# Supplementary Materials: Expressing OsMPK4 Impairs Plant Growth but Enhances the Resistance of Rice to the Striped Stem Borer Chilo suppressalis 

Xiaoli Liu, Jiancai Li, Liping Xu, Qi Wang and Yonggen Lou*

> 1 ATGGATTCCTCCTCCGGCGGCGCGGGCGGCGGCGGCGGCGCGCAGATCAAGGGGATGGGG
> $1 \mathrm{M} D \mathrm{~S} S \mathrm{~S} G \mathrm{G} A \operatorname{G} G \mathrm{G} G \mathrm{G} A \quad Q \quad I \quad K \quad G \quad M \quad G$
> 61 ACGCACGGGGGCCGCTACGTGCTGTACAACGTGTACGGGAACTTCTTCGAGGTCTCCTCC
121 AAGTACGCCCCTCCCATCCGCCCCATCGGCCGGGGCGCCTACGGCATTGTCTGCGCGGCT
181 GTTAACTCGGAGAACGGCGAGGAAGTTGCCATCAAGAAGATTGGCAATGCATTCGACAAC
241 CATATCGATGCCAAGCGGACACTGAGAGAAATCAAGCTGCTTCGCCACATGGACCACGAG
301 AATATTATTGCCATAAAGGACATAATTCGCCCCCCAAGAAGAGACAACTTTAATGATGTT
$101 \mathrm{~N} \quad \mathrm{I} \quad \mathrm{I} \quad \mathrm{A} \quad \mathrm{I} \quad \mathrm{K} \quad \mathrm{D} \quad \mathrm{I} \quad \mathrm{I} \quad \mathrm{R} \quad \mathrm{P} \quad \mathrm{P} \quad \mathrm{R} \quad \mathrm{R} \quad \mathrm{D} \quad \mathrm{N} \quad \mathrm{F} \quad \mathrm{N} \quad \mathrm{D} \quad \mathrm{V}$
361 TACATTGTTTCTGAGTTGATGGATACTGATCTCCATCAGATCATACGCTCAAATCAACCA
421 TTGACTGATGACCACTGCCAGTACTTCCTGTACCAGTTGCTACGAGGGCTAAAATATGTG
481 CACTCGGCAAATGTCTTGCACCGTGATCTGAAGCCAAGCAATTTGTTCCTTAATGCAAAT
$\begin{array}{llllllllllllllllllllll}161 & \mathrm{H} & \mathrm{S} & \mathrm{A} & \mathrm{N} & \mathrm{V} & \mathrm{L} & \mathrm{H} & \mathrm{R} & \mathrm{D} & \mathrm{L} & \mathrm{K} & \mathrm{P} & \mathrm{S} & \mathrm{N} & \mathrm{L} & \mathrm{F} & \mathrm{L} & \mathrm{N} & \mathrm{A} & \mathrm{N}\end{array}$
541 TGTGATCTCAAGATTGCTGATTTTGGGCTTGCAAGAACCACTACGGAGACTGACCTCATG
601 ACAGAGTATGTGGTCACTCGTTGGTATCGAGCACCAGAGCTGCTGTTGAACTGCTCGCAG
661 TATACTGCTGCTATTGATGTCTGGTCAGTTGGATGCATACTTGGTGAAATTGTGACTCGT
721 CAACCCCTGTTTCCTGGAAGGGATTACATTCAGCAACTAAAATTGATCACTGAGCTGATA
781 GGGTCGCCAGATGACTCAAGCCTAGGGTTTCTTCGGAGTGATAATGCAAGAAGATACATG
$\begin{array}{lllllllllllllllllllll}261 & G & S & P & D & D & S & S & L & G & F & L & R & S & D & N & A & R & R & Y & M\end{array}$
841 AAACAGCTACCACAGTACCCAAGGCAGGACTTCCGCTTGCGCTTCCGCAACATGTCTGCT
901 GGTGCAGTCGATCTGTTAGAGAAAATGCTGGTGTTTGACCCAAGCAGACGGATAACTGTT
961 GATGAGGCTCTTCATCACCCATACTTGGCTTCTCTTCATGACATCAATGAAGAACCCACC
$\begin{array}{lllllllllllllllllllll}321 & D & E & A & L & H & H & P & Y & I & A & S & I & H & D & I & N & E & E & P & T\end{array}$
1021 TGCCCAGCACCTTTCAGCTTTGATTTTGAGCAACCATCCTTTACTGAAGAACATATAAAA
1081 GAACTCATCTGGAGGGAATCCTTGGCATTTAATCCGGATCCTCCCTACTAA

Figure S1. Sequences of nucleotides and deduced amino acids of OsMPK4. The stop codon is marked by an asterisk.


Figure S2. Phylogenetic analysis of group B-type MAPKs from different species. The unrooted tree was constructed with a maximum likelihood method on the basis of the alignment of protein sequences and confirmation of the tree topology by bootstrap analysis (1000 replicates) were performed with MEGA software (default settings except the replicates of the bootstrap value). Species acronyms are included before the protein name: Ac, Ananas comosus; At, Arabidopsis thaliana; Bd, Brachypodium distachyon; Bn, Brassica napus; Cp, Carica papaya; Ga, Gossypium arboreum; Gm, Glycine max; Ha, Helianthus annuus; Na, Nicotiana attenuata; Nt, Nicotiana tabacum; Os, Oryza sativa; Pc, Petroselinum crispum; Pt, Populus trichocarpa; Sb, Sorghum bicolor; Si, Setaria italica; St, Solanum tuberosum; Zm, Zea mays. The scale bar represents 0.05 amino acid substitutions per site in the primary structure. Sequence data in the phylogenic tree can be found in the GenBank/EMBL data libraries under accession numbers: AcMPK2 (XP_020080580.1); AtMPK4 (NP_192046.1); AtMPK5 (NP_567378.4); AtMPK11 (NP_001117210.1); BdMPK6 (XP_003574247.1); BnMPK4 (NP_001303223.1); CpMPK4 (XP_021887822.1); GaMPK4 (KHG15311.1); GmMPK4a (NP_001339892.1); GmMPK4b (NP_001242364.2); HaMPK4 (XP_021969289.1); NaMPK4 (ABO65100.1); NtMPK4 (NP_001312502.1); NtNRK1 (BAB32406.1); OsMPK4 (XP_015615011.1); PcMPK4 (AAN65180.1); PtMPK4 (XP_002302599.1); SbMPK6 (XP_002467591.1); SiMPK6 (XP_004983829.1); StMPK4 (BAB93529.1); ZmMPK1 (AIX47138.1); ZmMPK4 (BAA74733.1); ZmSIMK1 (NP_001105239.2). The diamond indicates the gene OsMPK4 that is characterized in this paper.


Figure S3. Transformation vector used in this study

