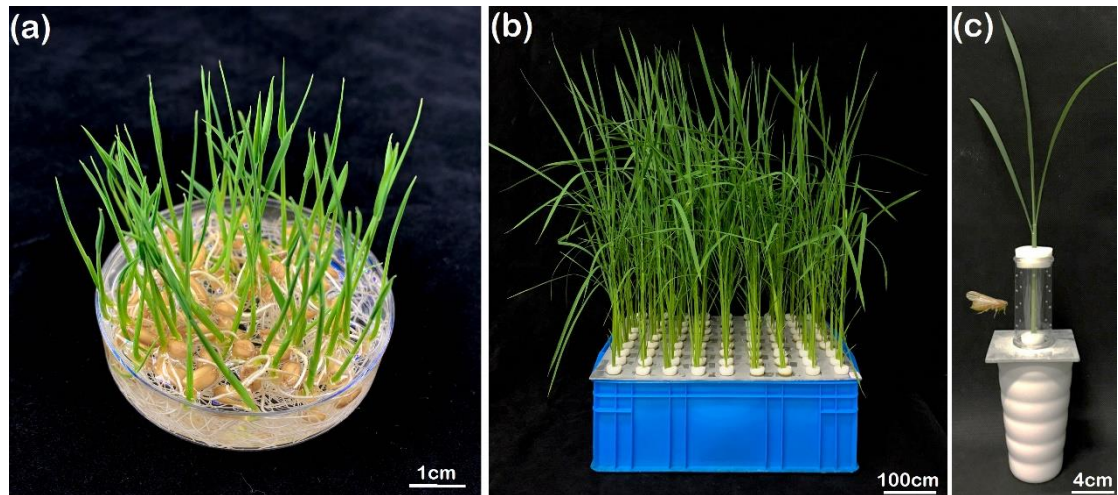


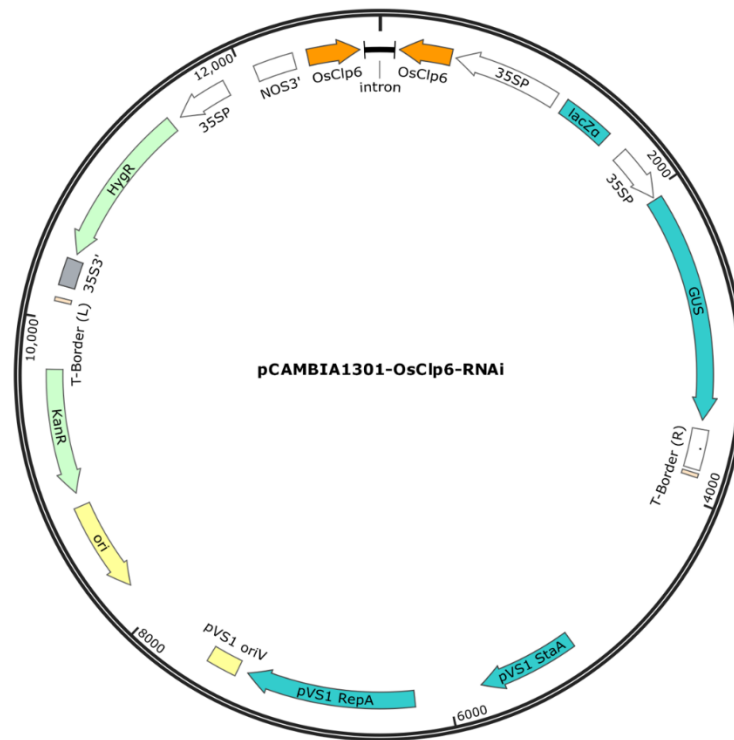
Supporting Information

# Silencing an ATP-dependent caseinolytic protease proteolytic subunit gene enhances the resistance of rice to *Nilaparvata lugens*

