAAAAGCCGGGCCTTTTTTTCC | *AscI* | *AvrPik-h* truncated CDS | Ubi- Ak$_{22-113}$ |
| FLAG-Nos | AACCCGGGATGGATTACAAGGATGATGATGATA | *Sma I* | AACCCGGG CGATCTAGTAACATAGATGA | *Sma I* | FLAG-tagged fragments | |
| HA-Nos | AACCCGGG ATGTACCCATACGATGTTCCAGATT | *Sma I* | AACCCGGG CGATCTAGTAACATAGATGA | *Sma I* | HA-tagged fragments | |