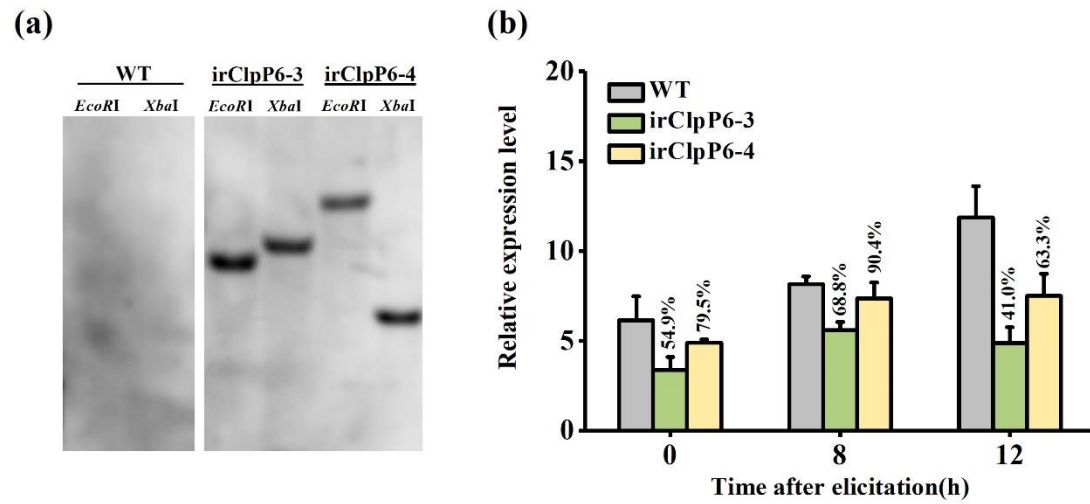
Shuting Chen, Miaofen Ye, Peng Kuai, Lin Chen, Yonggen Lou\*



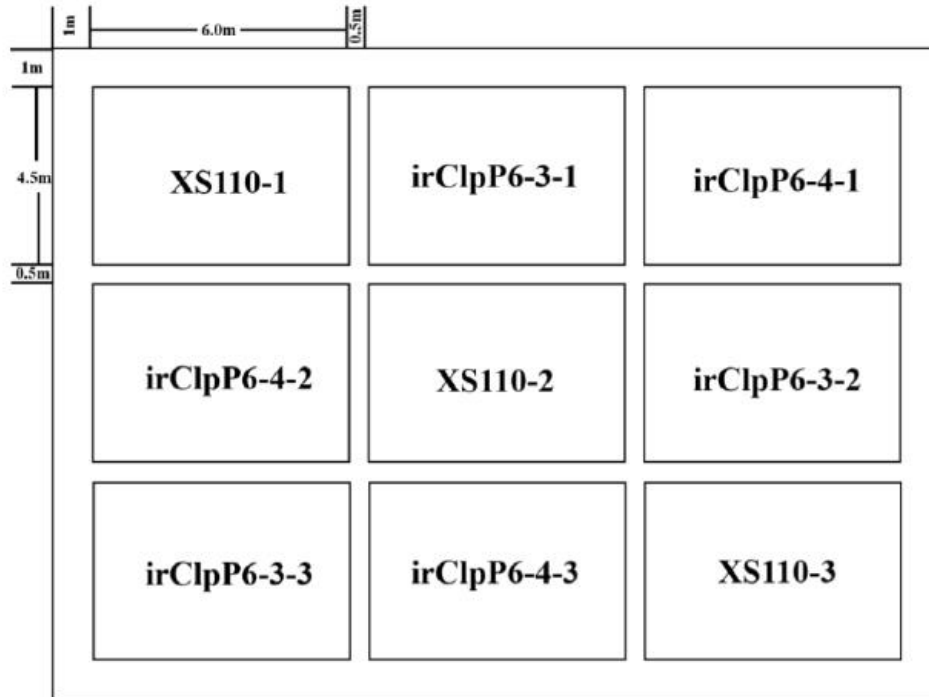
**Figure S1.** Setups for herbivore bioassay or treatment.



**Figure S2.** Vectors used in this study. The vector used for obtaining transgenic plants by silencing *OsClpP6*.



**Figure S3.** DNA gel-bolt analysis of WT and irClpP6 lines and the transcript levels of *OsClpP6* in irClpP6 lines. (a) Genomic DNA was digested with EcoRI or XbaI. The blot was hybridized with a probe specific for reporter gene GUS. (b) Mean expression levels (+ SE,  $n = 5$ ) of *OsClpP6* in WT and irClpP6 lines at 0, 8 h and 12h after BPH infestation.



**Figure S4.** Diagram of field experiment for OsClpP6.

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1      atggcgccctatggccatctccaccccgctcgccctccgcgcctcccgacccgcctcctc
1      M A P M A I S T P L A L R A S P T R L L

61     tcccgccaggcgagcgagcgagccaaatcaggcggtggctctcccagggtccacaatttgtaacca
21     S R R R S G A K S G V A L P G P Q F V P

121    cctggatatttcttcaaagttggacgagaggatacattgtcattcttctctgaggaaaaat
41     P G I S S K L D E R I H C H S S L R K N

181    acaattgtagcatcagagaatgaaaatccacctttaatgcctgccataatgactcctgct
61     T I V A S E N E N P P L M P A I M T P A

241    ggtgctcttgatctggcaactgtattgttggggaaccgcattatcttcattggtcaatat
81     G A L D L A T V L L G N R I I F I G Q Y

301    attaaactcgcaagtagcacagcggtgtaatatcacagcttgtcacacttgctgctgttgat
101    I N S Q V A Q R V I S Q L V T L A A V D

361    gaagaggctgatattctgatctacctgaactgccccggcggaagtctctactccatctta
121    E E A D I L I Y L N C P G G S L Y S I L

421    gcaatttatgattgcatgtcctggatcaagcccaaagttggaacagtggtgctttggtgtt
141    A I Y D C M S W I K P K V G T V C F G V

481    gttgctagccaggcgagcaattatacttgctggcggtgagaagggaatgcgttatgccatg
161    V A S Q A A I I L A G G E K G M R Y A M

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181    P N A R V M I H Q P Q G V S E G N V E E

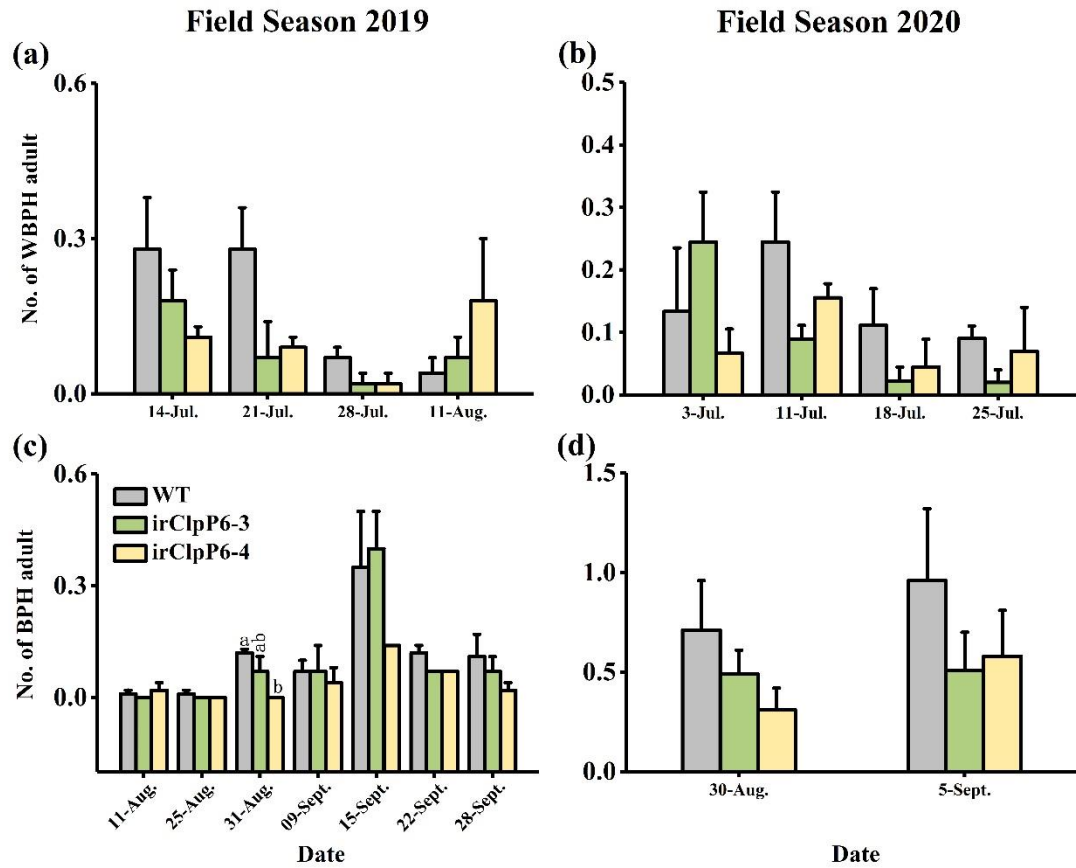
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201    V R R Q V G E T I Y A R D K V D K M F A

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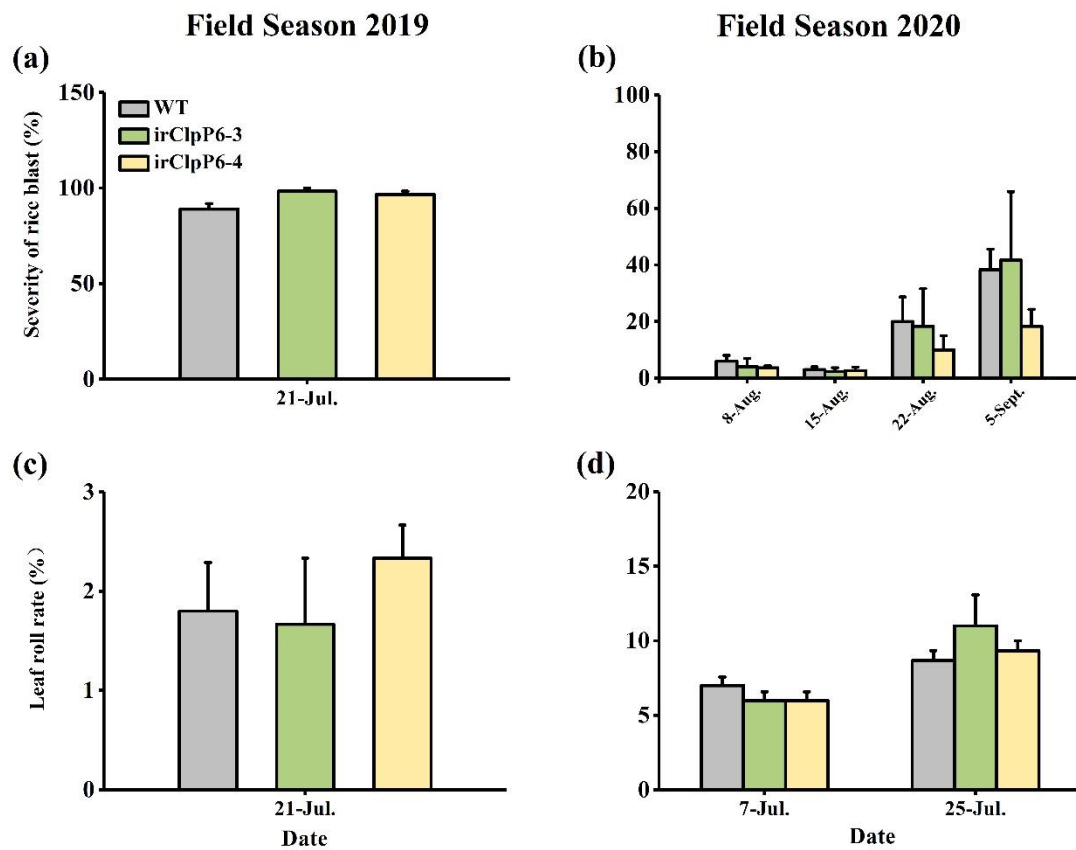
721    tcttcactctgaagccatggactttggactagttgatgccctgctggaacaagataactaa
241    S S S E A M D F G L V D A L L E T R Y *

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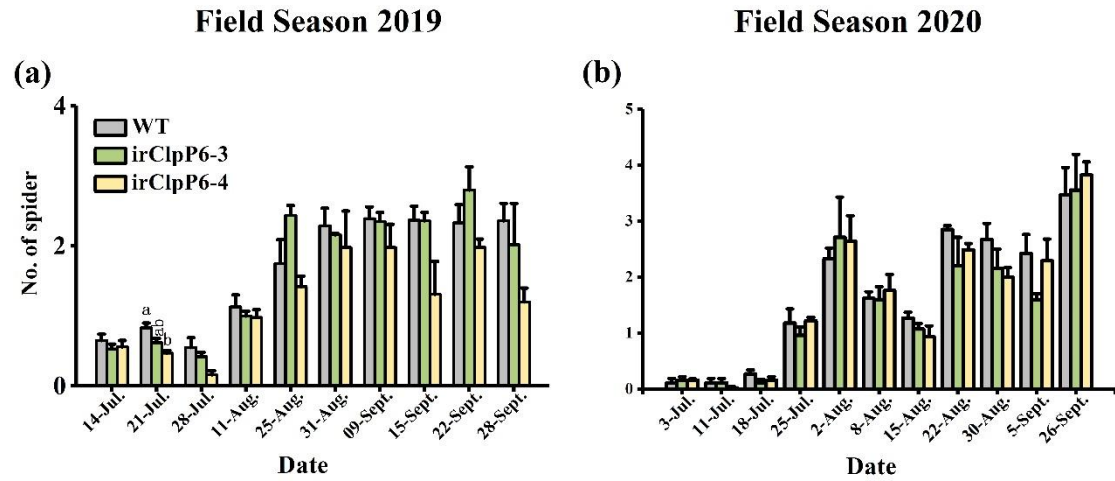
**Figure S5.** Sequences of nucleotides and deduced amino acids of OsClpP6.



**Figure S6.** Silencing *OsClpP6* decreases the population densities of WBPH and BPH adults in the field. Mean number (+ SE,  $n = 3$ ) of white-backed planthopper (WBPH) (a-b) and BPH adults (c-d) per WT and irClpP6 plant in year 2019 (left panel) and year 2020 (right panel). Different letters represent significant difference among lines ( $p < 0.05$ , Tukey's HSD post-hoc tests).

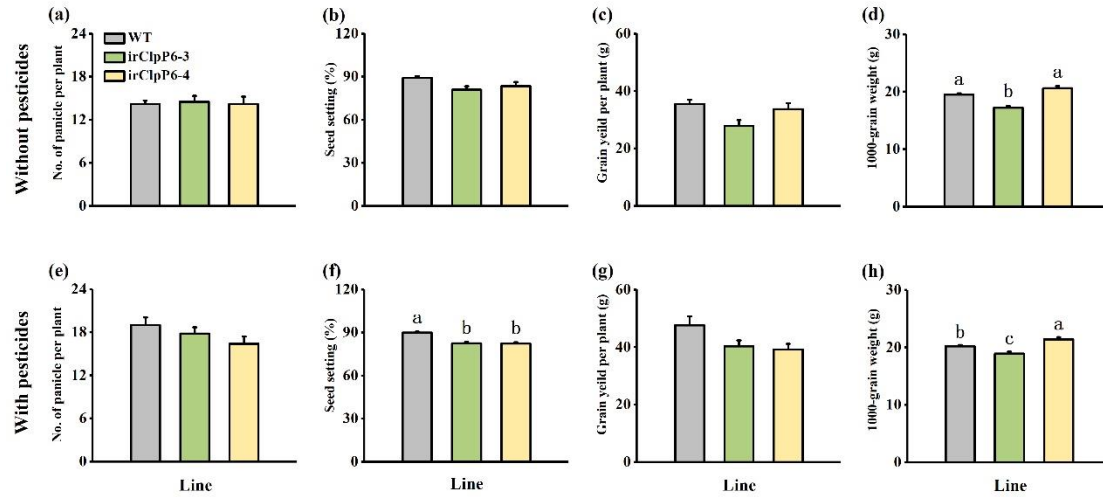


**Figure S7.** OsClpP6 does not affect other diseases and pests. (a-d) Mean severities (+ SE,  $n = 3$ ) of rice blast disease (a-b) and mean leaf roll rate (+ SE,  $n = 3$ ) caused by *Cnaphalocrocis medinalis* (c-d) per WT and irClpP6 plant in year 2019 (left panel) and year 2020 (left panel).



**Figure S8.** Silencing *OsClpP6* has little effect on natural enemies. Mean number (+ SE,  $n = 3$ ) of spiders per WT and irClpP6 plant in year 2019 (a) and year 2020 (b). Different letters represent significant difference among lines ( $p < 0.05$ , Tukey's HSD post-hoc tests).





**Figure S9.** The effect of OsClpP6 on the yield of rice. Mean number of panicle per plant (a, e), seed setting rate (b, f), grain yield per plant (c, g) and 1000-grain weight (d, h) (+ SE,  $n = 3$ ) of WT and irClpP6 lines in 2020 in the field without pesticides (up panel) and with pesticides (down panel). Different letters represent significant difference among lines ( $p < 0.05$ , Tukey's HSD post-hoc tests).